Gardner-Webb University
Digital Commons @ Gardner-Webb University

Education Theses, Dissertations and Projects

School of Education

2011

An Analysis of Individual Teachers' Development of Instruction Based on ClassScape Program Data

Jason L. Parker
Gardner-Webb University

Follow this and additional works at: http://digitalcommons.gardner-webb.edu/education_etd

Part of the Curriculum and Instruction Commons, Educational Assessment, Evaluation, and Research Commons, Educational Methods Commons, and the Junior High, Intermediate, Middle School Education and Teaching Commons

Recommended Citation

An Analysis of Individual Teachers' Development of Instruction
Based on ClassScape Program Data

By
Jason L. Parker

A Dissertation Submitted to the
Gardner-Webb University School of Education
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

Gardner-Webb University
2011

Approval Page

This dissertation was submitted by Jason L. Parker under the direction of the persons listed below. It was submitted to the Gardner-Webb University School of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Gardner-Webb University.

_____   _____
A. Doug Eury, Ed.D.   Date
Committee Chair

_____   _____
Jane C. King, Ed.D.   Date
Committee Member

_____   _____
Faye H. Rucker, Ed.D.   Date
Committee Member

_____   _____
Frances B. Burch, Ph.D.   Date
Dean of the Graduate School

Acknowledgements

This process would not have been able to be completed without the help and encouragement of several people. I am forever thankful to God for His mercy and forgiveness in my life; with Him, nothing is impossible.

Second, my mother, father, and sister have supported me from the beginning. Their constant support and confidence allowed me to see this dissertation through to completion. They were always positive and uplifting, which means so much to me. I will forever appreciate their support because it helped me reach the finish line. This dissertation is dedicated to them. Without my family, I would not be where I am today.

I would also like to thank my professors at Gardner-Webb. Dr. Eury, Dr. King, and Dr. Rucker made a phenomenal dissertation committee. Each of them has their own strengths, but together they made a great team. Dr. Doug Eury always provided insight and guidance to help me understand the different components of the dissertation. Dr. Jane King was always willing to answer my questions with patience and good advice. Dr. Faye Rucker, who was one of my undergraduate professors, has encouraged me to this goal since I was in the undergraduate program.

Finally, my fellow class members were also a great source of support. Dr. Kelly Taylor and Dr. Jennifer Putnam were always available when I needed a sounding board. Their support and encouragement helped me to stay on track and to learn to take the dissertation one day at a time.

Abstract

An Analysis of Individual Teachers' Development of Instruction Based on ClassScape Program Data. Parker, Jason L., 2011: Dissertation, Gardner-Webb University, Middle Schools/Formative Assessment/ClassScape Program/Student Assessment/Planning of Instruction

This dissertation was designed to examine and assess the effectiveness of the ClassScape formative assessment tool on the planning, implementation, and evaluation of instruction at a rural middle school in western North Carolina. The teachers had the ClassScape program for 3 years, but were not using the program to plan future instruction. The tools used for data collection revealed the strengths and weaknesses of the implementation of the program. It is essential that schools have ongoing formative assessment practices in order for students to be successful in the 21st Century.

This case study utilized the mixed methods approach in order to successfully collect and analyze the data to develop a correct conclusion so others can see the importance of using formative assessment correctly. In order to give the researcher an appropriate amount of data to determine the impact of the ClassScape program on the formative assessment process, the following data collection tools were utilized: teacher surveys, student surveys, teacher focus groups, a student focus group, and individual teacher interviews.

The results from this mixed methods case study indicate that teachers at the selected school were using the ClassScape assessment program as well as other methods of formative assessment to form future instruction. The teachers and students involved in the study, however, were not pleased with how the ClassScape assessment program was designed. Several barriers, including time, lack of computer availability, and the requirement to use several other technology programs hindered the level that ClassScape was utilized.

Table of Contents

Chapter 1: Introduction

Introduction

Teaching should not be measured by how much is taught, it should be measured by the productiveness of students (Berk, 2005). The No Child Left Behind (NCLB) legislation ushered in a new era of data-driven decision making and assessment into the country's public schools (NCLB, 2009). NCLB used "evidenced-based decisions" and "scientifically based research" over 100 times (Mann & Shakeshaft, 2003). Since the No Child Left Behind legislation was enacted, school systems have been forced to transfer their focus to student data and achievement so resources can be distributed appropriately (NCLB, 2009). Unfortunately, many assessments are called formative assessments simply because they are given frequently (Chappuis, 2005). According to Garrison and Ehringhaus (2007), "Formative Assessment is part of the instructional process. When incorporated into classroom practice, it provides the information needed to adjust teaching and learning while they are happening" (p. 1).

The new Race to the Top initiative is poised to continue the push for more formative assessments (U.S. Department of Education, 2009). In fact, the Race to the Top initiative presents the possibility to start key transformations for the teaching and instructional processes in the United States (Heritage, 2010a). Many testing companies are pushing new products that are supposedly formative assessment tools because they generate benchmark assessments (Redfield, Roeber, & Stiggins, 2008). The same research implies that these testing companies are actually creating short-term summative assessments. Schools must be aware of these assessment companies and be sure that formative assessments are accurate. Many teachers do not understand the differences between formative and summative assessments (Dixon & Williams, 2001). While the

new mandates continue to change the norms of education in the United States, it is important that "The balance of mandates and resources should be shifted from an emphasis on external forms of assessment to an increased emphasis on classroom formative assessment designed to assist learning" (Pellegrino, Chudowsky, & Glaser, 2001, p. 14).

According to Heritage (2010a), teachers must have a transparent acknowledgment of the framework of formative assessment and how it can improve learning. Heritage (2010a) indicated that this transformation must include a continuous effort, which forces teachers to make major changes to their teaching practice. "Without a clear recognition of the nature of formative assessment and its promise for improving learning, we risk losing the present historic opportunity to better serve our students, their teachers, and the future of the nation" (Heritage, 2010a, p. 17).

In 2005, superintendents identified that the most important approach to improving the achievement of students was to use data to make decisions (Coburn & Talbert, 2006). In an effort to respond to the superintendents' requirements for data in decision making, school-based administrators and teachers are now moving toward more assessments during instruction. Instructional decisions can be made during the school year to help students be successful on standardized tests (Young & Kim, 2010). The power of formative assessments is most often overshadowed by the headlines of high-stakes testing and higher standards being brought into the educational system (Box, 2008).

The number of researchers completing studies on formative assessments in education continues to increase. Marzano and Haystead (2008) alluded to how important it is for educators to realize that instruction is clearly linked to assessment. Schmoker

(2006) conveyed the importance of teachers investigating student work to prepare future lessons. Thompson and William (2007) expressed the importance of formative assessments to propel future learning activities. A large portion of the research, however, concentrates on the differences between formative assessment and summative assessment. Torrance and Pryor (1998) stated, "formative assessment *per se*, as opposed to formative assessment distinguished from summative assessment, has received relatively little attention" (p. 14). Missing in this research is the important examination regarding how students and teachers should have distinct roles within formative assessment so it can be a useful tool for education.

Formative assessment has taken on many roles in education. The teacher's level of knowledge of formative assessment determines how often it is used in their classroom (Heritage, 2010a). If formative assessment is used properly in the classroom, student gains could possibly have four to five times the effect of reduced class size (Ehrenberg, Brewer, Gamoran, & Willms, 2001). The same study found that formative assessment allowed the students who achieved the least to learn the most. Black and Wiliam (1998) determined that formative assessment allowed the lower level learners to achieve the largest gains ever reported in educational interventions. This study proves that formative assessment really is a tool that helps decrease the achievement gaps in classrooms. This argument continues to be one of the most authoritative arguments supporting formative assessment.

Assessment is completed for the benefit of students; assessment is not something we do to students (Green, 1998). It is important to understand that formative assessment is "an assessment *for* learning, not an assessment *of* learning" (Box, 2008, p. 7). First, formative assessment allows teachers to have information that can be analyzed to make

pertinent decisions about current and future lessons (National Research Council (NRC),

1996, p. 33). The information sharing between the teacher and the student is also a good

starting point for dialogue about the material. The data collected during formative

assessments is crucial in helping the teacher realize if the instructional practices are

allowing the students to make significant progress toward the desired goals (Wood &

West, 1998). The information, however, cannot be collected just as a standard practice.

The information must be used to provide feedback to students (Butler & McNunn, 2006).

Second, formative assessment is designed to move students toward mastery of the

material instead of meeting individual objectives (Tunstall, 1996). This mindset allows

students to become more comfortable with the pace of their learning and also helps them

to realize that feedback from the teacher is not punitive. Instead, the teacher feedback

will become a tool to help the student master the concepts (Tunstall, 1996). The positive

and timely feedback to students allows the students to recognize what concepts have been

mastered and which concepts still need to be developed. Not only should the feedback

allow the student to identify his/her strengths and weaknesses but it should also offer

them some strategies about how to make the needed improvements. This type of

feedback is termed *feedforward* (Priestley & Sime, 2005). Third, formative assessment

allows students to take ownership of their own learning (Stiggins, Arter, Chappuis, &

Chappuis, 2005). This self-motivation will allow students to adjust their learning to

become successful in the class while relying on teachers and parents less.

In order for students to learn the maximum amount possible, and in order for the

instruction to be clearer, formative assessment must be a part of the sequence of learning

and teaching (NRC, 2001). Even after vast amounts of research on the topic of

assessment, the majority of teachers still do not realize that teaching and assessment work

together to help the students succeed in the classroom (Heritage, 2010b). In classrooms where formative assessments are used on a normal basis, students reach higher academic levels because the assessments allow the teacher to meet the individual needs of students ("Formative assessment: Improving," 2005). In order for formative assessment to reach its highest potential, teachers must have a clear picture of how to use the data from formative assessments to direct their teaching. Daws and Singh (1996) indicated that a low percentage of teachers understand the role of formative assessments as a component of their normal instructional practices. The same study determined that many teachers issue assignments only so grades can be collected. The selected teachers did not see the importance of giving the students feedback or subsequent activities so the students could master the concepts.

Formative assessment is most powerful when no grade is given for the student (Chappuis & Chappuis, 2008). This is because a formative assessment should serve as a meaningful practice for students. Teachers should constantly give feedback to students (Chappuis & Chappuis, 2008). The students should be able to use this feedback to self-assess their progress to take ownership of their success. When the classroom reaches a mutual understanding that assessment is going to be ongoing, all stakeholders will learn that the assessment information is designed to improve the learning and not to simply judge the learning. All of this mindset pivots on the fact that the teacher is willing to provide appropriate feedback to the students. The World-Class Instructional Design and Assessment (WIDA) Consortium (2009) released a cycle that formative assessment should follow. This cycle uses the following components: goals, instruction, measuring, and feedback. This cycle includes feedback as an essential cornerstone for student success. According to WIDA (2009), student feedback is often overlooked by teachers.

Student feedback is crucial because it allows the teacher the opportunity to set new goals for students. The teacher then has the chance to reteach the material to the students to ensure they have learned the objectives from the lesson.

Boston (2002) identified several examples of formative assessment that are used frequently in classrooms. The first strategy is think-pair-share. This strategy involves students beginning to discuss a topic in small groups then selecting a representative to present the information to a larger group. Another strategy involves the teacher giving students several answer choices and allowing them to vote on which answer they think is correct. By completing this strategy, the teacher is able to quickly gauge how many students are aware of the correct answer without giving a quiz or test. The third strategy Boston (2002) discussed was having students summarize what was discussed in the lesson. A student's written summary allows the teacher to see what the student took away from the lesson. Finally, the author mentions small group or individual student interviews. By interviewing students, the teacher can quickly visualize to what extent the subject matter was understood.

Problem Statement

Assessment is an issue that has long been abandoned by educators (Stiggins, Frisbie, & Griswold, 1989). Teachers in the United States do not have a firm understanding of how to make formative conclusions about students (Schafer, 1993). Heritage, Kim, Vendlinski, and Herman (2009) acknowledged that teachers have deficient skills in using assessment data to plan future instruction. The Partnership for Assessment of Readiness for College and Careers (PARCC, 2010) acknowledged that teachers "need additional support to collect evidence of learning to form instruction, hour by hour, day by day, and week by week" (p. 56). As a result, teachers are not adequately

prepared to conduct formative assessments in their classrooms with regard to planning of

instruction, implementation, and assessment because teachers do not view formative

assessment as a fundamental part of their teaching methodology. This problem is

evidenced by a teacher's lesson plans, observations, and teacher interviews. Instead,

formative assessment is viewed as a separate component to instruction that is outside the

teacher's normal realm of duties (Neesom, 2000). The separation of instruction and

assessment is a major hindrance to students ("Using assessments to," 2009). Some of the

hindrance is due to the fact that teachers do not have a clear understanding of what

formative assessment is and how the data from the assessments assist the teacher in

making changes in their instructional practices (Wininger & Norman, 2005). Much of

this lack of understanding can be attributed to the fact that the many teachers feel they

lack proper training in the area of assessment (Wise, Lukin, & Roos, 1991). Many

teacher education programs in the United States do not offer assessment classes as part of

the teacher licensure requirements. In fact, the research reports that only one-half of the

states in America require assessment classes as part of teacher education programs

(Stiggins, 1999). Additionally, only 12 states unambiguously require teacher candidates

to be knowledgeable in the area of assessment (Stiggins, 2002). At other times, teachers

simply chose not to use formative assessment as a regular part of their teaching repertoire

even though they were aware of some of the benefits formative assessment would bring

to their classroom (Daws & Singh, 1996).

Purpose

The purpose of this study was to determine the impact of formative assessment

using the ClassScape formative assessment tool in a rural middle school in western North

Carolina and how the formative assessments were impacting student learning and teacher

planning. The teachers at this school used the ClassScape system for 3 years (Confidential, personal communication, October 2010). However, in those 3 years, a myriad of other initiatives for the classroom teacher were also established (Confidential, personal communication, October 2010). These other programs limited the teacher's ability to effectively learn how the ClassScape program works and how it can benefit the children (Confidential, personal communication, November 2010). Currently, the majority of the teachers at the selected middle school do not use ClassScape the way it was intended to be used (Confidential, personal communication, September 2010).

The school has a diverse population with 25 subgroups (North Carolina Department of Public Instruction (NCDPI), 2010). North Carolina Public Schools allows schools to group students into various subgroups based upon their ethnicity, gender, socioeconomic status, and race. A subgroup is formed when 40 or more students of the same classification are enrolled at the school. Students may be members of multiple subgroups if needed. The majority of the teachers had been teaching at this school for over 10 years (North Carolina Department of Public Instruction, 2010). ClassScape and other initiatives being required by the district office forced the teachers to teach more in less time (Confidential, personal communication, September 2010). According to the NC Report Card (NCDPI, 2010), the school has, for the most part, been below the district average on the end-of-year standardized test.

Table 1

Percentage of Students at Level III or IV on Reading and Math EOG Tests for 2010

	6th Reading	6th Math	7th Reading	7th Math	8th Reading	8th Math
2008						
School	68.2%	75.5%	59.1%	79.1%	56.6%	70.1%
District	65.2%	75.0%	56.5%	79.2%	61.3%	78.5%
2009						
School	72.5%	84.1%	69.8%	85.6%	76.5%	90.0%
District	77.4%	88.8%	71.4%	88.1%	74.7%	90.8%
2010						
School	79.4%	89.3%	71.7%	87.4%	75.2%	90.4%
District	82.8%	89.8%	73.5%	89.6%	77.8%	93.1%

Research Questions

After researching the current status of formative assessment at the selected rural middle school in North Carolina, the literature surrounding formative assessment, and the capabilities of the ClassScape program, the following questions were created. These questions guided this action research project.

1. What was the impact of the utilization of the ClassScape program and other formative assessments on the learning environment of the classroom?

2. What was the impact of the utilization of the ClassScape program and other formative assessments on instructional planning?

3. What was the impact of the utilization of the ClassScape program on instructional implementation as a part of formative assessment?

4. What was the impact of the utilization of the ClassScape program on instructional assessment as a part of the formative assessment process?

Researcher's Role

The researcher, as an assistant principal in the selected school, was partially responsible for implementing new curriculum and maintaining a high level of instruction. The researcher strived to develop positive relationships with the teachers at the selected school. The administration of the school had a strong, positive working relationship with the faculty and staff.

Significance of Study

This study was intended to further expand teachers' knowledge of formative assessment. This is necessary because "The best instructional improvements are informed by ongoing assessment of student strengths and needs" (Biancarosa & Snow, 2006, p. 19). Although research exists for formative assessment, additional research needs to be completed to validate the effectiveness of the use of the ClassScape formative assessment program. This investigation will further the previous research on formative assessment while customizing the data with the ClassScape program. Since the ClassScape program is relatively new and more school systems are purchasing this system, this examination will allow school districts to have a clearer understanding on how ClassScape impacts classroom instruction. It will also allow the teachers and the administrators of the selected school the ability to see the importance of formative assessments and how the assessments can help foster student learning. In fact, formative assessment "promotes the goals of lifelong learning, including higher levels of student achievement, greater equity of student outcomes, and improved learning to learn skills" ("Assessment for learning," p. 2).

ClassScape Program Overview

ClassScape was developed as an assessment tool in order to allow teachers in North Carolina to "evaluate students' academic progress on an ongoing basis, provide real-time feedback of the students' performance, and to allow teachers to self-assess the effectiveness of their instructional delivery in real-time" ("Classscape assessment system," 2008, p. 2). The same report also disclosed that ClassScape allowed teachers to "evaluate the degree to which they have focused their instruction, aligned their instruction to designated standards, assessed the alignment of their own instructional strategies, and…monitor student progress on an ongoing basis" ("Classscape assessment system," 2008, p. 2). The ClassScape program offered reading and math assessments for Grades 3 through 8. ClassScape also offered assessments for fifth and eighth grade science, physical science, geometry, U.S. history, and NC EXTEND 2 reading assessments. ClassScape issued the following status report for August 1, 2010 to December 31, 2010:

- 1.2 million assessment starts

- 503, 024 students registered

- 77,000 test items in database

- 1,010 schools enrolled

- 109 districts/charter schools/universities represented

- 62 districts enrolled state-wide. ("Where in the," 2011, p. 3).

As understood from the data above, ClassScape was a program that was being used more frequently in the public schools in North Carolina. This study evaluated to what degree the ClassScape system was being used to drive the planning of instruction, the implementation of instruction, and the assessment of instruction.

Formative Assessment Principles

"Ideas about assessments have undergone important changes in recent years. In

the new view, assessment and learning are two sides of the same coin….When students

engage in assessments, they should learn from those assessments" (National Research

Council, 1996, pp. 5-6). This statement reflects the current mood of the education

movement in the United States. In recent years, teachers and administrators have come to

understand that assessment and learning are linked together. This is far from the prior

belief that learning and assessment are two separate entities. In the race to help teachers

become more comfortable with formative assessments, school districts have forgotten

one piece of the puzzle. School districts have neglected to ensure that their teachers are

adequately prepared to formatively assess their students (Stiggins, 2002). In fact,

Stiggins (2002) stated that "Few teachers are prepared to face the challenges of classroom

assessment because they have not been given the opportunity to learn to do so" (p. 4). In

order to combat this issue, it is important that school districts, school building

administrators, and individual teachers are aware of the following principles of the

formative assessment process.

Cook (2009), in consultation with the World-class Instructional Design and

Assessment (WIDA) Center, published a list of best exercises for formative assessment.

The following list is considered acceptable methods to administer formative assessments

in the classroom: technically sound, embedded and ongoing, learning goals, examples,

identification of current skills, the identification of future goals, and integrated, dynamic,

and rigorous professional development. Below is a further explanation of each of these

components.

Technically sound. In order for formative assessments to be considered

technically sound, Cook (2009) determined that formative assessments have to be valid and reliable. To be considered valid, formative assessments have to determine what perceptions and skill sets need to be assessed. In addition to the above, formative assessments become valid when teachers ensure that the assessments are intertwined with the goals of the instruction in addition to being solely concentrated on the learning of the students. To be considered reliable, formative assessments must be able to be given multiple times while producing the same result. Furthermore, reliable formative assessments supply teachers and students with data that can be acted upon.

Embedded and ongoing. Cook (2009) also ascertained that formative assessments must be maintained within the instructional process and be completed throughout the duration of the instruction. In other words, formative assessments must not be given in isolation; they must be given in a way where students view the assessments as part of the regular instructional process. Additionally, Cook (2009) stated that formative assessments must be "...a process, not an event" (p. 11). This means that students must not only be given formative assessments at the beginning or end of an instruction, but formative assessments must be administered throughout each instructional unit.

Learning goals. In order for formative assessment to be considered effective, Cook (2009) concluded that the learning goals that the students are given must be abundantly unambiguous and specific so students can completely comprehend what is expected of them. In addition to the above, formative assessments must be suitably arranged so students can scaffold their learning throughout the unit. Finally, the learning goals for the students must be directly linked to the goals of the instruction.

Examples. The WIDA (2009) presentation presented information with what type

of examples must be used for teachers and students. For teachers, the rubrics used for student learning must include illustrations for students so they can understand how the levels within the rubric are different. Additionally, teachers must be willing to use student examples when introducing a topic or project so students can connect to the expectations while they are being discussed. For students, teachers should be willing to grant access to the instruments that will be used to assess their performance. In addition to the instrument availability, students should also be instructed in how to understand the rubrics and apply the information included on the rubrics to their own work.

Current skills, future goals, and integrated. According to Cook (2009), teachers should dedicate a portion of their class time to ensure students are aware of their current capabilities and proficiencies. Teachers should utilize time during conferences to underscore the abilities of the students. While reviewing the current status of the students, the teacher should also seek to share the future goals of the students. The discussion of the students' future goals should be completed with precision so students can determine the exact path they need to take. Cook (2009) stated that teachers need to be mindful to inform students of their "next steps" (p. 15) so the learning process can continue. However, the same researcher noted that it is important to inform students in familiar terms of the next process in their learning progression. While Cook (2009) inferred that formative assessments should not be exact replicas of other assessments used at the school, he did imply that formative assessments should be somewhat related with the other assessments. According to Cook (2009), formative assessments should have a direct impact on the students' performances on benchmark assessments. The students' performances on benchmarks should have a direct impact on the students' performances on summative assessments.

Dynamic and rigorous professional development. Cook (2009) alluded to the fact that formative assessments should not be difficult for teachers to administer to students. In fact, the researcher implied that formative assessments should easily conform to the regular classroom schedule. Formative assessments should not have to be scheduled or done outside of the regular instructional setting.

Chapter 2: Literature Review

Introduction

"Adolescents deserve assessments that show them their strengths as well as their needs and that guides their teachers to design instruction that will best help them grow…" (Moore, Bean, Birdyshaw, & Rycik, 1999, p. 6). However, teachers across the United States feel they are not adequately prepared to conduct formative assessments in their classrooms (Rogers, 1991). In fact, teachers are requesting more professional development in order to compensate for deficiencies in assessment preparedness from their teacher education program (Rogers, 1991). It is important for teachers to become proficient in the area of assessment because of the assortment of restructuring efforts in the field of education (Mertler, 2003). Teachers also need to be proficient in the field of formative assessment because of the positive effect it has on the students. After surveying over 600 teachers using a survey that measured teachers' knowledge of validity on testing, Mertler (2003) discovered that less than half of the respondents could offer a reasonable answer on how to add validity to assessments. Mertler (2003) has identified several facets of the teacher's role that are influenced by assessment. Some of the features impacted by assessment include:

1. Guiding decisions about large-group instruction.

2. Developing individualized instructional programs.

3. Determining the extent to which instructional objectives have been met.

4. Providing information for administrative decisions, such as promotion, retention, or graduation.

5. Providing data for state and federal programs. (Mertler, 2003, p. 3)

Formative assessment, when used appropriately by teachers, can have an

immediate impact on the performance of students (Volante, Beckett, Reid, & Drake, 2010). This conclusion was gained after interviewing 20 teachers. Each interview lasted approximately 60 minutes. The results were analyzed using the constant comparison approach. Part of the conclusions from the study revealed that when teachers' perceptions of their teaching and assessment increase, so do the performances of their students. This type of assessment will also create an environment where students are filled with self-assurance (Campos & O'Hern, 2007). Additional research indicates that formative assessment can lessen the achievement gap by assisting lower level learners gain the most from the instruction (Black, Harrison, Lee, Marshall, & Wiliam, 2004). Stiggins and Chappuis (2005) identified four conditions that must be met for assessment to be valuable to students and to ensure the achievement gap is reduced. Those conditions are: assessment development must always be driven by a clearly articulated purpose, assessments must arise from and accurately reflect clearly specified and appropriate achievement expectations, assessment methods used must be capable of accurately reflecting the intended targets and are used as teaching tools along the way to proficiency, and communication systems must deliver assessment results into the hands of their intended users in a timely, understandable, and helpful manner (Stiggins & Chappuis, 2005, pp. 5-6). Stiggins and Chappuis (2005) suggested that when these conditions are implemented into the classroom instruction and assessment becomes student-centered, the achievement gaps will be reduced because the students' pronouncements about their scholarly qualifications will be positive.

Since formative assessment allows teachers to form their instruction as the unit is taught, this tool gives teachers the ability to modify their instruction, to correct misconceptions, and to reteach a difficult component of the unit. By completing

formative assessments, teachers are able to identify problems and to correct the problems so the learning process is continued (Morrison, Ross, & Kemp, 2004, pp. 319-320). Since formative assessments should have the ability to alter teachers' lesson plans, this type of assessment is valuable to the success of students. Other research suggests that formative assessment gives students an avenue where they can correct their own learning (Fret & Schmitt, 2007). The ability for students to develop skills to self-reflect will allow them to have a better understanding of their own learning process. By completing formative assessments, teachers will be able to help students develop these skills sooner.

For formative assessment to be used correctly, teachers must have a firm grasp on how formative assessment can be implemented in their classrooms (Stiggins, 2001). When formative assessment is implemented successfully, a dramatic shift will be made in the classroom (Black & Wiliam, 1998). The classroom will move from a grading classroom to a learning classroom (Volante, Beckett, Reid, & Drake, 2010). Although the concept of formative assessment has been present in education for quite some time, assessing students during the instruction is still a mystery to many educators (Black & Wiliam, 1998). In order for true formative assessment to be accomplished, the following components must be fulfilled (Black & Wiliam, 1998). First, teachers must be willing to make modifications to the teaching and learning practices in order to reflect the data from the student assessments (Chappuis & Stiggins, 2002). The data from the assessments gives the teacher an idea of what the students did and did not grasp during the instruction (Young & Giebelhaus, 2005). Second, formative assessment involves students receiving timely advice and recommendations from the teacher about what and how they can improve (Chappuis & Stiggins, 2002). Finally, formative assessments are more effective when the students are allowed to have an active role in the learning process through self-

assessments (Greenstein, 2010).

History of Formative Assessment

Formative assessment is not a new concept to education (Bell & Cowie, 2000; Gipps & Stobart, 1997). The notion of formative assessment actually began in the realm of evaluation. In 1963, Robert Glaser realized that traditional tests were not the best practices for him to properly gauge the effects of some innovative technology. According to Glaser (1963), the traditional tests were not analyzing the different levels of understanding between the individuals. The traditional tests were simply measuring the relative standard. Scriven (1967) suggested two terms for the different types of evaluation. He began to describe the differences between formative evaluation and summative evaluation. According to this research, formative evaluation was designed to promote enhancement of the material during the activity. Scriven (1967) said that formative evaluation "may have a role in the on-going improvement of the curriculum" (p. 41). Summative evaluation, on the other hand, was designed to determine whether the outcomes of the object matched the before stated goals. The perception of formative assessment continued to develop. As the development progressed, formative assessment became more intertwined into the concept of learning for mastery (Bloom, Hastings, & Madaus, 1971). These researchers classified formative assessment as "the systematic evaluation in the process of curriculum construction, teaching, and learning for the purpose of improving any of these processes" (Bloom et al., 1971, p. 117). Under the concept of learning for mastery, students do not move from one goal to another goal until they have demonstrated mastery for the current objective. Learning for mastery also calls for the teacher to give a formative assessment for the unit of instruction. This assessment is to determine whether or not the students successfully mastered the goals for the unit. If

the students have not successfully met the stated goals of the unit, the teacher can use the data gained from the assessments to plan future activities for the students so they can meet the goals (Bloom et al., 1971). It is easy to see why mastery learning has been an important factor in the development of formative assessment. Mastery learning, like formative assessment, helps students of all instructional levels develop their academic potential (Guskey & Gates, 1986). However, in recent developments in education, formative assessment has continued to evolve to include assessment practices that do not automatically fall under the realm of learning for mastery. Wiliam and Black (1996) argued that formative assessment should have a component where teachers would be able to identify the subsistence of the genuine level of achievement and the preferred level of achievement. In addition to previous information, the research suggests that formative assessments should include proven techniques that could help the students close the achievement gap. Additionally, Wiliam and Black (1996) suggested that formative assessments can be intertwined in daily activities as long as the teacher can gain information about the progress of the students.

Constructivist Theory and Formative Assessment

Formative assessment is deeply rooted in the constructive educational theory. Tittle (1994) stated:

A cognitive constructivist perspective...suggests that teachers and learners construct schemas or integrate representations from assessments into existing views of the self, of teaching and learning, and of the curriculum. These interpretations include knowledge and beliefs and may also result in intents to use and actual use of assessments (p. 151).

Herman, Aschbacher, and Winters (1992) furthered the link between formative

assessment and the constructivist theory. Their study divulged that there is a necessity to link classroom assessments with teaching outcomes as well as the information being taught. Assessment within the sphere of learning is embedded within the constructivist theory. This is because the constructivist theory consists of learning being an active progression that the student is involved in as well as the systematic restructuring of the learning to ensure each student is grasping the material (Shepard, 1991). Additionally, according to Gamaron, Secada, and Marrett (1998), the constructivist theory further supports formative assessment because it allows the focus of the classroom to be moved from the teacher to the students. Formative assessment requires the teacher to move away from weeks and weeks of lesson plans and focus on the results of the formative assessment the teacher uses to gauge the level of understanding the students have of the content.

Formative Assessment Confusion

Formative assessment in the United States still receives a considerably different explanation than in other countries where formative assessment is an established and understood practice of the educational process (Heritage, 2010a). Many schools in the United States administer assessments throughout the school year and call them formative assessments (Perie, Marion, & Gong, 2009). Many of these assessments are mandated from the district level and are not meant to give feedback to the students. Teachers are warned to not call assessments formative unless they truly are. Shepard (2009) warned, "it is the use of an instrument, rather than the instrument itself that must be shown, with evidence, to warrant the claim of formative assessment" (p. 33). Many of today's teachers do not realize why assessments are important. They are fixated on the assessment itself. Brookhart (2009) said "there is too much emphasis on 'assessment'

(tests and assessment, schedules and data reports) and not enough on formation (learning)" (p. 1). Brookhart (2009) went on to say that formative assessment is truly "as much about learning as it is about assessment" (p. 1). Since the majority of schools in the United States have a high focus on testing, many schools use formative assessment as a means to assess students. It is not used as a way to direct the learning of a classroom.

Part of the confusion exists because of the lack of a solid definition for formative assessments. This lack of a definition has a direct impact on the lack of best practices for formative assessments (Dunn & Mulvenon, 2009). Because of the deficit of a solid and common definition, research supporting documented best practices for formative assessments will most likely be lacking. Wininger and Norman (2005) researched 20 of the most regularly used textbooks for educational psychology. The study revealed that each textbook's definition of formative assessment was distinctly different from the other definitions. Not only did the definitions of formative assessment show a discrepancy from book to book, the acknowledged significance and purpose was different as well. The study also identified different names for formative assessment. Other terms used in the textbooks were *formative evaluation* and *informal assessment* (Wininger & Norman, 2005). Teachers need to enter the classroom with a firm understanding of what formative assessment is and how it will benefit their students. According to another study, teachers want to understand the differences between formative assessments and other types of assessments. Neesom (2000) came to the following conclusion: "To avoid conflict and to clarify misconceptions, teachers would value clear guidance about what constitutes formative assessment" (p. 7).

Different Definitions of Formative Assessment

Many different definitions exist for formative assessment. Black and Wiliam

(1998) stated,

> We use the general term *assessment* to refer to all those activities undertaken by
>
> teachers -- and by their students in assessing themselves -- that provide
>
> information to be used as feedback to modify teaching and learning activities.
>
> Such assessment becomes *formative assessment* when the evidence is actually
>
> used to adapt the teaching to meet student needs. (p. 2)

In 2006, Popham defined formative assessment as follows: "An assessment is formative

to the extent that information from the assessment is used, during the instructional

segment in which the assessment occurred, to adjust the information with the intent of

better meeting the needs of the students addressed" (pp. 3-4). According to this

definition, formative assessment is only suitable to implement during a short timeframe,

while the same group of students is being taught and assessed. In 2008, the same author,

Popham, wrote, "Formative assessment is a planned process in which assessment-elicited

evidence of students' status is used by teachers to adjust their ongoing instructional

procedures or by students to adjust their current learning tactics" (p. 6). According to

Popham's newer definition, formative assessment can occur with or without the same

time restrictions as his 2006 definition. The Council of Chief State School Officers

(CCSSO), which is a major association in the United States, is composed of professionals

that lead each state's educational department. This group has an enormous amount of

political power over education legislation. In 2006, this organization started to call

attention to the area of educational assessment. As a result, the State Collaborative on

Assessment and Student Standards (SCASS) and the Formative Assessment for Students

and Teachers (FAST) were established. These groups were composed of approximately

25 states. The representatives of these states approved a definition of formative

assessment. According to the CCSSO, and reported by McManus (2008), formative assessment is "a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes" (p. 3).

Along with the lack of a solid definition, there are some misunderstandings present about the clear differences between formative and summative assessment (Chappuis & Chappuis, 2008). The sustained use of summative assessments being used and classified as formative assessments continues to destabilize the correct use of formative assessments (Foster & Poppers, 2009). This misuse of assessments hinders the full development of formative assessment and obstructs the capability of formative assessments to increase the accomplishments of students (Chappuis & Chappuis, 2008). Bell and Cowie (2000) suggested that formative assessment can be used as summative assessment and summative assessment can be used as formative assessment. This further adds to the dialogue surrounding the truth concerning formative assessment. Additionally, Wininger (2005) utilized a summative assessment as a formative assessment. The rationale for this occurrence was the feedback the students received from the assignment. For this investigation, Wininger (2005) gave the respondents quantitative and qualitative feedback. These examples further justify the need to restructure the formative assessment definitions into a user-friendly format so teachers can learn effective formative assessment strategies to use in their classrooms.

Formative Assessment Feedback

Feedback is a crucial component of any formative assessment. In fact, feedback to students has been established as the most influential component to support the learning of students (Sadler, 1989). Teachers, however, often have a skewed idea of how student

feedback should look in their classrooms. Many teachers provide feedback for the

incorrect reasons. Black and Wiliam (1998) stated, "Where the classroom culture focuses

on rewards, gold stars, grades, or place-in-the-class ranking, then pupils look for ways to

obtain the best marks rather than at the needs of their learning…" (pp. 8-9). Feedback

with formative assessments should come only after the students have had the opportunity

to react to the original instruction (Hattie & Timperely, 2007). The feedback should also

be given to students in segments so students have the ability to understand what the

feedback means and how they can use the feedback to make improvements (Brookhart,

2007). Students who have not had the opportunity to respond to the original instruction

may feel susceptible and inundated by the feedback. "If the material studied is

unfamiliar, providing feedback should have little effect on criterion performance, since

there is no way to relate the new information to what is already known" (Kulhavy, 1977,

p. 220). Feedback, according to Sadler (1989), allows formative assessment to eliminate

the space between the present standing of the student and where the student wants to be

academically. In order for feedback to be effective, students must be able to attach it to

something they have learned; feedback cannot just be information given to students after

formative assessment. Hattie and Timperely (2007) said "Feedback has no effect in a

vacuum; to be powerful in its effect, there must be a learning context to which feedback

is addressed" (p. 82). Information only becomes classified as feedback when it is used to

"alter the gap" in the student learning (Sadler, 1989, p. 121). "Feedback to 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" (Black & Wiliam,

1998, p. 9). The concept of student feedback containing recommendations for students to

improve their learning is further reinforced by other researchers. Bangert-Drowns, Kulik,

Kulik, and Morgan (1991) and Kluger and DeNisi (1996) said that student feedback

should not just contain praise for the student's work. The feedback should also be

constructive and give the student ideas, prompts, and indications of how to better their

performance. Feedback allows the teacher and the student to have the opportunity to

conference individually. It is vital that the teacher conference individually so

assumptions about the various ability levels within the classroom can be kept to a

minimum. The individual conferences also allow the students to keep competition to a

minimum so the focus of the classroom can stay on learning. Feedback allows the

teacher and student to be stakeholders in the formative assessment process (Sadler, 1989).

Teachers are able to use feedback in order to adjust the skill level of the students, and to

analyze which student needs additional instruction/time to grasp the concept. Students,

on the other hand, are able to closely watch their progress in order to meet their goals for

the class. Additionally, the feedback allows the students to stay focused on the high level

of excellence so these characteristics can be celebrated and allow for the substandard

qualities to be amended and enhanced. Teachers must be willing to listen to their

students and students must be willing to listen to their teachers. Easley and Zwoyer

(1975) described an environment where student feedback would be able to prosper:

> If you (teachers) can both listen to children and accept their answers not as things to
>
> just be judged right or wrong but as pieces of information which may reveal what
>
> the child is thinking, you will have taken a giant step toward becoming a master
>
> teacher rather than merely a disseminator in information. (p. 25)

The impact of student feedback was clearly noted in Hattie and Timperley's (2007)

research. In their empirical review, 196 studies that included 7,000 effects were

analyzed. Their analysis revealed that student feedback after formative assessment had

an average effect size of 0.79 standard deviation (Hattie & Timperley, 2007, p. 83). This

is an effect that is superior to reduced class size. Feedback helps learning become real

for students. Through feedback, students are able to test their own considerations and

acquire beneficial assessments from the teacher (Kolb & Fry, 1975). This information

sharing allows the learning sequence to be comprehensive for the students.

Computer-Aided Assessment

Communication of feedback from formative assessment is vital since the method

used may determine how students connect with the subject matter (Hatziapostolou &

Paraskakis, 2010). Computer-aided assessment allows students to reach beyond the

traditional methods of feedback (Hatziapostolou & Paraskakis, 2010). Computer-aided

assessment (CAA) can be defined as "any instance in which some aspect of computer

technology is deployed as part of the assessment process" (Atkinson & Davies, 2000, p.

1). Computer-aided assessment ultimately has the ability to increase student

achievement. Using technology for formative assessments presents many rewards. One

of the rewards computer-aided assessment offers students is the feedback students can

achieve. Race (2001) determined more teachers prefer the use of computer-aided

instruction because the feedback is easily delivered to students. Brown, Race, and Bull

(1999) listed some advantages for students when they use computer-aided assessment

tools:

- to give students feedback

- to guide student effort

- to diagnose problems in learning

- to give students experience in assessment methods

- to help staff direct their teaching effort

- to encourage students. (Brown, Race, & Bull, 1999, p. 87)

These advantages help the teacher enhance the quality of formative assessments.

Using Formative Assessment Data to Plan Future Instruction

"Decisions are limited by the information used to make them" (Wargo, 2006, p. 24). Thus, the utilization of data is vital to accountability in schools (Tihin, 2007). Data-driven decision making (DDDM) is becoming a growing trend in the field of education (Marsh, Pane, & Hamilton, 2006). Hoff (2006) predicted that education will continue to rely on more data in the future:

> Imagine an afternoon when a teacher can sit down at a computer desktop and quickly sort through reams of data she'll use to plan lessons for the next day…. She'll compare every student's achievement against state standards to decide which students need review and which ones are ready to move on….That technological capability can only be found in the rare classroom today, but some experts say that such a data-rich approach to instruction will soon be common place. (p. 12)

The concept has gained so much attention in recent years that many educators report they are overwhelmed by the amount of data they must collect and report (Celio & Harvey, 2005; Ingram, Louis, & Schroeder, 2004). During the past 10 years, large amounts of funding have been allocated to extend and acquire programs that allow teachers to have information regarding classroom assessments. In fact, two-thirds of the states now provide teachers with data tools that allow them to see their students' progression over time (Jerald, 2006). Even though a large number of states are pushing DDDM, and large amounts of funding are behind this initiative, many questions still surround this educational practice (Marsh et al., 2006). The uncertainty with DDDM is leading to an

increased gap between the data required by administrators and the data used to drive future instruction (Mandinach, Honey, & Light, 2006). According to Herman and Gribbons (2001), "Despite both the mandates and the rhetoric, schools are woefully unprepared to engage in such inquiry. The practice of applying large-scale data to classroom practice is virtually nonexistent" (p. 1). To meet the needs of the higher standards in education, teachers must improve their education at the classroom level (Bedwell, 2004). To make this improvement, teachers must begin to improve their data analysis skills so specific knowledge can be learned (Bedwell, 2004). "If teachers make quality instructional decisions on a daily basis, then instruction will improve. Such high-quality decision making depends on the use of high-quality information or viable data" (Bedwell, 2004, p. 9).

In order to make data-driven decision effective, teachers need immediate feedback to the data they collect (Kadel, 2010). Many teachers cite the lack of a quick turnaround time for data analysis to be a major hindrance for using data to make classroom decisions (Wayman, 2005). The time-consuming analysis and the lack of user-friendly reports results in teachers making classroom decisions based upon past experiences, their own educational viewpoints, or the current political climate of the district (Coburn & Talbert, 2006; Coburn, Toure, & Yamashita, 2009).

Learning Environment

"Formative assessment is related to a learner-centered classroom and a learner-centered classroom depends on formative assessment" (Box, 2008, p. 10). The learning environment is an influential manner in which to determine the level of accomplishment of a classroom or a school (Fraser, 1981; O'Reilly, 1975). The learning environment is defined as "all of the physical surroundings, psychosocial or emotional conditions, and

social or cultural influences" noticeable in classroom (Hiemstra, 1991, p. 8). In order to

develop an appropriate learning environment, teachers should understand that the center

of attention in their classrooms should be on the students (Brandsford, Brown, &

Cocking, 2000). The same researchers concluded that teachers who are conscious of the

climate in their classrooms often discover students' misconceptions before they occur.

This discovery allows the teachers to correct the students before their frustration level

gets high. Classrooms exhibit different impressions in which the learning and personal

progression of the students are fostered (Pierce, 1994). The same researcher also implies

that the environment of the classroom has a direct impact on the outcomes of the

students, the level of understanding and proficiency in different subjects, and the outlook

of the students on future academic endeavors. A classroom culture that is favorable to

learning allows students to meet their educational goals at a faster pace (Pierce, 1994). In

fact, a learning environment that is conducive to student achievement, along with a strong

program of study and supportive administration of the school, makes a great impact on

the level of success of the school (Fisher & Fraser, 1990). Along with the increase in

student achievement, the learning environment has an impact on other areas of the

students' development. The tangible and shared aspects included in a learning

environment can also be attributed to the increase in the level of student participation

during instruction as well as the level of contentment the students have (Fulton, 1991).

The learning environment established in classrooms is developed throughout the duration

of the school year through the give and take of student-to-student communication and

teacher-to-student exchange of ideas (Rorty, 1999). The classroom communication is

affected by the understanding of the lines of authority and the roles that are shared by the

students and the teacher (Hiemstra, 1991; Knowles, 1970). After researching the varying

definitions of classroom environment, Arter (1987) has identified four core components to use when evaluating the environment of a classroom. These four components were chosen because they appeared in five or more instruments that measured classroom environments. The four main components are student and teacher relationships, student attitudes toward school, relationships between students, and democracy in the classroom.

Role of Teacher in Formative Assessment

In order for formative assessment to be successful, the teacher must have a classroom environment that supports it:

> The classroom culture must breed success instead of competition. The foundation for this culture is a belief by the teacher that all students are capable of achieving. In such a classroom, the information gleaned from quizzes, homework, class discussions – any type of assessment used for formative purposes – can make a difference to individual students if it is conveyed appropriately to them. Verbal and written communication should concentrate specifically on what is wrong with the student's work and what can be done to make it better (Wren, 2008, p. 3).

Teachers must be willing to ensure that their students are aware of why they are learning the concepts and what they are expected to be learning. The Organization for Economic Co-operation and Development (OECD) (2005) completed a study of formative assessment in seven countries. The study discovered that "Teachers using formative assessment have changed the culture of their classrooms, putting the emphasis on helping students feel safe to take risks and make mistakes and to develop self-confidence in the classroom" (OECD, 2005, p. 2).

In order to conduct formative assessment successfully in classrooms, teachers need to possess detailed understanding and expertise. The following are four

fundamentals needed by teachers to implement formative assessments: domain

knowledge, pedagogical content knowledge, knowledge of students' previous learning,

and knowledge of assessment (Heritage, 2007). Domain knowledge requires teachers to

be competent in the ideas and abilities being taught and what success in each concept

resembles. This knowledge will help the teacher identify appropriate learning sequences.

Having appropriate domain knowledge will also ensure that teachers have sufficient

understanding of student metacognition and how it is related to assessment. In order to

obtain adequate pedagogical content knowledge, teachers must become comfortable in

using a multitude of teaching strategies so the full spectrum of learning styles can be

engaged in the instruction. Included in the multitude of teaching strategies is ample

knowledge of differentiated instruction. This knowledge of differentiated instruction will

allow the students to move from their current learning status to their learning objectives.

By having knowledge of students' previous learning, teachers are able to build on the

students' knowledge to create a learning environment where students can be successful.

Being familiar with the previous learning will allow the teachers to have a clear view of

the amount of knowledge on the concepts and how the students' attitudes are impacting

the instruction. Finally, the teacher's knowledge of assessments will help them as they

collect various samples of student data. This knowledge will also help teachers as they

coordinate their formative assessment with the instructional goals. This alignment is

important because teachers need to have appropriate knowledge of where students are in

their learning development (Stobart, 2006).

     The knowledge of formative assessment helps teachers develop the skills needed

to implement formative assessments. According to Heritage (2007), teachers need four

skills in order to implement formative assessment appropriately. First, teachers need to

develop a culture that is conducive to formative assessment in their classrooms. This

culture should enable students to be at ease with self-assessment and peer-assessment.

"When teachers struggle to make high-quality evaluative judgments and fail to foster

self-assessment, students' achievement suffers" (Pinchok & Brandt, 2009, p. 12). This

environment would allow a student to be comfortable with the constructive criticism of

other students. Second, the teacher needs to ensure their students are competent in setting

appropriate goals for themselves. The successful identification of goals will allow the

student to have a clear expectation of where their learning should direct them. Third,

teachers wishing to fully implement formative assessments should be comfortable with

analyzing the evidence so appropriate learning activities can be planned. By decoding

the evidence, the teacher can gain insight into possible misconceptions of students.

Future instruction will allow teachers the opportunity to correct the misconceptions.

Finally, teachers need to be well prepared to suit their instruction to the educational levels

of the students. This is a crucial step, as instruction is developed to suit the levels of the

students. Instruction that is too easy for the students could result in tediousness and

students distancing themselves from the instruction. Instruction that is too difficult for

the students could result in student disappointment. Formative assessment is becoming a

more popular component of education (Bell & Cowie, 2000; Tierney & Charland, 2007).

According to Olson (2005), the software (including test banks) that is integrated with

state standards which allows teachers to conduct classroom assessment is "one of the

fastest-growing segments of test publishing" (p. 11). Teachers must continue to become

more proficient in formative assessment so students can receive the maximum benefit

(Popham, 2007).

      Teachers in North Carolina are currently completing staff development to ensure

the teachers in the state understand the importance of formative assessment (NCDPI,

2011). The staff development initiative is referred to as NC FALCON. This acronym

stands for North Carolina's Formative Assessment Learning Community's Online

Network. NC FALCON, which is delivered online, has participants complete the

program in modules. The local school districts select personnel, usually instructional

coaches, to help facilitate the program. The goal of this program is to get every teacher

in the state to a point where they see the value of formative assessment and begin to use it

as a daily practice in their classroom.

Role of Student in Formative Assessment

In order to be successful, students need to be actively involved in the formative

assessment process (Pinchok & Brandt, 2009). Chappuis and Stiggins (2002) also

commented,

> Student involvement in assessment doesn't mean that students control decisions
>
> regarding what will or won't be learned or tested. Instead, student involvement
>
> means students learn to use assessment information to manage their own learning
>
> so that they can understand how they learn best, know exactly where they are in
>
> relation to the defined learning targets, and plan and take the next steps in their
>
> learning. (p. 41)

Being actively involved in formative assessments means students will be aware of what

success means and be comfortable with receiving practical feedback from the teacher.

Stiggins (2004) stated that positive and effective formative assessment will occur within

"environments in which students use assessments to understand what success looks like

and how to do better next time" (p. 25). One way students can be actively engaged in the

formative assessment process is by identifying and constructing the rubrics used for

scoring various projects and classroom work (Stiggins et al., 2004). This assistance to

the teacher will allow the students to develop their thinking processes for the various

classroom projects. Additionally, the student development of the scoring rubrics will

help them identify the learning objective for the project. By being aware of the rubrics,

the students will know and understand what mastery in the concept will resemble.

Another way students can take an active role in formative assessment is by the

means of self-assessment. Pinchok and Brandt (2009) stated,

> Many times, students' judgment of their own academic work, and of their peers, is
>
> clouded by personal, social, and emotional factors. Becoming better self-
>
> assessors is crucial, and moving students to the place where they can identify
>
> metacognitive strategies to improve their own work, or provide similar feedback
>
> on their peers' work, is ideal. Helping students to see assessment as a process for
>
> self-improvement, as opposed to a punitive or ranking mechanism, can aid in
>
> producing these desired effects. (p. 11)

Atkin, Black, and Coffey (2001) developed a representation of formative assessment

where students constantly asked themselves three key phrases. The first phrase, where

am I trying to go, allows students to see and understand what the learning objective is.

This component is crucial because the teacher can use inquiry while they ask students to

rearticulate what the objective should resemble (Arter & Busic, 2001; Clarke, 2001). The

second phrase, where am I now, allows the student to be aware of where they are in the

learning process, where they should be in the learning process, and how they can get to

the goal (Chappuis & Stiggins, 2002). The final phrase, how do I close the gap, allows

the student to create an arrangement to accomplish the subsequent objective (Clarke,

2001). These questions allow students to actively involve themselves in the learning

process while using feedback from the teacher in a successful manner (Chappuis & Stiggins, 2002). These questions, coupled with incessant feedback from teachers, will create a learning atmosphere where students are encouraged to self-assess on a continual basis (Sadler, 1989).

Effects of Formative Assessment

Classroom assessment is a fundamental component of instruction because it contributes to every other classroom function (Brookhart, 1998, 1999). It is also important because classroom teachers spend approximately 50% of their time on assessment (Plake, 1993). Formative assessment helps students from kindergarten to college to have the advantage of learning in a variety of subjects (Wiliam, Lee, Harrison, & Black, 2004). Formative assessment also helps students learn material at a quicker pace. Wiliam et al. (2004) determined that formative assessment can double the speed of learning for students. With the current focus on standardized testing, teachers are now expected to develop classroom assessments that support state standards in hopes of increasing standardized test scores (Campbell, Murphy, & Holt, 2002). Stiggins (1999) has found a correlation between classroom assessments and standardized tests. The research found that by increasing the caliber of classroom assessments, students were able to boost their standardized test scores by as much as three-fourths of a standard deviation. This is equivalent to 15 percentile points. This research further verifies the importance of formative assessments. Furthermore, Black and Wiliam (1998) have identified that formative assessment increases the effect size on standardized tests between 0.4 and 0.7. This effect size is greater than the majority of educational intercessions. An effect size of 0.4 denotes that an average student who had been involved in formative assessment would achieve the same as a student in the top 35% of

students who were not involved in formative assessment. Not only is formative

assessment an academic assistance, it is also a financial help. Wiliam (2007) concluded

that formative assessment is 20 to 30 times more cost effective than reduced class size.

Formative assessment can also have the ability to positively affect students beyond the

classroom (Black et al., 2004). This study determined that formative assessment could

significantly impact student enthusiasm and effectiveness in the classroom setting.

Barriers to Formative Assessment

Although formative assessment is a rising concept in education, several barriers

are present with the implementation of formative assessment (OECD, 2005). This

publication lists several barriers to formative assessment. First, notable disagreements

are present between formative assessments and other state mandated standardized

assessments. Because teachers and school districts are held accountable for their scores

on the standardized tests, attention seems to shift to these tests. Second, a lack of

consistency is apparent between the guiding principles at the school and district levels.

Finally, apprehension exists from teachers because they perceive formative assessments

as being too time consuming. Barriers also exist in educational policies at the state and

federal levels. The policies that govern the educational system put obstacles between

student and teacher interaction thus making it difficult to reform assessment efforts

(Clark, 2008). Stiggins (2004) said "…in districts, schools, and classrooms across the

nation [USA], educators still assess student learning the way their predecessors did sixty

years ago because they have not been given the opportunity to learn about…new insights

and practices" (p. 22). The mindset to correct assessment strategies is still not present in

the current world of educational policy. This is evidenced because assessment is still not

viewed as a way to change the direction of schools (Clark, 2008). The current state of

education policy hinders teachers who are trying to successfully implement formative

assessment in their classrooms because they are forced to view assessments in a

summative manner (Clark, 2008). School leaders can have a vast impact on how teachers

view formative assessment. When school leaders, as a whole, begin to see the full impact

formative assessment can bring to the system, a common language and reporting system

can be established (Clark, 2008). "Teachers who are supported to collect and analyze

data in order to reflect on their practice are more likely to make improvements as they

learn new skills and practice them in the classroom. Through the evaluation process,

teachers learn to examine their teaching, reflect on practice, try new practices, and

evaluate their results based on student achievement" (Speck & Knipe, 2001).

ClassScape Data

Even though ClassScape is a relatively new program in the state, the preliminary

data makes a case about the effectiveness of the program ("Where in the," 2011). The

research study involved evaluating students in mathematics because the mathematics

assessments were the only set of assessments that were fully operational during the 2007-

2008 school year. For this study, schools were included only if they had conducted 10 or

more ClassScape assessments. If a school had administered fewer than 10 ClassScape

assessments, the school was not included in the study and they were labeled a school that

was just testing the ClassScape program. In order to accurately compare the results of the

schools that do and do not use ClassScape, a statistical test (t-test) was used. The t-test

revealed a noteworthy difference in students passing the math EOG (t(420) = -2.71, $p <$

0.01) in settings where ClassScape was used (M = 70.8, SD = 13.6, N = 225) versus

settings where ClassScape was not used (M = 68.2, SD = 18.6, N = 1,609). According to

this data, students were more successful on the summative end-of-grade test when

ClassScape was used. The analysis of the data revealed that ClassScape is an effective

tool to assist teachers when making instructional decisions.

Chapter 3: Methodology

Problem

Formative assessment is not being used as a methodical component of education (OECD, 2005). As a result of the lack of knowledge, teachers do not possess the necessary knowledge to be able to successfully integrate assessment data to make learning more meaningful for their students (Bachor & Anderson, 1994). Teachers view assessment as simply another responsibility because it is not perceived as a fundamental component of the classroom (Baker, 1995). When teachers become overwhelmed with their responsibilities and lose the value of assessments, the effectiveness of the assessments is reduced (Irving, 1995). The negative progression of formative assessment knowledge has led to deprived usage of formative assessment (Daws & Singh, 1996). Because the use and knowledge of formative assessment is inadequate, the development of formative assessment needs to be initiated (Russell, Qualter, & McGuigan, 1995). Even though formative assessment has been researched for many years, there are still components of formative assessment that are vague and challenging (Sadler, 1998). This uncertainty surrounding formative assessments merits this action research project.

Research Questions

The purpose of this study was to determine the impact of formative assessment while using the ClassScape formative assessment tool at a middle school in western North Carolina and to show how the formative assessments impacted teacher planning and instruction. The implementation of the ClassScape assessment program may have had a potential positive influence on student achievement. The teachers at this school had used the ClassScape system for 3 years (Confidential, personal communication, October 2010). However, in those 3 years, myriad initiatives for the classroom teacher

were also established (Confidential, personal communication, October 2010). These other programs limited the teacher's ability to effectively learn how the ClassScape program works and how it can benefit the children (Confidential, personal communication, November 2010). Currently, the majority of the teachers at the selected middle school do not use ClassScape the way it was intended to be used (Confidential, personal communication, September 2010).

The following research questions guided this mixed methods case study:

1. What was the impact of the utilization of the ClassScape program and other formative assessments on the learning environment of the classroom?

2. What was the impact of the utilization of the ClassScape program and other formative assessments on instructional planning?

3. What was the impact of the utilization of the ClassScape program on instructional implementation as a part of formative assessment?

4. What was the impact of the utilization of the ClassScape program on instructional assessment as a part of the formative assessment process?

Study Design

In order to complete this case study, a mixed methods research design, composed of qualitative and quantitative methods, was used. The mixed methods approach allowed for qualitative and quantitative measurements to be taken and blended so the research issue could be understood (Creswell, 2008). This technique has been determined as a "legitimate inquiry approach" (Brewer & Hunter, 1989, p. 28). Researchers who promote the use of mixed methods research believe that "the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone" (Creswell & Plano Clark, 2007, p. 5). One reason this research

technique is highly regarded is because the blending of qualitative and quantitative data results in a "powerful mix" (Miles & Huberman, 1994, p. 42). This strong blend of data allowed the researcher to obtain a detailed understanding of the process and the conclusions of the study resulting in a "complex" representation of the information learned from the study (Greene & Caracelli, 1997, p. 7). The multifaceted representation of the data occurred because of the triangulation of the data within the mixed methods approach (Rossman & Wilson, 1985). The purpose of the triangulating of data was "to simultaneously collect both quantitative and qualitative data, merge the data, and use the results to understand the research problem" (Creswell, 2008, p. 557). By utilizing the mixed methods research strategy, the data collection techniques allowed for misinterpretations from the data to be reduced and the explanations from the information to be maximized (Patton, 2002).

Participants/Site Selection

The school selected for this study was a rural middle school in western North Carolina. The school has been serving students from three elementary feeder schools since the early 1990s. At the time of the study, the selected school was composed of students in Grades 6 through 8 and had an enrollment of 616. The school had a diverse population with 25 subgroups (NCDPI, 2010). The majority of the teachers had been teaching at this school for over 10 years (NCDPI, 2010). ClassScape and other initiatives mandated by the district office forced the teachers to teach more in less time (Confidential, personal communication, September 2010). According to the NC Report Card (NCDPI, 2010), the school has, for the most part, been below the district average on the end-of-year standardized test. The school had two Nationally Board Certified teachers (NCDPI, 2010). According to the North Carolina Department of Public

Instruction, the selected middle school had a student body composed of the following:

68% White, 13% African American, 8% Asian, 5% Multi-Racial, 4% Hispanic, less than

1% Hawaiian-Pacific, and less than 1% American Indian.

Instruments

In order to gain data for the research questions, the following data collection tools

were utilized: (a) teacher focus groups, (b) student focus groups, (c) teacher surveys, (d)

student surveys, (e) individual teacher interviews, and (f) an observation checklist. Two

focus groups, composed of teachers, were used as a data collection tool because they

allowed the participants to interact with each other while allowing the researcher the

opportunity to gather a wide-ranging amount of data (Krueger, 1994). Open-ended

questions were used in order to allow the participants the opportunity to construct their

own responses based upon their own experiences instead of relying on the experiences

the researcher provided them (Neuman, 2000). A separate focus group for students was

conducted for students because the participants were more likely to involve themselves

within the group when the interviewees were similar and assisted each other (Creswell,

2008).

Surveys were used because they "help and identify important beliefs and attitudes

of individuals" (Creswell, 2008, p. 388). In order to gain a clearer idea of the thoughts of

the participants, a cross-sectional survey was used. Cross-sectional surveys were useful

in that the researcher was allowed to collect data at a specific point in time (Creswell,

2008).

Focus group discussions are defined as "the process of collecting data through

interviews with a group of people, typically four to six" (Creswell, 2008, p. 226).

According to Morgan (1998), focus groups are "fundamentally a way of listening to

people and learning from them" (p. 9). According to Krueger (1998), focus group

investigations are designed in order to allow the researchers to ascertain a higher level of

understanding of the participants' inspirations, emotions, and thoughts of a topic.

Therefore, the main intention for using focus groups was "to obtain accurate data on a

limited range of specific issues and within a social context where people consider their

own views in relation to others" (Robinson, 1999, p. 906). By utilizing focus groups, the

researcher was able to capitalize on the following components of qualitative research:

1. exploration and discovery

2. context and depth

3. interpretation (Morgan, 1998, p. 12).

Procedures

To begin this project, the researcher first obtained appropriate permission from

the building administrator (Appendix A). Once the building administrator's permission

was obtained, the researcher requested and obtained permission from the district

superintendent (Appendix B). Since every student in the school used the ClassScape

program, the researcher conducted surveys that assessed the perceptions of the students

and academic teachers toward formative assessment and the ClassScape program. An

instructional coach and a former teacher validated the teacher survey questions. Both of

these individuals were impartial to the teachers at the selected school and have an

understanding of how the ClassScape system works. The student surveys were validated

by a selected group of students from the school. The teacher and students used in the test

item validation were removed from the administration of the survey for the research

project. The data from the student and teacher surveys assisted the researcher to

determine what, if any, strengths and weaknesses existed with the ClassScape program at

the selected school. The surveys also disclosed specific areas to address in the individual

interviews and student and teacher focus groups. Since approximately 600 students

participated in the survey and the data remained anonymous, student permission for the

survey was not obtained. After the teacher and student presurvey had been completed,

permission was obtained from the parents of the students who were going to be used in

the focus group (Appendix C) as well as the teachers who participated in the focus groups

(Appendix D). The students and teachers who participated in the focus groups were

asked specific questions which were generated from the survey responses. These

questions, which were validated by a former assistant principal and an instructional

coach, were created with the intention of gaining a deeper understanding of the student

and teacher awareness and opinion of ClassScape as a formative assessment tool. The

themes developed from the focus groups were related back to the research questions.

     The academic teachers at the selected school (n = 20) who participated in the

survey and focus groups understood and demonstrated the importance of confidentiality

with student information and were asked to submit straightforward answers. The purpose

of the teacher pre and postsurveys was to gain an understanding of how the teachers use

ClassScape to plan instruction, implement instruction, and assess instruction.

Data Collection

     Surveys. To begin the data collection phase, a survey was administered to the

teachers (Appendix E) and students (Appendix F) that allowed the researcher to gain a

clear understanding of how the teachers were using the ClassScape program at the

selected school. The teacher and student surveys were used and adapted with permission

from an individual in a school district within the same state (Appendix G). In order to

have a clear understanding of the data, a Likert scale was used. According to McIver and

Carmines (1981), a Likert scale is defined as follows:

> A set of items, composed of approximately an equal number of favorable and
> unfavorable statements concerning the attitude object, is given to a group of
> subjects. They are asked to respond to each statement in terms of their own
> degree of agreement or disagreement. Typically, they are instructed to select one
> of five responses: strongly agree, agree, undecided, disagree, or strongly disagree.
> The specific responses to the items are combined so that individuals with the most
> favorable attitudes will have the highest scores while individuals with the least
> favorable (or unfavorable) attitudes will have the lowest scores. While not all
> summated scales are created according to Likert's specific procedures, all such
> scales share the basic logic associated with Likert scaling. (pp. 22-23)

Additionally, the Likert scale used in surveys was analyzed to determine the level of
positive responses in the teacher and student surveys. The questions from the surveys
were grouped into themes, which relate to the research questions. In order to see the
change in the different surveys, the responses strongly agree and agree were considered
as positive. The responses disagree and strongly disagree were considered as negative
responses. The response no opinion was not considered as either positive or negative.
Once the percentages from the positive and negative responses were calculated from the
teacher survey and student survey, the researcher was able to see how the respondents
view their use of ClassScape and formative assessment in general.

The teacher survey had two sections. The first section asked introductory
information of the teacher and questions that were directly correlated to the research
questions. One question in the introductory section asked the participants to list three
words to describe ClassScape. This question helped the researcher develop themes and

questions, which were used in the individual interviews as well as the teacher and student focus groups. The remaining questions had the participants answer by either selecting strongly agree, agree, no opinion, disagree, or strongly disagree. The teacher survey determined the level of understanding and perceptions that the academic teachers had for formative assessment and the ClassScape program by analyzing the positive and negative responses and by examining the written responses. The survey asked teachers how they used the ClassScape program in order to help them have a richer learning environment, how ClassScape was utilized to help them plan and implement future instruction, and how ClassScape helped them assess their instruction. Questions 25, 26, 27, 28, and 29 in the teacher survey related to the learning environment of the students, which was directly related to research question 1. Questions 13, 17, 19, 21, and 23 dealt with using formative assessment to plan future instruction, which was directly related to research question 2. Questions 12, 20, 27, 28, and 29 were directly related to instructional implementation, which was research question 3. Finally, questions 16, 17, 18, 22, 25, 26, 27, and 28 were related to using formative assessment as a method for instructional assessment. The survey ended with an open-ended question in order to allow the teachers to submit suggestions to make ClassScape a more effective tool for their classroom. The answers to this particular question were analyzed for themes, which were discussed in the focus groups and individual interviews.

The student survey solicited their beliefs on how their teacher used formative assessments to plan future instruction for their class. The questions in the student survey were the same questions used in the teacher survey except that they were reworded using language that students could understand. The survey also asked the students how their teacher responded to the class while lessons were being taught. Additionally, the survey

allowed the researcher to have data to formulate questions in the focus groups and individual interviews. These discussions guided the researcher as they developed future plans for the ClassScape program. Questions 20, 21, 22, 23, and 24 on the student survey related to the learning environment of the classroom, which was directly related to research question 1. Questions 7, 10, 12, and 15 related to how the students perceived their teachers' use of formative assessment to plan future lessons, which was directly related to research question 2. Questions 6, 7, 12, 13, 17, 18, and 19 related to how the students perceived their teachers' use of formative assessment to implement their instruction, which was directly related to research question 3. Finally, questions 10, 11, 14, 16, and 18 were related to how the students perceived their teachers' use of formative assessment as a means to implement their instruction, which was directly related to research question 4.

In order to determine the level of internal reliability of the student and teacher survey, Cronbach's alpha was used. This test measured the reliability within a survey to determine if the survey really measured what the questions asked. Additionally, Daniel and Witta (1997) believed that the Cronbach's alpha is the most frequently used method to measure reliability within educational environments. According to Gliem and Gliem (2003), the reliability coefficients within the Cronbach's alpha usually vary from a value of 0 to a value of 1. The Cronbach's alpha is commonly used to determine reliability when multiple choices are given on survey questions (McIver & Carmines, 1981). Gliem and Gliem (2003) determined that an alpha of 0.8 is an equitable for determining reliability. Furthermore, George and Mallery (2003) made available the following scales as a measure for other researchers to follow: "_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and_ < .5 – Unacceptable" (p. 231).

Additionally, the survey results were scrutinized to determine what, if any, correlation existed between the various research questions. The researcher chose to use the Pearson's Bivariate Correlation method to look for associations between research questions. This method analyzed the relationship between two different variables without discerning between the independent variable and dependent variable (Mertler & Vanatta, 2005). This method is among the most common methods in the various educational settings.

After the data from the student survey and teacher survey were collected, a t-test was completed to analyze the differences between the positive perceptions of the teachers and students toward formative assessment and ClassScape. A t-test was chosen because it allows the researcher to compare the averages between two separate sets of data. A t-test measures a "quantitative dependent variable and a dichotomous independent variable" (Johnson & Christensen, 2007, p. 516). The t-test allowed the researcher to determine the differences between the perceptions on formative assessment from students and teachers. A significance level of 0.5 was used to determine the level of significance for each comparison.

The teachers and students utilized a computer lab at the middle school to complete the survey. The survey was completed using the Survey Monkey website. This website allowed the researcher to visualize the data and to have a clear understanding of the trends in the data so coding could take place. The researcher was available for technical assistance.

Focus groups and individual interviews. After the initial surveys had been completed, the information was analyzed to determine what themes were present in the data. Once these themes had been determined, randomly selected teachers and students

participated in focus groups. The focus groups allowed the researcher to add an additional level of data to the study. This additional level of data further validated the study because the information was able to be triangulated. The researcher used the constant comparison approach to analyze the data from the focus groups and interviews (Creswell, 2008). This researcher coded the responses in the margins of the first focus group, carried those themes over to the second focus group and so forth. This method allowed the researcher to track the themes across the student and teacher data. A student focus group and two teacher focus groups were interviewed. The participants for the student group and the teacher groups were randomly selected. The researcher generated the focus group questions based upon the responses from the surveys. The questions were generated in order to provide the researcher with a deeper understanding of student and teacher perceptions of formative assessment. Additionally, the focus groups allowed the researcher to understand exactly how the teachers utilized the ClassScape program in order to implement instruction, assess instruction, and plan future instruction. Before the interview sessions began, two individuals who have knowledge of the ClassScape program and formative assessment validated the questions. The sessions lasted approximately 30-45 minutes each. An administrator facilitated the focus groups and two nonbiased educators validated the themes. After the focus group sessions were completed, the responses were analyzed for common themes. The data were triangulated when the responses from the student and teacher surveys, the focus groups, and the individual interviews were analyzed.

Classroom Observations. Throughout the data collection process, the researcher, the principal, assistant principal, and content specialists conducted classroom observations at the selected school. These classroom walkthroughs provided the

researcher and the building administrators with information about how formative

assessment was being used in the classrooms. These classroom walkthroughs were

conducted several times a week, thus giving the researcher an additional perspective on

the effects of the ClassScape program on teacher planning and instructional assessment.

The walkthrough data were collected using a checklist form (Appendix H). The

researcher then aggregated the data from the walkthroughs to see what percentage of time

the teachers were using formative assessment, the ClassScape program, and data from the

ClassScape program.

Delimitations

Although a large portion of the students and all of the academic teachers at the

selected school were involved in this survey, only one school was used. If this study

were to be repeated in other middle schools, the researcher may be able to further edit the

survey questions to gain a clearer understanding of how teachers adapt their lesson plans

as a result of the ClassScape data. Additionally, the information gained from the

individual interviews and focus groups may have additional themes that could be further

investigated. This may have an impact on the validity of the data.

Limitations

The selected school is not implementing only the ClassScape program. Because

of initiatives from the district office, the teachers and students were in the process of

learning a multitude of new programs. Some of these programs include STAR (a

computerized reading program, AR (a computerized reading program), Study Island (a

formative assessment tool), MyAccess (a computerized writing program), etc. The

implementation of the other programs may have impacted how students and teachers

viewed computer-aided instruction and computer-aided assessment. The myriad of other

programs may have impacted how often teachers and students were able to have adequate time and access to the school's computer labs. Also, the ClassScape program only assesses students in reading, math, and science. Teachers who teach exploratory classes may have not fully understood the scope of the ClassScape program.

The ClassScape system, at times, was frustrating to access and manipulate. Because of the success of the ClassScape program in North Carolina, the ClassScape server becomes overloaded at times and users experience difficulties trying to access the programs. While this issue has become less prominent in recent months, this still can be an issue at times.

Summary

This study analyzed whether teachers use the ClassScape program to implement instruction, assess instruction, and plan future instruction at a rural middle school in western North Carolina. This study reinforced the need for formative assessment in the schools. It underscored the need for assessments to be tools to be used for students' success. Since the ClassScape system was relatively new in the state, this study evaluated the impact of the program on students' learning.

Chapter 4: Data Analysis and Explanation of Results

Introduction

Formative assessment is not being used as a methodical component of education

(OECD, 2005). As a result of the lack of knowledge, teachers do not possess the

necessary knowledge to be able to successfully integrate assessment data to make

learning more meaningful for their students (Bachor & Anderson, 1994). Teachers view

assessment as simply another responsibility because it is not perceived as a fundamental

component of the classroom (Baker, 1995). When teachers become overwhelmed with

their responsibilities and lose the value of assessments, the effectiveness of the

assessments is reduced (Irving, 1995). The purpose of this study was to determine the

impact of formative assessment while using the ClassScape formative assessment tool in

a rural middle school in western North Carolina and how the formative assessments are

impacting student learning and teacher planning. Teachers at this school have used the

ClassScape system for 3 years (Confidential, personal communication, October 2010).

However, in those 3 years, a myriad of other initiatives for the classroom teacher have

also been established (Confidential, personal communication, October 2010). These

other programs have limited the teacher's ability to effectively learn how the ClassScape

program works and how it can benefit the children (Confidential, personal

communication, November 2010). Currently, the majority of teachers at the selected

middle school do not use ClassScape they way it was intended to be used (Confidential,

personal communication, September 2010). In order to gain sufficient knowledge to

make conclusions from the data, a mixed methods research methodology was chosen by

the researcher. The researcher used triangulation between the teacher and student

surveys, the teacher and student focus groups, and the individual teacher interviews to

ensure the data had a sufficient amount of validity. Creswell (2008) described

triangulation as a method to help data to be explained better and as a way to justify

statistically significant results.

Research Questions

The following research questions guided this action research project:

1. What was the impact of the utilization of the ClassScape program and other

formative assessments on the learning environment of the classroom?

2. What was the impact of the utilization of the ClassScape program and other

formative assessments on instructional planning?

3. What was the impact of the utilization of the ClassScape program on

instructional implementation as a part of formative assessment?

4. What was the impact of the utilization of the ClassScape program on

instructional assessment as a part of the formative assessment process?

Procedures

The researcher completed the student and teacher surveys first. After the results

from the surveys were analyzed for important findings, the questions for the focus groups

were generated. Two focus groups, each consisting of four teachers, were conducted to

clarify the researcher's findings from the surveys. A student focus group, consisting of

four students was also conducted. The students were randomly selected from the student

body at the selected middle school. The student focus group consisted of two sixth-grade

students, one seventh-grade student, and one eighth-grade student. The data from the

focus groups were transcribed, examined, and coded into significant themes. After the

themes were generated, the researcher compiled similar information from the surveys,

teacher focus groups, student focus groups, and individual teacher interviews.

Additionally, the researcher completed classroom observations using checklists to determine the level of implementation of formative assessments in the classrooms at the selected school.

Analysis of Survey Data

  Cronbach's alpha for student and teacher surveys. In order to determine how reliable the survey questions were for the students and teachers, an analysis of the survey data was completed using the Cronbach's alpha formula. This test measures the internal reliability of the survey questions. The Cronbach's alpha for the teacher survey was found to be 0.954. This result is considered to be adequate for reliability in educational settings. George and Mallery (2003) determined that anything above .9 is an excellent measure of reliability for Cronbach's alpha. The Cronbach's alpha for the student survey was 0.871. According to George and Mallery (2003), this is considered to be good for surveys in educational settings. It is important to note, however, that the researcher did not discover any problems with discrimination or coding of the survey questions.

  Teacher survey analysis. The researcher continued the analysis of data by examining the percentages of responses that were on the teacher survey. The teacher survey utilized the following responses: strongly agree, agree, no opinion, disagree, and strongly disagree. In order for a response to be considered positive, the respondent had to either strongly agree or agree with the statement from the survey. The following information shows how the teachers responded to the survey statements.

Table 2

Descriptives by Individual Question on Teacher Survey

Question	N	% Positive Responses
I use formative assessment in my classroom.	13	92.31%
I use ClassScape as a method of formative assessment in my classroom.	13	76.92%
Formative assessment, in conjunction with the ClassScape program, allows the learning environment of my classroom to be improved.	10	90.00%
Formative assessment, in conjunction with the ClassScape program, has an impact on my lesson planning.	10	90.00%
Formative assessment, in conjunction with the ClassScape program, has an impact on how I implement instruction.	7	85.71%
Formative assessment, in conjunction with the ClassScape program, impacts how I assess my students.	11	90.91%
I tell my students what they are expected to learn and why they are learning the material.	12	100.00%
I invite and build on my students' contributions to the class.	12	100.00%
I encourage students through my specific and focused feedback about their performance in my classroom.	11	100.00%
I encourage students to help one another.	11	100.00%
I show students some examples of their peers' work for the purpose of guiding and learning.	11	81.82%
I ask students to demonstrate their work so I can analyze their thinking.	11	100.00%
I encourage my students to demonstrate their thinking/work to the class.	12	91.67%
I encourage students to suggest ways that their learning can be improved.	11	90.91%
I show students a range of other students' work to model (or exemplify) criteria for assignments.	11	81.82%

Question	N	% Positive Responses
I assist students in negotiating a route to improve their learning.	12	91.67%
I provide time for students to reflect and talk about their learning with me. (Conferences)	11	90.91%
I help students to understand their achievements and know what they need to do next to make progress.	12	100.00%
I provide opportunities for students to assess their own work and each other's work and give feedback.	12	91.67%
I use probing questions to diagnose the extent of the students' learning.	12	100.00%
I analyze completed work to comprehend why a student has or has not achieved success.	10	100.00%
I express approval to both students and their parents when students meet objectives on assignments.	11	100.00%
I tell students what they have or have not achieved with specific references to their learning.	11	90.91%
I write feedback on students' work that is specifically designed for the assignment and individual students.	12	91.67%
I strive to make my students the center of my classroom practices.	12	100.00%
I strive to catch student misconceptions about subject matter before they occur.	12	100.00%
I allow my students to communicate with me during instruction so I can ensure my instruction is meeting their needs.	12	100.00%
I allow the students to participate in the decision making process for my classroom.	11	81.82%
I encourage my students to work in learning teams to allow relationships to be fostered in my classroom.	12	91.67%

Table 2 presents the percentage of positive responses for each question on the teacher survey. Several questions reflect that all teachers felt positive about the issue. The question reflecting the lowest percentage of positive responses was question 2.

Table 3

Descriptives by Research Question on Teacher Survey

	N	Mean of Original Values	Std. Deviation of Original Values	% Positive Responses
Impact of utilization of ClassScape on Learning Environment in Classroom (RQ1)	12	4.3333	.58049	95.83%
Impact of utilization of ClassScape on Future Instructional Planning (RQ2)	12	4.4583	.52284	97.22%
Impact of utilization of ClassScape on Instructional Implementation as part of Formative Assessment (RQ3)	12	4.3214	.60341	93.06%
Impact of utilization of ClassScape on Instructional Assessment as part of Formative Process (RQ4)	12	4.2500	.59113	94.05%

Table 3 presents the descriptive statistics for each of the research questions for the

teacher survey. A total of 12 teachers participated in the survey. The first column

represents the number of teachers who answered each research question. The second

column shows the mean on the original Likert type scale (values ranging from 1 to 5).

Higher values indicate more students answered in the higher categories than the lower

values. The final column shows percentage of positive responses per each research

question. Based on these values, teachers showed the highest percent of positive

responses for their perception of how their teachers use formative assessment for future

lesson plans (97.22%). The lowest percent of positive responses were seen in how

students feel about the impact of ClassScape on instructional implementation as part of

formative assessment.

After analyzing the relationships between the research questions, the researcher discovered that all the results are significantly and positively correlated. The Pearson's correlations are found in Table 4. Pearson correlations are between zero and one. A correlation of zero implies there is no correlation between research questions. A correlation of one implies a perfect correlation between different research questions. These results also imply that as scores increase in one research question, they also increase in another area of research. The relationship is the strongest between research question 2 and research question 3. The relationship between these two research questions was $r = 0.945$. This relationship entails that as teachers' attitudes and perceptions of the impact of ClassScape in their instructional planning increase, so will the teachers' attitudes and perceptions on how they implement their instruction based on ClassScape data. This is further explained later in Chapter 4.

Table 4

Pearson's Bivariate Correlations by Research Question

	Impact of utilization of ClassScape on Learning Environment in Classroom (RQ1)	Impact of utilization of ClassScape on Future Instructional Planning (RQ2)	Impact of utilization of ClassScape on Instructional Implementation as part of Formative Assessment (RQ3)	Impact of utilization of ClassScape on Instructional Assessment as part of Formative Process (RQ4)
Impact of utilization of ClassScape on Learning Environment in Classroom (RQ1)	1			
Impact of utilization of ClassScape on Future Instructional Planning (RQ2)	$.799^{**}$	1		
Impact of utilization of ClassScape on Instructional Implementation as part of Formative Assessment (RQ3)	$.905^{**}$	$.945^{**}$	1	
Impact of utilization of ClassScape on Instructional Assessment as part of Formative Process (RQ4)	$.894^{**}$	$.925^{**}$	$.933^{**}$	1

Note. **Correlation is significant at the 0.001 level, two-tailed.

Student survey analysis. Table 5 presents some descriptive statistics for individual research questions within the student survey. A total of 573 students participated in the survey. The first column represents the number of students who answered in each research question area. (The questions on the survey were coupled with a particular research question. Information concerning which question is related to each survey question can be found in Chapter 3.) The second column shows the mean on the original Likert scale (values ranging from 1 to 5). Higher values indicate more students answered in the higher categories than the lower values. The final column shows percentage of positive responses per each research question. Based on these values, students showed the highest percent of positive responses for their perception of how teachers use formative assessment for future lesson plans. This information is reflected again in the qualitative section of Chapter 4. The lowest percent of positive responses was seen in how students feel about their learning environment in the classroom. Once again, this information is reflected in the qualitative section of Chapter 4.

Table 5

Descriptives by Research Question on Student Survey

Research Question	N	Mean on original scale	SD on original scale	Percent Positive Responses
1. Learning environment in the classroom	552	3.4043	.69457	69.41%
2. Student perception of how their teachers use formative assessment for future lesson plans	561	3.8085	.64237	84.05%
3. Student perception of how their teachers use formative assessment to implement instruction	563	3.5999	.59263	77.42%
4. Student perception of how their teachers use formative assessment as instructional assessment	561	3.4330	.62790	70.64%

     Histograms of the distribution of how students responded, by percentage of positive responses, are found in Figures 1 through 4. The value of the x-axis (horizontal) is the percentage of positive responses. The value of the y-axis (vertical) is the frequency. So, we see that for Figure 1, Percentage of Positive Responses for Learning Environment, there were a total of 552 students who answered the question and some of those students who had no positive responses. The bar furthest to the left represents this. There were also many people who answered all positive responses. The bar furthest to the right represents this. The remainder of the responses is dispersed from 20% positive to 80% positive. The bars in the middle represent these responses. These histograms give a clear picture of a wide assortment of students' positive mindsets toward each research question. These mindsets are further explained throughout the remainder of

Chapter 4.
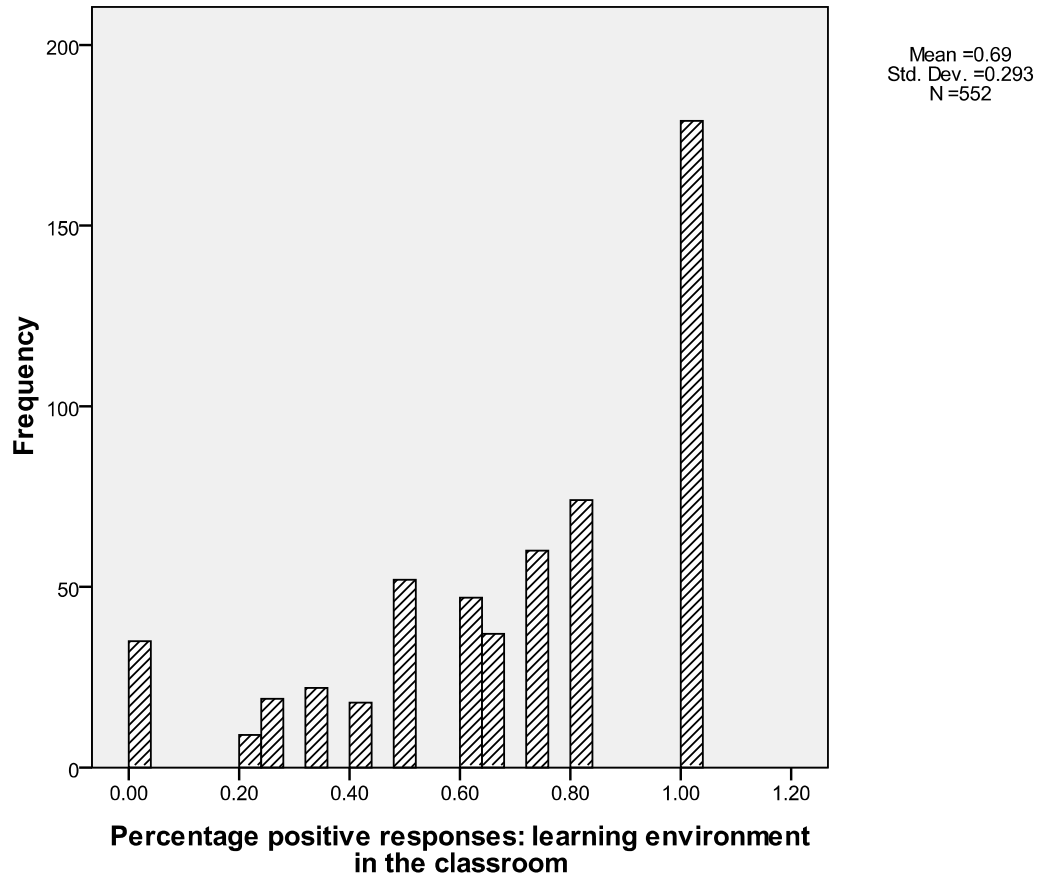
Figure 1. Distribution of Percentage of Positive Responses for Learning Environment.

Looking at Figures 2, 3, and 4, it is understood that the majority of people answered all

positive values. These figures are arranged in the same manner as Figure 1.
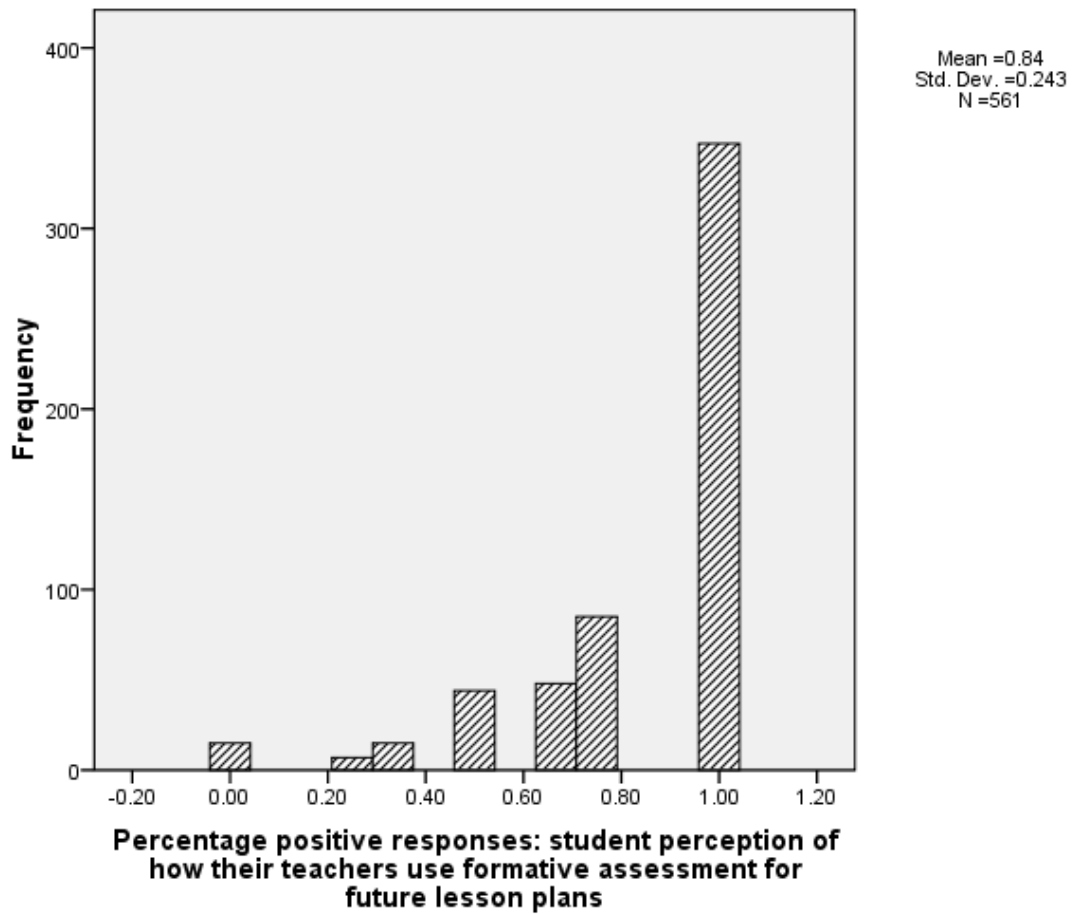
Figure 2. Distribution of Percentage of Positive Responses for Perception of Use of Formative Assessment for Future Lesson Plans.
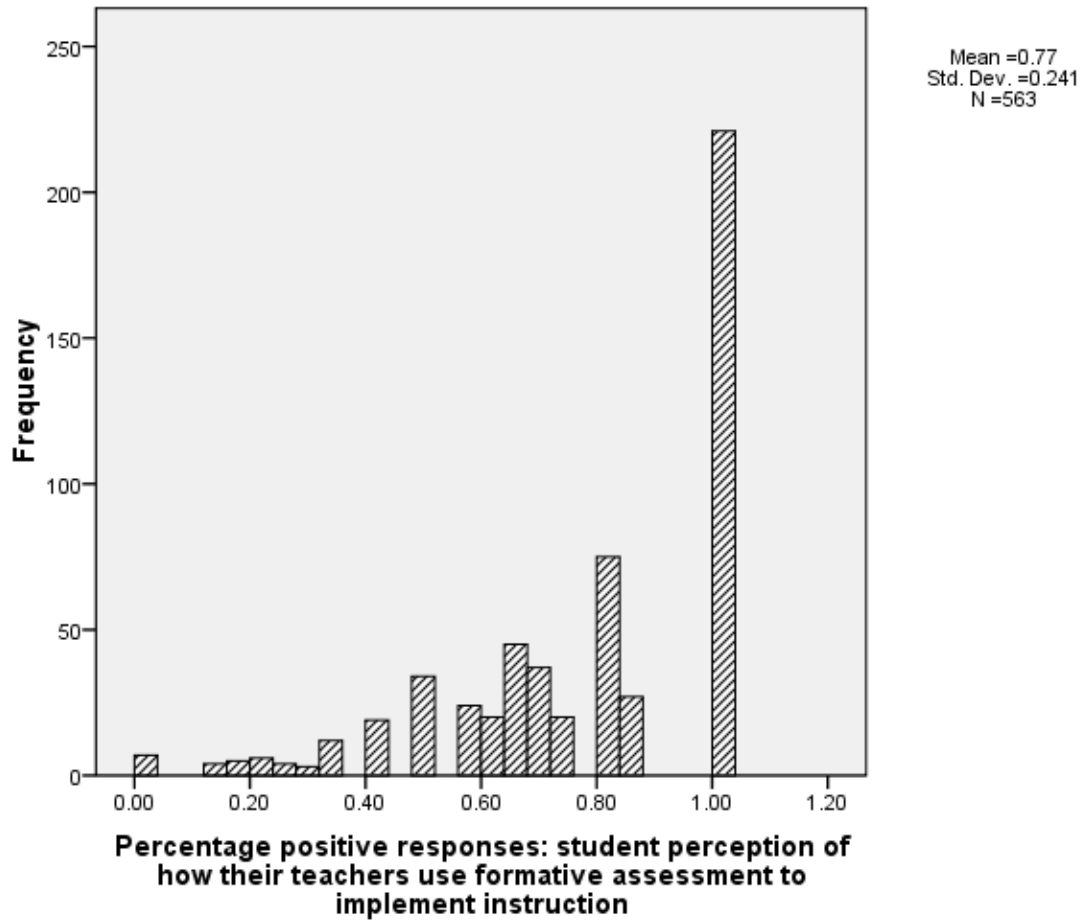
Figure 3. Distribution of Percentage of Positive Responses for Perception of Use of Formative Assessment for Instruction Implementation.
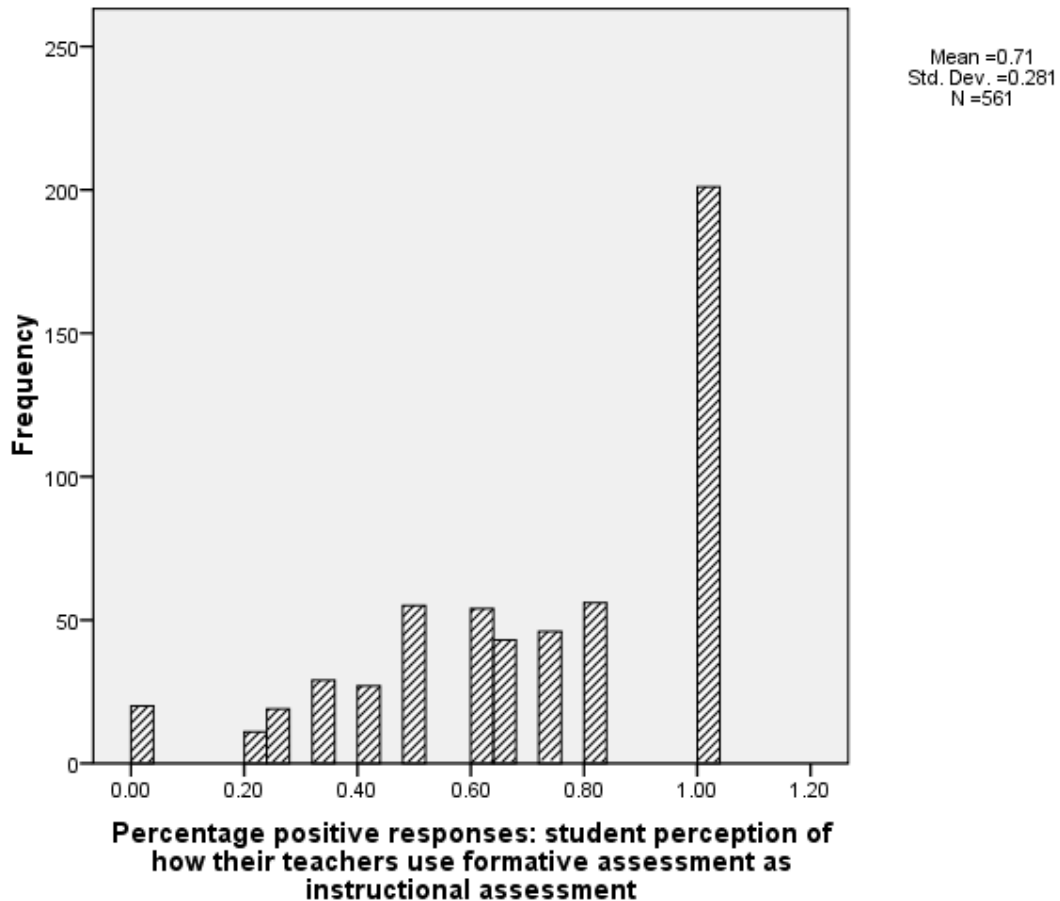
Figure 4. Distribution of Percentage of Positive Responses for Perception of Use of Formative Assessment for Instructional Assessment.

Table 6 presents the percentage of positive responses from students for each question/statement of the student survey. The statement, which gained the highest percentage of positive responses, was statement 1, "My teachers ask me how much I understand what they are teaching." This statement gained 96.25% positive responses from the students. On the other hand, the statement that gained the lowest amount of positive responses from students was question 23, "My teachers allow the students to set up some of the rules for the class." This statement only received a 26.63% positive rating from the students.

Table 6

Descriptives by Individual Question on Student Survey

Item	N	Percent Positive Response (Agree and Strongly Agree)
1. My teachers ask me during class how much I understand what they are teaching.	534	96.25
2. My teachers give me smaller quizzes before I take a big test on a unit.	535	91.03
3. My teacher puts as much emphasis on our classroom tests as they do for the End-of-Grade test.	467	87.58
4. My teachers plan their future lessons based upon how my class is understanding what is being taught.	500	97.40
5. I feel that I am properly prepared for my quizzes and test because my teachers ask me questions while they are teaching me.	517	94.39
6. My teachers tell me what I am expected to learn and why I am learning it.	506	94.86
7. My teachers ask me what they can do to help me better understand what they are teaching.	509	92.73
8. My teachers tell me what my strengths are.	385	73.51
9. My teachers encourage me to help other students during class.	429	75.52
10. My teachers ask me to show them my work during class so they can see what I understand and what they need to explain to me again.	496	87.30
11. My teachers ask me to showcase my work to the other students during class as a way to help them understand the assignment.	405	58.52
12. My teachers ask me how they can make their class more interesting.	379	53.56
13. My teachers show other students' work to the class so we know what the finished assignment is supposed to be.	437	78.72
14. My teachers allow me to have time to reflect in a journal about the things I learned in class.	434	47.47
15. My teachers help me to better understand the things I already know and help me to understand what I need to learn next.	497	95.37
16. My teachers give me time to grade my own assignments during class.	402	64.43
17. My teachers celebrate when I complete an assignment the correct way.	387	38.24

(continued)

Item	N	Percent Positive Response (Agree and Strongly Agree)
18. My teachers write notes to me on my work to let me know how I did and what I can do to improve.	449	78.40
19. My teachers place the students first in their classrooms.	414	87.44
20. My teachers usually catch my mistakes before I get frustrated trying to figure a problem out.	438	81.28
21. My teachers allow the students to communicate with them while they are teaching.	492	66.06
22. My teachers allow the students to set up some of the rules for the class.	413	26.63
23. My teachers want the students to work together to learn.	434	88.25

Correlations were also analyzed in the student survey. When the researcher analyzed the relationships between the research questions, connections, which were positively and significantly correlated, were noted. The Pearson's correlations are found in Table 7. Again, this implies that as scores improve in one area of research, the scores will also increase in another area of research. In the student survey, the relationship is strongest between research question 2 and research question 3. The relationship between these two questions is r = 0.788. This is considered a strong, positive correlation.

Table 7

Pearson's Bivariate Correlations by Research Question

	Learning Environment of Classroom (RQ1)	How students perceive teachers use formative assessment to plan future lessons (RQ2)	How students perceive teachers use formative assessment to implement instruction (RQ3)	How students perceives teachers use formative assessment as instructional assessment (RQ4)
Learning Environment of Classroom (RQ1)	1			
How students perceive teachers use formative assessment to plan future lessons (RQ2)	.506**	1		
How students perceive teachers use formative assessment to implement instruction (RQ3)	.591**	.788**	1	
How students perceive teachers use formative assessment as instructional assessment (RQ4)	.484**	.651**	.669**	1

Note. ** Correlation is significant at the 0.001 level, two-tailed.

In order to see how each research question related to other research questions on the student survey, a scatter plot was created for each comparison. Within each scatter plot, the relationship between the two research questions can be determined.
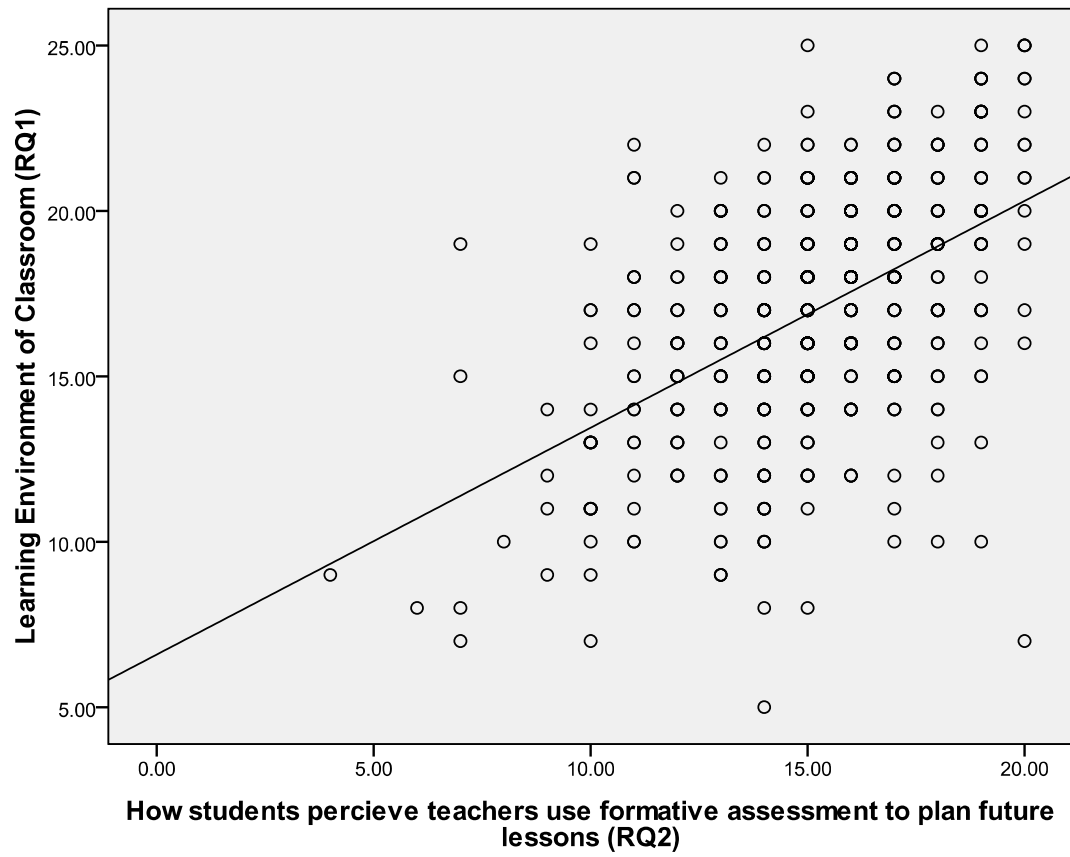
Figure 5. Relationship Between RQ1 and RQ2.
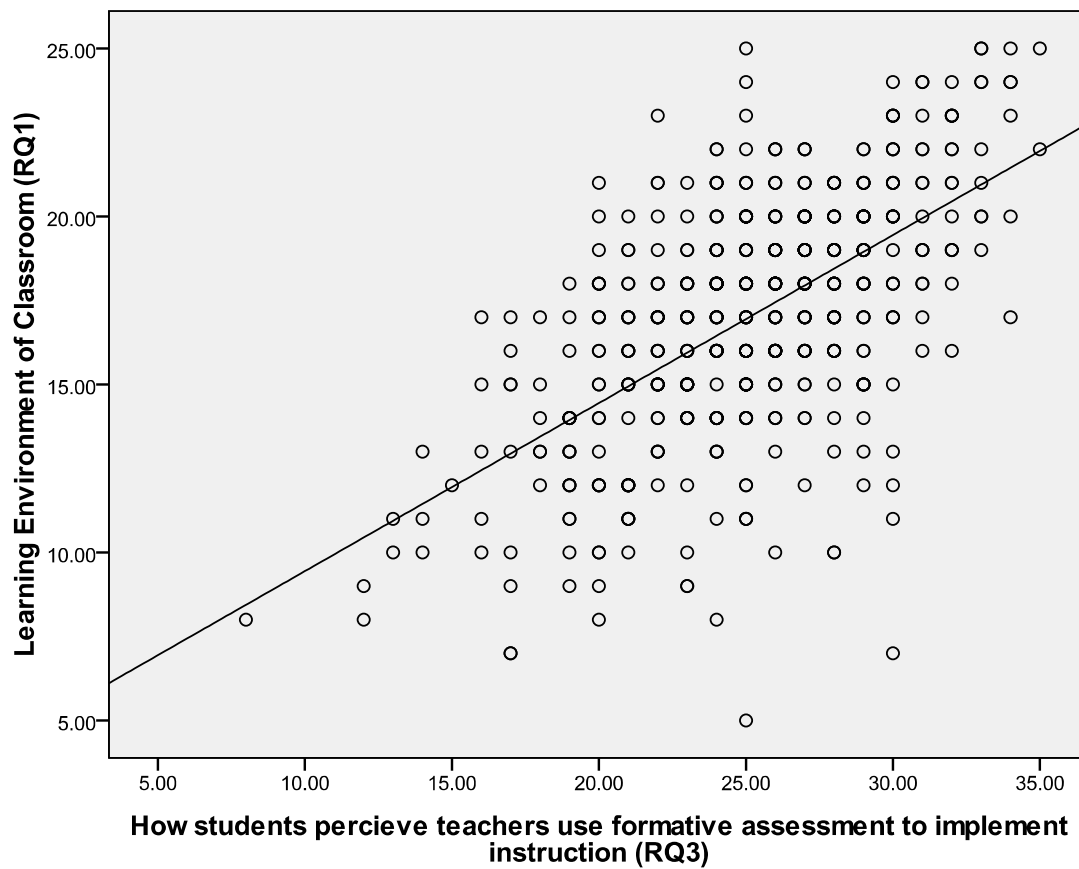
Figure 6. Relationship Between RQ1 and RQ3.
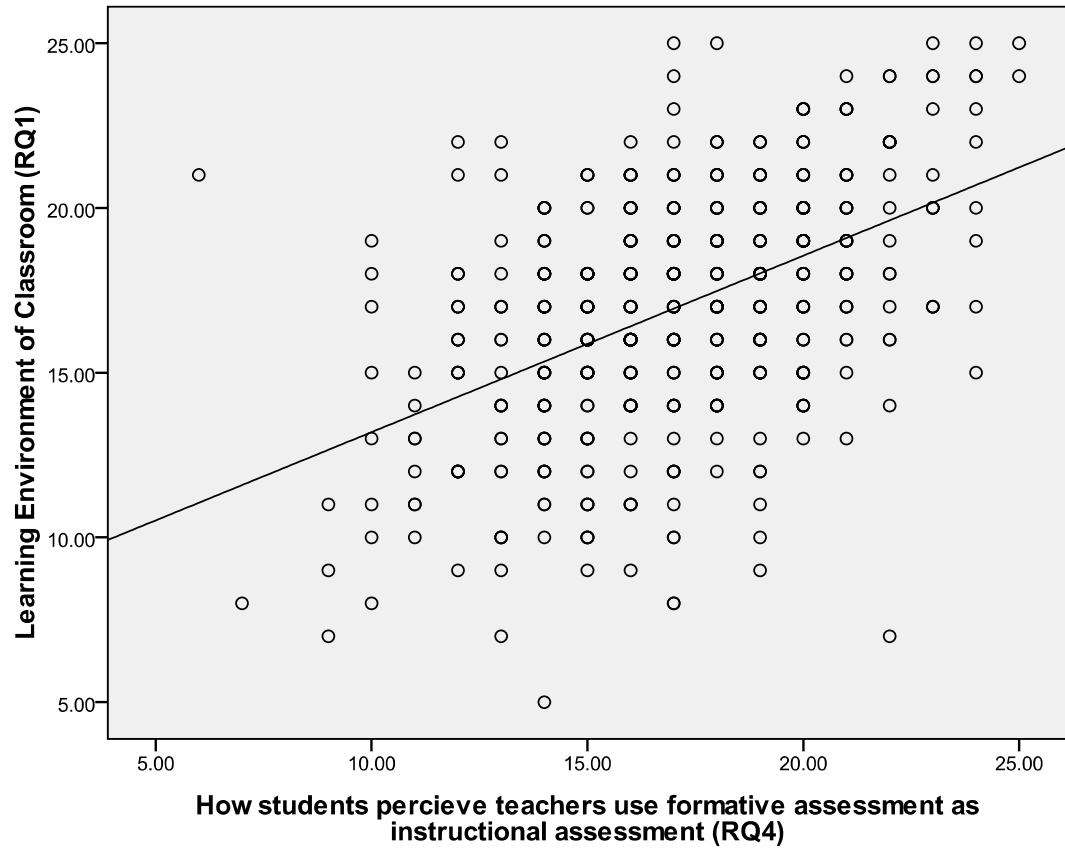
Figure 7. Relationship Between RQ1 and RQ4.
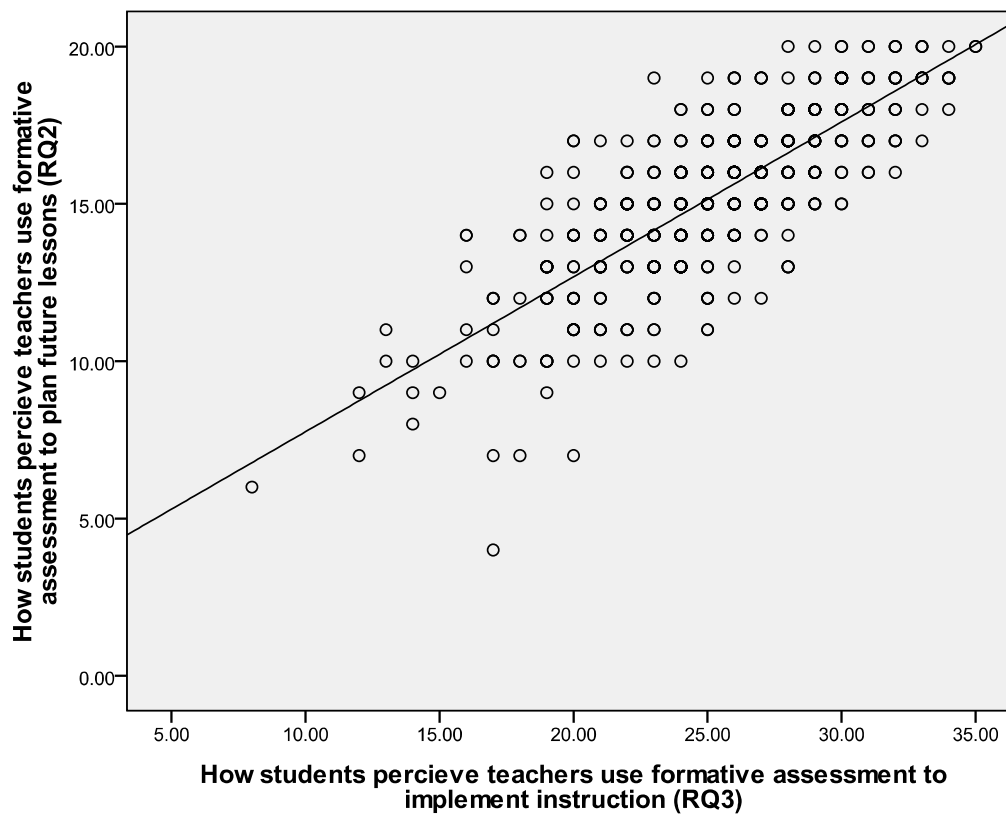
Figure 8. Relationship Between RQ2 and RQ3.
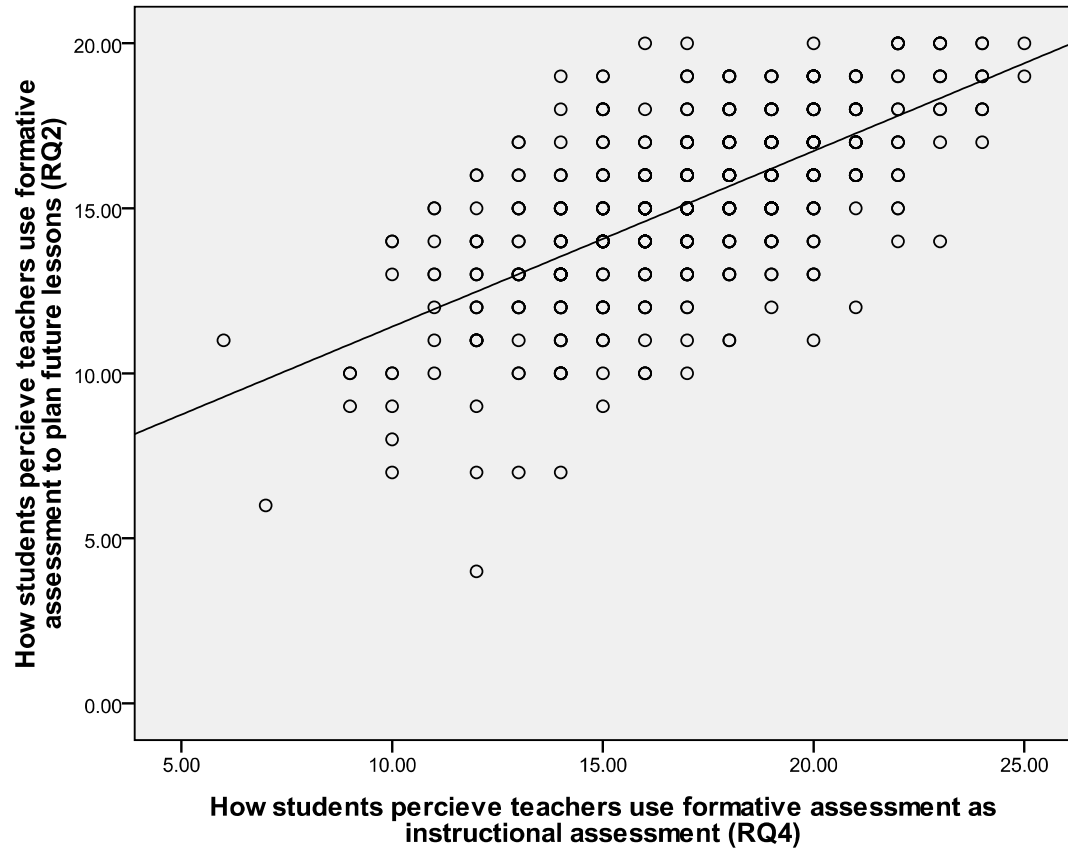
Figure 9. Relationship Between RQ2 and RQ4.
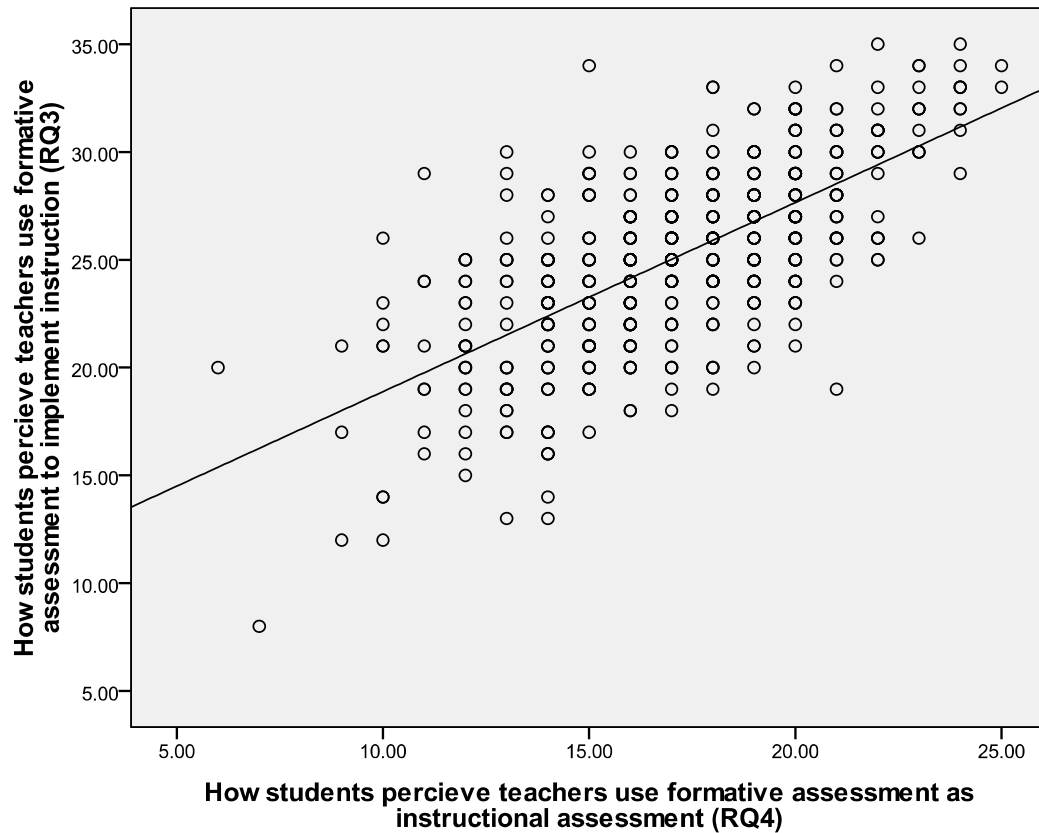
Figure 10. Relationship Between RQ3 and RQ4.

Analysis of student vs. teacher survey data. It is important for the research to note that the questions on the student survey and teacher survey had some differences in how each question was worded. The researcher chose to reword the student survey questions to ensure that each student who participated was able to comprehend what the question was asking. Since the comprehension of the students varies greatly across the school, the researcher wanted to give each student who participated an equal opportunity to answer the questions. While each question on the different surveys did not have the same wording, the researcher made certain each question was measuring the same concept. The results of the comparisons could be skewed. However, because the survey instruments were found to be reliable, some comparisons between the two sets of data

could be generated.

One interesting comparison was to determine the differences between how teachers perceived the content of the research questions versus how the students perceived the content of the research questions. Table 8 displays the percent of positive responses per research question, with designations made for student and teacher responses.

Table 8

Comparison of Research Question Between Teachers and Students

	Role	N	% Positive Responses
Research question 1	Teacher	12	95.83%
	Student	552	69.41%
Research question 2	Teacher	12	97.22%
	Student	561	84.05%
Research question 3	Teacher	12	93.06%
	Student	563	77.42%
Research question 4	Teacher	12	94.05%
	Student	561	70.64%

Additionally, an independent samples t-test was performed to further understand the relationships between the students and teachers on ClassScape and formative assessment. For research questions 1, 3, and 4, teachers scored significantly higher when compared to students in terms of the percent of positive responses. This could entail that what teachers think is a meaningful experience for students does not complement what the students perceive as a having an important effect.

Table 9

Independent Samples t-test Results

	t (df), p	Difference % Positive Response (Teacher-Student)	Std. Error Difference
Percent positive responses: Research question 1	3.115 (562), 0.002	26.42%**	.08483
Percent positive responses: Research question 2	1.877 (571), 0.061	13.18%	.07021
Percent positive responses: Research question 3	2.238 (573), 0.026	15.63%**	.06985
Percent positive responses: Research question 4	2.875 (571), 0.004	23.41%**	.08143

As stated before, the t-test reveals that students and teachers have a different

representation of the interpretation of research questions 1, 3, and 4. For research

question 2, the test statistics is t = 1.877, degrees of freedom = 571, significance ("p-

value") = 0.061. Because this p-value is greater than 0.05, the differences between the

percent of positive responses from the teachers and students is not significant. The

differences in the positive responses in question 2 are due to chance alone. Questions 1,

3, and 4 do have a significant difference between the positive responses of the students

and teachers due to the fact that the p-value is less than 0.05. For example, on question 1,

teachers feel more positive about the impact of the utilization of ClassScape on the

learning environment in the classroom than the students do. Figure 11 further depicts

these differences. A further description of some of the differences in student and teacher

perceptions can be found in the qualitative portion of Chapter 4.
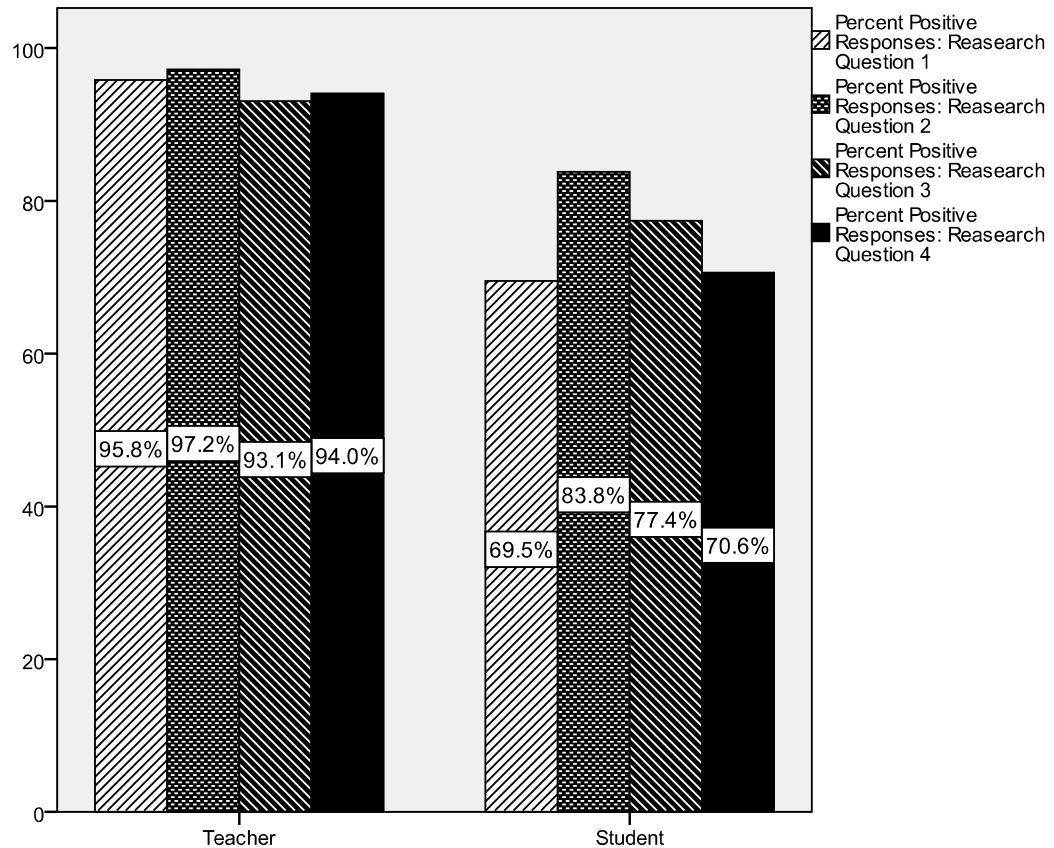
Figure 11. Percent of Positive Responses per Research Question Between Teachers and Students.

Analysis of Teacher Focus Groups, Student Focus Group, and Teacher Interviews

Coding of themes. As the researcher was analyzing the data and coding the themes, the relationship between the emerging themes and the ideas presented in literature review were investigated. The following themes emerged after the analysis of data concerning learning environments from the teacher focus groups, individual teacher interviews, and student focus group.

Frequency distribution tables. In order to graphically represent the number and percentages of the participants who contributed to the specific themes during the teacher focus groups, student focus group, and individual teacher interviews, a frequency

distribution table was included prior to the discussion of each theme. Within each

distribution table, the following information is identified: the theme being discussed, the

number of participants in the teacher focus groups who provided information regarding

the theme, the percentage of participants in the teacher focus groups who discussed the

theme, the number of participants in the student focus group who provided information

regarding the theme, the percentage of participants in the student focus group who

discussed the theme, the number of teachers who provided information during the

individual interviews, the percentage of participants in the individual interviews, and the

cumulative percentage of participants who provided information regarding the theme

from both the teacher focus group and the student focus group. This information is

shown before each theme throughout Chapter 4.

Learning Environment

> **Conferencing.**

Table 10

Frequency Distribution for Conferencing

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Conferencing	6	75	3	75	3	100	80

In regards to the learning environment, participants in the teacher focus groups

discussed the importance of conferencing with students. Some of the statements

concerning conferencing are recapped below: "...I like to sit down with my students after

they have finished an assessment and individually tell them where they have deficits and

the areas they need to work on more" (7th Grade Teacher Focus Group, 2011). Another

teacher in the 7th Grade Focus Group commented:

> I think it is good if I had time to sit down with my kids and individually plan what
>
> they need to go over for their basic needs and what they need help to correct. But
>
> unfortunately, while you are going over information with one child, you have 26
>
> sitting there hopefully doing what you have told them to do. (7th Grade Teacher
>
> Focus Group, 2011)

From these discussions, it is evident that the teachers know how valuable conference time

with students is because it provides teachers with an additional insight into the students'

progress. Conferencing also allows the teachers to give the students steps to help them

overcome their deficits. The researcher discovered how difficult the teachers view

student conference time is to maintain because of the number of technology programs

teachers in the selected school and district are required to sustain. Additionally, the class

size in the selected county has risen over the past several years. The extra number of

students in each classroom takes away from the number of minutes teachers can

conference with individual students. Teachers who were individually interviewed

reaffirmed the value of conferencing with students. When asked to describe how student

conferences add value to their classroom, teacher C stated:

> For one thing, student conferencing doesn't pit one student against another
>
> student because you are talking with them confidentially. There's no competition
>
> that way and students are not encouraged to show out. Conferencing really lets
>
> the student voice where they are struggling. They can do that more confidentially
>
> because they don't have to say things in front of the class or ask questions in front
>
> of the class. It is also a good way to get to know them individually. (Teacher C

Interview, 2011)

Another teacher shared during the interviews that student conferencing allows her another opportunity to gauge student understanding, which in turn drives her instruction. She explains as follows:

> It allows the student to express in their own words what they are having trouble with. Especially with writing conferences, you have no idea what their thoughts are because they are all over the place. I can help them with organization and their thoughts. In turn, I can drive my instruction with what they have said in comparison to where I want them to be. (Teacher A Interview, 2011)

Students were also questioned about the value of conference time with their teachers. Three out of the four students in the focus group responded positively when asked about the conferences they have with their teachers. Two students' remarks confirmed that the teachers were aware of the students' progress during instruction.

> I really do not like reading so I really do not pay attention like I should in my reading class. I was really slipping in her class so my teacher just pulled me out into the hallway and told me if I needed any extra help that she would be glad to help me. She gave me pretty detailed instructions about how I could do better in her class. Since she did that, I have learned that my teacher really does care whether or not I do well in her class. Now, I am doing better in her class. (Student Focus Group, 2011)

Another student commented:

> One time I started slipping in class so the teacher pulled me out into the hallways and told me that I was really not doing all that I could in her class. She told me exactly what I needed to work on in her class. That conference was kind of a

wake-up call for me. (Student Focus Group, 2011)

Student awareness as a result of conferencing. In regards to the learning environment and how formative assessments have an impact in the classroom, the teachers shared information about how their awareness of students is positively impacted as a result of conferencing. As teachers conference with students, which is a form of formative assessment, they indicate they are able to gain an awareness of the students that helps them change the learning environment in order to positively influence the students' success. Below are some excerpts from the focus groups regarding increasing student awareness and the effect it has on the classroom:

It (conferencing) is a way that you can get to know the student a little better.

Maybe things are happening in that student's life outside of school that are

affecting the student's performance in school. You might not know that unless

you have had a chance to sit and talk with that child and know their situation.

You won't ever know what is going on in the student's life unless you stop and

talk to them. (8th Grade Teacher Focus Group, 2011)

A teacher in the 7th Grade Focus Group said:

If you find their (the students') interest point and focus your teaching to it, that

pulls them in to being more in tune to what's going on. They are more likely to

pay attention to your lessons if they know you share some interests in common

with them. (7th Grade Teacher Focus Group, 2011)

As noted from the excerpts above, the teachers are aware that heightened student awareness allows them to adapt their teaching to be more in tune with the interest of the students. This is an example of how formative assessment can impact the learning environment of the classroom. Additionally, Teacher B shared in an interview how

valuable the time spent doing student conferences is to her because it allows her to see beyond what she would normally see in the classroom setting.

> I think conferencing gives the students more personal time with me that you do not get in the classroom. So, sitting down with them helps you to get more from them than what you would normally get in the classroom. (Teacher B Interview, 2011)

A student in the focus group discussed how conferencing with her teachers really helps her to understand that her teachers care about her:

> When my teacher pulls me out into the hall, they really care more about just what I need to know for the test. If I would ask a question in class, they would probably just repeat what they had just said in class again. But when I conference with them one-on-one, it is like they put more concern into what they are telling me and I seem to understand it better. (Student Focus Group, 2011)

A second student talked about how beneficial the conference time is with his teacher. "Conferencing with my teacher kind of helps me because you know what they are talking about and it makes it more personable because they are just talking to me instead of talking to everyone at the same time" (Student Focus Group, 2011).

Student accountability.

Table 11

Frequency Distribution for Student Accountability

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Self-Assessment	4	50	2	50	3	67	60

In regards to the learning environment, the teachers who participated in the focus groups conversed about the increase of student accountability that accompanies ClassScape assessments and formative assessment in general. A small representation of the teachers' comments about student accountability is below. These comments were mentioned after the focus groups were asked about their thoughts on self-assessment. "Self-assessment is crucial because they need to see what they missed and they need to be able to correct it....I think it is beneficial for them (the students) to see what they need to work on more" (7th Grade Teacher Focus Group, 2011). A teacher in the 8th Grade Focus Group commented about self-assessment:

> When I let students grade other students' work, I use it to check for homework completion. I always let them exchange back to their (own) work in order to analyze it. I am always the one who puts the grade on the assignment. I think letting other students analyze the kids' work adds accountability for the students. (8th Grade Teacher Focus Group, 2011)

As noted in the discussions below, the teachers view student accountability as an important component within formative assessment. The discussions confirm that one of the main ways teachers at the selected school add student accountability to their classrooms is by allowing the students to assess their own work as well as the work of their peers. To further authenticate these statements, individual teachers were asked to provide their views on student assessment. Teacher A responded with the following:

> It is a really good idea. Students can see what their weaknesses are and their strengths. They can bring up points to you by saying "This just didn't make sense to me" or "I think I may need more help with this problem." I use these statements to steer them in the right direction. (Teacher A Interview, 2011)

Additionally, Teacher C added, "It is a really good idea because they need to see where the teachers are coming from and be able to see their own mistakes" (Teacher C Interview, 2011).

Students at the selected school have become accustomed to self-assessment. The statements from the student focus groups below evidence this statement:

Grading my own work helps me a lot more because I can quickly see what I did wrong and what I did right. I do not have to wait for the teacher to grade it and give it back to me. (Student Focus Group, 2011)

A second student shared their perceptions about self-assessment during the student focus group. This student, along with two other students in the focus group, shared that they have a positive perception when they are allowed to peer assess their work:

I think it gives me more of an edge when other people grade my work because I want them to see how many problems I got right. When I know other people are going to grade my work, I am way more careful as I work through each problem. (Student Focus Group, 2011)

Student feedback.

Table 12

Frequency Distribution for Student Feedback

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Student Feedback	2	25	3	75	3	67	53

In regards to the learning environment, giving prompt and specific feedback to

students has an impact. The learning environment can move forward when teacher

feedback is present. The teacher focus groups allowed the researcher to gain insight into

how important feedback from teachers is. It also allowed the researcher to see how

important teachers take feedback from students. Some exchanges from the 8th Grade

Teacher Focus Group reinforced this concept:

> I have them (students) write down where they need help during the first
>
> ClassScape test and use their notes to reteach the lesson. I am really seeing how
>
> the kids are getting excited when they see their scores go up on the second
>
> ClassScape assessment. (8th Grade Teacher Focus Group, 2011)

As stated above, the teacher above uses student feedback as a way to drive her

instruction. The students are able to see that their input is taken and used by the teacher.

Another teacher discussed how she uses student feedback in her classroom: "I give my

students feedback on their assignment, which includes their grade and some advice on

how to fix their problems" (8th Grade Teacher Focus Group, 2011). "Just handing their

papers back to them doesn't do anything unless they know what they did wrong and how

they can get better" (8th Grade Focus Group, 2011). Another teacher added how she uses

short quizzes as a method of formative assessment to understand the level of

understanding students have of the concepts being taught.

> I have been giving two or three question quizzes on what we are learning now. I
>
> have been taking my pen and circling where the students messed up and telling
>
> them how to avoid this mistake in the future. I have seen how this helps them not
>
> to make the same mistake again. (8th Grade Teacher Focus Group, 2011)

A teacher in the 7th Grade Focus Group added, "I still require my students to write down

work even though they use calculators for computation because it allows me to give them

feedback, which will better support them" (7th Grade Focus Group, 2011). Finally, a teacher shared her experiences with the feedback abilities of the ClassScape program:

I do like the fact that it [the ClassScape program] is immediate feedback and that we can print off the reports and compare them quickly. We can quickly see what kids are not getting the concepts, regroup the students, and offer some students some remediation. (8th Grade Teacher Focus Group, 2011)

It is evident from these conversations that the teachers at the selected school have comprehended the importance of feedback, both from the teacher and from the students. Additionally, teacher feedback to students adds another layer of responsibility for students. One teacher noted, "I think it helps my students to know that I am looking over their work every day because it lets them know that I value their work enough to give my time to give them daily feedback" (8th Grade Teacher Focus Group, 2011). Finally, another teacher said that daily feedback helps:

The students know if they did well or not. I think relating their mistakes to my instruction adds accountability for the students because they know I am looking over their work and they need to turn in only their best work. (7th Grade Teacher Focus Group, 2011)

These conversations allow the researcher to see that the teachers not only leave feedback for the students but also give the students important steps to help them circumvent the same mistakes in the future.

The theme of the importance of student feedback was further reinforced in the individual teacher interviews. During the interviews, the teachers shared their perspectives on student feedback. Teacher C said:

I usually write a brief note to the student who is doing great or to the student who

is not doing so great and struggling. I always tell them what to try in the note and just give them some hints to try. Usually, it works after three or four hints because they learn I am taking their work seriously. (Teacher C Interview, 2011)

Throughout the student focus group, the importance of feedback from teachers was discussed. The students were quick to respond about the value they see in the feedback their teachers provide for them. The first excerpt listed below encapsulates a student's feelings on written and oral feedback from teachers:

Feedback from teachers on my papers helps me but sometimes our teachers just come up and give us feedback face-to-face. Sometimes they will just tell us to step it up because they know we did not do our best on the assignment. Or, if we do really well on the assignment, my teacher may just pull me out into the hall and say "Hey, you did really good on this assignment." (Student Focus Group, 2011)

One additional comparison to make from the student focus group is that the students agreed that their teachers put as much emphasis on the importance of praising the positive outcomes from the students as they accentuate ways to help the students become more successful on their work. The student below described this point during the focus group: "I think my teachers put more good comments on my work as they do for ways to help me to do better on my work. In my opinion, the good comments are a real confidence booster for me" (Student Focus Group, 2011).

Goal setting.

Table 13

Frequency Distribution for Goal Setting

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Goal Setting	5	63	3	75	3	100	73

The discussion in the focus groups then turned to how student feedback can help

teachers and students form appropriate goals for the students. Since goal setting is an

integral part of formative assessment, it would be important for the researcher to gauge

the teachers' perceptions on this topic. Captured below are some exchanges on this topic:

"Having a goal to reach with steps to get to that goal is very important in helping each

student to succeed" (8th Grade Teacher Focus Group, 2011). A teacher in the 7th Grade

Focus Group added:

> We talk about math being a ladder and that you can't just jump to the 5th or 6th
>
> step in math at one time. I tell the students that you have to set several smaller
>
> goals in order to be able to make it to the ultimate goal. (7th Grade Focus Group,
>
> 2011)

These conversations confirm that the teachers at the selected school understand the

importance of students having goals so they can be successful. The teachers who

participated in the individual interviews were also asked about goal setting for students.

The interviews shed some supplementary insight into the value of goal setting. Teacher

A responded by saying:

> The students and I always discuss where they need to be. I take their input very

seriously. Just yesterday, the students and I discussed where their percentages

were and where their percentages should be. Especially when progress reports go

home, I always ask them where they want to be by the time the report cards are

issued. I think it has to be a conglomeration between the students and the teacher.

I think you both have to come together and set the goals while steering the

students in the direction I think they should be going. I always ask the students

"why do you think you should be there? What can you do to get there?" I think

setting goals must be done together by the student and the teacher. (Teacher A

Interview, 2011)

The theme of assisting students with goal setting continues in a second teacher interview.

Teacher C stated:

I do have them set goals with guidance for themselves. If I said, for example, just

go and choose a book to read and tell me how long you think it is going to take

you, they would choose a thin book with no substance and say it was going to

take them a week to read it. I do have them set goals for things we do with my

help. I really like doing that with my kids. (Teacher C Interview, 2011)

Goal setting for students was also discussed during the student focus group. When asked

if setting goals for themselves has an influence on their classroom performance, students

responded favorably to the question. One particular student summarized what goal

setting did for her:

Yes, one of my teachers was really concerned about a low "B" that I was making

in her class. She came to me and asked me what I could do to bring that "B" up

to an "A." I gave my teacher several things I could improve on and she and I

agreed that if I did all of those things, I would probably end up with an "A" at the

end of the semester. And sure enough, I was able to pull my grades up in that

class. (Student Focus Group, 2011)

Instructional Planning

The following themes were gathered from the teacher data and student data.

Data-driven decision making.

Table 14

Frequency Distribution for Data-Driven Decision Making

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Data-Driven Decision Making	3	38	2	50	2	67	47

Throughout the teacher focus groups, it became evident to the researcher that

data-driven decision making is an important concept to teachers as they teach. Data-

driven decision making (DDDM) allows teachers to make sure their decisions are made

as a result of student data instead of just what the teachers do or do not want to do.

Teachers once again share their thoughts on DDDM:

I have the students write down where they think they need additional help while

they are taking the first ClassScape assessment. I then use their notes as I reteach

the lesson to the students. Because I am using their notes, I am really able to

cover all the deficiencies the students have with the concept. I can see the

students really get excited when they see their scores go up when they take the

second ClassScape assessment on the same topic. (8th Grade Teacher Focus

Group, 2011)

Another teacher added how the reports from ClassScape help her to direct her future

instruction:

> I use the reports from the ClassScape program to guide my future lessons. The
>
> reports help me to see how much of my class understood a specific lesson. If I
>
> need to spend additional time on a certain lesson, the reports help me to make that
>
> decision. (7th Grade Focus Groups, 2011)

Additionally, a teacher noted how valuable ClassScape data were in order to gauge the

effectiveness of their instruction and where to take the instruction.

> I think ClassScape is a great way to test to determine how much they know and do
>
> not know after my instruction. I can use a set of ClassScape questions, analyze
>
> the student scores, do some reteaching, and then use the second set of ClassScape
>
> questions to see how effective my instruction was and where I should go next.
>
> (8th Grade Teacher Focus Group, 2011).

Finally, a teacher shared her experiences with the ClassScape program data and how it

changed what she was planning on teaching next.

> ...I have had some of the questions on ClassScape where the kids thought it was
>
> wanting percent of change but it was really asking for rate of change. The
>
> program has helped me to distinguish what I really need to help the kids
>
> understand more. (8th Grade Teacher Focus Group, 2011)

Subsequently, teachers in the individual interviews furthered the conversation regarding

the use of the ClassScape program and data-driven decision making. Teacher A added:

> I have found a way to go in and create my own assessments in the ClassScape
>
> program. This allows me to pick questions for what we are working on for that
>
> week, select appropriate questions for the students, and read the reading selection

in class. This way, it saves us major time when we get into the computer lab. I

go ahead and have the students mark their answers while we are in the classroom

so all the students have to do is enter their answers into the ClassScape program

and then they and I can immediately see what their strengths and weaknesses are.

Depending on the results, I may or may not go back and reteach a certain concept.

(Teacher A Interview, 2011)

During the interview with Teacher B, she gave an example of how she uses ClassScape

for data-driven decision making in her classroom. Below is the excerpt from that

interview:

ClassScape has helped me to make instructional decisions because as soon as we

take a test on ClassScape, I print off what the students have missed and

immediately discuss it with the students. I then incorporate the questions into my

lesson plans for the next day. I try to review and reinforce what they missed on

the ClassScape test the next time I have those students in class. I gauge my lesson

plans by their scores on the test and I go from there. I'm still stuck in probability

because they bombed their assessments on it and I am trying now to get back and

patch the holes. Hopefully, the next assessments will show the difference our

review has made. (Teacher B Interview, 2011)

Students who participated in the focus groups also discussed how their teachers looked at

how well the class was doing before moving on to new material. As the students

discussed how their teachers use data-driven decision making, they were very cautious to

point out that each of their teachers throughout the day treat data-driven decision making

differently. Listed below are some excerpts from the conversation.

It really comes down to the individual teachers. I mean I have teachers that are

really careful to show us exactly what we did and did not get right. Like this morning, my math class did a ClassScape assessment but my math teacher always goes back the next day and pulls up the assessment in the classroom so we can all see what we made as a class average and on individual questions. I find out exactly what questions I got right and which questions I got wrong. My teacher shows me what I did to miss the question. My teacher then asks the class, "How many of you guys got this answer right or wrong?" This part is really fun for me because it lets me see how I did on the test compared to how my friends did on the test. (Student Focus Group, 2011)

Another student commented about how often their teachers utilize data-driven decision making in their instruction:

...Yes, my teachers go back and review tests and quizzes that we have done all the time. They will say "Class, a lot of you did ok on the quiz. But, a lot of you could have done better. Let's go back as a class and review and see if we can clear up some things." (Student Focus Group, 2011)

An additional student commented about how their teacher analyzes how the class is understanding the material being taught.

We were doing a paper 1 day about poems and there were a couple of students in the room that were really having a tough time understanding what they were supposed to be doing. The kids kept messing up and messing up. The teacher worked really hard with them to try and get them to understand. After that lesson, we did a sheet and almost half the class missed it. Then the teacher was like, "Wow! We need to stop and go back over this." She then taught the lesson over again and that really helped us out a lot. (Student Focus Group, 2011)

Finally, a student in the focus group talked about how his teacher's use of data-driven decision making helps him to take ownership of his learning.

> During class, my teacher will say things like "A lot of you guys missed question 7…" and I know in the back of my head that I was one of the kids who missed that question. Then my teacher will go over the correct way to get the answer for that question and I can listen to see how he works the problem out. Then, the teacher will go over that problem again just to be sure everyone got it. (Student Focus Group, 2011)

Differentiation.

Table 15

Frequency Distribution for Differentiation

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Differentiation	5	63	3	75	4	100	80

During the teacher focus groups, the researcher was able to see how the teachers used formative assessment data to plan appropriate activities for each level of students in the classroom as well as determine which students grasped a certain concept. One teacher stated how she used ClassScape to provide differentiation for her students.

> I like, due to the fact of having an algebra class, that I can put the assignment onto ClassScape for enrichment when they have finished an assignment in class. That way, the student can go in and do the basic 8th grade EOG type questions. Since those students are responsible for both the EOG and EOC, I can differentiate for both sets of students. (8th Grade Teacher Focus Group, 2011)

Another teacher mentioned how she uses the ClassScape program to differentiate for her students. "Since we plan together and work together, we use ClassScape to help us determine who needs to go to the exceptional needs teacher in the afternoons for additional help. That's huge differentiation" (8th Grade Focus Group, 2011). Yet another mentioned differentiation for her students as a result of formative assessments. This teacher uses the pace of her instruction as a form of differentiation. "If I see my students struggling, I slow down. If I see that they are doing well as a whole, I can move on while individually helping the students who need extra assistance" (7th Grade Focus Group, 2011). The theme of differentiation carried over into the individual teacher interviews. Teacher A stated:

> Yes. ClassScape has helped me to get a better idea of where the students really are in their understanding of math concepts. I try to get the exceptional children's teacher to pull the students who need additional help after an assessment. This is great differentiation because the kids who need additional help are receiving it. (Teacher B Interview, 2011)

Additionally, Teacher A added:

> Yes, I assign additional questions for reinforcement so students can get help with their weaknesses. Also, I assign more difficult questions for students who are excelling with the material. This really helps me to teach to every student's level. I take the data from ClassScape and use it during my conferences so I can get a clear picture of what every student knows. (Teacher A Interview, 2011)

The participants in the student focus group also discussed how their teachers differentiate their instruction based upon the level of student understanding. For the most part, the students said differentiation comes via the speed of the instruction. Listed below is an

extract from the students' discussions on differentiation:

> In my reading class, we were writing down notes about poems because we are
>
> learning about poetry now. Our reading teacher was writing the notes down but
>
> was, in my opinion, not really explaining what those notes mean. We [the class]
>
> thought that the teacher was really not explaining the notes. We were all really
>
> confused with what we were doing. I asked the teacher to slow down several
>
> times. Finally, once the teacher started seeing that it wasn't just me who was
>
> struggling to keep up, she started to really slow down. She even went back and
>
> reviewed what she had already said. (Student Focus Group, 2011)

The statement above demonstrates the dialogue between the students and the teacher that

is present. This dialogue, which is a component of formative assessment, allows the

teachers to further determine how much the students do or do not understand the material.

Instructional Implementation

Expectations for students.

Table 16

Frequency Distribution for Expectations for Students

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Expectations	4	50	3	75	3	100	67

Ensuring students are aware of their expectations was discussed in the teacher

focus groups. The teachers voiced their opinions about how each student knows what is

expected of them is important. One teacher said "Clear expectations are very important

because it sets the standard for student behavior and learning goals" (7th Grade Teacher Focus Groups, 2011). This theme was continued in the individual teacher interviews. Teacher C commented after being asked about her thoughts on letting students know their expectations prior to lessons being taught:

> I absolutely agree with letting students know their expectations prior to a lesson being taught. If I do not tell them, they are going to ask me anyway. Maybe that's because I always try to tell them ahead of time because they want to know what is expected of them. I think it is the fear of the unknown that gets them off track all the time. For example, one of my students I currently teach is very detailed driven. If I tell him what is expected before I begin the lesson, I have noticed he is more tuned in to the lesson. If I neglect to tell the class what is expected of them, I have noticed he is more scattered throughout the lesson. I think letting him know the expectations ahead of time helps him to concentrate more because he knows exactly what I want him to learn. (Teacher C Interview, 2011)

Another teacher discussed the importance of student awareness of lesson expectations in the interviews. Teacher A said:

> When I tell my students what I expect to get out of the lesson, a lot of times, at the end of the lesson, I have had a few students say "I really didn't get what you were trying to tell me." Comments like these really help me to understand if my instruction was beneficial to the kids. When I get these comments from the students, that is an instant indicator to me that my lesson was not successful. My kids are really giving me formative feedback without even knowing it. It is like they are giving me a teaching evaluation. I know they are being serious with me.

So, in turn, I go back the next day and try a different approach to see if that will help them understand the material better. (Teacher A Interview, 2011)

Finally, Teacher B said the following about student familiarity with lesson expectations prior to the lesson being taught:

I make sure my students know what I expect out of them before I start teaching. I think it helps the students to focus in and listen for key words and phrases that would be important in trying to understand what the lesson is about. I make sure my expectations for the students are in phrases that are friendly to the kids, not the old standard course of study language. That way, any knowledge the students had about the topic from previous lessons can be triggered in their heads and they can start thinking about what they already know. (Teacher B Interview, 2011)

Additionally, the students who participated in the focus group had some supplementary commentary about how setting expectations helps them in the academic setting. One student put this practice into very basic terms, "When the students tell me what I am supposed to do, it helps me because then I know I have to get this and this done by the end of class" (Student Focus Group, 2011). Furthermore, another student discussed how their teacher explains their expectations to the students in the class. "My teacher is really good to tell us what we are expected to know. She breaks down the bigger words into words that I really understand" (Student Focus Group, 2011). From this comment, another student immediately responded by stating how his teacher is different in how she sets expectations for her class:

...Well, my teacher doesn't break down the big words for us. She tells us that she uses the big words on purpose so the words will become familiar to us. What she does is teach using the words all the way throughout the lesson. She gives us a lot

of examples of what the words mean so we can really learn the words while she is

teaching. This way, the big words don't seem so big any more to us. (Student

Focus Group, 2011)

Learning styles.

Table 17

Frequency Distribution for Learning Styles

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Learning Styles	3	38	1	25	3	100	47

In looking at formative assessment and how it related to instructional

implementation, some key themes emerged. Having teachers who are interested in the

learning styles of their students and adapting their teaching practices to accommodate the

various learning styles represented in the classroom, the teachers will better serve

students because their instruction can be adapted to better suit the needs of the students.

Additionally, teachers indentified the importance of having students model the correct

procedures or use to model specific instructions. In order to develop an appropriate

learning environment, teachers should understand that the center of attention in their

classrooms should be on the students (Brandsford et al., 2000). The researcher asked

about the high number of teacher survey participants who said they asked students to

suggest ways their learning can be improved. The focus group participants said that

when asked by students to change a classroom practice, they take that opportunity to

discuss learning styles with students. The focus group participants say this discussion is

always very positive with the students and it has a positive effect on the classroom. Listed below are some of the excerpts that occurred in the teacher focus groups concerning learning styles:

> ...There are different learning styles in every classroom. I tell my students I am aware that everyone in the classroom does not learn their best when they are working with a paper and pencil. I ask them to give me suggestions as to what I can do better. (8th Grade Teacher Focus Group, 2011)

Additionally, a seventh-grade teacher said the following:

> I talk to my students about learning styles. I tell them that some students learn better by seeing material, some learn better by writing it down, and some learn better when they do more than one of those things at the same time....It is my job to provide these opportunities for my students. (7th Grade Teacher Focus Group, 2011)

This same theme was continued during the individual teacher interviews. The teachers also supported the concept of being aware of the various learning styles in the classroom and adjusting their teaching practices to reflect the different learning styles present. Teacher A gave a specific example of how her knowledge of the various learning styles allowed her to accommodate her students.

> ....Knowing the different learning styles of the students in my classes is a big plus for me. I usually get to know about the learning styles by just having a conversation with my students on how they learn the best. I have a student now who is a prime example of how my knowledge of his learning style helps me to help him. The student told me during this discussion that he hates to work in groups because he doesn't like the noise that working in groups makes. So I

responded with "How would you like me to help you with that?" The student responded by saying it would help him if he and his partner could sit at the front of the room to work. I agreed to let them work at the front of the room and it really seemed to help the students. So, all throughout the year, anytime we work in groups, that student and I have an understanding that he gets to work in the front of the room. I think letting me problem solve with him about where he would work the best during group work has really benefited him because now he does not get frustrated any time I mention that the class is going to do a group activity. This is great because he is really starting to work with other students better. (Teacher A Interview, 2011)

Teacher C added an interesting perspective about knowledge of learning styles in her interview:

I love to learn about the students' learning styles at the beginning of the school year. This is one of the first things I do at the beginning of the year. If I do not make any of my instruction interesting for my students by teaching in the way the students want to learn, my instruction is pointless. I know the students think, "If she is going to just get up there and lecture me all the time, I am just not going to listen. But if you are going to change it up and do some other stuff than just lecture me, maybe I should listen so I do not miss anything." (Teacher C Interview, 2011)

Additionally, the students added their own thoughts and perceptions on how their teachers teach to the different learning styles that are present in the classroom. One particular student in the focus group gave a specific example of how their teacher used learning styles:

...Yes, like we were reading a book and every now and then some people wanted

to read by themselves and some people wanted to read in groups. Some people

wanted the teacher to read the book to us. So, to help all the kids, the teacher

made a little schedule for us. The teacher then started reading for a day, letting us

read in groups for a day, and then we would read to ourselves one day. That way,

everybody got to do what they wanted to do. (Student Focus Group, 2011)

Modeling of instruction with student work.

Table 18

Frequency Distribution for Modeling of Instruction with Student Work

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Modeling	7	88	2	50	3	100	80

Using exemplary student work is a way to show students where they need to be

(Garrison & Ehringhaus, 2007). This component of formative assessment was discussed

in the teacher focus groups. Teachers were asked to discuss whether or not they believe

using student work as a teaching tool was a good teaching method. The teachers

expressed a positive outlook on using student work as an indicator of acceptable work.

"...It is nice to hold up a finished project and say this is what you are supposed to do" (7th

Grade Teacher Focus Group, 2011). Another teacher commented:

I think the students think the directions I give are vague even though I think they

are very specific. But, apparently, I miss steps. But, when they see another peer's

work and that they have figured it out, it is like oh, if they can do it, I can too.

When I show them how to do it and let them see another student's work, it really

helps students to get it. (8th Grade Teacher Focus Group, 2011)

Another eighth-grade teacher mentioned how technology has improved the way she uses student work as a tool to guide students.

> The SMART Board has been great for showing student work because I can put the work up there immediately and say this is the way it should be done. Just having the ability to show the students their peers' work is a great way to teach. You can also say, "Look! See right there. This is where he messed up." It really helps the students to understand what they should and shouldn't do. (8th Grade Teacher Focus Group, 2011)

Teachers in the focus groups not only mentioned how important it is to use student work but they also referenced the significance of having students give the instructions. "I do like having students who understood the concept explain to other students why and how they got it because they can explain it in a way where the other students will comprehend" (7th Grade Teacher Focus Group, 2011).

> Teachers in the individual interviews were also positive toward using student work as a guide for instruction. Within the interviews, the selected teachers gave examples about how they use student work as an exemplar for other students. The ideas taken from the individual teacher interviews matched the ideas from the teacher focus groups. Below are some selections from the teacher interviews about using student work. Teacher A said:

> I use student work frequently when students are required to complete a project. For example, the students in one of my classes just completed a project where I used some work from students I had taught in previous years as examples when I was introducing the concepts. As I was going over the directions for the project, I

related the directions to specific items on the projects from other students. It was

almost like I could see the students understanding what I was asking them to do as

I was explaining the directions. This concept works very well with me because it

helps the students to become aware of exactly what it is I want them to do.

(Teacher A Interview, 2011)

Another teacher discussed how she allows the students themselves to assume a leadership

role and model the instruction for other students.

...I pick a student who I know understands the concept in every small group so

they can model the concept to the other students. So inadvertently, I do use

student work to model instruction, it is just that the kids do not realize what they

are doing. It is amazing to see how differently students react to other students'

instruction, instead of the way I teach class. (Teacher B Interview, 2011)

Additionally, the members of the student focus group seconded the fact that when

teachers use student work to model instruction it helps more students to understand the

assignment. Below is a remark from a student during the focus group:

When my teachers hold up another student's work and show us why they like that

student's work and why we should make our work like theirs, I really want to do

well on the assignment because I want to show the teacher that I am as smart as

the other kids. (Student Focus Group, 2011)

Higher order thinking skills and questioning.

Table 19

Frequency Distribution for Higher Order Thinking Skills and Questioning

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Higher Order Thinking Skills	5	63	2	50	3	100	67

Using formative assessment is a method of determining the level of understanding

a student has for higher order thinking skills (Moore & Stanley, 2009). During the

seventh- and eighth-grade teacher focus groups, the participants alluded to how the

ClassScape program assisted the students in learning how to respond to higher level

questioning. According to the teachers, the questions in the ClassScape program are

written in a manner that requires students to not just answer a question with an A, B, C,

or D, but the questions require the students to use reasoning and knowledge to arrive at

the correct answer. Here is an excerpt from the teacher focus groups:

> ...Like I said earlier, ClassScape has more advanced questions. So the students
>
> may have the basics, but applying it and using different steps is a nice feature in
>
> ClassScape that helps me. You can see from the ClassScape data that the students
>
> can do the computations but they can't apply details and multi steps in advanced
>
> problems. The problem solving skills are nice in ClassScape. (7th Grade Teacher
>
> Focus Group, 2011)

As stated above, the teacher is pleased with how the ClassScape program requires

students to not just answer the question and move on to the next question, but it requires

students to exhibit a high level of reasoning to get the answer correct.

When asked more specifically about ClassScape questions and their classification of higher order thinking skills questions, the teachers in the individual interviews agreed with the conclusions from the teacher focus groups. Teacher B commented:

> I think other technology assessment programs have questions that are way too vague for my students. I also disagree with some of the answers on the other programs and how they have gone about getting the answers. I think the ClassScape questions are more concrete and help the students to get multi-step problems. There are several steps to each question on ClassScape and I use the questions to help prepare the students for the EOG. I tell them these questions are exactly what you are going to see on the EOG because they ask you more than one thing in each question. When kids get frustrated on a ClassScape question, it is a good opportunity for me to remind my students to really try to understand what the question is asking because you will probably see a question very similar to this when you take the EOG. (Teacher B Interview, 2011)

In addition to the teacher focus groups and individual teacher interviews, the students who participated in the student focus group agreed with their teachers that the questions in the ClassScape database are questions that contain higher order thinking skills. All of the students in the focus group mentioned something about how the questions in ClassScape do not stop after they ask one question. Below is a quotation from the student focus group:

> ...Yes, the ClassScape questions always make you find the answer and then do something else with it. My teachers tell me this every time we take a ClassScape assessment. There is always more than one step in ClassScape questions. Like

today, we were working on area formulas and my question said "what is the area

of the triangle and what is half of the rectangle's area added together?" It made

me think of one part of the question, leave that answer there, and then work on the

other part of the question and then bring both answers together in order to get the

problem correct. (Student Focus Group, 2011)

Assessment of Students

End-of-grade test preparation.

Table 20

Frequency Distribution for End-of-Grade Test Preparation

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
EOG Prep	5	63	4	100	3	100	80

Because of the renewed focus on standardized testing, teachers now have to spend

a large percentage of their time preparing students for the end-of-grade test. In the

selected state of North Carolina, the standardized test at the end of the year is commonly

referred to as the EOG. The ClassScape program is used by teachers not only as a

formative assessment tool but also as a means to help teachers prepare students for the

EOG. During the teacher focus groups, the researcher was able to gain a better

understanding of how the ClassScape program assists teachers in their EOG preparation.

The following statements encapsulate the teachers' thoughts of ClassScape as an EOG

prep tool: "I use ClassScape to tell the kids what the EOG is going to be. I tell them

these questions are very similar to what they are going to see on the real test" (7th Grade

Teacher Focus Group, 2011). Another teacher added:

I really think the ClassScape program helps you to understand the vocabulary of the EOGs so you can help the students prepare. By using the program, I have a better idea of how much they really understand the vocabulary that is going to be on the EOG. You know in math class we say add these two things together but on ClassScape, it will say find the sum of. Little things like this go a long way in helping students to be successful. (8th Grade Teacher Focus Group, 2011)

An eighth-grade teacher added that ClassScape not only has similar wording to the EOGs but the program also has similar illustrations:

The contexts of the questions are very similar to EOG questions. The same questions strategies are used. The same vocabulary is used. The questions are worded very closely to EOG questions. The illustrations and diagrams that go with the questions are the same that is on the EOGs. (8th Grade Teacher Focus Group, 2011)

Finally, a teacher discussed how close the answer choices were to the answer choices on the EOG and how this helped her instruction and her students to prepare for the standardized test.

I have noticed the answer choices on ClassScape are very close to each other. This has forced the kids to read each and every answer choice to determine which answer is really correct. I think this has helped my students pay better attention to detail, which will only help them. It is not just one or two words in the answer choice; it is whole sentences. This makes them read each answer choice and that makes some of them upset but it is really helping them. This is exactly how the test is. The vocabulary on ClassScape is sometimes identical to the vocabulary on the EOG. I'm glad my students are being shown the vocabulary now so they can

become familiar to it before test day. (7th Grade Teacher Focus Group, 2011)

The participants of both teacher focus groups, however, discussed the difficulty of navigating throughout the ClassScape program as well as getting students to the appropriate place within the ClassScape program to begin their assessments. This information is discussed later in Chapter 4. Teachers again expressed how they use ClassScape to prepare students for the EOG. When asked to elaborate on how ClassScape can be used as an EOG preparation tool, Teacher A responded, "The questions are exactly like the questions on the EOG. The wording of the questions is as close to the real EOG as you can possibly get." Another teacher, after discussing how the ClassScape program lacks in user-friendliness, conversed about how she uses the ClassScape program as an EOG preparation tool:

> I do use the ClassScape program as an EOG preparation tool. But I don't use the program so much with the kids actually in the program. I pull reading selections from the program and look at the tests and get ideas for how to ask questions appropriately. There are some really good questions with some really good ideas in them. It is not the materials so much that I do not like, it is the accessibility of the program....I use the ClassScape program a lot in my remediation program. When I was setting up for my classes, I went through and looked at every reading selection and answered the questions myself to see if it was something that would work with the kids well. I pull several, I mean several, questions from ClassScape. I even pulled questions from other grade levels. (Teacher C Interview, 2011)

It is important for the researcher to note that the selected school and selected school district do not require the teachers to use ClassScape in a particular manner. Teachers are

allowed to use the ClassScape program in the school computer labs, in the classrooms as a warm-up activity, or any other way that they deem appropriate for their classroom. Teachers are not required to log a specific amount of time using the ClassScape program.

In addition to the comments from the teacher interviews and focus groups, the students also agreed that the questions in the ClassScape database are very similar to the questions on the end-of-grade test. After students were asked to describe how the ClassScape program helps them to prepare for the EOG, one student responded "...because the questions are really like the ones on the EOG" (Student Focus Group, 2011). Another student responded, "The questions are ordered like they are on the EOG. It asks some of the same stuff that is on the EOG" (Student Focus Group, 2011). Yet another student commented, "I see some of the same words on ClassScape as I do on the EOG. Words like main idea, elaborate, simplify, and other big terms" (Student Focus Group, 2011). Finally, a student commented about how his teacher sets up a good environment in order to help his students be successful on ClassScape assessments:

> I think the ClassScape is a good way to get ready for the EOG because some of the same questions are on the EOG. Also, none of my teachers act like ClassScape is a really big test and that really helps to take the pressure off of me. This helps me to focus on what the questions are really asking instead of worrying about whether or not I am going to miss the questions and lower my grade. This helps me to learn more when I am on ClassScape. (Student Focus Group, 2011)

Frequency of assessments.

Table 21

Frequency Distribution for Frequency of Assessments

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Frequency of Assessments	7	88	3	75	4	100	93

On the student survey, 91.03% of students either agreed or strongly agreed that their teachers give them smaller assessments before the big unit test. Subsequently, 90.91% of teachers either agreed or strongly agreed that their formative assessment, in conjunction with the ClassScape program, has an impact on the way their students are assessed in their classes. When asked about the impact ClassScape has on this component of the learning environment, the teachers responded that the assessment program has impacted the manner in which their students are assessed. Teacher A responded to the question by saying, "Yes, I think I more frequently assess. But now, and this is different than before, I use the ClassScape data to go back and reteach concepts to the students" (Teacher A Interview, 2011). Another teacher gave an example of how her assessment tendencies have been impacted:

> I think I give harder tests now. There are four tests that go with every chapter in my math book. After doing ClassScape tests, I quickly learned that I was not picking the correct level of difficulty for these tests. The ClassScape program has helped me to learn exactly how difficult to make my tests. I have changed this year to give more pre-assessments and mid-assessments halfway through the

chapter. I change my instruction based upon how well the kids do on these

assessments. For example, if all the kids get question five correct on the pre-

assessment, I do not spend near the amount of time on that particular concept as I

do for other concepts. (Teacher B Interview, 2011)

A different teacher shared her experiences with the impact of ClassScape on her

assessment procedures:

It has changed how frequently I assess the kids and how difficult my tests are. I

used to think that there was not much information I could get from formative

assessments except for maybe once every 9 weeks. But now I have found myself

using ClassScape and other programs all the time. I've learned that if I do

formative assessment at the end of a set of skills, it really helps me to pinpoint

where they are really blowing the top off things and what they really do not know.

The kids seem to really work better that way. The tests I give now are not

necessarily more difficult but they are focused on a particular concept. (Teacher

C Interview, 2011)

Additionally, the students who participated in the focus group confirmed what their

teacher said in regards to the administration of smaller assessments. One student gave an

example of how her teacher uses smaller assessments in her class:

We do a pretest before we start a chapter and then we will do two or three quizzes

along the way through the chapter. As we do these quizzes, the teachers review

them and that helps me to get ready for the bigger tests. (Student Focus Group,

2011)

Issues Addressed by Teachers/Students

    Problems with the ClassScape program. Throughout the teacher focus groups

and student focus group, the researcher has learned several issues about the ClassScape program. These issues, for the most part, prevent teachers and students from maximizing the greatest potential the ClassScape program has to offer. Many of the problems noted are issues with how the program looks and performs when students are taking assessments as well as when teachers are creating custom assessments for their students.

User-friendliness.

Table 22

Frequency Distribution for User-Friendliness

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
User-friendliness	8	100	3	75	3	100	93

Data from the surveys and the focus groups validate that the users of ClassScape at the selected school have an issue with how the ClassScape program is set up and how the program interacts with its users. After the results from the teacher survey were categorized, the researcher discovered that 40% of the respondents said that the ClassScape program was either slow or not user-friendly for the teachers or the students. More specifically, the complaint was how many times the ClassScape program had to be refreshed before and during an assessment. This information was consequently discussed in the teacher focus groups. The participants in the focus groups, while stressing that the questions in the ClassScape database are accurate, emphasized that the program itself is the issue. In fact 100% of the participants in the teacher focus groups agreed that the user-friendliness of the ClassScape program is a major hurdle to implementing the

program successfully. One reason ClassScape frustrates teachers is the way the questions

are arranged on the screen.

> It affects the scores due to validity. I mean we see our kids not scoring very well
>
> because of the way ClassScape is arranged. They get frustrated because they have
>
> to go back and forth to the question. They are constantly scrolling up and down
>
> through the passage and they just end up hitting an answer. Our scores, because
>
> of this, are just not valid. (8th Grade Teacher Focus Group, 2011)

This teacher was referring to the way the ClassScape program is visualized on the screen.

Another teacher expressed her thoughts in regards to the frustration level with getting

students to the appropriate assessment within the ClassScape program:

> I think some if it has to do with the program. Teachers, including myself, become
>
> frustrated when they go into ClassScape and instantly 15 hands go up because the
>
> program shut down or lost their answers. They [the students] become frustrated
>
> quickly with the fact that they are having to refresh all the time in order to get the
>
> next question on the screen. (7th Grade Teacher Focus Group, 2011)

An additional teacher added that the level of questioning on ClassScape is good for

students but the ability to log in easily is not sufficient:

> I think the ClassScape program needs to be more user-friendly. I mean the fact
>
> that we log in and cannot get what we need is frustrating. That's the biggest
>
> strike against ClassScape. I mean the program has good questions. It is simply
>
> just not user-friendly for the students. (7th Grade Teacher Focus Group, 2011)

Another teacher described how the lack of user-friendliness in ClassScape causes her to

just set up a variety of ClassScape assessments at one time so she does not have to log in

and out of the program numerous times. This teacher blamed the lack of user-

friendliness in the ClassScape program to her not using the program the way it is intended to be used:

> I think that just setting up the scheduling of the assessments freezes up the program even though I just set my assessments up so my students can do many tests [assessments] per time period. Because setting up tests [assessments] one by one, like having a 2-week window for that test and a 2-week window for that test was just making too many problems for me. So, finally I just set it up that all the tests were turned on for the whole semester and then I would tell them [the students] that they had to have a certain date just because we could not get the program to do what we needed it to do. (8th Grade Teacher Focus Group, 2011)

An eighth-grade teacher expressed her concerns with the ClassScape program's ability to let users create custom assessments for the students. Currently, the ClassScape program requires teachers to put a certain number of questions pertaining to each objective on the North Carolina Standard Course of Study. According to this teacher, this setting in ClassScape adds frustration for the teachers because they cannot just ask students the specific questions they would like to ask:

> I think it [the ClassScape Program] needs to be changed so that custom assessments do not require four questions from each objective. I think that the custom assessments that I create should be exactly what I need them to be. I just want to pull my hair out because the objectives have to be grouped together. I spent two planning periods trying to make a custom assessment and still did not get it to be just what I wanted it to be. So I just end up going to one of the assessments that have already been made. (8th Grade Teacher Focus Group, 2011)

Another teacher added how different the level of user-friendliness is between the

ClassScape program and the Study Island program:

> Typically, if I just do Study Island with the kids, it just rolls through and I do not
>
> have to deal with a lot of computer questions or problems and constantly trying to
>
> help the students. But anytime we add in ClassScape, it is a constant from the
>
> kids that this isn't working or this is not loading. I mean it is ridiculous. (7th
>
> Grade Teacher Focus Group, 2011)

Finally, a teacher expressed frustration with the program because it requires the students

to frequently refresh the program in order to advance to the next question:

> I just get frustrated because the kids have to reload it [the ClassScape program]
>
> multiple times within a 10-question assessment. When I am doing it with the
>
> whole group on the Smart Board, I have to reload the program two to three times.
>
> Even the kids make comments like, "I know these are good questions but this
>
> thing freezes all the time." (8th Grade Teacher Focus Group, 2011)

Additionally, teachers in the individual interviews also voiced their opinions about the

lack of user-friendliness within the ClassScape program:

> My only negative about the program is that it does hang up a lot. You go have to
>
> hit F5 a lot and that usually fixes it. A lot of times, the graphics will not come up
>
> or are very slow when they come up. (Teacher B Interview, 2011)

Another teacher voiced their opinion of the lack of user-friendliness during the

interviews:

> ...Yes, it is very much true. It is hard to get through a whole session or a set of
>
> questions without the program freezing up. You end up logging out and back in
>
> or refreshing the program. That's the biggest issue with the program. It will stop

in the middle of something and the screen will just go white. The kids ask, "What

is it doing?" The program just literally freezes up. (Teacher C Interview, 2011)

Additionally, the students who participated in the focus group also agreed that the

ClassScape program lacks in user-friendliness. When the students were asked what they

would like to change in the ClassScape program, here are some statements from the

students' responses. "When you go into a question, ClassScape logs me out. I had to

start two times today before it let me finish a test" (Student Focus Group, 2011). Another

student added, "My screen just goes completely off. Like today, we had 28 kids logging

into the same test and a lot of computers stopped and we all had to log back in" (Student

Focus Group, 2011). Other students added comments about how the visual layout of the

ClassScape program could be improved. One student said, "I think it should be way

more colorful because I want to go to sleep because of all the dull colors" (Student Focus

Group, 2011). Finally, a student added, "I think the program should make more reading

passages that are really interesting for kids" (Student Focus Group, 2011).

Reading assessments.

Table 23

Frequency Distribution for Reading Assessments

Sub-Topic	Teacher Focus Group (n)	Teacher Focus Group %	Student Focus Group (n)	Student Focus Group %	Individual Interviews (n)	Individual Interviews %	Cumulative Percentage
Reading Assessments	3	38	2	50	1	33	40

The reading section of the ClassScape program allows the students to scroll up

and down throughout the reading selection while the particular question being asked

remains immobile on the screen. According to the teachers, the program discourages the students from locating the answers in selection the way the teachers instruct the students to do in class. Instead, the students get frustrated with having to scroll up and down through the passage because the entire selection is not visible on the screen.

Another example of frustration shared by teachers about the ClassScape reading assessments is the question types available for reading assessments. The following are some statements from the teacher focus groups. The first statement comes from an English/language arts teacher who teaches the academically gifted students:

...Because ClassScape has big, general themes in reading, I'm talking about humongous things like inferences, which covers so much ground, ClassScape doesn't give you much to work with. Inferences at this level compared to inferences at the lower level are all under one big category. (7th Grade Teacher Focus Groups, 2011)

The next statement from the eighth-grade teacher focus group reaffirms the above statement:

ClassScape really does not give you a lot to work with for telling students what to do to help them in reading. All the questions are with big and general themes so it doesn't give me a way to fine-tune the kids' reading deficiencies. ClassScape will not let you adjust the level of questioning like Study Island does. I wish this feature would get added to the ClassScape program. (8th Grade Teacher Focus Group, 2011)

Another eighth-grade teacher rearticulated the point about the lack of user-friendliness in relation to the ClassScape reading assessment layouts:

...And the reading part is not user-friendly at all because you cannot look at the

text as a whole. You have to scroll up and down and look at the text in chunks. It

is hard to say compare this to this and then the questions are over here. So, as far

as trying to do anything as a group after they have done an assignment is not easy.

If we were allowed to have the text on a sheet of paper where the students could

see it or project it in a chunk, it would help a lot. (7th Grade Teacher Focus

Group, 2011)

Additionally, teachers who participated in individual interviews seconded the position

that the reading section of the ClassScape is frustrating to students. The teacher

suggested, "I wish they would figure out a way for students to not have to scroll up and

down within the reading selections" (Teacher A Interview, 2011).

Time to implement ClassScape. The teachers at the selected school expressed

concerns with the amount of technology programs they have been required to implement

during the current school year. During the current school year, teachers at the selected

school have been asked to implement the following technology tools into their

instruction: ClassScape, Study Island, Accelerated Reader, STAR Assessments, and

MyAccess. However, it is important to note that the middle schools have not increased

the number of computer labs. Therefore, it is extremely difficult for teachers to secure

computer labs for the amount of time they need to in order to implement all the

technology programs to the greatest extent. Below are some excerpts from the teacher

focus groups concerning the implementation of ClassScape among a variety of other

technology programs:

...And obviously this year, I am using Study Island more than ClassScape because

when I get into the computer lab, I am having to use it for MyAccess and Study

Island and I just can't seem to work in a third program. (7th Grade Teacher Focus

Group, 2011)

Another teacher shared her annoyance with having to learn multiple technology programs simultaneously.

> I think teachers are frustrated with having to learn so many technology programs in such a short amount of time. We have to find time to use all of them in the classroom. We barely have enough time to teach as it is. (7th Grade Teacher Focus Group, 2011)

Lastly, another teacher remarked about how irritated they are with having to implement multiple technology programs at the same time. "I think we [teachers] have become a facilitator to a computer. We have taken the personal touch out of the teaching profession. We have so many things coming at us at once that we need to use" (8th Grade Teacher Focus Group, 2011).

Use of formative assessment during walkthroughs. Throughout selected days in March and April, the researcher and other personnel, including other administrators and instructional coaches within the selected school, used the walkthrough form to determine the level of implementation of formative assessments in the selected school. For the purposes of these tables, a walkthrough is considered as a 2-5 minute timeframe within the same classroom. The walkthrough forms, Table 24 through Table 29, are displayed in the following pages. The walkthrough forms contain key components of formative assessment as well as sections to observe the use of the ClassScape assessment system. Over the selected 14-day time span during the 2010-2011 school year, the actions of the teachers at the selected school were recorded using the following indicators: teacher has clear objective for students, teacher used formative assessment in the lesson, teacher was using ClassScape assessment system, teacher was reviewing

ClassScape assessment data, teacher was giving specific feedback to students, and students were actively involved in the lesson. Each "X" on the following charts represents the observer noted the specific behavior as the informal observation was taking place. The percentage of teachers observed performing the particular behavior is noted below each graph. Tables 24 through 29 exhibit a total of 280 opportunities each for 20 teachers to be observed.

Table 24

Walkthrough Data for "Teacher Has a Clear Objective for Students"

	3/21	3/22	3/23	3/24	3/28	4/4	4/5	4/6	4/7	4/8	4/12	4/13	4/14	4/15
6th A	X	X	X	X	X	X	X	X	X		X	X	X	X
6th B	X	X	X	X	X	X		X	X	X	X	X	X	X
6th C	X	X	X	X	X	X	X	X	X		X	X	X	X
6th D		X		X	X	X	X	X		X	X			X
6th E	X	X	X	X	X	X		X	X	X	X	X	X	
6th F	X	X	X	X	X	X	X	X	X	X			X	X
6th G		X	X	X	X	X	X	X	X	X	X	X		X
7th A	X		X	X	X		X		X	X	X		X	X
7th B	X	X		X	X	X	X	X	X		X	X		X
7th C	X	X	X	X		X	X	X		X	X	X	X	X
7th D	X	X	X		X	X	X	X	X	X	X	X	X	X
7th E		X	X	X	X	X	X	X	X	X	X	X		X
7th F	X	X	X	X	X	X	X	X	X		X	X		X
7th G		X	X	X	X	X	X	X	X	X	X		X	X
8th A	X	X	X	X	X		X	X	X	X		X	X	X
8th B	X	X		X	X	X	X	X		X	X	X	X	X
8th C	X		X	X	X	X	X	X	X	X	X	X	X	X
8th D	X	X	X	X		X	X	X	X	X		X	X	
8th E	X	X	X	X	X	X	X		X	X	X	X		X
8th F	X	X	X	X	X	X	X	X		X	X	X	X	X

Note: Dates are between March and April 2011.

According to the data, the teachers at the selected school had a clear objective for students during the classroom walkthrough 85.7% of the time. Having a clear objective

for students to learn is a component of the formative assessment process. It is important

for the researcher to note, however, that the administration at the current school requires

the teachers to include objectives for lessons in their lesson plans.

Table 25

Walkthrough Data for "Teacher Used a Formative Assessment During the Lesson"

	3/21	3/22	3/23	3/24	3/28	4/4	4/5	4/6	4/7	4/8	4/12	4/13	4/14	4/15
6th A	X			X		X		X				X	X	X
6th B		X				X		X		X				X
6th C	X		X		X		X		X		X		X	
6th D		X		X				X			X	X	X	
6th E		X	X			X				X		X	X	X
6th F	X					X	X	X	X		X			X
6th G			X	X				X	X	X	X		X	
7th A		X	X		X	X		X		X		X		
7th B	X						X		X		X		X	X
7th C	X	X		X		X			X	X		X		
7th D				X				X		X			X	X
7th E	X	X			X						X	X	X	X
7th F						X	X		X		X	X		
7th G	X		X			X	X		X		X	X	X	
8th A					X		X	X					X	X
8th B	X	X		X	X			X	X	X			X	X
8th C			X	X		X	X				X		X	
8th D	X	X	X						X		X	X	X	
8th E				X	X			X	X				X	
8th F		X					X			X				X

Note: Dates are between March and April 2011.

As noted from Table 25, the teachers at the selected school were observed during

the selected timeframe administering a formative assessment 55% of the time.

Table 26

Walkthrough Data for "Teacher was Using the ClassScape Assessment System"

	3/21	3/22	3/23	3/24	3/28	4/4	4/5	4/6	4/7	4/8	4/12	4/13	4/14	4/15
6th A	X		X		X			X			X			X
6th B		X	X		X			X			X	X		
6th C	X			X					X				X	
6th D						X			X					
6th E					X		X			X		X		X
6th F								X		X				
6th G				X									X	
7th A						X	X				X			
7th B	X								X					X
7th C			X	X							X	X		
7th D				X			X			X		X		X
7th E									X					
7th F	X					X			X			X		
7th G		X		X				X			X			X
8th A	X													
8th B			X						X		X			
8th C												X	X	
8th D		X			X		X							
8th E				X			X				X	X		X
8th F														X

Note: Dates are between March and April 2011.

As reported in Table 26, the teachers at the selected school were observed using the ClassScape program 24% of the time. For this table, it is important to note that the selected school only had three computer labs that were on flex schedule. This limited the number of times teachers could utilize the ClassScape program. Some teachers listed above, however, were using the ClassScape program as a whole group activity (warm-up) during the classroom walkthroughs.

Table 27

Walkthrough Data for "Teacher was Reviewing ClassScape Assessment Data"

	3/21	3/22	3/23	3/24	3/28	4/4	4/5	4/6	4/7	4/8	4/12	4/13	4/14	4/15
6th A	X											X		X
6th B		X	X				X				X		X	
6th C									X					
6th D														
6th E					X					X			X	X
6th F	X						X							
6th G														
7th A											X	X		
7th B									X					
7th C	X		X								X			
7th D	X													
7th E							X							X
7th F													X	
7th G				X										
8th A														
8th B						X			X					
8th C		X											X	
8th D	X													
8th E														
8th F														

Note: Dates are between March and April 2011.

As noted on the chart above, 11% of the teachers were specifically reviewing ClassScape data during a classroom walkthrough. This data could include review on a SMART Board, individual conferences, or a small group review.

Table 28

Walkthrough Data for "Teacher was Giving Specific Feedback to Students"

	3/21	3/22	3/23	3/24	3/28	4/4	4/5	4/6	4/7	4/8	4/12	4/13	4/14	4/15
6th A	X			X	X				X			X	X	X
6th B		X			X		X			X	X	X		
6th C	X	X		X				X	X				X	X
6th D	X							X	X				X	X
6th E			X							X			X	
6th F	X				X		X		X	X	X	X		X
6th G			X	X			X						X	
7th A	X	X			X			X				X	X	X
7th B	X	X		X				X	X	X			X	X
7th C					X		X		X					
7th D	X			X										X
7th E		X			X	X						X		
7th F						X			X	X				
7th G	X		X					X	X		X		X	
8th A			X	X				X		X			X	
8th B		X		X	X		X					X	X	
8th C	X		X			X	X	X	X		X			X
8th D			X		X					X				X
8th E				X	X			X				X	X	X
8th F		X				X			X			X		

Note: Dates are between March and April 2011.

As noted from the table above, the teachers at the selected school were observed giving specific feedback to students 39% of the time during the selected dates. This feedback could have been in the form of one-to-one conferences, small group instruction, or whole group instruction/feedback.

Table 29

Walkthrough Data for "Students Were Actively Involved in the Lesson"

	3/21	3/22	3/23	3/24	3/28	4/4	4/5	4/6	4/7	4/8	4/12	4/13	4/14	4/15
6th A		X		X		X		X			X			
6th B			X	X	X				X			X		
6th C					X	X		X	X		X	X		X
6th D	X		X			X		X						X
6th E		X								X	X		X	
6th F							X			X	X		X	X
6th G			X	X		X		X		X		X		
7th A	X	X	X		X				X			X		
7th B	X							X	X					
7th C		X		X	X			X	X	X	X	X		
7th D			X				X	X		X		X	X	X
7th E											X			X
7th F							X		X					X
7th G	X		X			X	X						X	
8th A	X							X		X		X	X	
8th B		X			X			X		X				X
8th C				X						X	X	X		X
8th D	X		X				X							
8th E						X	X		X				X	X
8th F					X				X	X		X		

Note: Dates are between March and April 2011.

As noted in Table 29, the teachers at the selected school had their students involved in an active role 35% of the time when the walkthroughs were conducted. For these classroom walkthroughs, an active role was considered as any time students were not solely listening to the teacher exclusively as they were providing the instruction.

Chapter 5: Conclusions, Discussions, and Recommendations

Introduction

In this chapter, the researcher will coalesce the information in the other chapters of this dissertation in order to summarize the results of the study, to generate conclusions from the data, to provide recommendations for improvement, and to make available suggestions for future research on formative assessment. Formative assessment is a concept that is spreading across the education spectrum (Sausner, 2005). Therefore, this study imparts further research on formative assessments into the educational atmosphere. This case study was completed in a rural middle school in western North Carolina. Although only one school was utilized in this case study, the implications gained from the study can be applied to other educational settings.

Restatement of the Problem

The area of assessment has long been ignored by educational leaders in the United States (Stiggins et al., 1989). As a result of this deficit, teachers in the United States do not have a firm understanding of the full outcomes that can be gained from formatively assessing students (Schafer, 1993). Consequently, teachers do not have the skills to utilize assessment data to implement future instruction (Heritage et al., 2009). The lack of teacher skills to utilize formative assessments properly hinders students from learning to their true potential. In fact, if teachers use formative assessments appropriately, the gains made by students could reach four to five times higher than the effect of reduced class size (Ehrenberg et al., 2001). The same study concluded that formative assessment methods allow students who normally achieve the least to achieve the greatest. Another study (Black & Wiliam, 1998) determined that formative assessments allowed learners at lower levels to achieve the highest gains.

Purpose and Overview of Study

The purpose of this study was to evaluate the impact of the formative assessments, in conjunction with the use of the ClassScape assessment program, on student learning. More specifically, the areas of student assessment, teacher planning, instructional implementation, and learning environments were analyzed. After researching the current level of implementation of formative assessments in conjunction with the ClassScape program, the researcher developed four research questions that guided this case study. The research questions were as follows:

1. What was the impact of the utilization of the ClassScape program and other formative assessments on the learning environment of the classroom?

2. What was the impact of the utilization of the ClassScape program and other formative assessments on instructional planning?

3. What was the impact of the utilization of the ClassScape program on instructional implementation as a part of the formative assessment process?

4. What was the impact of the utilization of the ClassScape program on instructional assessment as a part of the formative assessment process?

The middle school used for this case study has a diverse population and is located in rural western North Carolina. The teachers at the selected school had access to the ClassScape assessment program for 3 years at the time of the study. The school selected for the study had 25 subgroups (NCDPI, 2010). The majority of the teachers at the selected school taught at this school for over 10 years (NCDPI, 2010).

The literature review focused on how formative assessment is a growing trend in educational settings. While formative assessment is gaining popularity, teachers across the United States are experiencing difficulty when implementing formative assessment in

classrooms. The literature also revealed that there is a certain level of confusion that surrounds formative assessment. Part of this confusion is attributed to the large number of definitions that are available for formative assessment. For this study, the researcher chose to use the Council of Chief State School Officers' definition of formative assessment. The definition is as follows: "A process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes" (McManus, 2008, p. 3). As the review of the data continued, the researcher learned several best practices that should be implemented during the formative assessment process. Some of the components enveloped with formative assessments were: giving students timely feedback, using formative assessment data to plan instruction, establishing an appropriate learning environment, establishing a role for the teacher, establishing a role for the students, and defining barriers to formative assessment. Most importantly, the literature stresses that formative assessment should be an ongoing component in the curriculum (Scriven, 1967). In order to gain sufficient data to complete the study, the researcher chose to utilize the following data collection tools: student survey, teacher survey, teacher focus groups, student focus group, and individual teacher interviews. The data from the surveys were analyzed to determine strengths and weaknesses in the data. The data from the teacher focus groups, student focus group, and individual interviews were synthesized to determine themes present within the discussions.

Synopsis of Results

  Formative assessments/ClassScape and the learning environment. Findings indicate that students and teachers use formative assessments in conjunction with the ClassScape assessment program to positively adjust the learning environment of the

classrooms. Teachers indicated that student conferences were great methods to use in order to truly gauge to what extent their students were understanding a topic. Students indicated that conferences with their teachers increase the comfort level with asking questions during class instead of waiting until a later time. The conference time, according to the students, is beneficial because it allows them to get to know their teachers more. Students and teachers indicated that the conferences help them to become more accountable to each other. Since the learning environment is developed throughout the duration of the school year, student conferences provide the teachers with an invaluable method to foster the lines of communication (Rorty, 1999). The findings also indicate that student feedback is beneficial because teachers provide students with explicit instructions as to how to correct their mistakes in future work. Giving students responses to their class work, which includes specific instructions on how to improve their work, was a key component of Black and Wiliam's (1998) study. Additionally, the studies of Bangert-Drowns et al. (1991) and Kluger and DeNisi (1996) reaffirm the importance of giving students specific feedback about how to improve their work as a key component to student feedback. Goal setting is important for students because they want to reach the target they have set for themselves.

Formative assessments/ClassScape and instructional planning. Findings indicate that formative assessment data in conjunction with the use of the ClassScape program enables teachers to more effectively plan their future instruction. ClassScape data enables the teachers to use data-driven decision making to determine what, if any, classroom material needs to be reviewed again prior to moving to another topic. During the teacher focus groups, the teachers indicated the reports generated by the ClassScape program allowed them to decide what and how to proceed with their instruction. The

teachers mentioned that they appreciated the quick turnaround time needed for the

ClassScape program to generate reports. Wayman (2005) indicated that teachers need a

quick turnaround time in order to maximize the effect of the data. Students reported that

teachers are responsive when they are asked to review or rephrase segments of the lesson.

Additionally, both sets of stakeholders reported that differentiation of instruction occurs

as a result of formative assessment.

Formative assessments/ClassScape and implementation of instruction.

Students and teachers reported that the awareness of the expectations for the class/lesson

is beneficial. Students reported that the awareness of class expectations enables them to

focus on fewer objectives, thus helping their knowledge of the topic to increase.

Teachers reported that a higher percentage of their students seem to grasp the material

when clear expectations are given prior to the lesson beginning. Additionally, teachers

reported that the knowledge of the different learning styles present in the classroom

enables them to adjust their instruction so that every learning style is accommodated.

One student reported that their teacher created a menu of learning activities so that each

student in the classroom could learn the way that they learn the best. Additionally, the

students and teachers reported that using student work to model instruction was

advantageous for both groups. Finally, students and teachers reported that formative

assessments, especially through the utilization of ClassScape questions, enabled them to

focus on higher order thinking skills. The questions in the ClassScape database,

according to students and teachers, are excellent examples of higher order thinking

questions that require students to perform more than one computation within each

question.

Formative assessments/ClassScape and instructional assessment. Formative

assessment, along with the use of the ClassScape program allows teachers to fine tune their assessment and measurement practices. As reported by the students and teachers, the questions within the ClassScape program are extremely close to the questions that are on the North Carolina end-of-grade test. The teachers reported that the ClassScape assessments help to build the vocabulary levels of students. This increase will greatly benefit them on the EOG tests. In addition to the EOG preparation, the teachers reported that formative assessments help them to truly gauge how often they assess their students. Teachers reported that their assessments had increased in frequency so they could adjust their instruction according to student progress. Students reported that the more frequent assessments helped them to correct mistakes earlier.

Discussion of results. In order to encapsulate all the information from the quantitative and qualitative data collection tools, the researcher chose to discuss the results within the realm of individual research questions. When applicable, comparisons were made from research studies cited in Chapter 2.

Learning environment. Teachers overwhelmingly supported the survey questions that dealt with formative assessments and their implications for the learning environment. Over 95% of the teacher respondents positively agreed that formative assessments do change the learning environment. This result supports that the teachers understand the effect that formative assessment can have on the learning process for the students. Almost 70% of the student respondents agreed that formative assessments positively impact the learning environment. The drop in the positive responses from students could entail that students and teachers do not have the same perception of an effective learning environment. Since Hattie and Timperely (2007) discovered that formative assessment has a more powerful impact than reduced class size, it is important

to note the positive outlook the teachers and students have toward formative assessment.

According to Pinchok and Brandt (2009), students need to be actively involved in the

learning process in order for the learning environment to be conducive for student

learning. Some students reported that their teachers still use a lot of traditional methods

in their instruction. This could be the reason for the lower amount of positive responses

from the students. The students' and teachers' views on self-assessment were also

mixed. During the teacher focus groups and teacher interviews, the teachers praised the

concept of self-assessment but only when students graded their own work. This is in

agreement with the research of Pinchok and Brandt (2009). The researchers stated,

"When teachers struggle to make high-quality evaluative judgments and fail to foster

self-assessment, students' achievement suffers" (Pinchok and Brandt, 2009, p. 12).

However, in the student focus group, the students said that while they enjoy grading their

own papers, they also enjoy grading other student's papers. More self-assessments may

encourage students to think more favorably about their learning environment. Greenstein

(2010) discovered that self-assessments are one method to increase student involvement

in the classroom. The students and the teachers reported that self-assessments do help to

break the monotony and help students take more ownership of their work. Within the

same theme, students and teachers understand the importance of feedback. The teachers

shared that feedback is an important part of their instructional duties. This is a

continuation of Tunstall's (1996) conclusion that feedback should not be punitive to

students; instead, feedback should be utilized as a tool to ensure student success. Finally,

teachers overwhelmingly viewed the setting of goals by students as vital in the formative

assessment process. Again, teachers viewed the learning environment as being positively

impacted as the result of students setting goals for themselves. The teachers also stated

that students need to be given guidance and parameters when allowing students to set goals for themselves.

Instructional planning. For this research question, the students and teachers were more closely aligned in terms of positive responses than any other research question. Teachers responded with positive responses 97% of the time while students responded positively 84% of the time. This is an indication that students and teachers understand the importance of using data from formative assessment to plan future instruction. The responses from the surveys and teacher focus groups confirm the conclusion made by Celio and Harvey (2005) and Ingram et al. (2004). The teachers reported that they simply have too much data to decipher and not enough time to go back and do everything they should do with the data. As stated in Chapter 4, teachers use the ClassScape program at their discretion. However, the district office requires the use of several other computerized programs. The teachers reported that there are simply not enough computer labs to handle these requests. However, when teachers perform formative assessments, especially ClassScape assessments, they reported the data is used to plan future instruction for the students. Teachers said that the data from ClassScape is very useful in gauging the level of understanding the students have of a concept. Differentiation can then occur based upon how well the students grasped the concept. Teachers noted that they regroup their students using assessment data and students reported their teachers either slow down or speed up their instruction based upon whether or not the students are understanding the concept.

Implementation of instruction. Throughout the surveys, focus groups, and interviews, the students and teachers voiced their opinions about how formative assessment helps the implementation of instruction. The theme of making clear

expectations for students emerged. Throughout this theme, the students and the teachers

agreed that expectations should be clear prior to the beginning of the lesson. According

to Stiggins and Chappuis (2005), this is an essential component of formative assessment

that allows teachers and students to reduce achievement gaps. The discussion for this

topic was very interesting in the student focus group. Some students agreed that their

teachers give them clear expectations that are in their own words. Other students stated

that their teachers do not make the expectation into friendly language for the students.

Instead, the teacher leaves the expectation in the language on the North Carolina Standard

Course of Study. After the expectation has been made available for the students, the

teacher makes specific references to the lesson objective throughout the lesson.

According to the students, this method helps them to learn the official wording on the

standard course of study along with the contexts for how the words are supposed to be

used. Regardless of the routine used to make students aware of their expectations, all the

teachers in the small groups and focus groups were in agreement that this adds a large

amount of effectiveness and value to their lessons.

For the theme of using student work to model instruction, the participants on the

survey, focus groups, and interviews were overwhelming positive to this method of

instruction. The teachers said using student work was a great way to add a small level of

competition between the students. Subsequently, the students said seeing their peers'

work instills in them the desire to do better on their assignments. Both the students and

teachers mentioned the importance of seeing how students worked out problems correctly

and using student work to teach how not to make the same mistake again.

Learning styles were discussed at length inside this research question. The

teachers and students agreed that teaching to all the learning styles present in the room is

a vital component of instruction. This reaffirms Chappuis and Stiggins's (2002) research

that said that the involvement of every student is a component to using assessment

information correctly:

> Student involvement in assessment doesn't mean that students control decisions
> regarding what will or won't be learned or tested. Instead, student involvement
> means students learn to use assessment information to manage their own learning
> so that they can understand how they learn best, know exactly where they are in
> relation to the defined learning targets, and plan and take the next steps in their
> learning. (Chappuis & Stiggins, 2002, p. 41)

Finally, the theme of higher order thinking skills was thoroughly discussed in the

qualitative data. The teachers expressed their support for formative assessment, with the

use of the ClassScape assessment program, to determine the amount of higher order

thinking skills a student possesses. Both the teacher and student respondents mentioned

how the questions require the user to perform multiple computations on each question,

with each computation building on the previous one. According to the teachers, this

allows them to pinpoint their instruction to the exact need of the student. The students

expressed appreciation that the ClassScape program requires them to use some level of

reasoning in order to get the question correct. The students also mentioned how close the

ClassScape questions were to the questions on the end-of-grade test.

Instructional assessment. Within the questioning for this research question, two

themes emerged: end-of-grade test preparation and the frequency of assessments. As

stated in the earlier discussion, the teachers have some appreciation for the ClassScape

program because they are aware that the question writers are some of the same

individuals that write questions for the end-of-grade tests. The students were also aware

of the similarities in the questions for the ClassScape assessments and the end-of-grade

tests. A lot of the similarities addressed by the teachers and students are in the

vocabulary of the test questions. For this reason, teachers attributed the high level of

student attention during ClassScape assessments. Additionally, teachers noted their

assessments have become more frequent since they have been using the ClassScape

program. The teachers reported that instead of waiting until the end of the unit to assess

the students, they prefer to use ClassScape periodically to try and prevent error from

becoming habit for the students. Additionally, the students reported they like smaller

assessments because they are usually on a smaller amount of topics. Not only did they

report that they know what to study, but they also reported that they know what questions

to ask for help with when they miss questions. These statements confirm that Cook's

(2009) conclusion that formative assessment should be ongoing and not just at the end of

an instructional unit is correct.

Classroom walkthrough information. As discussed in Chapter 4, the researcher

collected data on 20 teachers at the selected school to determine the level of

implementation for the ClassScape assessment system and formative assessment in

general. The teachers at the selected school were observed for 14 days between March

and April 2011. The observations were either completed by the principal, the assistant

principal, an instructional coach, or by the researcher. The teachers at the selected school

were observed 85.7% of the time teaching to a specific objective. The teachers were

giving some type of formative assessment, not necessarily a ClassScape assessment, 55%

of the time. A ClassScape assessment was being given 24% of the time and teachers

were reviewing a ClassScape assessment 11% of the time the teachers were observed.

Finally, teachers were observed giving feedback to the students 35% of the time the

teachers were observed.

Recommendations for Improvement of the ClassScape Program

     1.   Determine if the ClassScape program can be overhauled to alleviate the frequency that users are dropped from the assessment being taken. Communicate the findings with the program designers of the ClassScape system.

     2.   Determine if the ClassScape program can add additional reading passages, which will give language arts teachers additional flexibility with determining the precise amount of understanding students have for specific reading skills. Communicate these findings with the program designers of the ClassScape system.

     3.   Determine if the ClassScape program can allow teachers additional flexibility when creating custom assessments for their classes. Communicate these findings with the program designers of the ClassScape system.

Recommendations for Changes in Formative Assessment/Use of ClassScape

     1.   Research the effectiveness of the other computer programs that are required by the school system. Determine if the ClassScape assessment program is more effective than some of the other programs.

     2.   Based upon the findings of the first recommendation, determine how more time can be allocated in the schedule of the selected school for the use of ClassScape and to review and implement the data ClassScape provides.

     3.   Seek out continued professional development so that teachers who are not currently using ClassScape can see and understand the importance of the program and of formative assessment. More widespread use of ClassScape is a need at the selected school. Mitchem, Wells, and Wells (2003) reported that professional development should be driven by the needs of the teachers. The same researchers also reported that

the professional development opportunities should allow teachers to understand what impact the program or concept would have on student learning. The original staff development did not accomplish this goal.

4. Seek out continued professional development for teachers who are currently using the ClassScape program. While the surveys, focus groups, and interviews confirmed that the program was being used at the school, the program would be more successful if every teacher used the program the way it was intended to be used. Fidelity of implementation of the ClassScape assessment program could allow for the program to be more effective. Johnson, Mellard, Fuchs, & McKnight (2006) identified that fidelity of implementation of educational programs has a direct impact on the effectiveness and the credibility of the program.

5. Determine the level of understanding of the teachers at the selected school used in the study on how to interpret the reports that the ClassScape program generates. The data analysis component of the ClassScape program was mentioned as a weakness during the teacher focus groups. The lack of knowledge of data analysis was also referenced within the study of Bedwell (2004). This study indicated that teachers needed to improve their data analysis skills so specific knowledge about the progress of students can be learned. Additionally, Coburn and Talbert (2006) reported that the lack of user-friendly reports results in teachers defaulting to using old information to plan future instruction. The determination of the level of knowledge the teachers have to interpret the ClassScape data and a subsequent plan of action to increase the teachers' knowledge may help to reduce the frustration the teachers experience as well as increase the amount the teachers use the ClassScape results.

Recommendations for Future Research

  1. Complete the case study in another school that uses the ClassScape system. Determine if similar negative responses to the ClassScape system are noted. Determine if other teachers/students recognize the value of the ClassScape system for the equivalent causes. This recommendation would add validity to this study.

  2. Complete a study that further determines the differences between what teachers and students perceive as a successful and engaging learning environment.

  3. Complete a study that analyzes how formative assessment and ClassScape data are analyzed during Professional Learning Communities in regards to the implementation of instruction, planning of instruction, and assessment of instruction.

Limitations

  The researcher was employed as an assistant principal at the selected school. This may have provided for some bias in the qualitative portion of the data collection. Student and teacher respondents were reminded to speak candidly and honestly. Nevertheless, some predispositions may be present in the data due to the researcher's position. Procedures were put into place to ensure the internal validity of this case study. Data were triangulated from various sources before conclusions were generated. Secondly, the data in this case study is from one school only. The study needs to be completed in similar middle schools that use the ClassScape program to add validity to this study.

Summary of Findings

  The results of the study fall under the realm of the constructivist educational theory. This educational theory, which has been described with wide-ranging views by Lebow (1993) and Ertmer and Newby (1993), has not received the appropriate considerations in terms of the effects formative assessment has on the theory (Lake &

Tessmer, 1997). However, certain assumptions regarding formative assessment and the constructivist educational theory have been completed (Bereiter & Scardamalia, 1992; Lebow, 1993; Wilson, Teslow, & Osman-Jouchoux, 1995). Some of the assumptions include, but are not limited to the following: the role of the teacher is to build the student's learning experiences on previous understandings and that the students should have an active role in shaping the culture of the classroom, which includes the creation of the objectives and the techniques used to teach the information. The results of this study align with these assumptions. Throughout the study, the theme of student leadership in the classroom prevailed. The teachers noted that they appreciate the ability to allow their students to have ownership in the classroom and the students added that they become more active in the classroom when they are allowed to make certain decisions that will impact how they learn. Additionally, the teachers said they adjust their lesson plans based upon the amount of understanding the students have. The students reported their teachers either speed up or slow down their instruction based upon how the class is responding to the information. This information is in sync with the study completed by Gamoran et al. (1998).

According to the findings from this study, the teachers at the selected school have an adequate knowledge of the effects of formative assessment and how to implement formative assessments correctly. The teachers and the students at the selected school have a positive outlook on formative assessment. Since the ClassScape assessment program is a relatively new program to the school and in general, this study will add to the dialogue surrounding the ClassScape assessment system and how it impacts instruction. As schools and districts continue to face higher demands, the formative assessments that take place in schools will continue to receive more attention. Although

most teachers who participated in this study perceive formative assessment and ClassScape positively, some teachers are still undecided on how ClassScape and formative assessment can help them become better teachers and help their students achieve more. When formative assessments, in conjunction with the ClassScape program, are used correctly, their impact will become clear to all involved.

References

Arter, J. A. (1987, April). *Assessing school and classroom climate: A consumer's guide.* Retrieved from http://www.eric.ed.gov/PDFS/ED295301.pdf

Arter, J. A., & Busick, K. U. (2001). *Practice with student-involved classroom assessment.* Portland, OR: Assessment Training Institute.

Assessment for Learning Formative Assessment. *Proceedings of the Learning in the 21st century. Research, innovation, and policy.* Retrieved from www.oecd.org/dataoecd/19/31/40600533.pdf

Atkin, J. M., Black, P. J., & Coffey, J. E. (Eds.). (2001). *Classroom Assessment and the National Science Education Standards*. National Research Council, National Academy Press: Washington DC.

Atkinson, T., & Davies, G. (2000). *ICT4LT module computer aided assessment (CAA) and language learning*. Retrieved November 29, 2010, from http://www.ict4lt.org/en/en_mod4-1.htm

Bachor, D., & Anderson, J. (1994). Elementary teachers' assessment practices as observed in the province of British Columbia. *Assessment in Education*, *1*(1), 63-93.

Baker, F. (1995). Moderation. *Teaching: The Magazine for Professionals in Education*, *33*, 1 & 3.

Bangert-Drowns, R. L., Kulik, C. L. C., Kulik, J. A., & Morgan, M. (1991). The instructional effect of feedback in test-like events. *Review of Educational Research, 61*, 213-238.

Bedwell, L. E. (2004). *Data-driven instruction.* Bloomington, IN. Phi Delta Kappa Educational Foundation.

Bell, B., & Cowie, B. (2000). The characteristics of formative assessment in science education. *Science Education*, *85*, 536–553.

Bereiter, C., & Scardamalia, L. (1992). Constructivist values for instructional design: Five principles toward a new mindset. *Educational Technology Research and Development, 41*, 4-1.

Berk, R. A. (2005). Survey of 12 strategies to measure teaching effectiveness. *International Journal of Teaching and Learning in Higher Education, 17*(1), 48-62.

Biancarosa, C., & Snow, C. E. (2006). *Reading next: a vision for action and research in middle and high school literacy: a report to Carnegie Corporation of New York* (2d ed.). Washington, DC: Alliance for Excellent Education. Retrieved December 10, 2010, from http://www.all4ed.org/publications/ReadingNext/ReadingNext.pdf

Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2004). Working inside the black box: Assessment for learning in the classroom. *Phi Delta Kappan, 86*(1), 9-21.

Black, P., & Wiliam, D. (1998). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan, 80*(2), 139-148.

Bloom, B. S., Hastings, J. T., & Madaus, G. F. (1971). *Handbook on formative and summative evaluation of student learning.* New York: McGraw-Hill.

Boston, C. (2002). The concept of formative assessment. *Practical Assessment, Research & Evaluation*, 8(9). Retrieved June 20, 2011, from http://PAREonline.net/getvn.asp?v=8&n=9

Box, C. (2008). *Formative assessment: patterns, personal practice assessment theories, and impact on student achievement and motivation in science.* Retrieved November 28, 2010, from http://etd.lib.ttu.edu/theses/available/etd-06302008-154934/unrestricted/Box_Mary_diss.pdf

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (2000). *How people learn: Brain, mind, experience, and school.* Washington, DC: National Academy Press.

Brewer, J., & Hunter, A. (1989). *Multimethod research: A synthesis of styles.* Newbury Park, CA: Sage.

Brookhart, S. M. (1998). *Teaching about grading and communicating assessment results.* Paper presented at the annual meeting of the National Council on Measurement in Education, San Diego, CA.

Brookhart, S. M. (1999). Teaching about communicating assessment results and grading. *Educational Measurement: Issues and Practice, 18*(1), 5-13.

Brookhart, S. M. (2007). Expanding views about formative classroom assessment: a review of the literature. In J. H. McMilliam (Ed.), *Formative classroom assessment: Research, theory, and practice.* New York, NY: Teachers College Press.

Brookhart, S. M. (2009). Editorial: Special issue on the validity of formative and interim assessment. *Educational Measurement: Issues and Practice, 28*(3), 1-4.

Brown, S., Race, P., & Bull, J. (1999). *Computer-assisted assessment in higher education*. London: Routledge.

Butler, S. M., & McNunn, N. D. (2006). *A teacher's guide to classroom assessment: Understanding and using assessment to improve student learning.* San Francisco, CA: Jossey-Bass.

Campbell, C., Murphy, J. A., & Holt, J. K. (2002). *Psychometric analysis of an assessment literacy instrument: applicability to preservice teachers.* Paper presented at the annual meeting of the Mid-Western Educational Research Association, Columbus, OH.

Campos, J., & O'Hern, J. (2007). How does using formative assessment empower students in their learning? Retrieved from http://www.eric.ed.gov:80/ERICWebPortal/detail?accno=ED496594

Celio, M. B., & Harvey, J. (2005). *Buried treasure: Developing an effective management guide from mountains of educational data.* Seattle, WA: Center on Reinventing Public Education.

Chappuis, S. (2005). Is formative assessment losing its meaning? *Education Week, 24*(44), 38.

Chappuis, S., & Chappuis, J. L. (2008). The best value in formative assessment. *Educational Leadership*, *65*(4). Retrieved from http://www.ascd.org/publications/educational-leadership/dec07/vol65/num04/The-Best-Value-in-Formative-Assessment.aspx

Chappuis, S., & Stiggins, R. J. (2002). Classroom assessment for learning. *Educational Leadership, 60*(1), 40-43.

Clark, M. A. (2008). Assessment is for learning: Formative assessment and positive learning interactions. *Florida Journal of Educational Administration & Policy*, *2*(1).

Clarke, S. (2001). *Unlocking formative assessment.* London: Hodder and Stoughton.

Classscape assessment system: Preliminary analysis of effectiveness. (2008). Proceedings of the Center of Urban Affairs and Community Services. Retrieved from http://www.classscape.org/ClassScape3/docs/userDocs/Research/docs/ClassScape_Analysis_Report.pdf

Coburn, C. E., & Talbert, J. E. (2006). Conceptions of evidence use in school districts: Mapping the terrain. *American Journal of Education, 112*(4), 469–495.

Coburn, C. E., Toure, J., & Yamashita, M. (2009). *Evidence, interpretation, and persuasion: Instructional decision making at the district central office.* Teachers College Record.

Cook, H. G. (2009). *Formative assessment: Best practices part one*. Presentation at the Elluminate Session, Pennsylvania Department of Education.

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* Upper Saddle River, NJ: Prentice Hall.

Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and conducting mixed methods research.* Thousand Oaks: CA, Sage.

Daniel, L. G., & Witta, E. L. (1997, March). *Implications for teaching graduate students correct terminology for discussing validity and reliability based on a content analysis of three social science measurement journals.* Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL. (ERIC Document Reproduction Service No. ED 408 853)

Daws, N., & Singh, B. (1996). Formative assessment: To what extent is its potential to enhance pupils' science being realized? *School Science Review, 77*(281), 93-100.

Dixon, H., & Williams, R. (2001). *Teachers' understandings of formative assessment.* Paper presented at the Annual Conference of the British Educational Research Association. Retrieved December 2, 2010, from http://www.leeds.ac.uk/educol/documents/00002533.htm

Dunn, K. E., & Mulvenon, S. W. (2009). A Critical Review of Research on Formative Assessments: The Limited Scientific Evidence of the Impact of Formative Assessment in Education. *Practical Assessment, Research, and Evaluation, 14*. Retrieved November 25, 2010, from http://pareonline.net/pdf/v14n7.pdf

Easley, J. A., & Zwoyer, R. E. (1975). In Crooks, T. (1988). The Impact of Classroom Evaluation Practices on Students. *Review of Educational Research*, *58*(4), 469.

Ehrenberg, R. G., Brewer, D. J., Gamoran, A., & Willms, J. D. (2001, February 6). *The class size controversy*. Retrieved from http://www.ilr.cornell.edu/cheri/workingPapers/upload/cheri_wp14.pdf

Ertmer, P., & Newby, T. (1993). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly, 6*(4), 50-72.

Fisher, D. L., & Fraser, B. J. (1990a). School climate: Assessing and improving school environments (Set: Research Information for Teachers No. 2, Item 4). Melbourne, Australia: Australian Council for Educational Research.

Formative assessment: Improving the learning in secondary classrooms. (2005). Policy Brief. Retrieved from http://www.oecd.org/dataoecd/19/31/35661078.pdf

Foster, D., & Poppers, A. (2009). Using formative assessment to drive learning. *The Silicon Valley Mathematics Initiative.* Retrieved from http://www.svmimac.org/images/Using_Formative_Assessment_to_Drive_Learning_Reduced.pdf

Fraser, B. J. (1981). Australian research on classroom environments: State of the art. *Australian Journal of Education, 15*, 238-268.

Fret, B., & Schmitt, V. (2007). Coming to terms with classroom assessment. J*ournal of Advanced Academics, 18*(3), 402-423.

Fulton, R. D. (1991). *A conceptual model for understanding the physical attributes of earning environments.* In R. Hiemstra (Ed.), Creative environments for effective adult learning, pp. 13-22. San Franscisco, CA: Jossey-Bass.

Gamoran, A., Secada, W. G., & Marrett, C. B. (2000). The organizational context of teaching and learning: Changing theoretical perspectives. M. T. Hallinan (Ed.), *Handbook of Research in the Sociology of Education,* pp. 37-63. New York, NY: Kluwer Academic/Plenum.

Garrison, C., & Ehringhaus, M. (2007). Formative and summative assessments in the classroom. Retrieved from http://www.nmsa.org/Publications/WebExclusive/Assessment/tabid/1120/Default.aspx

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th Ed.). Boston: Allyn & Bacon.

Gipps, C. V., & Stobart, G. (1997). *A teacher's guide to the issues.* (3d ed.). London, UK: Hodder & Stoughton.

Glaser, R. (1963). Instructional technology and the measurement of learning outcomes: Some questions. *American Psychologist, 18,* 519-521.

Gliem, J. A., & Gliem, R. R. (2003). *Calculating, interpreting, and reporting Cronbach's alpha reliability coefficients for Likert-type scales.* Paper presented at the Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education, The Ohio State University, Columbus, OH, Oct. 8-10, 2003.

Greene, J. M. (1998). Constructing the way forward for all students. *Education Canada*, *38*(3). Retrieved from http://www.cea-ace.ca/sites/default/files/EdCan-1998-v38-n3-Green.pdf

Greene, J. C., & Caracelli, V. J. (1997). *Advances in mixed-method evaluation: The challenges and benefits of integrating diverse paradigms. New Directions for Evaluation, 74.* San Francisco: Jossey-Bass.

Greenstein, L. (2010). *What teachers really need to know about formative assessment.* Alexandria, VA: ASCD.

Guskey, T. R., & Gates, S. L. (1986). Synthesis of research on the effects of mastery learning in elementary and secondary classrooms. *Educational Leadership, 43*(8), 73-80.

Hattie, J., & Timperely, H. (2007). The power of feedback. *Review of Educational Research, 77,* 81-112.

Hatziapostolou, T., & Paraskakis, I. (2010). Enhancing the impact of formative assessment on student learning through an online feedback system. *Electronic Journal of e-Learning, 8*(2), 111-122.

Heritage, M. (2007). Formative assessment: What do teachers need to know and do? *Phi Delta Kappan, 89*(2), Retrieved December 1, 2010, from http://www.pdkintl.org/kappan/k_v89/k0710her.htm

Heritage, M. (2010a). Formative assessment and next-generation assessment systems: Are we losing an opportunity? *Proceedings of the Council of Chief State School Officers.* Washington, DC.

Heritage, M. (2010b). Formative assessment: What do teachers need to know and do? *Kappan Magazine.* Retrieved from http://www.pdkintl.org/kappan/k_v89/k0710her.htm

Heritage, M., Kim, J., Vendlinski, T., & Herman, J. (2009). From evidence to action: A seamless process in formative assessment? *Educational Measurement: Issues and Practice, 28*(3), 24-31.

Herman, J. L., Aschbacher, P. R., & Winters, L. (1992). A practical guide to alternative assessment. Alexandria, VA: Association for Supervision and Curriculum Development.

Herman, J., & Gribbons, B. (2001). *Lessons learned in using data to support school inquiry and continuous improvement: Final report to the Stuart Foundation.* Los Angeles: UCLA Center for the Study of Evaluation.

Hiemstra, R. (1991). *Aspects of effective learning environments.* In R. Hiemstra (Ed.), Creative environments for effective adult learning, pp. 5-12. San Francisco: Jossey-Bass.

Hoff, D. J. (2006). Delving into data. *Education Week, 25*(5), 12-14, 20-22.

Ingram, D., Louis, K. S., & Schroeder, R. G. (2004). Accountability policies and teacher decision making: Barriers to the use of data to improve practice. *Teachers College Record, 106*, 1258-1287.

Irving, J. (1995). Teachers need to value their professional judgement. *NZEI Rourou*, *13*, 3.

Jerald, C. D. (2006). Using data: The math's not the hard part. *Issue Brief.* Retrieved from www.centerforcsri.org/files/Center_IB_Sept06B.pdf

Johnson, B., & Christensen, L. B. (2007). *Educational research: Quantitative, qualitative, and mixed approaches*. Boston, MA: Sage.

Johnson, E., Mellard, D. F., Fuchs, D., & McKnight, M. A. (2006). *Responsiveness to intervention (RTI): How to do it.* Lawrence, KS: National Research Center on Learning Disabilities.

Kadal, R. (2010, May). Data-driven decision-making - not just a buzz word. *Learning & Leading with Technology*, *37*(7). Retrieved from http://eric.ed.gov/ERICWebPortal/detail?accno=EJ886390

Knowles, M. S. (1970). *The modern practice of adult education: Andragogy versus pedagogy.* New York: Association Press.

Kolb, D. A., & Fry, R. (1975). Toward an applied theory of experiential learning. In C. Cooper (Ed.). *Theories of group process.* London: John Wiley.

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, *119*, 254 –284.

Krueger, R. A. (1994). *Focus groups: a practical guide for applied research* (2d ed.). Thousand Oaks, CA: Sage.

Krueger, R. A. (1998). *Focus groups: A practical guide for applied research.* Newbury Park: Sage.

Kulhavy, R. W. (1977). Feedback in written instruction. *Review of Educational Research*, *47*(1), 211-232.

Lake, C., & Tessmer, M. (1997). *Constructivism's implications for formative evaluation.* Paper presented at the annual meeting of the Association for Educational Communications and Technology, Albuquerque, New Mexico.

Lebow, D. (1993). Constructivist values for instructional systems design: Five principles toward a new mindset. *Educational Technology Research and Development*, *41*(3), 4-16.

Mandinach, E. B., Honey, M., & Light, D. (2006). *A theoretical framework for data-driven decision making.* Paper presented at the annual meeting of AERA. Retrieved December 1, 2010, from http:www.cct.edc.org/admin/publications/speeched/DataFrame_AERA06.pdf

Mann, D., & Shakeshaft, C. (2003, January). In God we trust; all others bring data. *School Business Affairs*, 19-22.

Marsh, J. A., Pane, J. F., & Hamilton, L. S. (2006). *Making sense of data-driven decision making in education. Evidence from recent RAND research.* Santa Monica, CA: RAND Education.

Marzano, R., & Haystead, M. (2008). *Making standards useful in the classroom.* Alexandria, VA: Association for Supervision and Curriculum Development.

McIver, J. P., & Carmines, E. G. (1981). *Unidimensional scaling.* Thousand Oaks, CA: Sage.

McManus, S. (2008). *Attributes of effective formative assessment.* Paper presented at the Formative Assessment for Teachers and Students (FAST) State Collaborative on Assessment and Student Standards (SCASS) of the Council of Chief State School Officers (CCSSO). Retrieved October 13, 2010, from http://www.ncpublicschools.org/docs/accountability/educators/fastattributes0408.pdf

Mertler, C. A. (2003). Preservice versus inservice teachers' assessment literacy: Does classroom experience make a difference? *Proceedings of the Mid-Western Educational Research Association.* Retrieved from http://wps.alongman.com/wps/media/objects/1530/1567095/tchassesslit.pdf

Mertler, C. A., & Vannatta, R. A. (2005). *Advanced multivariate statistical methods (3d ed.): Practical application and interpretation.* Glendale: Pyrczak Publishing.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: A sourcebook for new methods* (2d ed.). Thousand Oaks, CA: Sage.

Mitchem, K., Wells, D., & Wells, J. (2003). Using evaluation to ensure quality professional development in schools. *Journal of Research in Rural Education, 18*(3), 96-103.

Moore, D. W., Bean, T. W., Birdyshaw, D., & Rycik, J. A. (1999). *Adolescent literacy: A position statement.* Retrieved December 10, 2010, from http://www.reading.org/downloads/positions/ps1036_adolescent.pdf. Also published in the *Journal of Adolescent and Adult Literacy, 43,* 97-112.

Moore, B, & Stanley, T. (2009). *Critical thinking and formative assessments: Increasing the rigor in your classroom.* Larchmont, NY: Eye on Education.

Morgan, D. (1998). *The focus group guidebook.* Thousand Oaks, CA: Sage.

Morrison, G. R., Ross, S. M., & Kemp, J. E. (2004). *Designing effective instruction.* (4th ed.). Hoboken, NJ: John Wiley & Sons, Inc.

National Research Council. (1996). *National science education standards.* Washington, DC: National Academy Press.

National Research Council (2001). *Adding it up.* Kilpatrick, J., Swafford, J., & Findell, B. (Eds.). Washington DC: National Academy Press. Retrieved from www.nap.edu

Neesom, A. (2000). *Report on teachers' perception of formative assessment.* England: Qualifications and Curriculum Authority.

Neuman, W. L. (2000). *Social research methods: Qualitative and quantitative approaches* (4th ed.). Boston, MA: Allyn & Bacon.

No Child Left Behind: A Toolkit for Teachers. (2009, August 13). Retrieved from http://www2.ed.gov/teachers/nclbguide/toolkit_pg22.html

North Carolina Department of Public Instruction. (2010). *NC report card.* Retrieved from http://www.ncreportcards.org/src/schDetails.jsp?pSchCode=376&pLEACode=120&pYear=2009-2010&Page=2

North Carolina Department of Public Instruction. (2011). *NC FALCON.* Retrieved from www.ncpublicschools.org/acre/falcon

Olson, L. (2005). ETS to enter formative-assessment market at K-12 level. *Education Week, 24*(25), 11.

O'Reilly, R. (1975). Classroom climate and achievement in secondary school mathematics classes. *Journal of Educational Research, 21*, 141-248.

Organization for Economic Co-operation and Development. (2005). Formative assessment: Improving learning in secondary classrooms. Paris, France.

Partnership for Assessment of Readiness for College and Careers (PARCC). (2010, June.) The PARCC application for the race to the top comprehensive assessment systems competition. Retrieved November 20, 2010, from http://www.fldoe.org/parcc/pdf/apprtcasc.pdf

Patton, M. Q. (2002). *Qualitative research & evaluation methods*. (3d ed.). Thousand Oaks, CA: Sage.

Pellegrino, J. W., Chudowsky, N., & Glaser, R. (Eds.). (2001). *Knowing what students know: The science and design of educational assessment.* Washington, DC: National Academy Press.

Perie, M., Marion, S., & Gong, B. (2009). Moving toward a comprehensive assessment system: A framework for considering interim assessments. *Educational Measurement: Issues and Practice, 28*(3), 5-13.

Pierce, C. (1994). Importance of classroom climate for at-risk learners. *The Journal of Educational Research, 66*(1), 37-42.

Pinchok, N., & Brandt, W. C. (2009). Connecting formative assessment research to practice. *Learning Point Associated.* Retrieved from www.learningpt.org/pdfs/FormativeAssessment.pdf

Plake, B. S. (1993). Teacher assessment literacy: Teachers' competencies in the educational assessment of students. *Mid-Western Educational Researcher, 6*(1), 21-27.

Popham, W. J. (2006, Oct.). *Defining and enhancing formative assessment.* Paper presented at the Annual Large-Scale Assessment Conference, Council of Chief State School Officers, San Francisco, CA.

Popham, W. J. (2007). Formative assessment: False pathway to proficiency. *Leadership Compass*, *4*(3). Retrieved from http://www.naesp.org/resources/2/Leadership_Compass/2007/LC2007v4n3a3.pdf

Popham, W. J. (2008). *Transformative assessment.* Alexandria, VA: Association for Supervision and Curriculum Development.

Priestley, M., & Sime, D. (2005). Formative assessment for all: A whole-school approach to pedagogic change. *The Curriculum Journal*, *16*(4), 475-492.

Race, P. (2001). *Using feedback to help students learn.* The Higher Education Academy. Retrieved on December 1, 2010, from http://www.york.ac.uk/admin/aso/learningandteaching/id432_using_feedback.pdf

Redfield, D., Roeber, E., & Stiggins, R. (2008). *Building balanced assessment systems to guide educational improvement.* Paper presented at the National Conference on Student Assessment. Retrieved November 25, 2010, from http://www.ccsso.org/content/PDFs/openingSessionPaper-Final.pdf

Robinson, N. (1999). The use of focus group methodology-with selected examples from sexual health research. *Journal of Advanced Nursing, 29*(4), 905-913.

Rogers, W. T. (1991). Educational assessment in Canada: Evolution or extinction? *The Alberta Journal of Educational Research, 37*(2), 179-192.

Rorty, R. (1999). *Education as socialization and as individualization*. In R. Rorty (Ed.), Philosophy and social hope, pp. 114-130. London: Penguin Books.

Rossman, G. B., & Wilson, B. L. (1985). Number and words: Combining quantitative and qualitative methods in a single large-scale evaluation study. *Evaluation Review, 9*(5), 627-643.

Russell, T., Qualter, A., & McGuigan, L. (1995). Reflections on the implementation of national curriculum science policy for the 5-14 age range: Findings and interpretations from a national evaluation study in England. *International Journal of Science Education*, *17*, 481-492.

Sadler, D. R. (1989). Formative assessment and the design of instructional systems. *Instructional Science, 18*, 119-144.

Sadler, D. R. (1998). Formative assessment: Revisiting the territory. *Assessment in Education: Principles, Policy & Practice, 5*(1), 77-84.

Sausner, R. (2005). Making assessment work. District Administration. Retrieved June 27, 2010, from http://cusd.capousd.org/edusupport/Deptservices/Education%20Division/PLC/Making%20assessments%20work.pdf

Schafer, W. D. (1993). Assessment literacy for teachers. *Theory Into Practice, 32*(2), 118-126.

Schmoker, M. (2006). *Results now: How we can achieve unprecedented improvements in teaching and learning?* Alexandria, VA: Association for Supervisions and Curriculum Development.

Scriven, M. (1967). *The methodology of evaluation.* Washington, DC: American Educational Research Association.

Shepard, L. (1991). Psychometricians' beliefs about learning. *Educational Researcher, 20*(7), 2-16.

Shepard, L. A. (2009). Commentary: Evaluating the validity of formative and interim assessment. *Educational Measurement: Issues and Practice, 28*(3), 32-37.

Speck, M., & Knipe, C. (2001). *Why can't we get it right? Professional development in our schools.* Thousand Oaks, CA: Corwin Press, Inc.

Stiggins, R. J. (1999). Are you assessment literate? *The High School Journal, 6*(5), 20-23.

Stiggins, R. J. (2001). *Student-involved classroom assessment* (3d ed.). Upper Saddle River, NJ: Merrill-Prentice Hall.

Stiggins, R. J. (2002). Assessment crisis: The absence of assessment for learning. *Phi Delta Kappan, 83*(10), 758-765.

Stiggins, R. (2004). New assessment beliefs for a new school mission. *Phi Delta Kappan, 86*(1), 22-27. Retrieved December 1, 2010, from http://www.assessmentinst.com/documents/NewBeliefs.pdf

Stiggins, R. J., Arter, J. A., Chappuis, J., & Chappuis, S. (2004). *Classroom assessment for student learning doing it right-using it well*. Portland, OR: Educational Testing Service.

Stiggins, R. J., & Chappuis, S. (2005). Using student involved classroom assessment to close achievement gaps. *Theory into Practice, 44*(1), 11-18.

Stiggins, R. J., Frisbie, D. A., & Griswold, P. A. (1989). Inside high school: Building a research agenda. *Educational Measurement: Issues and Practice, 8,* 5-14.

Stobart, G. (2006). *The validity of formative assessment.* In J. Gardner (Ed.), *Assessment and Learning*. London: Sage.

Thompson, M., & William, D. (2007). *Tight but loose: Conceptual framework for scaling up school reforms.* Washington, DC: American Educational Research Association.

Tierney, R. D., & Charland, J. (2007). *Stocks and prospects: research on formative assessment in secondary classrooms.* Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Tihin, A. (2007). *A descriptive study of data-driven decision-making practices of a school district in an era of accountability*. Retrieved December 4, 2010, from http://domapp01.shu.edu/depts./us/apps/libraryrepository.nsf/resourceid/6999BD8 0F7D5731A852572D00066B795/$File/Tihin-Anna_Doctorate.pdf?Open

Tittle, C. K. 1994. Toward an educational psychology of assessment for teaching and learning: Theories, contexts, and validation arguments. *Educational Psychologist 29*(3), 149-16.

Torrance, H., & Pryor, J. (1998). *Investigating formative assessment.* Buckingham, UK: Open University Press.

Tunstall, P. (1996). Teacher feedback to young children in formative assessment: A typology. *British Educational Research Journal, 22,* 389-395.

U.S. Department of Education. (2009). *Race to the top program executive summary.* Washington, DC. Retrieved from http://www2.ed.gov/programs/racetothetop/executive-summary.pdf

Using assessments to improve learning and student progress. (2009). *Pearson Issue Papers.* Retrieved from http://www.pearsoned.com/pr_2009/051309.pdf

Volante, L., Beckett, D., & Reid, J., & Drake, S. (2010, May 1). Teachers' views on conducting formative assessment within contemporary classrooms. Retrieved from http://www.eric.ed.gov/PDFS/ED509293.pdf

Wargo, E. (2006). No data left behind. *Learning & Leading with Technology*, *33*(5), Retrieved from http://eric.ed.gov/ERICWebPortal/detail?accno=EJ728944

Wayman, J. C. (2005). Involving teachers in data-driven decision making: Using computer data systems to support teacher inquiry and reflection. *Journal of Education for Students Placed At Risk, 10*(3), 295-308.

Where in the world is ClassScape now? (2011, January 3). *ClassScape Newsletter, 6*(1), Retrieved from http://www.classscape.org/ClassScape3?newsletter.jsp

World-Class Instructional Design and Assessment. (2009). Focus of formative assessment. *Wisconsin Center of Education Research*, *1*(2). Retrieved from www.wida.us/resources/focus/Bulletin2.pdf

Wiliam, D. (2007). *Content then process: teacher learning communities in the service of formative assessment.* In Reeves, D. (Ed.), *Ahead of the curve: The power of assessment to transform teaching and learning.* Bloomington, Indiana: Solution Tree.

Wiliam, D., & Black, P. (1996). Meaning and consequences: A basis for distinguishing formative and summative functions of assessment? *British Educational Research Journal, 22*(5).

Wiliam, D., Lee, C., Harrison, C., & Black, P. (2004). Teachers developing assessment for learning: Impact on student achievement. *Assessment in Education: Principles, Policy & Practice, 11*(1), 49-65.

Wilson, B., Teslow, J., & Osman-Jouchoux, R. (1995). *The impact of constructivism (and postmodernism) on ID Fundamentals.* In B. Seels (Ed.), *Instructional design fundamentals: A reconsideration,* pp. 137-185. Englewood Cliffs, NJ: Educational Technology Publications.

Wininger, R. S. (2005). Using your tests to teach: Formative summative assessment. *Teaching Psychology, 32*(2), 164-166.

Wininger, S., & Norman, A. (2005). Teacher candidates' exposure to formative assessment in educational psychology textbooks: a content analysis. *Educational Assessment, 10*(1), 19-37.

Wise, S. L., Lukin, L. E., & Roos, L. L. (1991). Teacher beliefs about training and measurement. *Journal of Teacher Education, 42*(1), 37-42.

Wood, N., & West, B. (1998). The next steps: A guide for the continuous improvement instructional planning process. Professional development and appraisal system (PDAS).

Wren, D. G. (2008). Using formative assessment to increase learning. *Research Brief*, *1*. Retrieved from http://www.vbschools.com/accountability/research_briefs/ResearchBriefFormAss mtFinal.pdf

Young, S., & Giebelhaus, C. (2005). *Formative assessment and its uses for improving student achievement.* Retrieved from http://www.cblohm.com/news/STI/STI_White_Paper.pdf

Young, V. M., & Kim, D. H. (2010). Using assessments for instructional improvement: A literature review. *Education Policy Analysis Archives, 18*(19). Retrieved November 10, 2010, from http://epaa.asu.edu/ojs/article/view/809

Appendix A

Permission from School Principal

Dear Principal of Selected School for Study,

Thank you for your interest in my dissertation study entitled "An Analysis of the Development of Instruction Based on the Use of the ClassScape Program." I appreciate your help and support as I complete my doctorate degree in Curriculum and Instruction at Gardner-Webb University. As you and I discussed earlier, this dissertation study involves your students and teachers completing in a pre and post survey, participating in focus groups, and taking part in individual interviews.

I want to assure you that all information collected in the data collection phase will remain confidential and anonymous. Before students participate in focus groups or individual interviews, written permission will be obtained from their parents. Dr. Doug Eury, chair of my dissertation committee, is available to answer any questions you may have regarding the requirements of Gardner-Webb University. You may email him at aeury@gardner-webb.edu. If you agree to allow this study to be completed in your school, please indicate by signing below.

_____

Signature of Principal

Thank you for your time and consideration.

Jason Parker, NBCT

jparker@burke.k12.nc.us

Appendix B

Permission from School System Superintendent

Dear Superintendent of Selected School District,

Thank you for your interest in my dissertation study entitled "An Analysis of the Development of Instruction Based on the Use of the ClassScape Program." I appreciate your help and support as I complete my doctorate degree in Curriculum and Instruction at Gardner-Webb University. The research project I am completing involves the following data collection instruments: surveys, a teacher focus group, a student focus group, individual teacher interviews, and individual student interviews.

I want to assure you that all information collected in the data collection phase will remain confidential and anonymous. Before students participate in focus groups or individual interviews, written permission will be obtained from their parents. Dr. Doug Eury, chair of my dissertation committee, is available to answer any questions you may have regarding the requirements of Gardner-Webb University. You may email him at aeury@gardner-webb.edu. If you agree to allow this study being to be performed in your school district, please indicate by signing below.

_____

Superintendent Signature

Thank you for your time and consideration.

Jason Parker, NBCT

Assistant Principal, Table Rock Middle School

jparker@burke.k12.nc.us

Appendix C

Permission from Parents

Consent Form: The Analysis of the Development of Instruction Based Upon ClassScape Data

I am conducting research on the impact the ClassScape program on the development of instruction at a middle school. I am investigating this because the research will help educators make informed decisions about their instruction based upon formative assessment data. If you decide to do this, your child will be asked to participate in focus groups discussing their experiences in with formative assessment and the ClassScape program during the months of March and April. Students will generally participate in a focus group for only one session.

There are no risks to students in this study. All information is confidential, and no person or school will be identified in the study. All focus group sessions are with the research interviewer only, and no individual information shared in the sessions will be used for any reason beyond the research study, nor will it be shared with school personnel.

If your child takes part in this project, he or she will have the opportunity to give input about the future use the ClassScape program. Taking part in this project is entirely up to you, and no one will hold it against your child if you decide not to do it. If your child does take part, he or she may stop at any time without penalty. In addition, you may ask to have your data withdrawn from the study after the research has been conducted.

If you want to know more about this research project, please contact me at 828-437-5212 or email me at jparker@burke.k12.nc.us. The Institutional Review Board at Gardner-Webb University has approved this project. Information on Gardner-Webb University's policy and procedure for research involving humans can be obtained from Dr. Doug Eury at Gardner-Webb University.

You will get a copy of this consent form.

Sincerely,

Jason L. Parker

Ed.D. Candidate, Gardner-Webb University

Consent Statement

I agree to let my child take part in this project. I know what he or she will have to do and that he or she can stop at any time.

_____   _____
Signature   Date

Audio/Videotape Consent Addition

I agree to audio taping at Table Rock Middle School during the month of April, 2011.

_____   _____
Signature   Date

I have been told that I have the right to hear the audio tapes before they are used. I have decided that I:

_____ want to hear the tapes

_____ do not want to hear the tapes

Jason Parker and other researchers approved by Gardner-Webb University may use the tapes made of my child. The original tapes or copies may be used for this research project, teacher education, and presentation at professional meetings.

_____   _____   _____
Signature   Date   Address

Appendix D

Permission from Teachers

Dear Teacher:

My name is Jason Parker and I am a doctoral candidate at Gardner-Webb University. I am currently finishing the requirements for my degree by completing a dissertation researching how teachers use data from the ClassScape program to drive their instruction. I have chosen to focus my research on one particular school. You have been selected to participate in this study as a teacher at this school.

As a research participant, you will be asked to complete an online survey and take part in a focus group interview. You may also be asked to participate in an individual interview or be part of an observation during the school day. All information collected will be kept completely confidential. You may choose to leave the study at any time with no repercussions. No teacher names or information will be collected or used for this study other than to state permission. No teacher names or information will be used in the research report.

Please respond to this letter by selecting one of the following options.

_____ I agree to participate in the research study.

_____ I do not agree to participate in the research study.

Signature: _____

Thank you for your time. If you have any questions, you may contact me by email at jparker@burke.k12.nc.us or by phone at (828) 439-5711.

Sincerely,

Jason Parker

Doctoral Candidate, Gardner-Webb University

Appendix E

Teacher Survey

Thank you for your willingness to complete the survey. Please press submit when you have completed the survey.

1. I use ClassScape as a method of formative assessment in my classroom.
Yes
No
2. I use formative assessment in my classroom.
Yes
No

3. What are three words you would use to describe the ClassScape program?

4. Formative assessment, in conjunction with the ClassScape program, allows the learning environment of my classroom to be improved.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

5. Give an example of how the learning environment in your classroom was impacted as a result of the ClassScape program.

6. Formative assessment, in conjunction with the ClassScape program, has an impact on my lesson planning.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

7. Please give an example of how your lesson planning was impacted as a result of the data from the ClassScape program

8. Formative assessment, in conjunction with the ClassScape program, has an impact on how I implement instruction.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

9. Please give an example of how the ClassScape program impacts how you implement your instruction.

10. Formative assessment, in conjunction with the ClassScape program, impacts how I assess my students.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

11. Please give an example of how the ClassScape program impacts how you assess your students.

12. I tell my students what they are expected to learn and why they are learning the material.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

13. I invite and build on my students' contributions to the class.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

14. I encourage students through my specific and focused feedback about their performance in my classroom.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

15. I encourage students to help one another.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

16. I show students some examples of their peers' work for the purpose of guiding and learning.
Strongly Agree
Agree
No Opinion

Disagree
Strongly Disagree

17. I ask students to demonstrate their work so I can analyze their thinking.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

18. I encourage my students to demonstrate their thinking/work to the class.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

19. I encourage students to suggest ways that their learning can be improved.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

20. I show students a range of other students' work to model (or exemplify) criteria.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

21. I assist students in negotiating a route to improve their learning.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

22. I provide time for students to reflect and talk about their learning with me. (Conferences)
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

23. I help students to understand their achievements and know what they need to do next to make progress.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

24. I provide opportunities for students to assess their own work and each other's work and give feedback.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

25. I use probing questions to diagnose the extent of the students' learning.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

26. I analyze completed work to comprehend why a student has or has not achieved success.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

27. I express approval when achievement is satisfactory to both students and parents.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

28. I tell students what they have or have not achieved with specific references to their learning.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

29. I write an evaluative note on a student's work that is specifically designed for the assignment and student.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

30. I strive to make my students the center of my classroom practices.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

31. I strive to catch student misconceptions about subject matter before they occur.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

32. I allow my students to communicate with me during instruction so I can ensure my instruction is meeting their needs.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

Appendix F

Student Survey

1. My teachers ask me during class how much I understand what they are teaching.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

2. My teachers give me smaller quizzes before I take a big test on a unit.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

3. My teacher puts as much emphasis on our classroom tests as they do for the End-of-Grade test.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

4. My teachers plan their future lessons based upon how my class is understanding what is being taught.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

5. I feel that I am properly prepared for my quizzes and test because my teachers ask me questions while they are teaching me.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

6. My teachers tell me what I am expected to learn and why I am learning it.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

7. My teachers ask me what they can do to help me better understand what they are teaching.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

8. My teachers tell me what my strengths are.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

9. My teachers encourage me to help other students during class.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

10. My teachers ask me to show them my work during class so they can see what I understand and what I need more help with.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

11. My teachers ask me to showcase my work to the other students during class as a way to help them understand the assignment.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

12. My teachers ask me how they can make their class more interesting.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

13. My teachers show other students' work to the class so we know what the finished assignment is supposed to be.
Strongly Agree

Agree
No Opinion
Disagree
Strongly Disagree

14. My teachers allow me to have time to reflect about the things I learned in class.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

15. My teachers help me to better understand the things I already know and help me to understand what I need to learn next.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

16. My teachers give me time to grade my own assignments during class.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

17. My teachers celebrate when I complete an assignment the correct way.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

18. I always know what questions I got correct on an assignment and which questions I need more help with.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

19. My teachers write notes to me on my work to let me know how I did and what I can do to improve.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

20. My teachers place the students first in their classrooms.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

21. My teachers usually catch my mistakes before I get frustrated trying to figure a problem out.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

22. My teachers allow the students to communicate with them while they are teaching.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

23. My teachers allow the students to set up some of the rules for the class.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree
24. My teachers want the students to work together to learn.
Strongly Agree
Agree
No Opinion
Disagree
Strongly Disagree

Appendix G

Permission to Use Adapted Survey

Yes, you do--I used *********--always, sometimes, or never for anonymous responses--I did preface it with one response for "all that apply"--listed grade levels, subject areas, EC, AIG, electives. Good luck on the completion of your dissertation.
Ms. ****,

Thanks again for the information regarding the survey. I have spoken with my dissertation chair and he has approved me (with your permission) to use your adapted survey for my pre and post survey questions.

Do I have your permission to use your adapted survey?

Thanks again for your time.

*****

From: *******

Sent: Wednesday, January 12, 2011 1:18 PM
To: *******
Subject: Re: Survey

In the 5th module for administrators--It is from a *******--cited also in the intro is "adapted from a survey contained in the Report on Teachers' Perception of Formative Assessment (2000) written by Ann Neesom for the Qualifications and Curriculum Authority (QCA) of the United Kingdom of Great Britain).

We used it as a prelim reflective tool prior to departmental planning.
****

On Wed, Jan 12, 2011 at 9:07 AM, ***********wrote:
Ms. F******,

I am completing a dissertation study on formative assessment. I came across the formative assessment teacher survey on the "********" blog. I would like to use this survey as one of my data collection tools. Could you tell me where I could find the original questionnaire you discussed in the blog post? You mentioned the **** and *********. I searched the ** ******** website and could not find anything.

Thank you so much for your time.

*****

Appendix H

Classroom Observation Checklist

Table
Walkthrough Data
Dates are between March and April 2011

Name of Teacher Date: _____	Teacher has a clear objective for students	Teacher used a formative assessment during the lesson	Teacher was using the ClassScape Assessment System	Teacher was reviewing ClassScape Assessment data	Teacher was giving specific feedback to students	Students were actively involved in the lesson