ABSTRACT

William Steven Hill, SCHOOL PROFESSIONALS' PERCEPTIONS OF FORMATIVE ASSESSMENT AS RELATED TO STUDENT ACHIEVEMENT (Under the direction of Dr. William Grobe). Department of Educational Leadership, October 2014.

This study examined potential relationships between North Carolina school professionals' perceptions of formative assessment and district-level EOG, EOC, and AYP proficiencies. There were three primary areas of interest for the study as follows:

1. Analyze North Carolina school professionals' perceptions toward formative assessment after completing online learning modules that define formative assessment and identify formative assessment practices.
2. Use pre-existing survey data to identify potential district-level clusters based on perceptions toward formative assessment.
3. Investigate district-level clusters for potential relationships with district EOG, EOC, and AYP academic proficiencies.

A literature review on formative assessment as a school improvement strategy was performed. Quantitative research methodologies were utilized to describe the perceptions of formative assessment in a sample of North Carolina school district professionals and tested for any statistically significant relationships to EOG, EOC, and AYP proficiencies.

The findings provided preliminary data on the perceptions of formative assessment in North Carolina school districts. Each district was able to be statically placed in a cluster and then evaluated for relationships with student and district proficiencies.

It was found that differences between clusters were statistically significant; however, the parametric statistic was extremely sensitive to the large sample size of the study. Due to the small differences and the large sample sizes, it was determined that the differences were

practically insignificant. The findings indicate the lack of a dominant perception about formative assessment and may suggest North Carolina education professionals are unsure or unaware of formative assessment implementation. A major implication from the study that is relevant to state educational policymakers and school leaders is the importance of communicating a clear, coherent formative assessment implementation plan consistent with the purpose.

Over time, future research studies on the perceptions of formative assessments may build a more comprehensive picture of school professionals' perceptions of formative assessment and how they affect school improvement in North Carolina. Such research could include qualitative inclusive case studies focusing on specific districts that have a cohesive perception of formative assessment. This work could also include a methodological component that quantifies the relationship between perceptions of formative assessment and student proficiencies.

SCHOOL PROFESSIONALS' PERCEPTIONS OF FORMATIVE ASSESSMENT AS RELATED TO STUDENT ACHIEVEMENT

A Dissertation

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Doctor of Education

by

William Steven Hill

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SCHOOL PROFESSIONALS' PERCEPTIONS OF FORMATIVE ASSESSMENT AS RELATED TO STUDENT ACHIEVEMENT

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DEDICATION

To William James Hill Jr. - My Father - My driving force. It has taken my entire life to understand the reason for your fortitude and insistent nature, but I now thank you for instilling in me the work ethic to never stop.

To Janice Hill - My Mother - My life counselor. Thank you for loving me, teaching me that Christ will always be with me, and supporting me tirelessly through the years.

To Michelle Hill - My Wife - My rock and best friend. Your selfless actions of sacrifice have allowed me to succeed. Thank you for encouraging and loving me.

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To my family--your prayers, tireless support and love have been the staple substance of this achievement. I thank my wife, Michelle, for never giving up on me and consistently lifting me up. To my children, Hannah, Madison and Stevie, I apologize for stealing time from you and thank you for understanding when I couldn't be there. I truly hope through your support of my work that you have learned to highly value education.

Thank you to Jane Brothers, who helped organize my words and move me forward when I was struggling to stay on track. I welcomed your expertise, but mostly enjoyed your personable nature and friendship.

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I am also thankful to the staff at the North Carolina Department of Education for sharing their data. To Sarah and Ann Marie, thank you for providing all the documentation and helping me find answers whenever I called.

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CHAPTER 1: INTRODUCTION

This study will focus on incorporating formative assessment as a process to improve summative tests. The study will analyze possible relationships between school professionals' perceptions of formative assessment and student achievement on 2010–2011 end-of-grade (EOG) math and reading summative tests and end-of-grade (EOG) science summative tests at the middle school levels. These same relationships will be studied with end-of-course (EOC) English I, Algebra I, Algebra II, Biology, Physical Science, Civics & Economics, and U.S. History summative tests at the high school levels. District proficiencies on Annual Yearly Progress (AYP) will also be examined for relationships to school professionals' perceptions of formative assessment.

Conducting this study is relevant due to numerous researchers linking school professionals' understanding and implementation of formative assessment as a key to raising student achievement (Black & Wiliam, 1998; Marzano, 2001, 2003, 2007; Sadler, 1989; Schmoker, 2009; Stiggins, 1994; Stiggins & Chappuis, 2005). Formative assessment is a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning with intended improvement for instructional outcomes (Council of Chief State School Officers [CCSSO], Formative Assessment for Students and Teachers [FAST], & State Collaboratives on Assessment and Student Standards [SCASS], 2006). Through the consistent use of formative student assessments it is assumed that teachers will make informed decisions, progress their instructional practice, and ultimately increase student achievement on summative tests (Cizek, 2007; Pellegrino & Goldman, 2008; Perie, Marion, & Gong, 2009; Perie, Marion, Gong, & Wurtzel, 2007). Some research indicates a primary reason school reform efforts struggle is due to overlooking formative assessment processes and their positive

impact on final summative tests (Black & Wiliam, 1998). Focusing solely on large-scale, summative assessment data to drive instructional improvements may cause reform efforts to not be as successful (Stiggins, 2001).

Modern day increased dependence on summative data may be contributed to negative national school reports during the early 1980s. *A Nation at Risk,* a 1983 U.S. education review, advised more intensive summative testing to evaluate and compare student proficiency in U.S. public schools. Influenced by the federal government, North Carolina policy makers followed the recommendations of the federal report and established performance-based accountability programs (North Carolina State Board of Education [NCSBE], 2008). The summative tests created by these accountability programs were analyzed to indicate a school's effectiveness, which was later publically reported (NCSBE, 2008). In the mid-1990s, North Carolina revised the process and created the initial version of the ABCs Accountability Model. The ABCs model placed an emphasis on summative tests that take place at the end of the semester or school year (NCSBE, n.d.). The school rankings within the model consistently hinge on EOG and EOC summative tests.

The No Child Left Behind Act (NCLB) of 2001 prompted North Carolina policy makers to raise school accountability for meeting proficiency levels of the ABCs model, and add sanctions to failing public schools. NCLB may have gained bipartisan support through the comparison of state data to the National Assessment of Educational Progress (NAEP), which indicated many states, including North Carolina, had inadequate summative student test scores (The Nation's Report Card, 2007).

Today, public school professionals converge their efforts toward summative testing accountability thresholds, which are overshadowed by pending sanctions. In an urgency to

produce better summative scores, school professionals continuously focus more attention on instructional practices that prompt teaching toward summative tests.

This still evolving cultural bias toward meeting new state and federal summative testing metrics may be influencing schools to neglect formative assessments (Black & Wiliam, 1998; Shepard, 2005). Research finds school leaders focus too heavily on state summative tests as guidance tools for instructional improvement (Black & Wiliam, 1998; McGehee & Griffith, 2001; McMillan, 2001; Shepard, 2000; Stigler & Hiebert, 1997). Research also reveals a relationship between the implementation of large-scale summative testing as the primary stimulus for school reform and the assessment methodologies used by the classroom teachers becoming primarily summative in nature (Amrein & Berliner, 2002; Bolante, 2004; Popham, 2000; Wilson, 2005). By emulating the competitive nature of summative testing in instructional and assessment methodologies, teachers may inadvertently inhibit student engagement in the learning process. Marking and grading practices tend to emphasize competition rather than personal improvement, and assessment feedback can often have negative impacts (Black & Wiliam, 1998).

Recognizing this concern for instructional practices in the classroom, the NCSBE requisitioned an independent review commission to investigate improvement options for North Carolina public schools (Framework for Change, 2008). In January 2008, the commission presented a report to the NCSBE recommending the inclusion of research based formative assessments (Framework for Change, 2008).

With a supportive report from the commission, the NCSBE developed a challenge document entitled *The Framework for Change* for the North Carolina Department of Public Instruction (NCDPI) (see Appendix A). This document outlined a roadmap for improvement of

state standards, assessments, and accountability metrics (Framework for Change, 2008).

NCDPI responded to the challenge of creating an improved assessment system by working toward a tiered model that includes summative and formative assessments. This tiered assessment process is outlined in a state printed document titled, *The Response to the Framework for Change: The Next Generation of School Standards, Assessments and Accountability* (2008) (see Appendix B). The model takes into consideration research that stresses the need for teachers to include formative assessments through sharing achievement targets with students and providing frequent student self-assessments with continued feedback for the student and the teacher (Brookhart, 2009; Framework for Change, 2008; Stiggins, 2007). The model includes a scaffolding approach to assessment by promoting multiple classroom formative assessments, intermediate district summative assessments, and state summative tests.

During the 2012–2013 school year, NCDPI included the scaffold assessment program in transitioning to the READY school accountability model. The READY accountability model resembles the ABC model but with the inclusion of revised curriculums and support for additional assessment processes. Through the READY model, NCDPI reports the delivery of teacher online formative assessment training modules, but the overall accountability piece in the READY model still includes EOG and EOC summative tests.

The movement of the current state accountability model to include formative assessment challenges the traditional roles of district principals and superintendents. Principals and superintendents who have previously developed their personal leadership styles around summative evaluation data must now consider their personal paradigms toward formative evaluation processes and potential augmentation of their professional practices. With existing research indicating a relationship between formative assessment and student achievement, and

with the drive of the NCSBE to incorporate formative assessment in accountability documentation, personnel perceptions of formative assessment pedagogy should now be a high priority for school leaders.

Significance of the Study

In the constantly changing world of accountability goals, it is imperative that school professionals learn what is vital for student academic achievement. This study will attempt to identify any relationships between school professionals' perceptions of formative assessment and student academic achievement at the district level. Information revealed in this study may better inform principals, as school leaders, and superintendents, as district leaders, of the role formative assessment plays in school improvement efforts as well as the level of formative assessment implementation within school districts. The study may also assist school professionals in developing improved instructional practices that obtain higher student achievement.

Definitions

This section lists key terms that need to be defined clearly within the study. Student assessment, the focal point of the study, is normally classified into one of two categories: summative or formative. Researchers often use similar concepts but the definitions can vary. For the purpose of this study, we provide the following definitions and clarifications for both assessments and other pertinent terms.

Summative Assessments

This study uses Clarke's (2005) definition of summative assessment, which defines it as any assessment method that measures whether or not a target goal has been reached. This definition most represents the classroom environment discussed in this study where there is a teaching process and then a final collective exam. Summative assessment at the district and

classroom level is an accountability measure that is generally used as part of the grading process (Arter, 2003; Clarke, 2005; McTighe & O'Conner, 2005). Examples of summative assessments include district benchmarks or interim assessments, end-of-unit or chapter tests, EOG tests, EOC tests, semester exams, and scores that are used for school accountability (e.g., AYP) and student accountability (e.g., report card grades). Some research indicates that summative assessments occur too late in the learning process to provide useful information at the classroom level and to make instructional adjustments and interventions (Bloom, 1980; Garrison & Ehringhaus, 2009; Stiggins, 2006).

Formative Assessments

Allal and Lopez (2005) indicated in their research that Scriven, in 1967, was the first to coin the term *formative evaluation*. They acknowledged that Bloom made the term more known through his 1968 mastery-learning model (Bloom, 1968). The more recent, referenced, and most cited works of Black and Wiliam (1998) define formative assessment as "all those activities undertaken by teachers, and/or by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged" (p. 10). Even though Black and William's research is cited in almost all literature reviewed since its publishing, the NCDPI chose to follow a derived modified version developed by the CCSSO. The CCSSO modified the Black and Wiliam definition of formative assessment according to the specifications provided by FAST, a department of CCSSO. FAST defines formative assessment as "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" (as cited in Response to the Framework for Change, 2008, p. 14). The Formative

Assessment Learning Online Network (NC FALCON), which is reviewed in this study, provides this definition in their learning modules.

Formative assessment as an instructional tool is included in the NCDPI document titled, *A Response to the Framework for Change*. The following excerpt gives the reader a better understanding of the current view of past accountability practices by educational leaders and the commitment of the NCDPI to support the expansion of formative assessment:

> The purpose of formative assessment is to assist teachers in identifying where necessary adjustments to instruction are needed to help students achieve the intended instructional outcomes that are ultimately defined by the Essential Standards**.** Formative assessment is ongoing, minute-by-minute assessment that is integral to instructional delivery. The primary users of formative assessment information are students and teachers. Formative assessment, as here defined, is a best practice that research has shown will improve student learning. In the current testing system, there is not a systematic effort to maintain and improve the effectiveness of formative assessment. In a testing system that only includes statewide summative tests, formative assessment is often forgotten while the classroom assessment focus is on benchmark tests that look and feel like mini-statewide tests. In the new assessment system, formative assessment should be a daily practice to support and promote learning. Teachers will need ongoing professional development, and the State will need to build and provide continued support to enhance the local capacity to meet this need. (Response to the Framework for Change, 2008, p. 14)

The mission of North Carolina schools is moving from the traditional role of assessment to detect and highlight differences in student learning to help all students succeed, as evidenced from the DPI literature. School professionals are encouraged by researchers to embrace the

concept that all children can learn. To enable all students to experience the productive emotional dynamics of winning, Stiggins (2007) states that a change from exclusive use of assessments that verify learning to the use of assessments that support learning will be necessary.

School Professionals

For the purpose of this study, the term *school professionals* will refer to the position selection titles listed on the NC FALCON participant survey (NC Education, 2011). Less than 5% of the surveys used in this study were nonteaching positions. A list of the titles with a brief general definition follows:

- Teacher PK–2: Teachers working with entry-level students to second grade. A majority of these teachers are referred to as pre-k and elementary school teachers.
- Teacher 3–5: Teachers working with third grade to fifth grade students. A majority of these teachers are referred to as elementary school teachers.
- Teacher 6–8: Teachers working with sixth through eighth grade students. A majority of these teachers are referred to as middle school teachers.
- Teacher 9–12: Teachers working with ninth through twelfth grade students. A majority of these teachers are referred to as high school teachers.
- TA: Teacher Assistants with a majority of assignments located at the elementary school level.
- School Support Staff: Generic listing for other personnel that may work with students such as literacy coaches.
- Principal PK–5: Principals of students in grades pre-kindergarten through five. A majority of these principals are often referred to as pre-K or elementary school principals.

- Principal 6–8: Principals of students in grades six through eight. A majority of these principals are often referred to as middle school principals.
- Principal 9–12: Principals of students in grades nine through twelve. A majority of these principals are often referred to as high school principals.
- Other School Administrators: School administrators at all levels other than the principals such as assistant principals.
- Curriculum /Program Coordinator: District/school personnel responsible for the coordination of specific educational programs.
- Media Coordinator: District/school personnel responsible for media collections and operations.
- Testing Coordinator: District/school personnel responsible for coordinating the district and state student testing process.
- Other CO Administrator: Generic listing for other Central office/district administrators that direct or coordinate programs that influences student instruction.

Homogeneous Cluster Groups

This study will use cluster analysis to identify homogeneous cluster groups. Cluster analysis is an exploratory statistical method designed for determining which divergent characteristics exist in a sample that can be combined, thus turning the sampled population into multiple subgroups (Romesburg, 1984). The partitioning of the NC FALCON dataset or survey responses into units of similar characteristics or perceptions toward formative assessment will be referenced as *homogeneous clusters* (or simply *clusters*) within the study. The respondents in these groups are grouped based on statistical similarities in select variables.

School Leaders

For the purpose of this study, *school leaders* or *leadership* refer to public school principals. Outcomes of this study will be of equal value to public school superintendents as their position, to some degree, directs the actions of principals. School leadership for this study will be defined by Hallinger and Heck (2006) as "an influence process by which school administrators, focusing especially on principals, seek to work with and through people towards the identification and achievement of organizational goals" (p. 216). It is important to understand that principals are also school professionals; however, at times in the study they will need to be discussed separately, as their perceptions and actions will directly impact all other school professionals. For this reason, the term *school professionals* will include all of the study population, which includes principals during the data collection, and analysis of the data. When speaking separately about principals' perceptions, the term *school leaders* or *leadership* may be applied to distinguish principals from other school professionals.

Race to the Top

Race to the Top (RTTT) is a federal competitive grant program designed to encourage and reward states that are developing infrastructures for education reform that lead to significant student improvement. RTTT is included as part of the American Recovery and Reinvestment Act of 2009 (ARRA) that provides $4.35 billion dollars for the RTTT program (U.S. Department of Education [USDE], 2010).

No Child Left Behind

NCLB, formerly the Elementary and Secondary Education Act (ESEA), is a federal bipartisan reform law passed in 2001 to increase student achievement throughout the United States (USDE, 2004).

Adequate Yearly Progress

AYP is a federal metric set forth by NCLB to gauge the performance of schools within the United States. Annual summative tests across all subgroups of students are evaluated to place in effect titles of distinction or NCLB prescribed sanctions (USDE, 2004).

End-of-Grade Tests

EOGs are North Carolina grades 3–8 summative tests designed to measure student performance on goals, objectives, and grade-level competencies specified in the NC Standard Course of Study (NCDPI, 2013a).

End-of-Course Tests

EOCs are North Carolina grades 9–12 summative tests designed to sample a student's knowledge of subject-related concepts as specified in the NC Standard Course of Study and to provide a global estimate of the student's mastery of the material in a particular content area (NCDPI, 2013b).

Student Achievement

For this study, *student achievement* is defined as a positive change for a group of students between two or more points in time, expressed by the North Carolina Report Card summative test scores and federal AYP reports.

Purpose of the Study

The purpose of this study is to determine if a significant relationship exists between North Carolina public school professionals' perceptions of formative assessment and student achievement. For this study, perception will refer to the formative assessment conceptual and procedural knowledge indicated by school professionals within North Carolina school districts. With research supporting formative assessment and continuing accountability measures being

placed before schools it is necessary to examine school professionals' perceptions, which may or may not affect student achievement.

The literature review for this study will provide historical formative assessment information with previous researchers' findings inserted to provide better understanding of formative assessment practices and potential impact on student achievement. The research will examine the reliability of statewide school professional surveys associated with formative assessment professional learning modules. Potential relationships between formative assessment perceptions by the respondents and district achievement on North Carolina EOG tests, EOC tests, and AYP by district will also be a focus of this study. NC FALCON surveys completed by school professionals will relate to five online formative assessment learning modules as follows (NC Education, 2011):

1. Importance of Formative Assessment
2. Learning Targets and Criteria for Success
3. Collecting and Documenting Evidence
4. Analyzing Evidence and Descriptive Feedback
5. Administrator's Role in Formative Assessment

The modules will provide a common definition of formative assessment for the study population, and the post-survey will provide data for cluster analysis based on respondents' perceptions.

Research Questions and Hypotheses

The study will collect survey information from NC FALON to evaluate school professionals' perceptions toward formative assessment, and then investigate potential relationships with summative student and district achievement. The following research questions

and hypotheses will be considered during the process of analyzing the effectiveness of the modules to provide a common definition of formative assessment and the comparison of data from the post survey:

Research Question 1: To what degree did participant perceptions toward formative assessment change between pre NC FALCON online module surveys and post NC FALCON online module surveys?

Hypothesis 1: There is a statistically significant relationship between the reliability evaluation of the pre-survey and post-survey, and the provision of a qualifying formative assessment definition.

Research Question 2: Can the participants in this study be classified into homogeneous clusters based on their post-module self-perception survey responses?

Hypothesis 2: There is a statistically significant relationship between evaluated post-module survey responses, which allow for homogeneous clusters.

Research Question 3: Are there mean differences in student academic achievement—as measured by percent proficiency on the North Carolina EOG test in Reading and Math for academic school year 2010-2011 (NC School Report Card)—between potentially identified homogeneous clusters?

Hypothesis 3: There is a statistically significant relationship between identified homogeneous clusters and higher student academic achievement percentages on the North Carolina EOG test in Reading and Math for the academic school year 2010–2011(NC School Report Card).

Research Question 4: Are there mean differences in student academic achievement—as measured by percent proficiency on the North Carolina EOG test in Science for

academic school year 2010–2011 (NC School Report Card)—between potentially identified homogeneous clusters?

Hypothesis 4: There is a statistically significant relationship between identified homogeneous clusters and higher student academic achievement percentages on the North Carolina EOG test in Science for the academic school year 2010–2011(NC School Report Card).

Research Question 5: Are there mean differences in student academic achievement—as measured by percent proficiency on the North Carolina EOC Tests for English I, Algebra I, Algebra II, Biology, Physical Science, Civics & Economics, and U.S. History for academic school year 2010–2011 (NC School Report Card)—between potentially identified homogeneous clusters?

Hypothesis 5: There is a statistically significant relationship between identified homogeneous clusters and higher student academic achievement percentages on the North Carolina EOC Tests for English I, Algebra I, Algebra II, Biology, Physical Science, Civics & Economics, and U.S. History.

Research Question 6: To what degree was there a relationship between identified homogenous clusters and higher district achievement on the North Carolina AYP reports?

Hypothesis 6: There is a statistically significant relationship between identified homogeneous clusters and higher district achievement on the North Carolina AYP reports.

Overview of Methodology

The population of interest for this study will be public school professionals working in

North Carolina. The sampling method is a statewide, self-selected convenience sample that allows for an extensive collection of surveys for statistical evaluation. The sample group survey was distributed through the state NC FALCON project. The survey data were collected as part of this statewide project that could be described as a web-based formative assessment professional development system.

The sample group will consist primarily of North Carolina K–12 teachers with much smaller percentages of other K–12 personnel (i.e., principals, assistant principals, counselors, teacher assistants, coordinators, and support staff). The survey was not intended for maintenance, cafeteria, bus drivers, or other similar school personnel. Descriptive statistics will be computed to obtain an overall perspective of the data provided by the sample population. Cronbach's alpha will be computed as an indicator of internal consistency reliability for the two survey constructs identified in the study as Conceptual Knowledge and Procedural Knowledge. Additional statistics to be examined include means and standard deviations. In order to address the research questions, analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA) will be performed to determine if a mean difference exists between the pre- and post-module respondent data. The ANOVA and MANOVA analyses help determine the modules' effects on participants' perceptions of formative assessment. A cluster analysis will divide the data into groups or clusters by combining select characteristics. Discriminant analysis will be implemented to confirm the clusters. Kappa analysis will be implemented as a check measure to determine how similar clusters are. Finally, significance testing will be conducted to examine whether mean differences in EOG, EOC, and AYP percent proficiencies between clusters are statistically significant.

Limitations of the Study

The study has several potential limitations, which include the following:

1. The study focuses on school professionals throughout North Carolina. It would therefore be problematic to generalize with certainty the results of this study to school professionals and achievement data in other locations within the United States or other countries.
2. Only school professionals of public schools in North Carolina identified as such by NC FALCON are included in this study. Schools with special populations such as home schools or private charter schools are not included.
3. This study does not examine the extent to which other factors such as socioeconomic status or demographic status may have influenced student achievement.
4. The survey participants in the study are self-selected and therefore may limit the ability to collect a representative sample rate from each segment of the targeted population.

Assumptions

This study was conducted with several assumptions, including the following:

1. Participants will respond to the pre-survey and post-survey in a truthful manner.
2. The NCDPI School Report Card will provide a valid and reliable summative measurement of district performance.
3. The NCDPI AYP report will provide a valid and reliable summative measurement of district performance.
4. Improved district, school, and student achievement is an annual goal of all school professionals in the study.

5. The study assumes that participants who will finish the post-surveys are subsets of participants who will finish the pre-survey.
6. The study assumes that a majority, if not all, of the *Other* positions written into the survey and reported by respondents are considered as part of the NCDPI 2010–2011 Statistical Profile (NCDPI, 2011) reported titles.

Research Organization

This study will be organized into five chapters. Chapter 1 will be the introduction to the study and will include a statement of the problem, the study purpose, definitions, limitations, and any assumptions made by the researcher. Chapter 2 will consist of a literature review of significant historical assessment influences, introduction to the Framework for Change state plan, and an overview of NC FALCON. Chapter 2 will also describe the relationship between school leadership and other school professional's perceptions at the classroom level. Conceptual and procedural knowledge of formative assessment will be defined, and examples relating to the study will be included. Chapter 3 will describe the population of interest, sampling methods, instruments, data collection, and statistical analysis to be used. Chapter 4 will present results of the analysis, including demographics, reliability, cluster grouping, and cluster means. Chapter 5 will discuss for each research question a statistical review, relevant findings, interpretations, and recommendations for further research.

CHAPTER 2: REVIEW OF RELATED LITERATURE

The purpose of Chapter 2 is to investigate formative assessment research as it relates to student achievement. The literature review will build support for the study, which examines relationships from school professionals' perceptions of formative assessment to student academic achievement and district progress. The literature review also will address the factors that may have influenced the current perceptions of school professionals. The topics covered within the related literature review will be as follows:

1. The historical influences on assessment perceptions from researchers and other sources not directly tied to K–12 education.
2. State and federal policy and procedural influences on assessment perceptions.
3. The *Framework for Change* implemented by NCSBE.
4. The NC FALCON as a responsive measure to the *Framework for Change*.
5. Research of school professionals' perceptions of assessment and actions that influence perceptions.
6. School improvement as it relates to formative assessment perceptions.
7. Descriptions of conceptual and procedural knowledge of formative assessment.

Historical Influences on Assessment Perceptions

Historically, researchers have indicated the existence of relationships between student achievement and formative assessment practice (Black & Wiliam, 1998; Marzano, 2001, 2007; Sadler, 1989; Stiggins, 1994; Stiggins & Chappuis, 2005). Some research indicates that school leaders may be guided by an impeding set of beliefs or perceptions that have hampered new breakthroughs in their understanding of how to use assessments to promote student achievement (Stiggins, 2008). School leaders have traditionally relied upon the creation of large-scale

assessments administered under uniform conditions to compare students (Stiggins, 2001). Advocated by district and school administrations, the summative functions of these tests are emphasized by teachers who replicate the process as the primarily classroom tool for grading and reporting (Kehr, 1999; McNair et al., 2003; Uchiyama, 2004).

This reliance on large-scale summative assessments can be traced back to War World I when the U.S. Army used large-scale standardized tests to determine military recruits' suitability as officers (Scherer, 2005). Schools, being government entities, adopted this model of summative exams for grading and promoting students.

Support for such assembly line testing may have been encouraged by a 1972 publication by Christopher Jencks and colleagues titled, *Inequality: A Reassessment of the Effects of Family and Schooling in America*. This book articulated that schools do little to lessen the gap between rich and poor students, do little to lessen the gap between more and less able students, and that student achievement on summative assessments are primarily influenced by the background of the student. Jencks and colleagues suggested that little evidence existed to prove that education reform could improve a school's impact on student achievement. Jencks and colleagues' research enhanced the belief by some educators that a certain percentage of students were incapable of higher education, and may have discouraged earlier research into working formatively with diverse student populations. This type of research possibly influenced an increase in the implementation of standardized summative testing as it would appear that testing was the quickest way to determine which students to support academically and which students to move toward a more immediate vocation.

In 1983, The National Commission on Excellence in Education released *A Nation at Risk*, a detailed report that portrayed a deficiency of education progress in the United States. This

report did not lead educational reformers to restructure the summative assessment process ingrained in the American education system. Instead, it greatly encouraged the continued paradigm shift to rational choice and the use of summative data in public school accountability models.

Prior to this era of summative monitoring, educational leaders relied on institutional tradition, organization tradition, organizational culture, and collective entities as accountability models. The process-oriented traditions of educational institutions were set aside by the evolution of the rational choice model. Any studies on the formative process of decision making were replaced by a determined approach to school reform through econometric analysis and mathematical languages (Wong, 1994). The idea that schools should be accountable in a similar manner as a production-based business became the dominant concept of the mid-to-late 20th century. Federal policy makers followed recommendations of the rational choice model research and supported the extension of summative tests beyond placement and entrance tests to include state-governed, school-level testing. Educational summative test results began serving a similar role as a production line quota report.

Research on the Use and Perceptions of Summative Assessment

Similar to many states that receive federal funding, North Carolina developed policies to follow federal recommendations. In 1992, the North Carolina Legislation approved the implementation of a performance-based accountability program. The program focused on improving student achievement, mandating individual school-level plans, and requiring that school systems meet the performance indicators set by the State Board of Education (NCSBE, 2008). The program required school-level committees and advisory panels to report to the local board of education. Half of the system panel members had to be practicing teachers. The

NCSBE oversaw the approval of student performance indicators and guidelines for local school improvement plans, decided over waivers submitted by school systems, and governed the school improvement reporting process.

The 1995 NC General Assembly asked the NCSBE to propose a plan to address the progression of the educational system into the 21st century. The NCSBE responded by developing a proposal called the ABCs of Public Education. The ABCs model announced a framework for increased accountability, higher standards, and maximum local control. The ABCs emphasized reading, writing, and mathematics by creating incentive programs based on high growth in these areas. Student achievement became a factor measured by state-wide summative tests (NCSBE, n.d.).

In 1996, the ABCs standardized summative testing program became a factor in accountability for all K–8 schools when the first ABCs Accountability Report, focusing on school performance, was submitted to the State Board of Education. The high school accountability model followed in 1997 with a similar report card in combination with the K–8 schools (NCSBE, n.d.).

In 1999, the NC Committee of Standards and Accountability, a committee created by the General Assembly to advise the Board on student performance standards, recommended the NCSBE develop summative student proficiency benchmarks to survey workforce readiness. From this request came the alignment of statewide student accountability standards, or *gateways* to school performance under the ABC model. The policy set minimum standards at grades three, five, and eight because each was considered a *gateway* to the next level of learning. The *gateways* were phased in over 3 years at the high school level as well (NCSBE, n.d.).

As schools worked to integrate new summative testing guidelines and improve student achievement, the federal government also worked to pass new school improvement legislation. In 2001, President George Bush addressed the U.S. Congress with this educational message: "We must confront the scandal of illiteracy in America, seen most clearly in high-poverty schools, where nearly 70% of fourth-graders are unable to read at a basic level" (as cited in Testing for Results, 2004, Measuring Student Progress Section, para. 1). From this introduction came the proposal for NCLB. Based on research from The National Assessment of Education Progress (NAEP), which noted that 60% of 12th graders were reading below proficiency, the Bush Administration led a movement to change the accountability standards for public education. American schools were accused of developing huge bureaucracies that did not contribute to student success. A more statistical federal accountability model was laid out. By law, states would now have to develop testing programs to display publically the effectiveness of each school districts taught curriculum. The NCLB Act passed the U.S. Congress in 2002 with strong bipartisan support; states were now required to develop stringent accountability models (NCLB 2002).

Under the NCLB Act, states retained the authority to determine what curriculum would be taught at each grade level. States were required to develop academic standards to drive this taught curriculum with aligned instruction. Statewide summative assessments, aligned to the curriculum, were developed to offer an external, independent measurement of instructional effectiveness within the classroom. These summative tests were designed to give early detection of students who fell behind mainstream achievers. The intent was to identify students in need of remediation and direct resources to these students in a quick, efficient manner (Testing for Results, 2004).

Looking at the longitudinal history of the North Carolina accountability program, one might consider that the federal government's NCLB Act would mesh nicely with the state's efforts and therefore provide similar student proficiency at both the state and federal level. Some literature suggests that there is a considerable discrepancy between the state and federal testing programs. For example, comparing the North Carolina state test results with the Federal NAEP assessment, a nationwide summative test similar to the state EOG and EOC, reveals a possible discrepancy between reported student proficiency results. Sam Dillon, National Education Correspondent and two-time Pulitzer Prize winner from The New York Times (2005), wrote about North Carolina in a review of the NAEP as having *students doing far better on their own reading and math tests than on the federal ones.* The question of rigor may arise from reports of such inconsistency in test scores. A sample selection of math summative test scores was reviewed from the national and state released reports to further evaluate this issue. The NAEP *At or Above Proficient* percentage scores for fourth- and eighth-grade math were compared to third- through eighth-grade NC EOG average scores titled *At or Above Level III (Grade Level)*. The NAEP data were gathered from the 2011 testing analysis presented by the National Center For Education Statistics (2011) and the EOG data were gathered from the 2011–2012 NC School Report Card (NCDPI, 2012) presented by NCDPI. The 2011 reports list the NAEP *proficient* scores of NC students on fourth-grade math tests at 44% and eighth-grade math tests at 37%. The 2011 NCDPI reports list the EOG average scores of third- through eighth-grade math students at 82.4%. There appears to be a potential disconnect in the reported proficiency results of the listed state and federal percentages. This type of reporting may have influenced NC summative test revision initiatives due to the NCDPI accountability program being represented as not as rigorous as the program established by the USDE.

In the wake of such legislation and reports, North Carolina embarked on a surge of revisions in the accountability program of public education. Formula adoptions, test revisions, and standards studies were implemented to help narrow the gap between the federal government NAEP and the NC EOG and EOC summative tests. During the 2006 and 2007 school years, the NCSBE convened an independent Blue Ribbon Commission on Testing and Accountability to provide a comprehensive review of the state's accountability system, including student testing. At the introduction of this process NCSBE Chairman, Howard Lee, stated:

> As the State Board of Education moves forward with its 21st century goals for public schools, we believe that it makes strategic sense to evaluate our state's testing and accountability system to make sure it aligns properly with new expectations for student learning. North Carolina's accountability system was cutting edge in 1996, but many things have changed since then. We look forward to a robust review of how we measure student and school success (as cited in History of the NC State Board of Education, n.d.)

Chairman Lee made reference to certain changes, which could lead one to believe he was referring to the current federal involvement in school accountability and the fact that even with years of work in the area, North Carolina still had a deficiency when compared to federal summative test data.

The EOG and EOC summative tests (NCDPI, 2013a, 2013b) were the primary state accountability tools at this time, which is still accurate to the date of this study. The results of the EOG and EOC state summative tests are listed for public review as a report card document (NCDPI, 2012b). A research-based argument can be made that summative state proficiency reports are the determining factors in state recognition or state sanctions, and school leaders rely heavily on state summative data when shaping school improvement plans (Stiggins, 2001).

Multiple researchers report that school leaders' perceptions of summative data as the primary instructional improvement tool are placing too much emphasis on EOC and EOG tests (Black & Wiliam, 1998; McGehee & Griffith, 2001; McMillan, 2001; Shepard, 2000; Stigler & Hiebert, 1997).

Research on the Use and Perceptions of Formative Assessment

Black and Wiliam (1998) report that present policies in the state and federal government are limiting the improvement of classroom instruction. They describe the public education approach to using summative data for school reform in the following words:

> In terms of systems engineering, present policies in the U.S. and in many other countries seem to treat the classroom as a black box. Certain inputs from the outside – pupils, teachers, other resources, management rules and requirements, parental anxieties, standards, tests with high stakes, and so on – are fed into the box. Some outputs are supposed to follow: pupils who are more knowledgeable and competent, better test results, teachers who are reasonably satisfied, and so on. But what is happening inside the box? How can anyone be sure that a particular set of new inputs will produce better outputs if we don't at least study what happens inside? (Black & Wiliam, 1998)

Stigler and Hiebert (1997) argue that "a focus on standards and accountability that ignores the processes of teaching and learning in classrooms will not provide the direction that teachers need in their quest to improve" (p. 19). The concept of including classroom-developed data as a school improvement stimulus is not a new concept to educational researchers. Approximately 20 years prior to Stigler and Hiebert's work, Bloom (1980) found value in focusing on continuous evaluations of classroom instructional data illustrated by his comments in *Negro Education Journal*. Bloom (1980) wrote, "Perhaps the most important methodological

change is the movement from what I have termed stable or static variables to variables which are alterable either before the teaching-learning processes or as a part of these processes" (pp. 337-349). Additional researchers not only support the inclusion of a formative assessment methodology but also openly criticize the use of bureaucratic summative testing. Their research reports that a sole reliance on summative testing may stagnate attempts at school reform (Heritage, 2007; Rodriquez, 2004; Shepard, 2000, Stiggins, 2004; Tindal, 2002; Wiliam, 2005). Popham (2006) notes, "In the future, evidence may show that benchmark or interim tests are instructionally beneficial in the short term. But research currently does not support that claim" (Popham, 2006, p. 87).

Possibly recognizing the emerging research and the recommendations of other advisory organizations such as the Partnership for 21st Century Skills and the CCSSO, the NCSBE enacted a testing review commission. This commission was called The Blue Ribbon Commission on Testing and Accountability (*Framework for Change: The Next Generation of Assessments and Accountability*, 2008). The NCSBE articulated five goals and a series of strategies to be addressed by the commission. Included in the strategies were the following guiding beliefs for a next generation system of standards assessments and accountability measures:

- Every student excels in rigorous and relevant core curriculum that reflects what students need to know and demonstrate in a global 21st century environment.
- Every student's achievement is measured with an assessment system that informs instruction and evaluates knowledge, skills, performance, and dispositions needed in the 21st century.

- Every teacher and administrator will use a 21st century assessment system to inform instruction and measure 21st century knowledge, skills, performance, and dispositions.
- Every education professional will use data to inform decisions (Framework for Change, 2008).

The 26-member Commission was comprised of representatives of education, business, and government, which met regularly to listen to a large number of stakeholders, including teachers, administrators, parents, and national experts on assessment and accountability (Framework for Change, 2008). In January 2008, the Commission presented a report to the NCSBE that recommended a drastic change in how North Carolina Schools assess students. The Commission called for a multi-layered assessment system to include formative assessments. The report supported formative assessments as a process to equip teachers and administrators with feedback needed to align instruction with individual student needs (Framework for Change, 2008).

The commission results combined to form the NCSBE document titled, *The Framework for Change* (2008) that appeared to influence and motivate North Carolina reform initiatives. North Carolina was the first state to partner with the federal Partnership for 21st Century Skills to create the Center for 21st Century Skills focused on revising standards, assessments, and professional development (Framework for Change, 2008). Figure 1 describes the stages of infusing 21st century skills and assessments into public education.

	Assessment	Pedagogy	Professional Development
Early Stage	Academic success is focused on the mastery of core subject content. Teaching focuses on student mastery of core subject knowledge and improving student performance. Students, teachers and parents rarely collaborate to monitor student progress. Assessments are pencil-and –paper-based and few assessments use technology.	The teacher acts as a provider of knowledge, a subject matter expert and a role model for teaching. Teachers occasionally use adaptable and flexible teaching strategies. Teachers occasionally integrate learning skills when teaching content. 10% or more of teachers integrate the use of 21st century tools into their curriculum.	Professional development supports content knowledge and administrative processes. Professional development occasionally integrates the application of learning skills into teaching strategies. 10% or more of professional development is accessed through the use of technology. Some teachers use professional development to build a high level of competency in their content area.
Transitional Stage	Students begin to be assessed on their understanding and application of learning skills. Assessment is more frequent. Most teachers use classroom assessments to measure the effective application and integration of learning skills and 21st century tools. Teachers begin to use student assessment results to improve teaching efficacy. Students, teachers and parents often collaborate to monitor student progress in achieving learning goals and use assessment to evaluate long-term student progress. Some assessments use technology but most assessments continue to be pencil-and-paper-based.	The teacher acts a subject matter expert, a facilitator for information and a role model for both teaching and learning. Teachers often use adaptable and flexible teaching strategies that integrate 21st century skills. Teachers frequently integrate learning skills when teaching content. 50% or more of teachers integrate the use of 21st century tools into their curriculum.	Professional development often integrates the application of learning skills into teaching strategies. Professional development occasionally integrates the application of contemporary context and content into teaching strategies. 50% or more of professional development on the use of 21st century tools. Most teachers use 21st century skills to work on advanced certifications or credentialing.
21st Century	All assessment is learner-centered, formative, context-specific, ongoing and rooted in teaching strategies. All teachers use classroom assessments that demonstrate evidence of student performance in core subject and 21st century skills. All teachers share with parents and students the information needed to monitor student progress in achieving learning goals. Students, teachers and parents always collaborate to monitor student progress in achieving learning goals and use assessment to evaluate long-term student progress. Most assessments use technology and record student performance as a means of tracking information over time.	Teachers act as facilitators, resources and partners for teaching and learning. All teachers use adaptable and flexible teaching and learning strategies that integrate 21st century skills. All teachers act as role models in the application and use of 21st century skills. Professional development supports the application of 21st century skills in teaching and learning strategies and classroom management practices. All teachers access professional development through 21st century tools when applicable. All teachers use professional development to reinforce their content competency and integrate 21st century skills.	

Adapted from "A Mile Guide: Milestones for Improving Learning and Education," by Partnership for 21st Century Skills (2009).

Figure 1. Learning and teaching 21st Century Skills.

The CCSSO shares the external role with the Partnership for 21st Century Skills in influencing the promotion of formative assessments in North Carolina Schools. The CCSSO is an advocacy organization that promotes the attributes of formative assessments among U.S. educators (CCSSO, 2006). Since the emergence of the group, separate entities within the organization have split off to study and clarify the meaning of formative assessment based on current literature, and determine how formative assessment may best be used by the nation's educators. Sarah McManus, previous Section Chief for Testing Policy and Operations in the Accountability Services Division of the NCDPI, served as a team member for the CCSSO (2009) research report titled, *Lessons Learned: Implementing and Improving Comprehensive and Balanced Learning and Assessment Systems in High School—A Report for State Education Leaders*.

McManus's participation in this study may have influenced the use of CCSSO material in developing NCDPI progression planning and policy development. The CCSSO formative assessment initiative formally began in January 2006, when the organization formed the Formative Assessment Advisory Group consisting of state agency leaders and measurement and education researchers including Jim Popham, Lorrie Shepard, Rick Stiggins, and Dylan Wiliam. As of September, 2009, June Atkinson, North Carolina State Superintendent of Schools, was named as a state chief participant (CCSSO, 2009). The goals for the organization as listed on their website include:

- Identify and develop cost-effective, train-the-trainer systems for delivering high-quality professional development for leaders and teachers.
- Optimize communications and outreach strategies to promote the overall formative assessment literacy of policymakers, stakeholders, and the public through the

intuitive, understanding of the direct connection between classroom formative assessment and learning.

- Continuing to build and extend a policy and implementation framework that can make formative assessments more effective as a component of a balanced and comprehensive learning and assessment system.
- Clarifying and strengthening the appropriate connections between assessment and curriculum, instruction, teacher quality, pre-service and in-service teacher and administrator education programs, school improvement, program evaluation, and accountability.
- Continuing to provide leadership and professional development opportunities, including facilitating an ongoing online collaborative community of practice, including state members, experts, and partners through CCSSO's communities site (CCSSO, 2009).

In comparing the background and direction of the Partnership for 21st Century Skills and the CCSSO it is a reasonable assumption that their resources may have been referenced in the constitution of the NC assessment systems revision report titled, *Response to The Framework for Change: The Next Generation of School Standards, Assessments and Accountability (2008).*

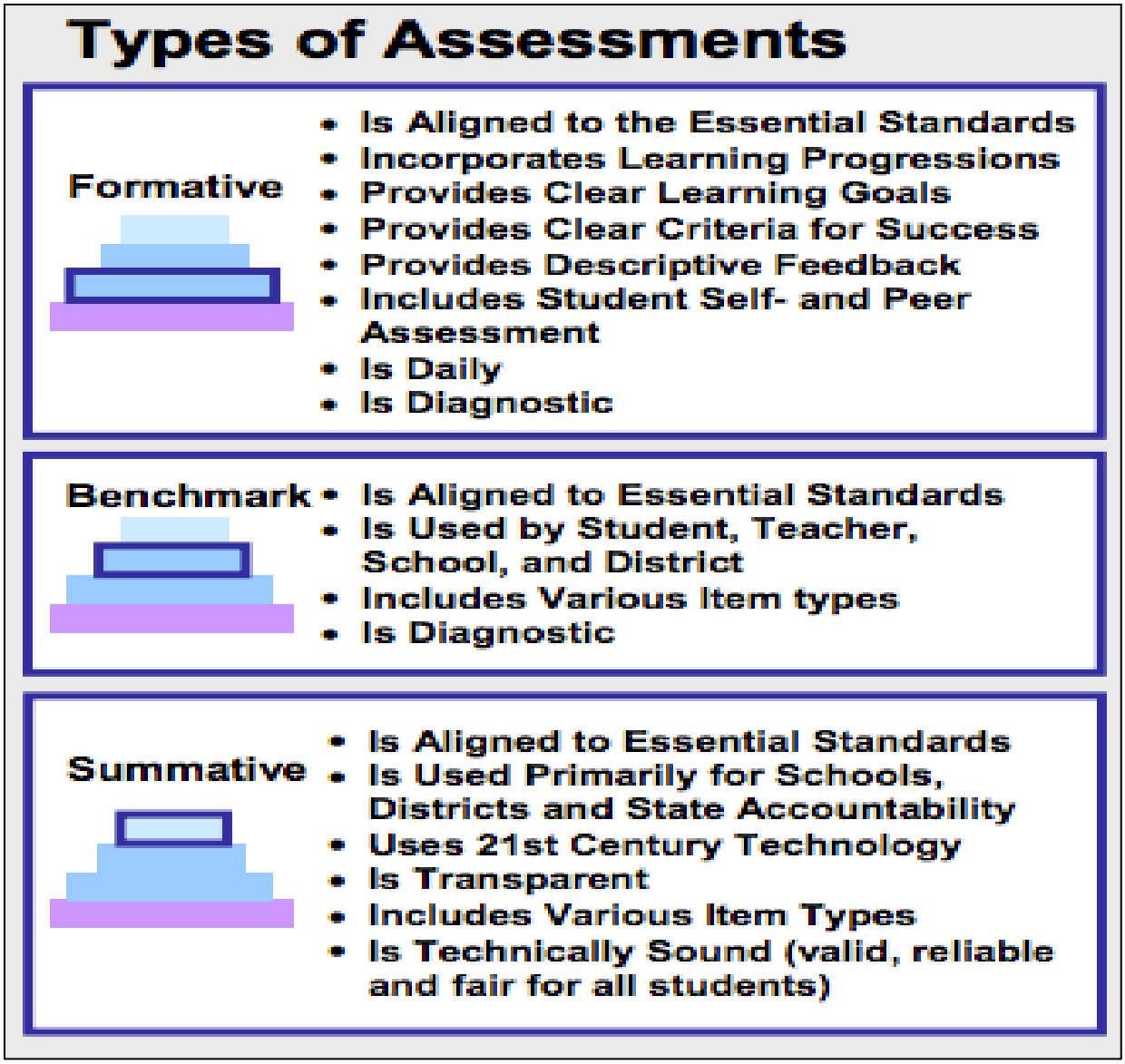
The Framework for Change

The *Response to the Framework for Change: The Next Generation of School Standards, Assessments and Accountability* was the NCDPI document response to *The Framework for Change* document presented by the NCSBE in June of 2008. *The Framework for Change* document consisted of a short background on North Carolina accountability and school assistance, the mission of the NCSBE, action steps for improvements, development goals for

standards, assessments and accountability, and a section on the NCSBE commitment to high standards for students and schools (see Appendix A). This study focuses on the *Developing the Next Generation of Standards, Assessments, and Accountability* section. It is here that the NCSBE directs the NCDPI to begin a revision of the current assessment system in North Carolina Schools. NCDPI had approximately 6 months to develop a next generation assessment system, which would have to include three assessment types: formative, benchmark, and summative. The criteria for these assessments were as follows: be aligned with a graduation project; include performance-based, authentic, real-world tasks; and provide diagnostic information to teachers on individual students. The NCSBE made reference to offering support to Local Education Agencies (LEAs) who piloted 21st century assessment models. A key component within this particular section of the *Framework for Change (2008)* was the directive to create, "a comprehensive, customized professional development system to provide teachers and administrators with the skills and understandings needed to use data to inform instructional practice and make formative assessments a daily practice in the classroom" (The comprehensive implementation plan section, para. 4).

The Framework for Change became a working agenda for the NCDPI. From this call to action was developed the adequately titled, *Response to The Framework for Change: The Next Generation of School Standards, Assessments and Accountability (2008),* which included a multi-tier assessment system approach that is directly aligned to the developing essential standards (see Appendix B). A descriptive diagram from this document is found in Figure 2.

The response document acknowledges that large-scale summative tests are significantly less informative at the teacher and student level. Formative assessments are encouraged by statements such as, "A teacher using appropriate standards-aligned classroom assessments will



Adapted from "Response to The Framework for Change: The Next Generation of School Standards, Assessments and Accountability," by NCDPI/Academic Services, 2008, p. 4.

Figure 2. Response to the Framework for Change assessment types.

invariably know at a much deeper level what a student knows and is able to do" (Response to a Framework for Change, 2008, p. 12).

The Response to a Framework for Change promises the delivery of aligned tools and training to ensure teachers have the knowledge and resources to administer formative assessments aligned with standards that will inform instruction (Response to a Framework for Change, 2008).

North Carolina Formative Assessment Learning Community's Online Network

During the 2010–2011 school year, NCDPI released the NC FALCON professional development system for free use by schools across North Carolina (NC Education, 2011). NC FALCON learning modules consist of online, self-paced professional development modules that are intended to serve as an introduction for teachers to learn more about the impact formative assessment can have on their instruction and help their students achieve targeted learning goals (NC Education, 2011). Districts were instructed to develop implementation plans and submit them to NCDPI. Many districts began use of NC FALCON during the 2010–2011 school year as it was an expectation that all districts will eventually adopt the model as a primary resource for teachers to build their formative assessment knowledge and skills. NC FALCON, as reviewed in this study, consists of five online learning modules. Modules include (a) Importance of Formative Assessment, (b) Learning Targets and Criteria for Success, (c) Collecting and Documenting Evidence, (d) Analyzing Evidence and Descriptive Feedback, and (e) Administrator's Role in Formative Assessment.

NCDPI anticipated that the release of NC FALCON would provide a core definition of formative assessment for educators, improve student learning, and increase student achievement on the state standardized tests (NC Education, 2011).

School Leadership and Classroom Perceptions of Assessment

School leadership is defined by Hallinger and Heck (2006) as "an influence process by which school administrators, focusing especially on principals, seek to work with and through people towards the identification and achievement of organizational goals" (p. 216). School leaders play a fundamental and multidimensional role in influencing schools that are constructive instructional environments for teachers and optimistic learning environments for students. Leaders must be well informed and effectual in the way they shape the faculty culture. With the development of high-stakes school accountability, it has become more important for school leaders to be viewed as instructional leaders rather than just administrators. According to Hallinger (2003), instructional leaders lead from a blend of knowledge and personality, they are proactive and goal-oriented, and they are concentrated on the improvement of teaching, learning, and student academic outcomes. Instructional leaders are viewed as philosophy builders.

Some studies of successful schools concentrate attention on school leadership. Indications suggest that school leaders' attitudes and actions play a large role in shaping how schools create a perspective in which students can effectively learn (Davis et al., 2005). Effective school leaders can create collaborative cultures that interact with institutional frameworks to bring all stakeholders toward common goals and desired outcomes (Hallinger & Leithwood, 1998).

Some research reveals a trend that when school leaders utilize large-scale summative testing as the primary stimulus for school improvement, it has a negative impact on the instructional and assessment methodologies used by classroom teachers (Amrein & Berliner, 2002; Popham, 2000; Volante, 2004; Wilson, 2005). By emulating the competitive nature of the summative testing, teachers begin using instructional and assessment methods that are not

effective in promoting good learning; marking and grading practices tend to emphasize competition rather than personal improvement, and assessment feedback often has a negative impact (Black & Wiliam, 1998). Instructors with a state-tested curriculum tend to spend a majority of their instructional time teaching low-level skills and covering shallow swaths of educational material in an attempt to raise student achievement scores (Heubert & Hauser, 1999). By failing to teach at higher, in-depth skill levels, teachers inadvertently negatively impact student learning (Black & Wiliam, 1998; Shepard 2005; Stiggins, 2004).

Two studies submitted in 2007 place emphasis on the influence school leaders have on teacher perceptions of formative assessment. A 2007 USDE study indicates that the use of student data to plan individualized student instruction appears less common than the use of the systems to inform parents or keep track of accountability measures (USDE, 2007). Wayman (2007) conveyed that teacher use of available data systems is greatly influenced by the types of data and data functions available to teachers (Wayman et al., 2004).

Research indicates that when school leaders place a cultural bias toward meeting new state and federal summative testing requirements it influences teachers' perceptions of student assessment and allows them to neglect classroom developed, formative data (Black & Wiliam, 1998; Shepard, 2005). Wilson (2004) suggests school leaders consider the relationship between assessment and educational accountability. He references the importance of keeping in mind the two-way flow of information that it involves, from the classroom out into the system and from the system back into the classroom. The reviewed literature reveals that the summative, standards-based testing framework found in most states indicates the flow is mainly from the system into the classroom.

The literature review indicates an importance for school leaders to understand the reasons why many curricula are problematic when planning instruction with formative assessments (Glatthorn, 2000; Heritage, 2008). A dependence on commercially produced materials may be fueling the overwhelming confusion school leaders and school professionals have about formative and summative assessments within the classroom. Commercial textbooks are arranged in the same scope and sequence as the curricula with specific procedural objectives having to be mastered at each grade. It has been recorded that the objectives in these books are disjointed and not connected to each other in a consistent learning network (NRC, 2000). Data gathered from these reportedly disconnected objectives might only determine if a goal has been met but may not contribute to pedagogical actions. This level of school assessment is reported as a series of mini-summative tests, which are not closely aligned to what is taught in the classroom (Chappuis & Chappuis, 2008).

Research indicates that formative assessments used for instructional purposes will have assorted assessment formats (Black & Wiliam, 1998; Popham, 2006), provide results that offer insight into the conceptual comprehension of students (Black & Wiliam, 1998; Cowie & Bell, 1999; Popham, 2006; Wiliam & Thompson, 2008), refer to specific instructional improvements that go beyond item-by-item reteaching (Bloom et al., 1971; Brookhart, 2008; Crooks, 1998; Guskey, 2007; Harlen & Winter, 2007; Heritage, 2007; Kluger & DeNisi, 1996; Shepard, 2008; Stiggins, 2002), be clearly aligned to content standards and instructional units (Black & Wiliam, 1998; Harlen & Winter, 2007; Herman & Baker, 2005; Sadler, 1989; Shepard, 2008), be integrated into the curriculum instead of constituting an interruption to regular teaching, and be accompanied by professional development to ensure effective use of results (Perie et al., 2007).

School Improvement and Formative Assessment

The process of formatively assessing students presupposes that all students learn more effectively if educators can clear away, by sensitive handling, the obstacles to learning, be they non-diagnosed cognitive failures or damage to personal confidence or a combination of the two (Black & Wiliam, 1998; Brookhart, 2009). The perceptions projected by school leaders and held by school professionals in regard to the potential of all their pupils to learn may also directly affect attempts to implement quality formative assessments and overall school improvement.

Ruby Payne (2008) cites in her publication, *Under Resourced Learners*, that teachers are the primary formative assessment developers. Payne identifies a relationship between the perceptions and actions of school leaders and the abilities of teachers to develop formative assessment processes. She indicates that teachers, supported by school leaders with a positive perception of formative assessment, demonstrate the ability to employ data in the identification of student target goals and measurement of student growth. Robert Marzano's (2007) major reviews of research on the effects of formative assessment indicate that it might be one of the more powerful tools for teachers to improve student achievement and affect overall school improvement.

Common formative assessments are listed as a key element in developing professional learning communities (PLCs; DuFour, DuFour, Eaker, & Many, 2006). PLC's are a NCDPI supported school improvement practice where collegial groups come together in a commitment to student learning and self-discovery. Researchers specify that school-wide improvement through such practices requires common formative assessments to answer the most fundamental of questions: How will one know if students are learning, and without frequent checks of what students are retaining, how can effective teaching be accomplished (DuFour et al., 2006)? The

DuFour and colleagues write substantially about the positive effects had on classroom instruction when teachers formatively assess their students and no longer solely depend on summative feedback data from school leaders or commercial vendors. Evidence of student learning is created from constant formative assessments that are shared within teacher groups or PLCs. Student work is reviewed with multiple teachers so that assessment structure and student feedback can be more beneficial. Teachers learn from each other's successes and find different approaches to helping students learn. Formative assessment based PLCs also expand to vertical teams that allow for teachers to see the big picture as they discover how their work contributes to a larger purpose.

The overall goal of all reviewed school improvement methodology is student achievement. Student achievement is reported through the defining of what is expected to be learned and how students are called upon to demonstrate their learning (Blythe, 1999; Brookhart, 2009; Dufour et al., 2006; Hord, 1997). Hattie (1992) indicates that constant monitoring of student learning, and the use of this information to guide instruction, sparks self-assessment and increases student achievement. This self-assessment or discovery builds confidence for both students and teachers (Black & Wiliam, 1998). Students learn to make connections in the learning based on teacher feedback and then use established transparent achievement goals to succeed (Stiggins, 1994, 2001; Wiliam, 2007).

Multiple researchers indicate positive relationships between formative assessment practices and the establishment of effective school improvement models with higher student achievement. The theory of implementing formative assessment as a long-term, cultural norm for schools is a uniting literature review theme (Barootchi & Keshavarez, 2002; Black & Harrison, 2001; Black & Wiliam, 1998; Blythe, 1999; Coffey, 2003; Hord, 1997; Lee & Gavine,

2003; Orsmond et al., 2002; Perie et al., 2009; Sadler, 1989; Shepard, 2010; Stiggins, 1994; Stiggins & Chappuis, 2005; Waddell, 2004; Wiliam & Leahy, 2006).

Conceptual and Procedural Knowledge of Formative Assessment

Focusing Students on Target Goals

Formative assessment for learning begins when teachers share achievement targets with students in terms that are easily understood by the pupil (Brookhart, 2009; Stiggins, 2007). Frequent self-assessments are provided to give continuous feedback to the student and the teacher. Assessments should be compiled in manageable amounts so both the student and the teacher will not become overwhelmed with the data but will use it effectively to guide student instruction. Students then can chart their educational goals toward transparent achievement targets their teachers have established (Brookhart, 2009; Stiggins, 2007). As students progress in their proficiency, they learn to generate their own descriptive feedback and set goals for what comes next on their journey. Students and teachers develop a partnership in the assessment for learning process (Stiggins, 2007).

Student Self-Discovery

Students accept and work with self-discovered data and teacher feedback, provided that they are not distracted with overtones about ability, competition, and comparison with others. Current students may find it difficult to learn in this type of environment. According to researchers, most students appear to have become accustomed to accepting classroom instruction as an arbitrary sequence of exercises with no overarching rationale (Black & Wiliam, 1998). Overcoming this pattern of passive reception requires students to be committed to developing a reflective approach to their own thinking. Self-assessment by pupils appears as an essential component of formative assessment.

Students need three elements of feedback from teachers to maintain a productive trajectory for learning: (a) recognition of the desired goal, (b) evidence about present position, (c) and some understanding of a way to close the gap between the two (Black & Wiliam, 1998). Discovering new content must be assimilated in relation to preexisting ideas. There may be conflict and disparities between the new and old concepts to be learned. These inconsistencies must be resolved by thoughtful actions on the part of the learner for the process of assimilation to be effective (Black & Wiliam, 1998).

Student opportunities to communicate their evolving understanding should be built into the planning for instruction. Discussion, observation of activities, and marking of written work can all be used to provide communication opportunities. The teacher must take care to listen carefully to the talk, the writing, and the actions through which pupils develop and display the state of their understanding (Black & Wiliam, 1998; Stiggins, 2007).

Discussions with pupils in which the students are encouraged to talk about their understanding in their own ways are important aids to increasing knowledge. Student dialogue with instructors provides an opportunity for the teacher to respond to and reorient a pupil's thinking. Black and Wiliam (1998) find in their research that this dialogue is difficult for some educators. They conclude that there are clearly recorded examples of such discussions in which teachers have unconsciously responded in a way that would inhibit the future learning of a pupil. Black and Wiliam are referring to teachers who look for particular responses to questions and lack the flexibility or the confidence to deal with the unexpected. Teachers try to direct students toward giving the expected answer by manipulating the dialogue. This method of shutting out often thoughtful but unorthodox attempts by pupils to work out their own answers creates a

classroom culture of discovering what answer the teacher expects to see or hear and not of thoughtful involvement.

Talk between student and teacher is often in the form of teacher questioning. Open classroom questioning is a direct way of checking on learning but it may sometimes bring unproductive results. Teachers who fail to allow adequate wait time between questions do not allow students the opportunity to think. Students soon learn that the answer, followed by another question, will come along in a few seconds so they give up trying. This classroom ritual often takes the shape of factual questions, due to the short time allotted for an answer. It is generally the case that only a few students will answer the questions in adequate time, the rest of the class knowing they cannot respond as quickly become unwilling to risk public embarrassment. The students and the teacher are content to proceed with these lower level questions, and accept answers from only a few students because it keeps the lesson going. The routine of question and answer continues as thoughtful involvement suffers (Black & Wiliam, 1998).

Effective formative assessment gives students time to respond. Pupils should be given the opportunity to discuss their thinking in pairs or in small groups so that a respondent may speak on his or her behalf. Formative assessments include giving students a choice between different possible answers and asking them to vote on the options, or asking pupils to write down an answer and then report out a selected few. The important essential is that all dialogue should evoke thoughtful reflection in which all students can be encouraged to take part. This ability of all pupils to have an opportunity to think and to express their ideas is key for the formative process to work (Brookhart, 2009; Clarke, 2005).

Test Structure Development and Feedback

Classroom tests and homework assignments are also important means of student feedback. It is better to provide frequent short tests than infrequent long ones (Black & Wiliam, 1998). New student learning should be tested within approximately 1 week of encounter. The validity of the test questions should come under strong scrutiny as well. Teachers should collaborate and draw on outside sources to collect quality questions that will allow for quality feedback. Without quality test feedback, students are forced to rely on marks and grades to guide their educational endeavors. Pupils who receive consistent low marks on tests will come to expect them as a norm. This cycle of repeated failure becomes part of a shared belief between students and teachers. Test results should be presented in the form of student strengths and weaknesses. Pupils must be given the opportunity to work with evidence of their learning challenges in order for them to overcome deficiencies in their learning. This type of learning is time consuming and challenging for students and teachers. Teachers must take the risk of slowing instruction and communicating with students; curriculum delivery with poor student understanding is pointless and may be harmful (Black & Wiliam, 1998).

Creating Learning Connections

Evidence supporting the importance of building communication learning bridges with students is illustrated in Vygotsky's (1978) research of the zone of proximal development, which attempts to explain the region of imaginary learning continuum that dictates between what a child can do independently and what the child can do with support (Vygotsky, 1978). Vygotsky indicated that the use of communication tools was important for the student to understand classroom concepts. The use of formative assessment as a dynamic process in which supportive adults or classmates help learners move from current knowledge to what they are able to do next

was a similar concept described by Vygotsky (Shepard, 2005). Stiggins (2006) uses an illustration of scaffolding to show how students get from one point to another in the learning process through continuous reflection and nonthreatening formative assessments. Stiggins argues that educators must focus on assessment for learning and not assessments of learning. He states that if students are allowed the opportunity to evaluate their progress and show their understanding without the penalty of grades then they are more likely to respond to remedial efforts (Stiggins, 2006). Stiggin's research also falls in line with that of earlier educational works of Bruner (1975), who writes that adults should provide bridges of support so that children can move from one level of accomplishment to another.

One of Dr. Art Costa and Dr. Benia Kallick's *16 Habits of Mind*, which is a list of habits that promote successful learning, is taking responsible risks (Costa & Kallick, 2009). Their research supports a belief that students will not take risks if they are not allowed a nonthreatening arena in which to display their understanding. Costa and Kallick's research indicates school professionals should be interested in how students produce knowledge and not just how they reproduce it (Costa & Kallick, 2009). This type of educational process allows students the opportunity of discovery, which increases intellectual ability and leads to new inquiry (Bruner, 1975).

Summary

In conclusion, this chapter reviews the perceptional effects of North Carolina statewide summative testing on school professionals. The chapter discusses the evolution and reliance on summative testing programs and how they affect formative assessment research, and potentially influence school leaders to focus school improvement initiatives around summative data. The chapter identifies the findings of multiple researchers concerning the use of formative assessment

as a foundation for implementing effective school reform, including raising student summative assessment achievement levels. Research-based formative assessment concepts and practices are also reviewed in this chapter.

CHAPTER 3: METHODOLOGY

This chapter will describe the procedures and methodology used to conduct this study. Chapter 3 will reiterate the purpose of the study and the research questions. The population of interest, the sample selection method, research design, and data collection procedures will be described. Analysis of the data will be outlined and discussed.

Statement of the Problem

Summative testing is currently the primary indicator of student achievement and K–12 school rankings in the state of North Carolina. This has led school leaders to focus on summative tests, commonly known as EOG or EOC tests, as a chief school improvement tool and potentially ineffectively include formative assessments in plans to improve student achievement (Stiggins, 2001). Some research indicates a primary reason school reform efforts are not successful is due to the overlooking of formative assessment processes and their relationship to improving summative tests (Black & Wiliam, 1998).

Is there alignment between formative assessment implementation and improved summative test scores? Meta-analysis conducted by previous researchers demonstrates that the use of formative assessment can produce learning gains of one half to one standard deviation on summative tests (Black & Wiliam, 1998). This research warrants a similar look at North Carolina schools to identify any potential relationships between education professionals varying perceptions of formative assessment and student summative test scores. Formative assessment perceptions by North Carolina school professionals as they relate to summative test scores have not been thoroughly studied. As noted in Chapter 1, identifying potential relationships between formative assessment and student achievement may be beneficial to school leaders and

superintendents who make professional development and budgetary decisions based on limited resources and, in the case of formative assessments, with limited data.

The purpose of this study will be to examine the potential relationships between North Carolina school professionals' perceptions of formative assessment and district-level EOG, EOC, and AYP proficiencies. The study will examine the characteristics of the NC FALON survey to measure North Carolina school professionals' perceptions toward formative assessment. Summative North Carolina EOG and EOC test data will be included in the study to evaluate any potential relationships between identified school professional perceptions and student achievement.

The purpose of this study will be to do the following:

1. Analyze sample group perceptions toward formative assessment after completing online learning modules defining formative assessment and identifying formative assessment practices.
2. Identify potential cluster groups in relationship to the survey participants (sample group) perceptions of formative assessment.
3. Investigate cluster group perceptions of formative assessment and potential relationships with district EOG, EOC, and AYP proficiencies.

Research Questions

Statewide survey data will be gathered by NCDPI as part of the administration of the online modules. These data will be developed via an NCDPI committee and provided to the researcher for analysis by the NCDPI Director of Learning Systems office. During the analysis of the instrument to define formative assessment and to provide quantitative data, the following research questions will be considered:

1. To what degree did participant perceptions toward formative assessment change between pre NC FALCON online modules surveys and post NC FALCON online modules surveys?
2. Can the participants in this study be classified into homogeneous clusters based on their post-module self-perception survey responses?
3. Are there mean differences in student academic achievement—as measured by percent proficiency on the North Carolina EOG test in Reading and Math for academic school year 2010–2011 (NC School Report Card)—between potentially identified homogeneous clusters?
4. Are there mean differences in student academic achievement—as measured by percent proficiency on the North Carolina EOG test in Science for academic school year 2010–2011 (NC School Report Card)—between potentially identified homogeneous clusters?
5. Are there mean differences in student academic achievement—as measured by percent proficiency on the North Carolina EOC Tests for English I, Algebra I, Algebra II, Biology, Physical Science, Civics & Economics, and U.S. History for academic school year 2010–2011 (NC School Report Card)—between potentially identified homogeneous clusters?
6. To what degree was there a relationship between identified homogenous clusters and higher district achievement on the North Carolina AYP reports?

Population of Interest

The population of interest for this study will be school professionals working in North Carolina public schools. The titles of the school professionals will fall within categories as follows:

- Teacher PK-2
- Teacher 3-5
- Teacher 6-8
- Teacher 9-12
- Teacher Assistant
- Testing Coordinator
- Principal PK-5
- Principal 6-8
- Principal 9-12
- Other School Administrator
- Curriculum/Program Coordinator
- Support Staff
- Media Coordinator
- Other Central Office Administrator

Sampling Method

The sampling method will be a self-selected convenience sampling model that allows for an extensive collection of surveys for statistical evaluation. The sample group survey will be distributed through the NCDPI NC FALCON project. The survey data will be collected as part of a North Carolina public school district training initiative that provides a common definition of

formative assessment and modules with formative assessment examples. The sample group consists primarily of North Carolina K–12 teachers with much smaller percentages of other K–12 school professionals.

Survey Instrumentation Design

After being tasked with revamping the public schools assessment system by the NCSBE, NCDPI developed NC FALCON to disseminate formative assessment learning modules to all public school districts. The initial deployment of this professional development system includes a pre- and post-survey instrument to evaluate participant perceptions of formative assessment. A multi-agency committee participated in the initial development of the Formative Assessment pre- and post-survey instrument. The committee, as indicated in meeting reports, included state and federal education departments as well as university representation. Committee membership included representatives from NCDPI, Appalachia Regional Comprehensive Center (ARCC), University of North Carolina at Greensboro SERVECenter, and the USDE Regional Comprehensive Center. ARCC worked with NCDPI to expand the capacity of the state education agency staff to identify and design high-quality formative assessments, and to offer support for the deployment of the project. The SERVECenter at UNCG function included university-based research, development, dissemination, evaluation, and technical assistance for the project. The instrument was designed to evaluate the extent participants knew the following:

- NC formative assessment initiative
- Understanding of formative assessment generally
- Confusion regarding the initiative
- Perceptions of connecting formative assessment with other educational initiatives
- Difficulties supporting formative assessment efforts

The instrument contained specific indicators that were used in this study to evaluate participant perceptions of formative assessment.

This study will incorporate pre- and post-survey data retained by the NC FALCON project committee to evaluate formative assessment perceptions held by school professionals. NC FALCON provides each participant the same definition and demonstrations of formative assessment. The online learning modules will establish the study definition of formative assessment as "a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve intended instructional outcomes" (Response to the Framework for Change, 2008, p. 12). The common definition will limit the variance of post-survey responses based on random previous participant experiences with formative assessment and increase the validation of this study.

NC FALCON, as reviewed in the study, consisted of five learning modules. Modules include the following:

- Importance of Formative Assessment
- Learning Targets and Criteria for Success
- Collecting and Documenting Evidence
- Analyzing Evidence and Descriptive Feedback
- Administrator's Role in Formative Assessment

NCDPI anticipated that the release of the NC FALCON learning modules would provide a core definition of formative assessment for participants, improve student learning and increase student achievement on the state standardized tests.

Pre-survey data were collected as participants first logged into the NC FALCON system for the 2010–2011 school year. A post-survey with identical questions was administered as

participants finished the last module. As of February 29, 2012, a group of 43,139 school professionals participated via the pre-assessment with 25,938 post-assessments being completed at school districts across North Carolina. This compares to 99,290 total classroom teachers reported on the *2010–2011 NC Report Card.* The study does assume that participants who finished the post-surveys are subsets of participants who finished the pre-survey. In order to solicit the most truthful answers, survey respondent names were not collected for survey administrations so it will not be possible to track the participants in a linear pattern for their pre- and post-surveys.

A focus of this study will be two post-survey constructs that totaled 15 items, which describe to what degree participants agree or disagree with specific formative assessment concepts and procedures. Participants indicated their agreement or disagreement using a five-point Likert-type scale (see Appendix C). The post-survey true/false construct and modules benefit construct will also be analyzed to create a more rigorous study.

Items one through eight on the pre-survey (see Appendix D) collected demographic characteristics. Item nine on the pre-survey requested information about the participants' previous formative assessment professional development and experience with formative assessment, which is not included on the post survey. Item nine used a true/false format to collect the respondents' answers to questions about formative assessment practices. Sections 10 and 11 used a five-point Likert type scale to ask participants how they felt about certain statements or questions. For question 10, concept knowledge content section, a value of one indicated an individual's self-perception as had no knowledge or strongly disagreed with the statement provided within that particular content section, while a value of five indicated that the respondent felt they had expert knowledge or strongly agreed with the statement. For question

11, procedural knowledge content section, a value of one indicated an individual's self-perception as rarely or never initiated or participated within the statements' indicated action while a value of five indicated that the respondent did daily or regularly initiate or participate in the statements' indicated action. Question 12 of the instrument contained an open-ended question asking participants to include any additional comments.

Items one through seven on the post-survey (see Appendix E) collected demographic characteristics. Item eight used a true/false format to collect the respondents' answers to questions about formative assessment practices. Sections 9 and 10 used a five-point Likert type scale to ask participants how they felt about certain statements or questions. For question nine, concept knowledge content section, a value of one indicates an individual's self-perception as had no knowledge or strongly disagreed with the statement provided in that particular content area, while a value of five indicated that the respondent felt they had expert knowledge or strongly agreed with the statement. For question 10, procedural knowledge content section, a value of 1 indicated an individual's self-perception as rarely or never initiated or participated within the statements' indicated action, while a value of 5 indicated that the respondent did daily or regularly initiate or participate in the statements' indicated action. Section 11 required respondents to evaluate how beneficial each module was by use of a 1–4 indication scale. The selection of one indicated not applicable (N/A) while a selection of four indicated the module was very beneficial. Sections 12 through 13 focused on feedback for developers, advice for teacher support in the classroom, and offered an opportunity for any additional comments.

For the purpose of this study, the concept knowledge content section and the procedural knowledge content section for post-surveys are of primary interest. These survey sections used a

five-point Likert type scale, which will allow for descriptive statistics to be employed. Sections 8 and 11 will also be analyzed as they also add validity to the study.

Data Collection

The NC FALCON data collection process involved NCDPI delivering self-activated learning modules, with online video presentations and printed material that respondents could access after being issued a password from a district administrator. District administrative personnel informed all participants of the following: the initiation of the project, the defined purpose of the formative assessment project, the collaboration among all NC school systems to embed the project, and a time estimate for module and survey completion.

Pre- and post-surveys accompanied the NC FALCON formative assessment training program, which was distributed during the 2010–2011 school year to all public school districts, charter schools, and other North Carolina educational organizations. Pre-survey data were collected as participants first logged into the NC FALCON system for the 2010–2011 school year. Post-survey data were collected as participants finished the last NC FALCON training module.

In an effort to encourage truthful responses to the statements presented in the surveys, educators were not allowed to place any identifying information on the survey instruments. After the presentation by district personnel and the creation of an online account, participants completed a pre-survey. The participants then completed five online learning modules. Each module took an estimated 1 hour each to complete. In addition to viewing the online video and scripted material, participants were also requested to contribute to online forums in which opinions and experiences were shared with NCDPI and other educators across the state. The estimated total time for each participant to complete the five modules and the requested input

was 15 hours. This estimated timeframe might have fluctuated, as some districts and schools did not require non-administrative participants to complete the *Administrator's Role in Formative Assessment* learning module, while others required each participant to complete all five learning modules. Modules for the entire instrument include the following:

1. Importance of Formative Assessment
2. Learning Targets and Criteria for Success
3. Collecting and Documenting Evidence
4. Analyzing Evidence and Descriptive Feedback
5. Administrator's Role in Formative Assessment

Once the modules were completed the participants were requested to complete a post-survey on formative assessment perceptions. The post-modules survey contained the same questions as the pre-modules survey but with additional open remarks, and without the assessment background questions as the participants now had experienced many of these titled constructs during the online learning module process.

The study will record 115 individual district EOG and EOC student proficiency results and AYP target results for the 2010–2011 NC FALCON implementation year. The results will provide a comparison measurement for the study. These proficiencies will be analyzed with the cluster analysis results to identify potential relationships between districts clustered by perceptions and their EOG, EOC, and AYP proficiencies.

Statistical Analysis

All answers on the surveys will be converted to number responses and dichotomously recorded for analysis. In order to obtain an overall perspective of the data provided by the sample population, descriptive statistics will be computed. Cronbach's alpha (Cronbach, 1951)

will then be computed to indicate the overall internal consistency reliability of the pre and post surveys. Cronbach's alpha is commonly used by researchers to measure internal consistency and is an indicator of reliability. This analysis will be conducted to support the supposition that the learning modules provided a common definition of formative assessment. The two survey constructs, concept knowledge and procedural knowledge, are the focus of the alpha analysis. These pre- and post-survey constructs were selected for their relevancy to the purpose of the study and they incorporate a Likert-type response scale allowing for Cronbach's alpha measurement for internal consistency to be used.

Cronbach's coefficient alpha will be calculated and examined using the Statistical Package for the Social Sciences (SPSS Version 20.0). The data from the pre and post surveys will be analyzed and examined for frequency of responses to the identified constructs and reliability levels of the Likert question scales. Analysis of the means, standard deviations, and mean differences will be reported to test beyond the reviewed alpha coefficient.

In order to address the research questions, ANOVA and MANOVA will be performed in each of the two survey content areas to determine if a mean difference exists between the pre- and post-course groupings. ANOVA and MANOVA are statistical tests that identify whether there are any statistically significant differences between two or more sample means with MANOVA including one or more covariates in the analysis.

The reliability analyses will be used to confirm the reliability of the survey for cluster analysis. The cluster analysis function in SPSS 20.0 will be implemented as an exploratory statistical method for determining which divergent characteristics exist in the study sample that can be combined, therefore turning the sampled population into homogeneous clusters (Romeburg, 1984).

Discriminant analysis will be conducted to confirm the cluster solution. Discriminant analysis is conducted to confirm the cluster solution because cluster analysis does not have the ability to confirm or deny cluster solutions; thus, discriminant analysis serves as a measure for how well the cluster groupings are formed (Green & Salkind, 2003). Discriminant analysis requires clusters to be known in advance and determines which data belong with certain clusters.

A kappa coefficient will be computed to measure the level of agreement between the two evaluators. In this study, cluster analysis and discriminant analysis serve as the two evaluators determining how well the variables assigned cluster group membership. Kappa analysis will be implemented as a check measure to determine consistency within clusters. Kappa is used to reduce the effect of coincidental agreement and will better validate the study.

The study seeks to identify potential relationships between identified clusters and NC EOG, EOC, and AYP district proficiencies. Therefore, each district will be classified into a cluster from the overall statewide data. District designation will be determined by the cluster classification of the majority of the district's education professionals. For example, a district in which 56% of the individual education professionals fall into Cluster 1 will be designated Cluster 1.

To examine potential significant mean differences between each identified cluster district and the EOC, EOG, and AYP district proficiencies *t*-tests will be performed. These tests will increase the validity of any potential relationship found between clustered districts and district EOG, EOC, and AYP proficiencies.

Conclusion

To summarize this chapter, a description of the study procedures and methodology was provided along with a reiteration of the purpose and research questions for the study. A research

example was provided to support the exploration of statewide data for relationships between education professionals' perceptions of formative assessment and summative district proficiencies; and to also help better define the problem and purpose. The population of interest within NC Schools was clarified under the title of *school professionals.* The deployment of the survey instruments and the collection of related respondent data via NCDPI online resources and databases were described. An overview of the NC FALCON learning modules and indications they have for the study was presented. Chapter 3 also included a review of the statistical analysis or methodology of the study. As reviewed, descriptive statistics will summarize and interpret the properties of the sample data. Cronbach's alpha, means, and standard deviation will identify internal consistency of the survey instruments. Reliability will be examined by use of ANOVA and MANOVA analysis. Cluster analysis will follow to explore possible characteristics within the sample that can be combined. Discriminant and Kappa analyses will confirm possible cluster groups. Finally, *t*-tests will be implemented to examine potential significant mean differences and validation of relationships between identified cluster districts and EOC, EOG, and AYP proficiencies.

CHAPTER 4: DATA ANALYSIS AND RESULTS

The ultimate purpose of this study was to explore whether relationships existed between public school professionals' perceptions of formative assessment and student achievement at the district level in North Carolina. Student achievement was operationalized as district-level measures of EOG, EOC, and AYP. School professionals' perceptions were measured using extant data collected from pre-existing statewide formative assessment surveys. Driven by the study's research questions, these data were analyzed using multiple methods, including descriptive statistics (e.g., means and standard deviations), internal consistency reliability (i.e., Cronbach's alpha), MANOVA, ANOVA, discriminant analysis, and cluster analysis. This chapter provides a report of the results.

Demographics

Of the 115 public school districts analyzed in the study, all had representation in the pre-survey, and 114 districts were represented in the post-survey responses. The survey data used for this study included 43,139 education professionals participating in the pre-survey and 25,938 participating in the post-survey. Charter schools, universities, colleges, and other educational organizations were grouped together in the analysis and segregated by district (see Table 1).

Pre-survey Demographics

This section will explore the pre-survey demographics of NC districts to better show who made up the sample. *Teachers* composed the highest proportion of pre-survey respondents (77.1%) and *Other Central Office Administrators* accounted for the lowest proportion of respondents (0.6%). *Principals*, as school leaders, represented 2.9% of the total respondents. Table 2 shows all pre-survey respondent positions reported by counts and percentages.

Table 1

Respondent County by Public Educational Institution Category

Category	Pre-survey Respondents	Post-survey Respondents
Public County/City School Districts	42,357	25,742
All Charter Schools*	553	125
College/Universities*	35	11
Other Educational Organizations*	194	60

Note. All Charter Schools, College/Universities and Other Educational Organizations were grouped in the analysis and are not reported in the final results of this study. *n* (Pre survey) = 43,139; *n* (Post survey) = 25,938.

Table 2

Demographic Characteristics of the Pre- and Post-survey Respondents by Position

Variable (Position)	Pre-survey Count	Pre-survey Response %	Post-survey Count	Post-survey Response %
Teacher	36,161	77.09%	22,490	80.47%
Teacher Assistant	348	0.74%	126	0.45%
Support Staff	1,673	3.57%	784	2.81%
Principals	1,354	2.89%	651	2.33%
Other School Administrator	865	1.84%	450	1.61%
Curriculum/Program Coordinator	586	1.25%	268	0.96%
Testing Coordinator	525	1.12%	225	0.81%
Other Central Office Administrator	283	0.60%	104	0.37%
Other Self-Reported Titles	5,115	10.90%	2,339	8.37%
Media Coordinator	-	-	509	1.82%

Note. Respondents had the option to select multiple positions. *n* (Pre survey) = 46,910; *n* (Post survey) = 27,946.

The top four subjects taught by the teacher respondent majority had similar percentages. The subjects taught most included *English/Language Arts* (16.6%), *Mathematics* (16.2%), *Science* (14.9%) and *Social Studies* (14.8%), with *Dance* (0.3%) making up the smallest percentage (see Table 3).

When analyzed by years of experience, it was found that the largest proportion of pre-survey respondents had more than 11 years of professional experience (32.5%), and the smallest proportion of respondents had 1–3 years of experience (13.3%). The majority of pre-survey respondents were *Female* (81.2%). Also, a majority reported their ethnicity as *White* (83.7%). *Native Hawaiian and other Pacific Islander* was the lowest represented ethnic group (0.1%). Table 4 shows all pre-survey reported demographic percentages by count and percentages.

Each of the 115 public school districts in the statewide sample had pre-survey representation in the analysis. Using NCDPI reported positions listed in the state 2010–2011 Districts Statistical Profile (NCDPI, 2011), it was found that district-level response rates ranged from 0.1% to 87.1%. The aggregated, state-level response rate for all pre-survey responding NC public school districts was 29.7% (see Appendix F).

Post-Survey Demographics

This section will explore the post-survey demographics of NC districts involved in the study. Within all the respondent positions recorded, it was found that *Teachers* (80.5%) still composed the highest proportion of respondents, with *Other Central Office Administrators* (0.4%) still representing the smallest proportion of respondents. *Principals*, as school leaders, accounted for 2.3% of the recorded respondents. Table 2 shows all post-survey reported positions by counts and percentages.

Table 3

Demographic Characteristics of the Pre- and Post-survey Respondents by Subject

Variable (Subject)	Pre-survey Count	Pre-survey Response %	Post-survey Count	Post-survey Response %
Not Teaching	4,394	4.71%	2,096	3.69%
Art	1,972	2.12%	1,182	2.08%
CTE	2,378	2.55%	1,435	2.52%
Dance	319	0.34%	152	0.27%
ELA	15,457	16.58%	9,638	16.95%
ESL	986	1.06%	587	1.03%
Health	5,753	6.17%	3,533	6.21%
Math	15,124	16.23%	9,570	16.83%
Music	1,877	2.01%	1,156	2.03%
PE	2,658	2.85%	1,757	3.09%
Science	13,929	14.94%	8,746	15.38%
2nd Language	690	0.74%	454	0.80%
Social Studies	13,823	14.83%	8,610	15.14%
Special Ed	4,347	4.66%	2,571	4.52%
Technology	4,477	4.80%	2,701	4.75%
Theatre Arts	429	0.46%	222	0.39%
Other	4,598	4.93%	2,451	4.31%

Note. Participants had the option to select multiple subject areas. *n* (Pre survey) = 93,211; *n* (Post survey) = 56,861.

Table 4

Demographic Characteristics of the Pre- and Post-survey Respondents by Experience, Gender and Ethnicity

Trait/Variable	Pre-survey Count	Pre-survey Response %	Post-survey Count	Post-survey Response %
Experience				
1-3 Years	5,736	13.30%	3,590	13.84%
4-6 Years	5,827	13.51%	3,652	14.08%
7-10 Years	6,961	16.14%	4,376	16.87%
11-20 Years	14,129	32.75%	8,482	32.70%
21 Years or More	10,486	24.31%	5,838	22.51%
Gender				
Female	35,020	81.18%	21,071	81.24%
Male	8,119	18.82%	4,867	18.76%
Ethnicity				
African American	5,127	11.88%	2,904	11.20%
American Indian	584	1.35%	253	0.98%
Asian	207	0.48%	106	0.41%
Hispanic/Latino	645	1.50%	392	1.51%
Native Hawaiian and other Pacific Islander	39	0.09%	22	0.08%
White	36,113	83.71%	21,989	84.78%
Other	424	0.98%	272	1.05%

Note. *n* (Pre survey) = 43,139; *n* (Post survey) = 25,938.

The top four subjects taught by the teacher respondent majority had similar percentages. The subjects taught most included *English/Language Arts* (17.0%), *Mathematics* (16.8%), *Science* (15.4%) and *Social Studies* (15.1%), with *Dance* (0.3%) making up the lowest percentage. Table 3 shows all post-survey reported subjects taught by counts and percentages.

When analyzed by years of experience, it was found that a substantial proportion of post-survey respondents had more than 11 years of professional experience (32.7%). A majority of post-survey respondents reported themselves as *Female* (81.2%). Also, a majority reported their ethnicity as *White* (84.8%). Again, *Native Hawaiian and other Pacific Islander* was the lowest represented ethnic group (0.1%). Table 4 shows all post-survey reported demographics by counts and percentages.

All but one public school district responded to the post survey. Using NCDPI reported positions listed in the state 2010–2011 Statistical Profile (NCDPI, 2011), it was found that district-level response rates ranged from 0.1% to 77.6%. The aggregated, state-level response rate for all post-survey school districts was 18.1%, 11.6 percentage points lower than the statewide pre-survey response rate (see Appendix G).

The remainder of this chapter presents the results as they pertain to the study research questions. Prior to conducting any tests, an exemption request form was submitted to the East Carolina University and Medical Center Institutional Review Board Office and study approval was obtained (see Appendix H).

Research Question One: Change in Perceptions from Pre to Post

To what degree did participant perceptions toward formative assessment change between pre NC FALCON online modules surveys and post NC FALCON online modules surveys?

The first research question has to do with whether participants' perceptions changed from pre NC FALCON to post NC FALCON. To determine whether changes occurred, and to determine whether these changes were statistically significant, MANOVAs and ANOVAs were conducted. Prior to reporting results from the MANOVAs and ANOVAs, this section first presents results from the tests of internal consistency reliability (i.e., Cronbach's alpha) for the pre- and post-survey constructs, as well as descriptive statistics (e.g., means and standard deviations).

Based on theoretical and conceptual overlap and based on factor convergence, a decision was made to combine the *Conceptual Knowledge* construct and the 10 items within the *Procedural Knowledge* construct. Combined into a larger 15-item unidimensional factor, an acceptable Cronbach's alpha coefficient of .84 (Nunnally & Bernstein, 1994) on both the pre-and post-survey samples was obtained.

Table 5 displays the means, standard deviations, and mean differences between the pre- and post-survey constructs. Analysis of the conceptual knowledge and procedural knowledge item and factor means demonstrated a pattern of increases from pre to post survey—thus, based on mean differences, it appeared that perceptions improved consistently from pre to post. The means for all 15 items increased from the pre survey to the post survey with the exception of one item. The pre survey mean for the statement, "In a parent teacher conference, I communicate how well a student is doing by sharing the grades in my grade book" was 3.27, which was 0.17 higher than the post-survey mean score of 3.10. This might suggest respondents see a disconnect between formative assessment and sharing students' grades with parents.

MANOVAs were conducted to determine whether group differences existed in the dependent variables. Whereas ANOVA examines group differences for a single dependent

Table 5

Means, Standard Deviations and Mean Differences for the Pre and Post Surveys

	Mean		St. Deviation		Mean Difference
Variable	Pre	Post	Pre	Post	(Post-Pre)
Conceptual Knowledge					
Adequate Training	3.69	4.10	.878	.629	.41*
Students Abilities	3.49	3.79	.856	.716	.30*
Student Understanding	3.44	3.72	1.043	.922	.28*
Parent Communication with Grades	3.27	3.10	1.146	1.141	-.17*
Procedural Knowledge					
Checklists	3.33	3.57	1.310	1.212	.24*
Rubrics	3.17	3.30	1.213	1.172	.13*
Learning Targets	3.71	3.92	1.466	1.337	.21*
Student Specific Information	3.50	3.89	1.245	1.083	.39*
Modify Classroom Instruction	4.30	4.41	.853	.796	.11*
Students Self-Assess	3.39	3.70	1.264	1.154	.31*
Students Reflect	3.64	3.88	1.224	1.089	.24*
Students Formatively Assess Peers	2.55	3.09	1.353	1.319	.54*
Students Summatively Assess Peers	2.21	2.53	1.278	1.346	.32*
Students Provide Input (Asses. Des.)	2.45	2.84	1.318	1.333	.39*

Note: Responses were recorded on a 5-point scale: 1=*strongly disagree*, 2=*disagree*, 3=*neither disagree nor agree*, 4=*agree*, 5=*strongly agree*. Asses. Des.= Assessment Design. *$p < .001$. *n* (Pre survey) = 43,153; *n* (Post survey) = 26,001.

variable, MANOVA allows one to examine group differences for multiple dependent variables. First, a MANOVA was conducted for each subconstruct, using all items as the dependent variables. With the conceptual knowledge items as dependent variables, the MANOVA indicated a significant difference in pre- and post-survey perceptions (F[5,67549] = 1218.81, p < .001; Wilk's Λ = .917, partial η^2 = .08). Statistically significant differences were also found with the procedural knowledge items as dependent variables (F[10,64926] = 343.08, p < .001; Wilk's Λ = .950, partial η^2 = .05). Next, a MANOVA was conducted where the mean composite for conceptual knowledge and the mean composite for procedural knowledge were used as the dependent variables. With composites as dependent variables, significant differences were found from pre to post survey (F[2,68120] = 1257.51, p < .001; Wilk's Λ = .964, partial η^2 = .04).

To supplement the MANOVA results, ANOVAs were conducted at both the item and factor levels to determine whether the mean differences were statistically significant. For the conceptual knowledge dimension, the pre-survey mean composite was 3.59 and the post-survey mean composite was 3.77. The difference of 0.18 was statistically significant at the p < .001 level. For the procedural knowledge dimension, the pre-survey mean composite was 3.24 and the post-survey mean composite was 3.51. The increase of 0.27 was statistically significant at the p < .001 level. The item level differences and significance results are reported in Table 5. In sum, all items (except the aforementioned one about sharing grades with parents) increased nontrivially from pre to post, which indicates that respondents' perceptions were more positive after NC FALCON.

Research Question Two: Homogenous Clusters

Can the participants in this study be classified into homogeneous clusters based on their post-module self-perception survey responses?

Cluster analysis was used as an exploratory technique to determine whether the post-survey constructs could be used to successfully identify homogeneous respondent clusters. The large sample size for this study met the minimum respondents considered necessary to execute cluster analysis with any level of assurance (Lorr, 1983; Miller, 2002). A cluster analysis was conducted specifying a two-, three-, and four-cluster solution. The different cluster solutions were examined along with the ANOVA of the predictor variable to determine which cluster solution presented the best fit and separation between cluster groups.

Based on the results, a two-cluster solution was chosen, which provided a clean balance of sample sizes between the two clusters. Cluster 1 consisted of a sample size of 10,282 respondents and Cluster 2 consisted of 15,663 respondents. Also, based on the ANOVA, the clusters were found to have a statistically significant difference between mean construct scores. The overall ANOVA results of the survey constructs can be found in Appendix I.

A discriminant analysis was conducted to determine whether the constructs of the post survey could accurately predict cluster membership and support the cluster analysis results. The discriminant analysis correctly classified 96.6% of the cases in Cluster 1 and 96.8% of the cases in Cluster 2 (see Table 6).

In an effort to further confirm the strength of the relationship between the cluster and discriminant analyses, a kappa coefficient was computed using the cross-tabulations function of SPSS 20.0. The kappa coefficient returned a value of .932, which indicates that the high level of agreement between the cluster and discriminant analysis did not occur by chance (see Table 7).

Descriptive data of Cluster 1 and Cluster 2 was reviewed to better report which clustered respondents had the highest perception of formative assessment. The two construct statements that measured respondent perceptions of students formatively assessing peers and students

Table 6

Results of the Discriminant Analysis for Classifying Clusters

Cluster Number of Case		Predicted Group Membership		Total
		1	2	
Original Count	1	9,935	347	10,282
	2	495	15,168	15,663
%	1	96.6	3.4	100.0
	2	3.2	96.8	100.0

Table 7

Results of the Kappa Analysis

	Value	Asymp. Std. Error	Approx. T	Approximate Significance
Measure of agreement (Kappa)	.932	.002	150.187	.000

Note. n = 25,945.

providing input in assessment design equally had the greatest Cluster 1 to Cluster 2 mean difference (1.81). The item with the lowest mean difference was the statement concerning respondents' perceptions of themselves receiving adequate training (0.29). A detailed record of means and standard deviations for the construct statements used to measure perception are displayed in Table 8.

For further descriptive purposes the post-survey true/false statements for Cluster 1 and Cluster 2 were reported. Mean scores between true/false statements indicate the largest mean difference was 0.09. Of the 11 true/false statements, most were equal with or under a 0.05 difference in mean score, with 0.01 being the lowest. A detailed record of means and standard deviations for the true/false statements that were used to measure perceptions of formative assessment are displayed in Table 9.

Additionally, cross-tabulations by respondent positions were reported to better represent Cluster 1 and Cluster 2 respondent characteristics. When respondent counts were reported as percentages, it was found that the greatest difference between Cluster 1 and Cluster 2 percentages was between *Central Office Administrators* (82.8%). PreK–2 Teachers composed the lowest separation between Cluster 1 and Cluster 2 respondent percentages (2.9%). *Teacher* and *Principal* positions had multiple levels of representation. Within the *Teacher* positions, there was a percentage difference range of 2.9% to 31.1%. Within the *Principal* positions there was a range of 64.3% to 68.3%. An entire listing of Cluster 1 and Cluster 2 positions by count and percentages can be found in Table 10.

Table 8

Cluster 1 and Cluster 2 Post-Survey Construct Statement Descriptions

	Cluster 1		Cluster 2		
Variable	Mean	*SD*	Mean	*SD*	Diff
Conceptual Knowledge					
Adequate Training	3.93	.662	4.22	.629	.29*
Students' Abilities to describe targets	3.45	.746	4.02	.598	.57*
Student Understanding	3.45	.974	3.89	.841	.44*
Parent Communication with Grades	2.91	1.124	3.22	1.136	.31*
Parent Communication Evidence	3.95	.699	4.23	.570	.28*
Procedural Knowledge					
Checklists	2.92	1.332	4.01	.894	1.09*
Rubrics	2.61	1.181	3.76	.911	1.15*
Learning Targets	3.21	1.595	4.38	.862	1.17*
Student Specific Information	3.30	1.289	4.27	.695	.97*
Modify Classroom Instruction	4.16	1.005	4.57	.565	.41*
Students Self-Assess	2.86	1.246	4.24	.660	1.38*
Students Reflect	3.18	1.260	4.34	.620	1.16*
Students Formatively Assess Peers	2.00	1.115	3.81	.874	1.81*
Students Summatively Assess Peers	1.51	.826	3.20	1.193	1.69*
Students Provide Input (Asses. Des.)	1.75	.972	3.56	1.013	1.81*

Note. * $p < .001$. n (Cluster 1) = 10,282; n (Cluster 2) = 15,663.

Table 9

Cluster 1 and Cluster 2 Post-Survey True/False Statement Descriptions

	Cluster 1		Cluster 2		
Variable	Mean	*SD*	Mean	*SD*	Diff
True/False					
I use classroom assessment information to guide and revise teaching.	1.96	.200	1.99	.107	.03
I know about what students learn in my class from quizzes and tests.	1.59	.491	1.64	.479	.05
To be useful, a classroom assessment must be graded.	1.12	.327	1.17	.378	.05
Statements such as “good job,” “excellent,” or “way to go” are useful in providing feedback to students regarding their mastery of class concepts.	1.28	.451	1.37	.482	.09
Statements such as “try harder,” “concentrate more,” or “apply yourself” are useful in providing feedback to students regarding their mastery of class concepts.	1.15	.357	1.22	.411	.07
Students should be allowed to assess their own mastery of class concepts.	1.92	.275	1.94	.229	.02
Students should not be involved in the assessment process.	1.10	.304	1.15	.352	.05
Classroom discussion and discourse will provide teachers with feedback on how well they are conveying ideas to students.	1.97	.164	1.98	.148	.01
Frequent testing (e.g. daily graded quizzes) helps motivate students to learn.	1.08	.272	1.13	.339	.05
The purpose of formative assessment is to make ongoing judgments about the quality of work students produce.	1.69	.461	1.76	.425	.07

Table 9 (continued)

	Cluster 1		Cluster 2		
Variable	Mean	*SD*	Mean	*SD*	Diff
Formative assessment is just another thing to do and I do not have time for it.	1.04	.196	1.06	.238	.02

Note. *n* (Cluster 1) = 10,282; *n* (Cluster 2) = 15,663.

Table 10

Cross-tabulation Results for Cluster 1 and Cluster 2

Variable	Cluster 1 Count	Cluster 1 Percentage	Cluster 2 Count	Cluster 2 Percentage	% Diff.	*n*
Teacher (PreK-2)	2,703	48.5%	2,870	51.4%	2.9%	5,573
Teacher (3-5)	2,086	402%	3,096	59.7%	19.5%	5,182
Teacher (6-8)	2,139	38.9%	3,350	61.0%	22.1%	5,489
Teacher (9-12)	2,157	34.4%	4,096	65.5%	31.1%	6,253
Teacher Assistant	59	46.8%	67	53.1%	6.3%	126
School Support Staff	371	47.3%	413	52.6%	5.3%	784
Principal (PreK-5)	56	17.5%	263	82.4%	64.9%	319
Principal (6-8)	30	17.8%	138	82.1%	64.3%	168
Principal (9-12)	26	15.8%	138	84.1%	68.3%	164
Other School Administrator	93	20.6%	357	79.3%	58.7%	450
Curriculum/Program Coordinator	46	17.1%	222	82.8%	65.7%	268
Media Coordinator	233	45.7%	276	54.2%	8.5%	509
Testing Coordinator	91	40.4%	134	59.5%	19.1%	225
Central Office Administrator	9	08.6%	95	91.3%	82.7%	104

To allow for EOC, EOG, and AYP district proficiency percentage comparisons, data were aggregated at the district level and districts were classified as belonging to either Cluster 1 or Cluster 2 based on the percentage of respondents within the district that belonged to each cluster. That is, Cluster 1 and Cluster 2 designation was determined by which cluster the majority of the district's education professionals belonged to. Nine districts were assigned to Cluster 1 and 105 districts were assigned to Cluster 2. Research Questions 3–6 present results from Clusters 1 and 2 districts as they relate to EOC, EOG, and AYP proficiency percentages.

Research Question Three: Reading & Math EOG *t*-tests Analysis

Are there mean differences in student academic achievement—as measured by district percent proficiency on the North Carolina EOG test in Reading and Math for academic school year 2010–2011 (NC School Report Card)—between identified homogeneous clustered districts?

Using SPSS 20.0, *t*-tests were conducted to examine whether mean differences in percent proficiencies between Cluster 1 districts and Cluster 2 districts were statistically significant. Cluster 1 and Cluster 2 district percent proficiencies were analyzed with North Carolina EOG tests in Reading and Math in 2010–2011.

Across all district-level EOG Reading and Math student percent proficiencies, the average difference between Cluster 1 and 2 districts was 2.82%, and none of the differences were statistically significant. The range of the differences was an absolute of between 0.7% and 5.2% (see Table 11). Grade 6 Reading had the largest percentage (5.2%) of absolute difference between clusters, with Grade 7 Math having the lowest (0.7%). A detailed record of means, standard error of the means, and significance for each variable used to measure differences in EOG Reading and Math percentages are displayed in Table 11.

Table 11

District-level Mean Differences in EOG Reading and Math Scores between Cluster 1 and Cluster 2

	Cluster 1		Cluster 2					
Variable	Mean	SEM	Mean	SEM	Diff.	t	*df*	Sig.
Grade 3 Reading	70.3%	.028	65.7%	.010	4.6%	1.36	112	.177
Grade 3 Math	84.6%	.023	81.1%	.007	3.5%	1.43	112	.155
Grade 4 Reading	72.3%	.032	70.2%	.009	2.1%	0.65	112	.520
Grade 4 Math	85.4%	.028	83.0%	.007	2.4%	0.92	112	.359
Grade 5 Reading	74.2%	.031	70.1%	.010	4.0%	1.16	112	.246
Grade 5 Math	81.7%	.034	80.1%	.009	1.7%	0.52	112	.608
Grade 6 Reading	78.8%	.033	73.5%	.010	5.2%	1.50	111	.138
Grade 6 Math	84.3%	.025	80.0%	.009	4.4%	1.34	111	.183
Grade 7 Reading	66.8%	.045	66.1%	.010	0.7%	0.19	111	.848
Grade 7 Math	79.7%	.038	80.4%	.008	-0.7%	-0.24	111	.811
Grade 8 Reading	70.4%	.044	67.7%	.010	2.8%	.074	111	.462
Grade 8 Math	87.0%	.026	83.9%	.008	3.1%	1.11	111	.268

Note. Diff.=Absolute difference between clusters. Sig.=Statistical significance. *n* (Cluster 1) = 9 *n* (Cluster 2) = 105.

Research Question Four: Science EOG *t*-tests Analysis

Are there mean differences in student academic achievement—as measured by percent proficiency on the North Carolina EOG test in Science for academic school year 2010–2011 (NC School Report Card)—between identified homogeneous clusters?

To examine whether mean differences in percent proficiencies between Cluster 1 districts and Cluster 2 districts were statistically significant, *t*-tests were conducted. Cluster 1 and Cluster 2 district percent proficiencies were analyzed with North Carolina EOG tests in Science during 2010–2011. Science EOG testing was performed in fifth and eighth grade.

Across all district-level EOG Science student percent proficiencies, the average difference between Cluster 1 and Cluster 2 districts was 0.4%, and none of the differences were statistically significant. The range of the differences was an absolute value of between 0.1% and 0.9% (see Table 12). Grade 8 Science had the largest percentage (0.9%) of absolute difference between clusters, with Grade 5 Science having the lowest (0.1%). A detailed record of means, standard error of the means, and significance for each variable used to measure differences in EOG Science percentages are displayed in Table 12.

Research Question Five: EOC *t*-tests Analysis

Are there mean differences in student academic achievement—as measured by percent proficiency on the North Carolina EOC Tests for English I, Algebra I, Algebra II, Biology, Physical Science, Civics & Economics, and U.S. History for academic school year 2010–2011 (NC School Report Card)—between identified homogeneous clusters?

To examine whether mean differences in percent proficiencies between Cluster 1 districts and Cluster 2 districts were statistically significant, *t*-tests were conducted. Cluster 1 and Cluster 2 district percent proficiencies were analyzed with North Carolina EOC tests in English I,

Table 12

District-level Mean Differences in EOG Science Scores between Cluster 1 and Cluster 2

	Cluster 1		Cluster 2					
	M	*SEM*	*M*	*SEM*	Diff.	*t*	*df*	Sig.
Grade 5 Science	72.8%	.033	72.9%	.011	-0.1%	-0.021	112	.983
Grade 8 Science	74.7%	.046	73.8%	.011	0.9%	0.218	111	.828

Note. Diff. = Absolute difference between clusters. Sig. = Statistical significance. *n* (Cluster 1) = 10,154-10,224. *n* (Cluster 2) = 15,379-15,523.

Algebra I, Algebra II, Biology, Physical Science, Civics & Economics, and U.S. History in 2010–2011.

Across all district-level EOC student test proficiencies, the average difference between Clusters 1 and 2 districts was 0.5%, and none of the differences were statistically significant. The range of the differences was an absolute value of between 1.3% and 2.9% (see Table 13). Algebra 2 had the largest percentage (2.9%) of absolute difference between clusters with Physical Science having the lowest (1.3%). A detailed record of means, standard error of the means, and significance for each variable used to measure differences in all EOC percentages are displayed in Table 13.

Research Question Six: AYP *t*-tests Analysis

To what degree was there a relationship between identified homogenous clusters and district achievement on the North Carolina AYP reports?

To examine whether mean differences in district-level percentages of met North Carolina AYP targets between Cluster 1 districts and Cluster 2 districts were statistically significant, *t*-tests were conducted. For district-level percentages of met AYP targets, the difference between Clusters 1 and 2 was 3.7 % (see Table 14). Based on the *t*-test, this difference was not statistically significant. A detailed record of means, standard error of the means, and significance for the variable used to measure differences in AYP district percentages are displayed in Table 14.

Table 13

District-level Mean Differences in Academic Achievement between Cluster 1 and Cluster 2

	Cluster 1		Cluster 2					
	M	SEM	M	SEM	Diff.	t	*df*	Sig.
English 1	79.8%	.024	79.5%	.007	0.3%	0.10	112	.923
Algebra 1	74.8%	.055	74.2%	.010	0.6%	0.15	112	.880
Algebra 2	84.7%	.031	81.8%	.011	2.9%	0.74	112	.464
Biology	78.6%	.051	78.8%	.008	-0.2%	-0.06	112	.950
Physical Science	75.7%	.051	76.9%	.013	-1.3%	-0.24	112	.785
C&E	79.7%	.027	77.9%	.010	1.7%	0.51	112	.612
U.S. History	78.7%	.040	78.9%	.009	-0.2%	-0.07	112	.943

Note: C&E = Civics and Economics. Diff. = Absolute difference between clusters. Sig. = Statistical significance. *n* (Cluster 1) = 9. *n* (Cluster 2) = 105

Table 14

District-level Adequate Yearly Progress for Cluster 1 and Cluster 2

	Cluster 1		Cluster 2					
	M	*SEM*	*M*	*SEM*	Diff.	*T*	*df*	Sig.
AYP	80.0%	.031	76.3%	.010	3.7%	1.08	112	.284

Note. AYP = Adequate yearly progress. Dif. = Absolute difference between clusters. Sig. = Statistical significance. *n* (Cluster 1) = 9; *n* (Cluster 2) = 105.

CHAPTER 5: SUMMARY AND DISCUSSION

The purpose of this study was to explore relationships between North Carolina public school professionals' perceptions of formative assessment and school district proficiencies. School district proficiencies were measured using district EOG, EOC, and AYP data. School professionals' perceptions of formative assessment were measured using pre-existing statewide formative assessment survey responses, which were analyzed using multiple methods. Based on survey responses, it was viable to cluster respondents according to whether they reported being *more* or *less* positive toward formative assessment. These clusters were formed at the district level and ultimately demonstrated correlations with the districts' EOG, EOC, and AYP proficiencies.

Chapter 1 provided an introduction to the study and included a statement of the problem, the study purpose, definitions, limitations, and any assumptions made by the researcher. Chapter 2 consisted of a literature review that focused on historical influences, and it provided an introduction to the Framework for Change state plan and an overview of NC FALCON. Chapter 2 also described the relationship between school leadership and other school professionals' perceptions at the classroom level. Next, conceptual knowledge and procedural knowledge of formative assessment were both defined, and examples that related both concepts to the study were included. Chapter 3 described the population of interest, sampling methods, instruments, data collection methods, and statistical analyses. Chapter 4 presented the results of the analysis of the data collected from all North Carolina school districts. This chapter summarizes the findings of the study and discusses theoretical rationale for the results. Discussion of the practical implications for educational leaders will also be included. This chapter concludes with study limitations and suggestions for further research.

Research Question One

To what degree did participant perceptions toward formative assessment change between pre NC FALCON online modules surveys and post NC FALCON online modules surveys?

Study results indicated that the NC FALCON learning modules positively influenced respondents' perceptions toward formative assessment. Survey constructs used were found to be reliable with a Cronbach's alpha of .84. Comparison of respondent pre- and post-survey scores showed that item-level means increased for 14 out of the 15 survey questions. The only mean that decreased was the item measuring the respondents' perceptions of communication toward parents about grades. This result could be attributed to the NC FALCON formative assessment learning module's implication that grades were summative reports, leading respondents to answer this item differently. In sum, these results support the conclusion that the learning modules positively influenced participants' perceptions of formative assessment and lend support to the NC FALCON program.

Research Question Two

Can the participants in this study be classified into homogeneous clusters based on their post module self-perception survey responses?

The post survey was used successfully to identify and classify respondents into homogeneous clusters. Based on the results from a cluster analysis, the respondents were separated into two clusters, one containing education professionals with lower perceptions of formative assessment (Cluster 1) and the other containing education professionals with higher perceptions of formative assessment (Cluster 2). The sizes of the two groups were 10,282 for Cluster 1 and 15,663 for Cluster 2. This indicates that there is significant variability in

educational professionals' perceptions and that two clusters with meaningful differences can be identified based on their perceptions of formative assessment.

It is interesting to note that the two items that equally had the greatest mean difference (1.81) between Cluster 1 and Cluster 2 were items that measured (a) respondent perceptions toward students formatively assessing peers and (b) respondent perceptions toward students providing input in assessment design. The item with the lowest mean difference (0.29) between Cluster 1 and Cluster 2 was the item concerning respondents' perceptions of whether or not they received adequate training.

The difference between the mean construct scores for Cluster 1 and Cluster 2 was found to be statistically significant, therefore exploration of significant relationships between each group's perception of formative assessment and district proficiencies could be examined. Respondents from both clustered groups as well as the proficiency levels of their associated school districts were analyzed with the cumulative results discussed in Research Questions 3–6 of this chapter.

Research Question Three

Are there mean differences in student academic achievement—as measured by percent proficiency on the North Carolina EOG test in Reading and Math for academic school year 2010–2011 (NC School Report Card)—between potentially identified homogeneous clusters?

At the district level, results indicated that differences in student academic achievement—as measured by EOG Reading and Math tests—between Cluster 1 and Cluster 2 were statistically significant but not necessarily practically significant. Initially, these results suggested significance; however, parametric statistics are highly sensitive to large sample sizes. Due to the small differences and the large sample sizes, one can reasonably determine the differences to be

practically insignificant. Furthermore, when a smaller randomized sample was pulled from within the study sample, the results found all *p* values reduced to statistical nonsignificance.

Despite the lack of practical significance, it was still interesting to note the trend indicating Cluster 1 had higher mean EOG scores than Cluster 2. This was a surprise because the vast majority of research, with the exception of Jencks' (1972) *Inequality: A Reassessment of the Effects of Family and Schooling in America*, supported a direct, positive relationship between higher perceptions of formative assessment and higher summative proficiency scores (Black & Wiliam, 1998; Marzano, 2001, 2007; Sadler, 1989; Stiggins, 1994; Stiggins & Chappuis, 2005). Because the study findings suggest that there is no significant relationship between education professionals' perceptions of formative assessment and district-level proficiencies on Reading and Math EOG tests, it may be possible that there is still confusion about the meaning and implementation of formative assessment.

Research Question Four

Are there mean differences in student academic achievement—as measured by percent proficiency on the North Carolina EOG test in Science for academic school year 2010–2011 (NC School Report Card)—between potentially identified homogeneous clusters?

At the district level, results indicated that differences in student academic achievement—as measured by EOG Science tests—between Cluster 1 and Cluster 2 were statistically significant but not necessarily practically significant. Initially, results suggested significance; however, parametric statistics are highly sensitive to large sample size. Due to the small differences and the large sample sizes, one can reasonably determine that the differences are practically insignificant. Furthermore, when a smaller randomized sample was pulled from

within the study sample, the results demonstrated that all *p* values were statistically nonsignificant.

Despite the lack of practical significance, it was interesting to note the trend that Cluster 1 had higher mean EOG scores than Cluster 2. This was a surprise because the vast majority of research, with the exception of Jencks' (1972) *Inequality: A Reassessment of the Effects of Family and Schooling in America*, supported a direct, positive relationship between higher perceptions of formative assessment and higher summative proficiency scores (Black & Wiliam, 1998; Marzano, 2001, 2007; Sadler, 1989; Stiggins, 1994; Stiggins & Chappuis, 2005). Because the study findings suggest that there is no significant relationship between education professionals' perceptions of formative assessment and district-level proficiencies on Science EOG tests, it may be possible that there is still confusion about the meaning and implementation of formative assessment.

Research Question Five

Are there mean differences in student academic achievement—as measured by percent proficiency on the North Carolina EOC Tests for English I, Algebra I, Algebra II, Biology, Physical Science, Civics & Economics, and U.S. History for academic school year 2010–2011 (NC School Report Card)—between potentially identified homogeneous clusters?

At the district level, results indicated that differences in student academic achievement—as measured by EOC English I, Algebra I, Algebra II, Biology, Physical Science, Civics & Economics, and U.S. History tests—between Cluster 1 and Cluster 2 were statistically significant. Initially, results suggested significance; however, parametric statistics are highly sensitive to large sample sizes (Cohen, 1988). Due to the small differences and the large sample sizes, one can reasonably determine the differences to be practically insignificant. Furthermore,

when a smaller randomized sample was pulled from within the study sample, the results found all *p* values to be statistically nonsignificant.

Despite the lack of practical significance, it was interesting to note the trend that Cluster 1 had higher mean EOG scores than Cluster 2. This was a surprise because the vast majority of research, with the exception of Jencks' (1972) *Inequality: A Reassessment of the Effects of Family and Schooling in America*, supported a direct, positive relationship between higher perceptions of formative assessment and higher summative proficiency scores (Black & Wiliam, 1998; Marzano, 2001, 2007; Sadler, 1989; Stiggins, 1994; Stiggins & Chappuis, 2005). Because the study findings suggest that there is no significant relationship between education professionals' perceptions of formative assessment and district-level proficiencies on EOC English I, Algebra I, Algebra II, Biology, Physical Science, Civics & Economics, and U.S. History tests, it may be possible that there is still confusion about the meaning and implementation of formative assessment.

Research Question Six

To what degree was there a relationship between identified homogenous clusters and higher district achievement on the North Carolina AYP reports?

At the district level, results indicated that differences between Cluster 1 and Cluster 2 district achievement—measured by district AYP proficiencies—were statistically significant. Initially, results suggested significance; however, parametric statistics are highly sensitive to large sample sizes. Due to the small differences and the large sample sizes, one can reasonably determine that differences are practically insignificant. Furthermore, when a smaller randomized sample was pulled from within the study sample, the results demonstrated all *p* values reduced to statistical nonsignificance.

Despite the lack of practical significance, it was still interesting to note the trend that Cluster 1 had higher mean scores than Cluster 2. This was a surprise because the vast majority of research, with the exception of Jencks' (1972) *Inequality: A Reassessment of the Effects of Family and Schooling in America*, supported a direct, positive relationship between higher perceptions of formative assessment and higher summative proficiency scores (Black & Wiliam, 1998; Marzano, 2001, 2007; Sadler, 1989; Stiggins, 1994; Stiggins & Chappuis, 2005). Because the findings suggest that there is no significant relationship between education professionals' perceptions of formative assessment and district-level AYP proficiencies, it may be possible that there is still confusion about the meaning and implementation of formative assessment.

Response to Research Question Findings

This section will discuss different possible viewpoints when considering the results of the study. First, the importance of differentiating between statistical significance and practical significance (or meaningfulness) is strongly suggested when examining the results, particularly in light of the sample size included in this study. One could argue that the findings of statistical significance based on the MANOVA and ANOVA for Research Question 1 was not practically significant because the statistic is highly sensitive to the extremely large sample that was examined. In other words, the statistical test was so powerful that it detected very minor differences that were not meaningful. For example, the average change of .18 in the conceptual knowledge sub-construct from pre- to post-survey was statistically significant because the sample size was over 25,000—however, that small change (i.e., less than a quarter of a scale point) may not be meaningful in practice.

Readers should also continue to consider practical significance of findings when statistical nonsignificance is the initial outcome. Table 15 shows the range of mean differences

and average mean for Research Questions 3–6, all of which were statistically nonsignificant. Many readers may move from results of no significant differences to conclude nothing of interest was in the findings. Because the outcome of interest was student achievement tests, the practical significance of the results may warrant closer attention. Consider the average differences in Table 15 for the HS EOCs. The range of mean differences between Cluster 1 and Cluster 2 was 1.3% to 2.9%. Using the lower end of the range (i.e., 1.3%), one could relate this percentage to equaling one question on a student's 100-question final exam in History. Some educators may argue that they have witnessed a considerable group of students fail similar summative exams by one question. In this type of situation the practical differences of the analysis may indeed be meaningful. Ultimately, the discerning reader should use judgment when deciphering between statistical and practical significance.

Based on the literature research, the cluster group who rated themselves higher on formative assessment would be expected have higher achievement scores, even if it was not by a substantial percentage (Black & Wiliam, 1998; Marzano, 2001, 2007; Sadler, 1989; Stiggins, 1994; Stiggins & Chappuis, 2005). The study data did not support those findings. One possible explanation is the Dunning-Kruger Effect, which has consistently demonstrated that those who are more skilled or more knowledgeable in a given domain, tend to underestimate their skill and knowledge level (Dunning, Ehrlinger, Johnson, & Kruger, 2003; Dunning & Kruger, 1999). Conversely, those who are less skilled and/or knowledgeable tend to inflate their estimates because they lack the necessary information and metacognitive processing to accurately self-assess. Thus, education professionals who sufficiently understand formative assessment may have underestimated their levels of formative assessment, which would lead to reversing the

Table 15

Research Questions 3-6: EOG/EOC/AYP t-tests Analysis

Research Question	Proficiency Examined	Range of Mean Differences Between Clusters 1&2	Average Mean Difference Between Clusters 1&2	Statistically Significant
Three	Reading & Math EOG	0.7%-5.2%	2.82%	No
Four	Science EOG	0.1%-0.9%	0.4%	No
Five	*HS EOCs	1.3%-2.9%	0.5%	No
Six	AYPs	-	3.7%	No

Note. English I, Algebra I, Algebra II, Biology, Physical Science, Civics & Economics, and U.S. History.

relationship between formative assessment level and achievement level. The data presented in Research Questions 3–6 align with this rationale.

It is also possible that educators may be conflicted about past formative assessment professional development and the construct definition and specific items offered in the study. One noted example is that the largest mean difference between clusters was seen on the items about perceptions of students formatively assessing peers and students providing input in assessment design. The items were tied for the greatest mean difference between Cluster 1 and Cluster 2 (1.81). These items may be viewed as essential pieces for any actively practicing formative assessment educator and are part of formative assessment professional developments, but these precise statements are the two that are farthest apart for the groups. Furthermore, the lowest mean difference reported was the item concerning respondents' perceptions of whether they received adequate training (0.29). The fact that the two clustered groups can be the farthest apart on key formative assessment methodology statements but at the same time be the closest on their beliefs of receiving adequate training offers supportive evidence of inconsistencies in educator professional development.

Perhaps another reason for the inconsistency between the results and extant literature is that there has not been enough time to see the impact of formative assessment efforts in North Carolina. Typically, interventions, technological implementations, and change movements take time before the impact is felt. Continued efforts by NCDPI and districts to expand the skill and knowledge level of educators could influence future study findings.

Implications

The findings from this study have two major implications relevant to district education leaders: (a) the importance of establishing a clear purpose for formative assessment and (b) the need for a coherent training and implementation plan.

Establishing a Clear Purpose for Formative Assessment

The study results show that school professionals across North Carolina have mixed perceptions about conceptual knowledge and procedural knowledge of formative assessment. There is no dominant perception, even though research indicates formative assessment knowledge and skill is critical to increasing student proficiency (Black & Wiliam, 1998; Marzano, 2001, 2007; Sadler, 1989; Stiggins, 1994; Stiggins & Chappuis, 2005). The study also implies that a high number of school professionals believe they have had adequate formative assessment professional development. Prior to implementing further professional development programs school leaders may want to complete additional formative assessment research to revise local programs. School leaders may too often be using large-scale summative testing as the primary stimulus for local professional development programs, which research suggests has a negative impact on the instructional and assessment methodologies used by classroom teachers (Amrein & Berliner, 2002; Popham, 2000; Volante, 2004; Wilson, 2005). School professionals may have become so focused on summative assessment in previous professional development programs that they find it difficult to find a purpose for formative assessment. School leaders may need to establish a more inclusive assessment model program and seek to work with education professionals to build a clear purpose for formative assessment as an organizational goal.

Developing a Long-term, Coherent Implementation Plan

A primary purposing obstacle may be an unclear or inconsistent approach by school leaders to expand education professionals' knowledge about formative assessment. A long-term, coherent implementation plan led by school leaders could better support school professionals to use effective formative assessment instructional practices. Furthermore, this could create the possibility for more in-depth studies of the relationship between education professionals' perceptions of formative assessment and student achievement on summative tests.

School leaders may use established planning methods such as the PELP Coherence Framework. Adapted from Tushman and O'Reilly's (2002) Congruence Model, the PELP Coherence Framework helps school leaders to identify the key elements that support district-wide improvement. The framework then assimilates these elements into a coherent, comprehensible set of relationships. School leaders could use this framework to create professional development strategies that support improving student achievement (PELP, 2006). Investigating the use of formative assessment through the PELP lens could provide a platform for important discussions. The framework could support the identification of key elements that are present or missing from formative assessment district implementation. Working from the current NC FALCON professional development modules, state and district school leaders could thoroughly review alignment between the use of formative assessment and the instructional core: teacher knowledge, student engagement, and content. School leaders could consider their underlying theory of change regarding the implementation of formative assessment. This specific reflection and the decisions made forthwith could increase the coherence of future actions taken.

School leaders could also more closely consider the norms, values, and attitudes that drive behaviors across a district in order to improve outcomes. More specifically, they could further examine the structures and systems in place that determine how current school assessments are completed, the availability of resources necessary to implement formative assessments, and external factors that may impact the implementation of formative assessments.

The implications of this study for school leaders support a continued focus on formative assessment, but also highlight the importance of carefully designing a clear, rational implementation plan. This would include establishing a well-defined purpose, developing supportive activities and programs, and communicating with stakeholders in a coherent manner over an extended time period to ensure consistency and sustainability at the district level.

The current effort to establish formative assessment as a unified practice in districts has been found by this study to be in its infancy. By following the recommendation to focus on a well-defined purpose over an extended time period, formative assessments may become a more effective strategy for increasing student achievement. It will certainly allow for a fairer, more accurate evaluation of formative assessment as a practice for district improvement in future studies.

Limitations of the Research Study

This study provided preliminary, district-level findings about the perceptions of formative assessment practices of North Carolina school professionals and their relationship to student achievement. However, there were some important limitations to note. The size of the dataset used for analysis was very large, which made it challenging to interpret the tests for statistical significance. The parametric statistic used is highly sensitive to large sample sizes. That said, the benefits of having a large sample far outweigh the limitations. Further, we were

able to use professional judgment in order to determine whether the differences were meaningful and practically significant.

Also, individual-level student achievement data and demographic data were not available for the study. For this reason district-level analyses had to be used. The use of a dataset linking school professionals' perceptions of formative assessment, their individual characteristics, and the achievement of their assigned students may have enabled even richer findings.

Finally, time was also a limitation of this study. Research favoring the use of formative assessments dates back many years, but not until the 2010–2011 school year did NCDPI implement a formal state-wide professional development effort. This study looked at what school professionals thought about formative assessment in a brief, yearlong timeframe in their career. Even with a module explaining a definition of formative assessment and providing video examples, it may likely take many years for educators to overcome norms and dependably implement formative assessment into daily classroom instruction. Like many other occupations, effective use of knowledge or skills comes after the professional has had opportunities to apply them. The study examined the education professionals' perception of their own engagement with formative assessment after a single, short period of time when they were first being offered an NCDPI common definition of formative assessment.

Recommendations for Further Research

This study examined the total population of North Carolina school districts and included all district-level school professionals within the reviewed respondent data. An additional study using a smaller sample that looks deeply within a few districts may yield more precise results. Furthermore, even though the study did identify respondents by role, the final analysis included a total school professional sample. Smaller, district-level research based on the respondent's

professional role and other defining characteristics may find variations in perceptions of formative assessment between sub-groups. Also, additional psychometric development of the NC FALCON survey may yield more precise, accurate measurements of educators' perceptions of formative assessments. Further validity and reliability testing could be conducted. If a sustained implementation plan can be conducted by state and school leaders, later studies may find cluster samples much more indicative of higher or lower perception of formative assessment. Finally, further individual-level analyses may better identify the factors impacting educators' perceptions of formative assessment. Measuring important variables like an educator's college or university preparatory studies or past work experiences may provide informative data.

Conclusion

This study provided preliminary results on the perceptions of formative assessment among education professionals in North Carolina school districts. Specifically, the study hoped to explore whether any significant relationships existed between school professionals' perceptions of formative assessment and student achievement measured by district EOG, EOC, and AYP proficiencies. Based on survey results, districts were categorized as either having a population of educators with slightly more negative perceptions of formative assessments or slightly more positive perceptions. Each district was then evaluated for relationships with student proficiencies on summative tests.

Initial results suggested small, significant differences between the student achievement levels of clustered districts. The parametric statistic used to test for significance, however, was highly sensitive to the large sample size of this study. Due to the small differences found and the

large sample sizes, it was determined that the differences in student achievement between the two clusters of districts were practically insignificant.

The findings indicate that education professionals across North Carolina have mixed perceptions of their own conceptual knowledge and procedural knowledge of formative assessment. There is no dominant perception of formative assessment even though they indicate a belief of receiving adequate formative assessment professional development.

A major implication from the study relevant to school leaders is the importance of understanding and communicating a clear, coherent formative assessment professional development plan consistent with a defined purpose. Future research studies on perceptions of formative assessments could take place over a longer period of time, compare respondents based upon their professional role, and use qualitative or mixed-methods studies to explore further relationships between perceptions of formative assessment and student achievement.

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APPENDIX A: FRAMEWORK FOR CHANGE

NORTH CAROLINA STATE BOARD OF EDUCATION

FRAMEWORK FOR CHANGE:

The Next Generation of Assessments and Accountability

June 5, 2008

STATE BOARD OF EDUCATION

The guiding mission of the North Carolina State Board of Education is that every public school student will graduate from high school, globally competitive for work and postsecondary education and prepared for life in the 21st Century.

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FRAMEWORK FOR CHANGE:
The Next Generation of Assessments and Accountability

Background

North Carolina is known as a leader in innovations in public education. The state pioneered the use of school-based accountability and school assistance in the late 1980s and early 1990s. North Carolina was the first state to administer a teacher working conditions survey for every educator and the first state to partner with the federal Partnership for 21st Century Skills to create a Center for 21st Century Skills focused on revising standards, assessments, and professional development. One out of every four early colleges in the United States now resides in North Carolina, and the state is poised to add over 30 more in the next two years under the state's Learn and Earn initiative. North Carolina has become a leading state in virtual education with both online high school courses and free online college courses for credit offered to any North Carolina high school student.

Today, public education stands at the threshold of major innovations in teaching and learning. As the pace of technological and economic change accelerates, the system of public schooling is being called upon to quicken its response to these changes and ensure our students are well-equipped to find success in 21st century work and life.

Few would challenge that our systems of standards, assessments, and accountability are the most important drivers for accelerating that change and creating fertile ground for major innovations in how we do business in our schools and classrooms. After over a decade of experience with a system of standards and accountability, North Carolina is positioned to once again lead the nation in this arena.

Our system of assessments and accountability has served North Carolina well for over a decade. Achievement in reading and math on state and national tests has risen since school-based accountability began in the state in the mid-1990s. In fact, North Carolina has made more gains in mathematics since the inception of the National Assessment of Educational Progress (NAEP) than any other state.

Today, it is time to build on the solid foundation that has been laid and construct the next generation of assessments and accountability. This next generation of assessments and accountability must build on what we have learned from more than a decade of experience. Teaching and learning today must be aligned with the 21st century skills that students need for success in their educational, work, and life pursuits. The State Board of Education has a deep commitment to school accountability, to high standards, and to success for all students.

The State Board of Education's 21st Century Mission and Goals & the Blue Ribbon Commission on Testing and Accountability

In September 2006, the State Board of Education adopted a mission that *every public school student will graduate from high school, globally competitive for work and postsecondary education, and prepared for life in the 21st century.* To support that mission, the Board articulated five goals and a series of strategies[1]. Included in those strategies were a number that reflected a vision for a next generation system of standards, assessments, and accountability such as:

- Every student excels in rigorous and relevant core curriculum that reflects what students need to know and demonstrate in a global 21st century environment.
- Every student's achievement is measured with an assessment system that informs instruction and evaluates knowledge, skills, performance, and dispositions needed in the 21st century.

[1] *The State Board of Education's mission, goals, and strategies are detailed in Appendix A.*

- Every teacher and administrator will use a 21st century assessment system to inform instruction and measure 21st century knowledge, skills, performance, and dispositions.
- Every education professional will use data to inform decisions.

In May 2007, the State Board of Education convened a Blue Ribbon Commission on Testing and Accountability to begin the process of assisting the Board in charting a course for realizing these and other goals. The State Board charged the Commission with conducting a comprehensive review of the current assessment and accountability system and offering recommendations for modifications to the current testing program as well as identifying next steps for meaningful change. The State Board asked that the Commission's work be "visionary and in-depth, searching for credible and practical solutions that will serve us well in public education."

The 26-member Commission, chaired by Dr. Sam Houston, was comprised of representatives of education, business and government. Teachers, principals, central office administrators, superintendents, legislators, representatives of higher education, and business/community leaders met regularly over a seven-month period and heard from a large number of stakeholders, including teachers, administrators, parents, and national experts on assessment and accountability.

In January 2008, the Commission presented a report to the State Board that recommended improvements in the current system of testing and accountability and steps toward a next generation of standards, assessments, and accountability for North Carolina's public schools.

The Commission's findings and recommendations have helped to isolate the major next steps needed to transform our approach to standards, assessments, and accountability in North Carolina. The Commission's recommendations for dramatic changes in testing and accountability called for:

- deepening the curriculum and defining more specifically the essential content standards in the core subjects and reflecting 21st century skills in both content standards and aligned assessments;
- moving to a system that includes formative assessments (not just summative assessments or end-of-grade and course tests) which will equip teachers and administrators with data and feedback needed to align instruction to individual student's needs;
- revising the K-8 accountability model and transforming the high school accountability model to focus on graduation rates and student readiness for college and work, not just on performance in core subject areas; and
- providing much greater transparency for educators, parents and the public about expectations, assessments, and results.

The State Board of Education believes that critical improvements can be made immediately to the current system that will lead to greater effectiveness, understanding, and transparency for students, educators and the public at large. In addition, the Board is committed to building a next generation of standards, assessments, and accountability to support student learning and quality teaching that reflect the 21st century assessment and accountability systems outlined in the *Partnership for 21st Century Skills Milestones for Improving Learning and Education*[2] and serve as a model for other states and the nation. This next generation must be characterized by: 1) assessments that are learner-centered, diagnostic, performance-based, and that provide evidence of student performance in core subjects and 21st century skills; 2) accountability measures that focus on both student achievement and learning outcomes; and 3) transparency that provides parents, teachers, and other stakeholders with meaningful information about the expectations, assessments, and performance of students.

Action Steps for Immediate Improvement & Development of the Next Generation of Standards, Assessments, and Accountability

What follows are actions that the State Board of Education is directing the Department of Public Instruction (DPI) to implement. These actions fall into two categories: 1) immediate improvements to our current system, and 2) steps to build the next generation of standards, assessments, and accountability.

Progress in implementing the action steps adopted by the Board will be monitored monthly through the Board's Globally Competitive Students (GCS) Committee.

[2] *The Mile Guide for 21st Century Skills, Milestones for Improving Learning and Education can be found at: http://www.21stcenturyskills.org/downloads/P21_MILE_Guide.pdf*

IMMEDIATE IMPROVEMENTS

The State Board of Education directs DPI to take the following actions to modify and improve assessments and accountability:

1. **Release one form of each test on an annual basis.** DPI will release one form of the test for each grade level and subject tested to the school districts and the public to provide transparency on the state's assessment program.
Effective: 2008-09 school year.

2. **Enact a moratorium on the content standards revision/test development cycle.** DPI will suspend the revision cycle of content standards and development of new tests based on the revised standards. As reflected in the next section of this report, DPI is to undertake a comprehensive revision of content standards.
Effective: immediately.

3. **Make results from new tests comparable to prior tests.** When a test is rescaled to meet higher standards, scale scores and proficiency in both the old standard and the new standard are to be provided for a one-year transition period.
Effective: 2007-08 school year.

4. **Move to a five-year graduation rate for Adequate Yearly Progress (AYP) purposes.** North Carolina will continue to report four-year cohort graduation rates as agreed to in the compact with the National Governors Association. However, if approval is granted by the US Department of Education (USED), for AYP purposes, the high school cohort graduation rate is to be redefined so that it includes students who graduate in five years or less.
Effective: 2007-08 school year.

5. **Count retest scores in performance composites.** Any student who scores at Achievement Level III on a retest of an end of-grade test (EOG) or end-of-course (EOC) test for grades or courses included in the Student Accountability Standards is to be counted as proficient for the school's ABCs performance composite and Adequate Yearly Progress (AYP) purposes.
Effective: 2008-09 school year.

6. **Eliminate the redundancy in EOC (End of Course) and EOG (End of Grade) testing by allowing EOC scores to count as EOG scores in middle grades.** Middle school students who score proficient on an EOC test are to be counted proficient on the comparable EOG test without having to take the EOG test (e.g., middle school students taking Algebra I and scoring proficient on the Algebra I EOC are to be counted as proficient on the math EOG).
Effective: 2008-09 school year.

7. **Change the current approach to writing assessment.** To elevate the importance of writing throughout the curriculum, the current 4th, 7th, and 10th grade writing assessments are to be replaced with a K-12 writing assessment system that includes authentic and on demand writing assignments, appropriate to each grade level and backmapped from the graduation project. The DPI is to provide rubrics, aligned with the writing rubric used for the graduation project, for LEAs to use in assessing these K-12 writing assignments. Writing samples will be housed and scored locally, and DPI staff will conduct random audits to ensure compliance with on-going writing assessments. The DPI is to provide training and professional development to educators to ensure fidelity to the writing assessment process at each grade level.
Effective: Transition in the 2008-09 school year; Full implementation in the 2009-10 school year.

8. **Replace the current English I EOC with a high school English assessment given in grade 10.** The test will be used for ABCs and No Child Left Behind AYP accountability purposes and reflect the communication skills that high school students should have. The assessment is to include performance-based and authentic, real-world tasks.
Effective: 2010-11 school year.

9. **Revamp the current Computer Skills Test to ensure it measures 21st century Information Communication Technology (ICT) literacy.** The current computer skills test is to be reviewed and revised to ensure it measures 21st century ICT literacy, including understanding of systems of technology. The testing window for students to take the test is to be expanded to allow administration

anytime between the sixth and eighth grades, depending on student readiness. Scores are to be banked for accountability purposes.
Effective: 2008-09 school year.

10. **Eliminate the misalignment of assessment for the integrated math courses.** The DPI is to develop appropriate EOC assessments for integrated math courses. The assessments are to include performance-based and authentic, real-world tasks.
Effective: Development is to begin in the 2008-09 school year. The assessments are to be available for use by the 2010-2011 school year.

11. **Shorten the timeframe for reporting results after new tests are administered.** The DPI is to explore options for setting "cut" scores in the most timely manner possible and report to the Board on options.
Effective: Report due by October 2008.

Developing the Next Generation of Standards, Assessments, & Accountability

The State Board of Education directs the DPI to begin immediately the development of a detailed implementation plan for the action steps detailed in this section. The plan is to include timelines, resources needed, and strategies for involving appropriate stakeholders, including the business community, in the development process. In developing the next generation of standards, assessments, and accountability, the DPI is directed to:

- include the participation of teachers, content specialists, and technical experts in the development of the actual assessments;
- provide for the development of briefs/guides for each assessment and release of sample questions before new assessments are administered; and
- provide for the release of at least one form of each assessment on an annual basis.

The comprehensive implementation plan is to be presented to the State Board by October 2008.

1. **Overhaul the PreK-12 Standard Course of Study (SCOS) to focus on essential standards in order to narrow and deepen the state's curriculum.** The DPI is directed to conduct a comprehensive review of the PreK-12 content standards. This should include:
   - articulation of the skills, understandings, and learning experiences critical at each grade level;
   - inclusion of the skills, understandings, and learning experiences necessary to satisfactorily complete the graduation project;
   - infusion of writing, 21st century content, thinking and learning skills, and life skills[3] throughout the content standards; and
   - reflection of rigor, relevance, and relationships between and among subject areas.

Upon adoption of the essential standards by the Board, the Department is to develop appropriate curriculum support materials and professional development, utilizing appropriate technological tools for delivery.

2. **Develop a next generation assessment system which includes formative, benchmark and summative assessments based on the new standards.** The DPI is directed to develop new and aligned assessments based on the essential standards. This includes appropriate extensions for students with disabilities. The new assessment system must:
   - be aligned with the graduation project;
   - include performance-based, authentic, real-world tasks; and
   - provide diagnostic information to teachers on individual students.

3. **Allow LEAs to develop and pilot 21st century assessment models.** The DPI is to present a plan for approving assessment pilots that allow LEAs to develop alternative approaches to assessment that are consistent with the Board's 21st century mission and goals.

4. **Create a comprehensive, customized professional development system to provide teachers and administrators with the skills and understandings needed to use data to inform instructional practice and make formative assessments a daily practice in the classroom.** The system is to include professional development on the essential standards, diagnostic and formative assessment, and technical assistance

[3] *Defined in Appendix B.*

on using data to inform instruction. The plan for the professional development system is to include an assessment of resources currently available.

5. **Update the analysis of the technology infrastructure needed to support a 21st century curriculum and assessment system and to move additional testing to appropriate technology formats.** This analysis will allow the transition from a paper-based assessment system to one that takes greater advantage of technology.

6. **Examine the K-8 accountability model with a 21st century focus.** This examination should include consideration of whether the model appropriately reflects 21st century skills and understandings and how the model affects school designations and recognition. While additional components may be considered, *the focus must remain on student achievement and academic growth.*

7. **Develop a new high school accountability model that includes the high school graduation rate, participation in the high school Future-Ready Core, student performance in core subjects, and other measures of readiness for post-secondary education and skilled work.** To more meaningfully and transparently reflect progress toward graduating students who are future-ready and prepared for life in the 21st century, the DPI is directed to develop a new accountability model for high schools. An advisory committee with appropriate technical expertise should guide the development of the model. *The focus of the new model must remain on student achievement and academic growth.*

The State Board of Education's Commitment to High Standards for Students and Schools

As North Carolina moves to the next generation of assessments and accountability, the State Board of Education's commitment to high standards for students is **unwavering**. The Board recognizes that today's students live in an ever-changing, global economy. Without a doubt, students will enter a workforce and a world that is different than the one that exists today. It is clear to the State Board of Education that the state's expectations for student learning must increase accordingly.

The Board understands that North Carolina's system of assessments and accountability must support the kind of teaching and learning that prepare students for the future. As the Board and the DPI implement the action steps described in this document, it may also consider and identify additional steps to be implemented in moving to the next generation of assessments and accountability. For example, it may consider ways to provide students, parents, and other stakeholders with more meaningful information about how North Carolina's students perform in comparison to other students globally. In all deliberations, the Board will be guided by its mission. It will seek input from and the involvement of stakeholders, including the business community, which is a critical partner as we develop the next generation of assessments and accountability.

APPENDIX A: North Carolina State Board of Education Mission and Goals

The guiding mission of the North Carolina State Board of Education is that every public school student will graduate from high school, globally competitive for work and postsecondary education and prepared for life in the 21st Century.

Goal 1: NC public schools will produce globally competitive students.

- Every student excels in rigorous and relevant core curriculum that reflects what students need to know and demonstrate in a global 21st century environment, including a mastery of languages, an appreciation of the arts, and competencies in the use of technology.
- Every student's achievement is measured with an assessment system that informs instruction and evaluates knowledge, skills, performance, and dispositions needed in the 21st century.
- Every student will be enrolled in a course of study designed to prepare them to stay ahead of international competition.
- Every student uses technology to access and demonstrate new knowledge and skills that will be needed as a life-long learner to be competitive in a constantly changing international environment.
- Every student has the opportunity to graduate from high school with an Associates Degree or college transfer credit.

Goal 2: NC public schools will be led by 21st century professionals.

- Every teacher will have the skills to deliver 21st century content in a 21st century context with 21st century tools and technology that guarantees student learning.
- Every teacher and administrator will use a 21st century assessment system to inform instruction and measure 21st century knowledge, skills, performance, and dispositions.

- Every education professional will receive preparation in the interconnectedness of the world with knowledge and skills, including language study.
- Every education professional will have 21st century preparation and access to ongoing high quality professional development aligned with State Board of Education priorities.
- Every education professional will use data to inform decisions.

Goal 3: NC public school students will be healthy and responsible.

- Every learning environment will be inviting, respectful, supportive, inclusive, and flexible for student success.
- Every school provides an environment in which each child has positive, nurturing relationships with caring adults.
- Every school promotes a healthy, active lifestyle where students are encouraged to make responsible choices.
- Every school focuses on developing strong student character, personal responsibility, and community/world involvement.
- Every school reflects a culture of learning that empowers and prepares students to be life-long learners.

Goal 4: Leadership will guide innovation in NC public schools.

- School professionals will collaborate with national and international partners to discover innovative transformational strategies that will facilitate change, remove barriers for 21st century learning, and understand global connections.
- School leaders will create a culture that embraces change and promotes dynamic continuous improvement.
- Education professionals will make decisions in collaboration with parents, students, businesses, education institutions, and faith-based and other community and civic organizations to impact student success.
- The public school professionals will collaborate with community colleges and public and private universities and colleges to provide enhanced educational opportunities for students.

Goal 5: NC public schools will be governed and supported by 21st century systems.

- Processes are in place for financial planning and budgeting that focus on resource attainment and alignment with priorities to maximize student achievement.
- Twenty-first century technology and learning tools are available and are supported by school facilities that have the capacity for 21st century learning.
- Information and fiscal accountability systems are capable of collecting relevant data and reporting strategic and operational results.
- Procedures are in place to support and sanction schools that are not meeting state standards for student achievement.

APPENDIX B: Twenty-First Century Content and Skills

21st Century Content

Global Awareness

- Using 21st century skills to understand and address global issues.
- Learning from and working collaboratively with individuals representing diverse cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in personal, work and community contexts.
- Having the ability to utilize non-English languages as a tool for understanding other nations and cultures.

Financial, Economic, Business and Entrepreneurial Literacy

- Knowing how to make appropriate personal economic choices.
- Understanding the role of the economy and the role of business in the economy.
- Using entrepreneurial skills to enhance workplace productivity and career options.

Civic Literacy

- Being an informed citizen to participate effectively in government.
- Exercising the rights and obligations of citizenship at local, state, national and global levels.
- Understanding the local and global implications of civic decisions.

Health Awareness

- Having the ability to access health information and services, navigate health institutions and act as an effective advocate to improve health for self, family and/or community.
- Understanding preventive physical and mental health measures, including proper diet, nutrition, exercise, risk avoidance and stress reduction.
- Demonstrating understanding of national and international health.

Thinking and Learning Skills

Critical Thinking and Problem Solving Skills

- Exercising sound reasoning in understanding.
- Making complex choices.
- Understanding the interconnections among systems.
- Framing, analyzing and solving problems.

Communication

- Articulating thoughts and ideas clearly and effectively.

Information and Media Literacy Skills

- Understanding, managing and creating effective oral, written and/or multimedia communication in a variety of forms and contexts.
- Analyzing, accessing, managing, integrating, evaluating and creating information in a variety of forms and media.

Creativity and Innovation Skills

- Demonstrating originality and inventiveness in work.
- Developing, implementing and communicating new ideas to others.
- Being open and responsive to new and diverse perspectives.

Collaboration Skills

- Demonstrating ability to work effectively with diverse teams.
- Being willing to be helpful and make necessary compromises to accomplish a common goal.

Contextual Learning Skills

- Having the ability to take advantage of education in a variety of contexts both inside and outside the classroom; understanding that knowledge is acquired within a context.

ICT literacy

- Using technology in the course of attaining and utilizing 21st century skills.

Life Skills

Leadership

- Using interpersonal and problem-solving skills to influence more than one person toward a goal.
- Having the ability to leverage strengths of others to accomplish a common goal.

Ethics

- Demonstrating integrity and ethical behavior in personal, workplace and community contexts.

Accountability

- Setting and meeting high standards and goals for one's self and others.

Adaptability

- Adapting to varied roles and responsibilities.
- Tolerating ambiguity and changing priorities.

Personal Productivity

- Utilizing time efficiently and managing workload.
- Being punctual and reliable.

Personal Responsibility

- Exercising personal responsibility and flexibility in personal, workplace and community contexts.

People Skills

- Working appropriately and productively with others.

Self Direction

- Monitoring one's own understanding and learning needs.
- Demonstrating initiative to advance professional skill levels.
- Having the ability to define, prioritize and complete tasks without direct oversight.
- Demonstrating commitment to learning as a lifelong process.

Social Responsibility

- Acting responsibly with the interests of the larger community in mind.

FINAL PAGE OF APPENDIX A

APPENDIX B: RESPONSE TO THE FRAMEWORK FOR CHANGE

Response to *The Framework For Change:* The Next Generation of School Standards, Assessments and Accountability October 2008

NCDPI/Academic Services

Table of Contents

I. Introduction to the Next Generation of Standards, Assessments and Accountability

Since the publication of *A Nation at Risk* (1983), there have been ongoing efforts by states to revise standards, assessments, and accountability to increase student achievement. North Carolina has continually been a leader in these efforts and the publication of the North Carolina State Board of Education's *Framework For Change* (*FFC*) calls our state to again lead educational reform in the United States by example. The *FFC* provides a clear, broad directive to improve standards, assessments, and accountability and represents an opportunity for the Department of Public Instruction (DPI) to lead, with the help of engaged stakeholders, a collaborative revision process that contributes to accomplishing the SBE's goals for students.

The spirit of the *Framework For Change,* that *every public school student will graduate from high school, globally competitive for work and postsecondary education, and prepared for life in the 21st century,* is the spirit of the proposed plan.

a. A Simple Vision

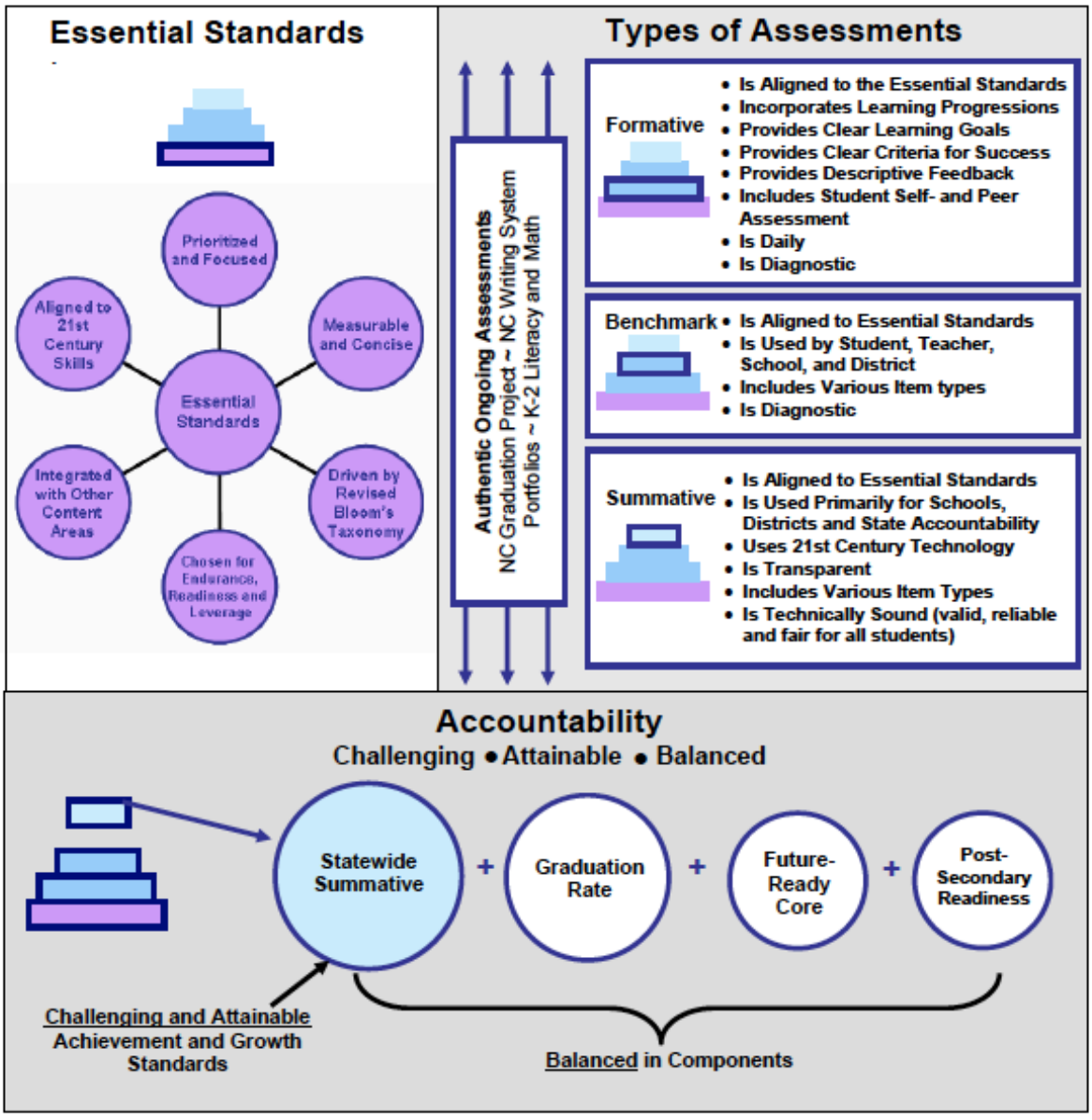
The Framework for Change focuses on…

Essential Standards	***What students must know, understand and be able to do to be prepared to compete in the 21st century.***
Assessments	***The tools or processes used to determine what students know, understand and are able to do at any point in time.***
Accountability	***A system to ensure SBE, DPI, District Leaders, School Leaders and Teachers are preparing students to compete in the 21st Century.***

b. Overview of the Simple Vision

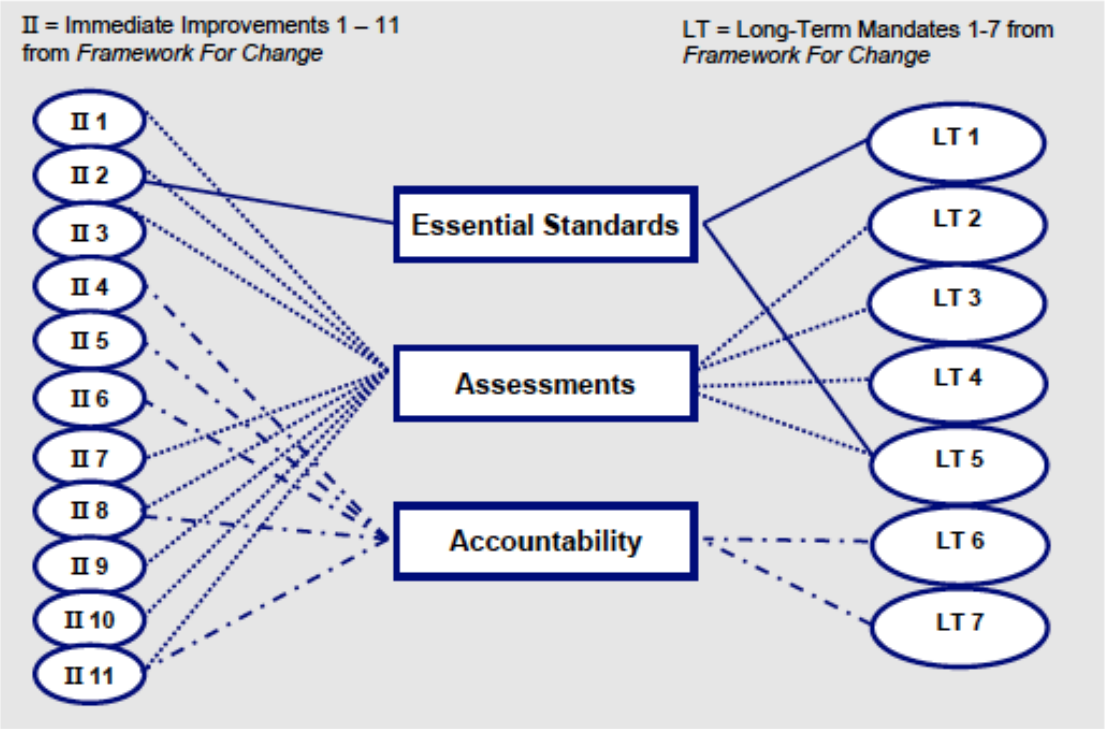
Figure A offers a preview of the components of the proposed model for The Next Generation of School Standards, Assessments and Accountability.

Figure A: Overview of The Next Generation



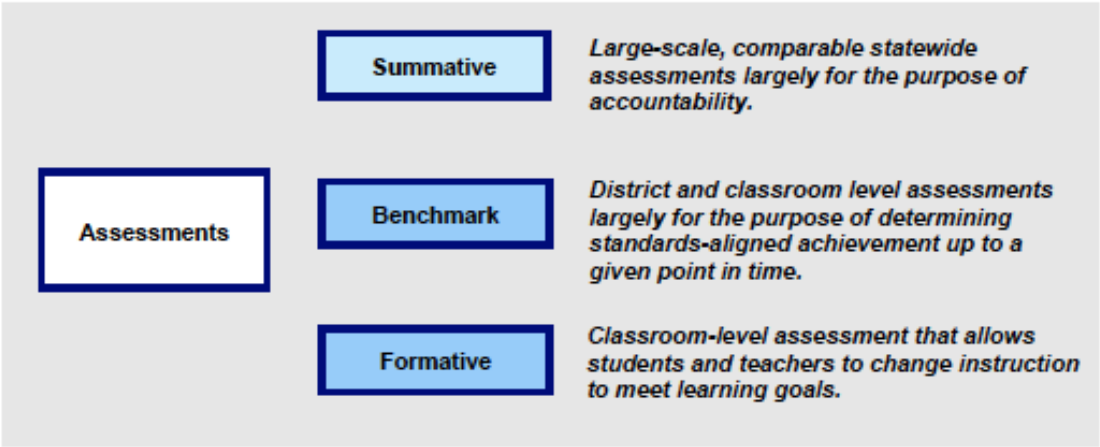
Every part of the *Framework for Change* aligns to Essential Standards, Assessments or Accountability.

Figure B: Alignment to the Framework



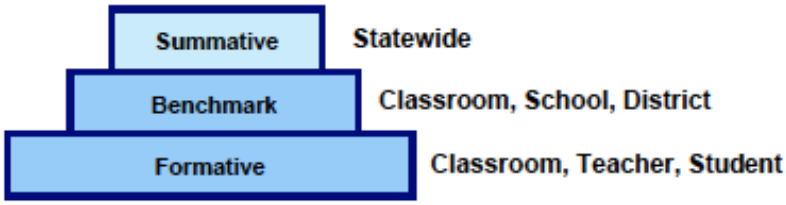
While the ultimate student goals are defined by the **Essential Standards** for each grade and subject area, **Figure B**, demonstrates that **assessments** require a more multi-dimensional response (12 out of 18 directives are aligned to revision of assessments). For greater clarity, assessments can be better defined in three categories as in **Figure C**.

Figure C: Assessment Categories



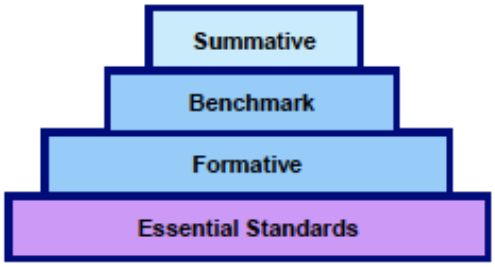
All three categories of assessment are important. Classroom formative assessment is important for changing outcomes, benchmarking for following incremental progress and statewide summative for school and district accountability. **Figure D** depicts the relative importance of each type of assessment and the way each builds on the other…

Figure D: Assessment



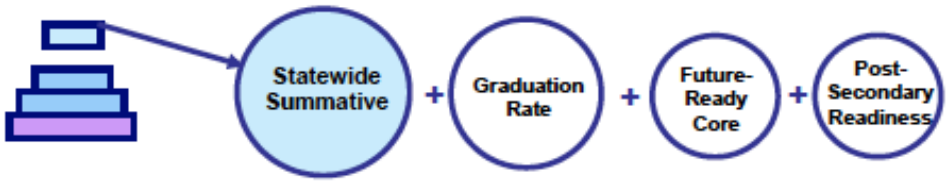
The **Essential Standards** are the foundation as shown in **Figure E**.

Figure E: "The Cake"



Accountability fits into this picture as the summative layer (standardized student achievement and growth) of the cake and adds a couple of other key ingredients…

Figure F: Accountability Components



c. Principles for *Framework for Change* Implementation

Plans are filtered through four principles.

Transparency: At its very root, transparency means that there are "no mysteries" about what teachers should teach, students must learn and how students will be assessed. The end product for every content area and subject, including both the essential standards themselves as well as all supporting materials and assessment tools, must be a totally clear expression of student expectations that set a prioritized, rigorous and understandable standard. How the expectations will be measured, particularly on the statewide summative assessment, must be clear.	**Stakeholder Involvement:** To ensure the right choices are made, the process of developing standards and assessments will be decentralized. Involving teachers, principals, parents, students and the higher-education and business community has always been an important part of curriculum and assessment writing. That involvement will be increased through the use of technology (electronic surveys, Wikis, video-conferencing, etc.) so that DPI's role will be as facilitator of an authentic, statewide collaborative process of standard setting and assessment development.
Alignment: Throughout the process, the alignment of all components must be ensured and alignment must continually and systemically be tested. A key step forward will be ensuring the vertical alignment of the curriculum so the K-12 pathway leads to success on EOCs and the North Carolina Graduation Project.	**Measuring Our Success, Formatively and Summatively:** Regular updates will be provided to the State Board of Education and the public on progress in implementation of the *Framework For Change*. Updates will include evidence of progress against indicators of success and any necessary changes to the implementation plan.

II. Essential Standards – Long-Term I

Alignment to Framework:

Long-Term 1: Overhaul the PreK-12 SCOS to focus on essential standards in order to narrow and deepen the state's curriculum

- articulation of the skills, understandings, and learning experiences critical at each grade level;
- inclusion of the skills, understandings, and learning experiences necessary to satisfactorily complete the graduation project;
- infusion of writing, 21st century content, thinking and learning skills, and life skills throughout the content standards; and
- reflection of rigor, relevance, and relationships between and among subject areas.

a. Essential Standards Overview

The Essential Standards will be those skills, understandings and learning experiences that all students must master and/or complete at each grade level or course in order to move to the next level of learning. Essential Standards will clarify what must be learned at each level and lessen the chance that critical knowledge is overlooked.

Essential Standards will provide the focal point for professional development, teacher education programs, instructional technology uses, and supporting documents.

b. Definitions

Curriculum is a plan for the management of time, materials and learning experiences that contains content standards, scope and sequence.

Essential Standards are content standards that focus on big, powerful ideas and enduring understandings. Essential standards are assessed in the classroom via formative, benchmark, and summative assessments.
These standards will be identified based on three main criteria:

1) Endurance: Standards will provide students with knowledge and skills that are valuable beyond a single test. For example, reading comprehension skills will endure.
2) Leverage: Standards will provide knowledge and skill that will be of value in multiple disciplines. For example, writing persuasively will serve a student in many disciplines.
3) Readiness: Standards will provide students the ability to move to the next grade-level or next level of learning.

Supporting Standards are standards that can be used during the instruction to under-gird and add breadth to the essential standards.

Essential Objectives are sub-sets of essential standards. Statewide accountability assessments will be written in precise alignment to essential objectives.

Supporting Objectives are sub-sets of supporting standards.

Strands are organizing features that provide vertical alignment K-12 and are prevailing concepts that permeate a discipline.

Performance Indicators are descriptions (or assessment items) at each grade level that indicate how students demonstrate mastery of content and cognitive skills.

Curriculum integration is when skills and knowledge from multiple disciplines are taught in relation to one another, promoting conceptual understandings.

Interdisciplinary study is when concepts are derived from content standards of two or more disciplines and taught by one or more teachers to demonstrate the interconnectedness of multiple disciplines and promote the expansion of a shared body of knowledge and skills.

c. Qualities of Essential Standards

The Essential Standards will be characterized by six qualities.

Quality	Why Is This Important?	Achieved By…
Chosen for Endurance, Leverage, and Readiness	• Helps teacher and students master what is most important and prioritizes limited time in the classroom • Helps content writers determine what is most important for students to know, understand, and be able to do • Forces the standards writers to be deliberate in determining what standards are essential • Ensures that a uniform process of developing standards is used by all content areas	• Implementing the Ainsworth process of identifying and developing Essential Standards that considers endurance, leverage, and readiness as key criteria • Regular stakeholder involvement in determining priority standards and objectives
Prioritized and Focused	• Helps teachers and students master what is most important and prioritizes limited time in the classroom • Provides a rigorous and in-depth study of content • Allows teachers more time to spend on a narrowed content • Leads to alignment of the written, taught, and assessed content	• Regular stakeholder involvement in determining priority standards and objectives • Use of a new format to promote integration and alignment • Use of a single taxonomy to promote consistency (and emphasizing the cognitively complex levels of Revised Bloom's Taxonomy (RBT) to ensure depth and rigor) • Enabling statewide summative assessments to focus on the Essential Standards
Aligned to 21st century skills	• Equips students for the current century • Prepares students with the knowledge and skills to compete and collaborate in a global society • Provides a national and international set of priority skills to which the Essential Standards will align	• Filtering Essential Standards through the Framework for 21st century learning • Using a new format that promotes alignment with 21st century skills • Embedding technology in the instruction and learning in all content areas
Measurable and Concise	• Guarantees instruction, assessments and statewide tests are parallel to enhance measurable student achievement • Promotes relevant classroom instruction aligned with the Essential Standards and related assessments and tests	• Communicating clearly what students are expected to know, understand, and be able to do using RBT and making choices about what is most important for endurance, leverage and readiness • Clarifying in the SCOS what should be measured via classroom and state level assessments • Developing performance indicators simultaneously with Essential Standards and objectives
Integrated with other content areas and driven by RBT	• Demonstrates that integration is inherent to the learning process • Drives teachers to make natural connections between content areas when plausible and possible • Ensures consistency among content areas standards development • Use of the higher levels of Bloom's ensures depth	• Using a format that identifies potential integration of content areas • Employing RBT when developing content area standards

d. Essential Standards Format

The new NC Essential Standards Course of Study framework conveys the NCSCOS as an interactive, dynamic system. It provides standards, objectives, strands, and performance indicators in addition to showing connections between objectives in disciplines as well as 21st century themes and skills.

Under each standard, essential objectives necessary to reach the standard, and performance indicators for assessing proficiency levels of achievement on each objective, will be provided. Strands will be correlated to track the development of important concepts throughout each grade/course. Finally, a matrix will show connections between specific content objectives and other disciplines and 21st century themes and skills. All content standards will be posted on-line as an interactive tool for teachers.

All content areas and grades will have:

- *Introduction to Essential Standards*
- *Integration of technology for each specific content area*
- *K-12 essential content standards*
- *Classroom assessments and performance indicators*
- *Appendices including:*
    1. *Glossary of Terms*
    2. *Bibliography*
    3. *Members of writing committee*

Supporting Documents:

1. *International and national standards matrix*
2. *Workplace skills and career development competencies matrix*
3. *Extended standards for exceptional children*
4. *Supporting standards and objectives*

III. 21st Century Balanced Assessment System – Long-Term 2, 4 & 5

Alignment to Framework:

Long-Term 2: Develop a next generation assessment system which includes formative, benchmark and summative assessments based on the new standards.

Long-Term 4: Create a comprehensive, customized professional development system to provide teachers and administrators with the skills and understandings needed to use data to inform instructional practice and make formative assessments a daily practice in the classroom.

Long-Term 5: Update the analysis of the technology infrastructure needed to support a 21st century curriculum and assessment system and to move additional testing to appropriate technology formats. This analysis will allow the transition from a paper-based assessment system to one that takes greater advantage of technology.

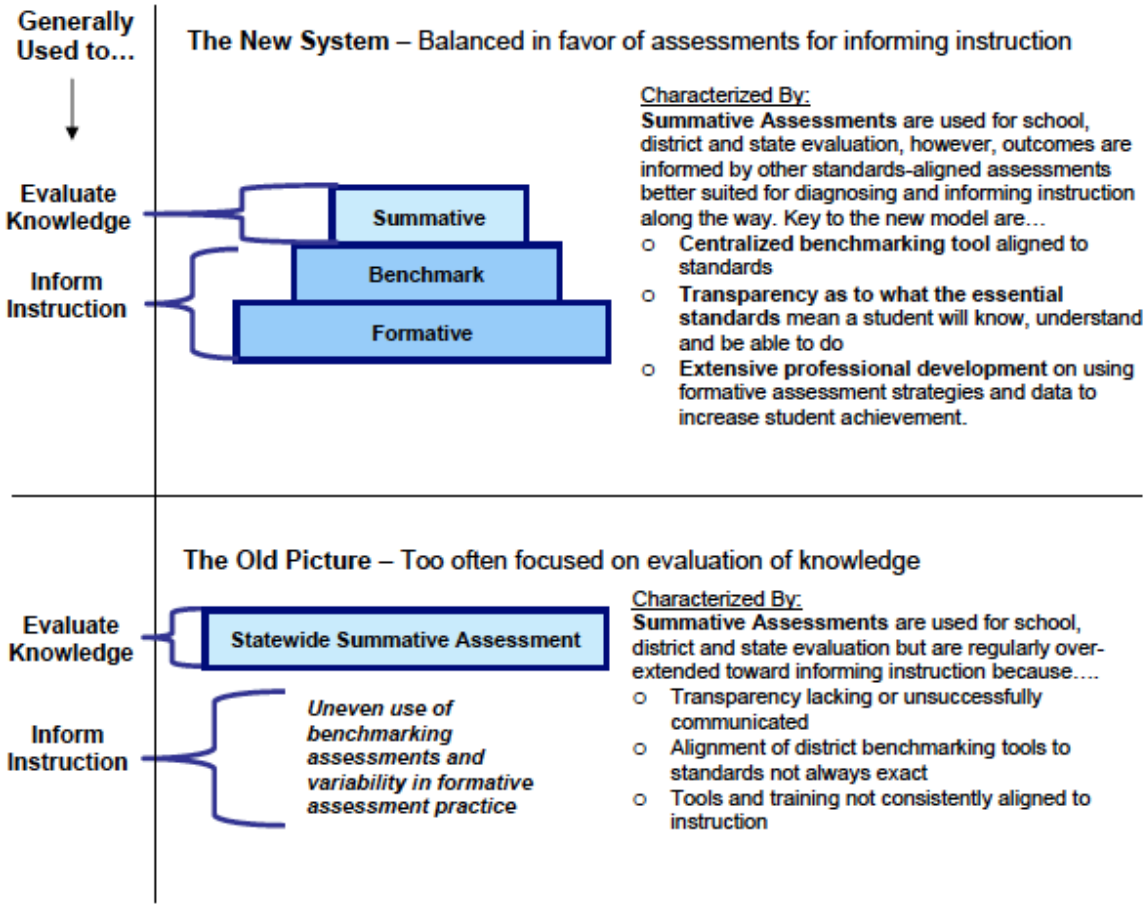
a. Inform Instruction *and* Evaluate Knowledge

The State Board of Education recognizes the need for an **assessment** system that supports, promotes, and measures 21st century learning as stated in the following goals:

> ***(1) NC public schools will produce globally competitive students.***
>
> *Every student's achievement is measured with an assessment system that* ***informs instruction and evaluates*** *knowledge, skills, performance, and dispositions needed in the 21st century.*
>
> ***(2) NC public schools will be led by 21st century professionals.***
>
> *Every teacher and administrator will use a 21st century assessment system to inform instruction and measure 21st century knowledge, skills, performance, and dispositions.*

A key to understanding the approach from the *Framework for Change* and this plan is to take a closer look at goal # 1. Educators need to assess both to inform instruction *and* evaluate knowledge, skills, performance, and dispositions. This is a dichotomy about how assessments are used. Assessments are typically designed for only one of the two uses. To evaluate *and* inform instruction requires more than a single test, even more than a series of assessments: it takes a **system** both to evaluate and inform instruction. **Figure G** illustrates the old and new picture.

Figure G – The New System and the Old Picture



Data from large-scale summative tests are significantly less informative at the teacher and student-level, most dramatically in comparison to effective classroom assessment. A teacher using appropriate standards-aligned classroom assessments will invariably know at a much deeper level what a student knows and is able to do. The new model will supply aligned tools and training to ensure teachers have the knowledge and resources to administer standards-aligned assessment that will information instruction.

In line with the *FFC*, the new assessment system will emphasize the importance of classroom level assessment and transparency. Each type of assessment must be aligned to Essential Standards.

Figure H: A Comprehensive Balanced Assessment System*
Each type of assessment is important and serves a distinct purpose.

	Formative	Benchmark	Statewide Summative Assessments
Purpose	Assessment *for* Learning What learning comes next for *this* student at this point in time?	Assessment *of* Learning How are students progressing? How well is this program working?	Assessment *of* Learning How are schools and districts progressing? How is the state progressing?
Focus	❖ Teachers ❖ Students ❖ Parents	❖ School Leaders ❖ District Officials ❖ Curriculum Specialists ❖ Teachers (Professional Learning Communities) ❖ Students and Parents	❖ Policymakers ❖ School Board Members ❖ Legislators ❖ District Staff ❖ Teachers (Professional Learning Communities) ❖ Students and Parents
Frequency	❖ Daily, prior to, and during instruction	❖ Periodically, throughout the year, between and among instructional units.	❖ Annually, coming as close to the end of the year or end of course as possible
Use of Results	❖ To inform instruction and provide descriptive feedback to students about their learning ❖ To promote meta-cognition and self-assessment behaviors in students ❖ To direct teacher response to the student's need for remediation or extension ❖ To develop teachers as reflective practitioners ❖ To develop students as reflective learners	❖ To determine how much learning has taken place up to a particular point in time ❖ To identify learning issues for targeted groups and subgroups based on their progress ❖ To evaluate efficacy and gaps in adopted curriculum and instructional strategies.	❖ To develop strategic, long-term evaluation of curriculum and programming based on trends over time ❖ To determine student achievement levels ❖ To provide institutional information that influences policy developed by superintendents, school board members and legislators
Examples	❖ Questioning ❖ Discussions ❖ Learning Activities ❖ Descriptive Feedback ❖ Teacher-Student Conferences ❖ Interviews ❖ Student Reflections/Journals ❖ Ungraded class work or homework ❖ Teacher observations	Teacher or textbook quizzes, tests Teacher Learning Teams or districts may develop common: ❖ Mid-term and end of unit assessments ❖ 9-week or quarterly assessments ❖ District Assessments Commercial Products ❖ Examples: MAP, SCASS, DIBELS, Classworks, Blue Diamond State-Specific Systems: ❖ ClassScape	❖ NC End-of-Grade ❖ NC End-of-Course ❖ VoCATS

*The assessment system may also include other standardized assessments such as ASVAB, NAEP, TIMSS, SAT, ACT

b. Formative Assessment

i. What is Formative Assessment?

Formative assessment is a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve intended instructional outcomes (CCSSO FAST SCASS, 2006).

The purpose of formative assessment is to assist teachers in identifying where necessary adjustments to instruction are needed to help students achieve the intended instructional outcomes that are ultimately defined by the **Essential Standards.** Formative assessment is ongoing, minute-by-minute assessment that is integral to instructional delivery. The primary users of formative assessment information are students and teachers. Formative assessment, as here defined, is a best practice that research has shown will improve student learning.

Attributes of effective formative assessment include:

- → providing students with learning goals and targets in language they can understand
- → clearly describing the criteria for successfully meeting the target through examples
- → effectively using learning progressions to scaffold learning
- → providing descriptive feedback that helps students know what to do next in their learning
- → establishing collaborative partnerships between teachers and students
- → actively engaging students in self-assessment as well as peer-assessment.

In the current testing system, there is not a systematic effort to maintain and improve the effectiveness of formative assessment. In a testing system that only includes statewide summative tests, formative assessment is often forgotten while the classroom assessment focus is on benchmark tests that look and feel like mini-statewide tests. In the new assessment system, **formative assessment** should be a daily practice to support and promote learning. Teachers will need ongoing professional development, and the State will need to build and provide continued support to enhance the local capacity to meet this need.

ii. Formative Assessment and the Essential Standards

By defining formative assessment as daily, ongoing, classroom assessment such as descriptive feedback and minute-by-minute checks for understanding, it becomes one of the most powerful types of assessment for changing student outcomes. To ensure that formative assessment is aligned to the Essential Standards two major initiatives are proposed:

1) **Transparency.** One of the main ways to ensure that day-to-day instruction and day-to-day formative assessment align to the Essential Standards is to ensure that every teacher and every student understands what the Essential Standards mean a student will know, understand and be able to do. Some ways to take the mystery out of what students must know, understand and be able to do are…
    - Writing a concise set of Essential Standards
    - Developing performance indicators that clearly define how an essential objective will be measured
    - Unpacking objectives into discrete sub-objectives for transparency
    - Releasing one form of the EOCs and EOGs annually
    - Providing a benchmarking tool that provides an exhaustive set of usable items (multiple-choice, constructed response and performance tasks) aligned to the Essential Standards
2) **Professional Development.** Online professional development (PD) modules will consistently address and incorporate alignment to the Essential Standards.

iii. Formative Assessment and PD Recommendation

Recommendation: Professional development through the use of modules, digital learning sites, and an online professional learning community should be developed, maintained, and delivered by the North Carolina Department of Public Instruction in order for educators and stakeholders to support a comprehensive balanced assessment system with a specific emphasis on formative assessment.

Next Steps: All DPI staff and NC public school educators should be introduced to the new assessment system and the differences between formative, benchmark, and summative assessment. A cross-functional team (e.g., representatives from various sections, divisions, and areas) of professional development staff should be identified and trained on delivering professional development to NC teachers, district coordinators, and administrative staff. Professional development should focus on formative, benchmark and summative assessment.

Because formative assessment should be used daily and promotes learning, development of a series of modules focused on formative assessment is essential for increasing student achievement. These modules will be developed and administered online and will focus on authentic teaching scenarios, alignment to the Essential Standards and widely acknowledged best practices.

Formative Assessment Training modules are proposed based on the needs identified by representatives from the following teams/staffs who have recently observed teachers in North Carolina classrooms: North Carolina Formative Assessment Project Team; Comprehensive Support Instructional Facilitators; Curriculum, Instruction, and Technology staff; Exceptional Children staff; NC Testing Program staff; and CTE staff. Please see the table in Appendix B.

iv. Qualities of Formative Assessment

The formative assessment process will be characterized by seven qualities.

Quality	Why Is This Important?	Achieved By…
Is Daily	• Provides ongoing feedback to students and teachers • Integrates seamlessly with instruction	• Providing PD Modules • Discussing the importance of formative assessment in professional development • Continuing to partner with other states to explore ways to build capacity • Working with Local Education Agencies (LEAs) to build capacity at the local level
Provides Clear Learning Goals	• Provides learning goals in language students can understand	• Providing PD Modules • Working with the Essential Standards Committee to ensure targets are clear • Providing professional development to teachers and district leaders on how to deconstruct/unwrap standards
Provides Clear Criteria for Success	• Provides students examples of what quality work looks like • Allows teachers to plan with the end in mind	• Providing PD Modules • Providing clear examples of quality work and emphasizing their importance in curriculum documents
Provides Descriptive Feedback	• Provides specific information to identify the gap between current learning and desired outcomes • Focuses on enhancing student learning without assigning grades or scores	• Providing PD Modules • Providing examples on the web site • Developing an online professional learning community so that teachers can share student work and get advice on how to provide effective feedback to students • Providing recommendations on how to balance the need for grades and the power of descriptive feedback
Includes Student Self and Peer Assessment	• Provides opportunities for students to self-reflect • Enables students to use the criteria for success and focus on the learning targets	• Providing PD Modules • Providing examples on the web site
Is Aligned to ES	• Ensures that the focus is on learning the Essential Standards	• Incorporating alignment to standards throughout the 13 PD modules
Is Diagnostic	• Uses assessments to uncover necessary pre-requisite skills that students need to master essential objectives	• Developing Professional Development Modules to help teachers interpret evidence of learning

c. Benchmark Assessments

i. Overview of Proposed Benchmarking Tool

Benchmark assessments are given to students periodically throughout the year or course to determine how much learning has taken place up to a particular point in time and to track progress toward meeting curriculum goals and objectives.

Currently, each Local Education Agency (LEA) or school must develop its own benchmarks using tools the school system develops or purchases. The degree of alignment and quality varies from system to system. All school systems and schools should have access to standards-aligned items to create benchmarks. Tools should be in place to diagnose which standards still need to be met and strategies on what to do next to meet them.

Recommendation: A benchmark assessment tool that contains an item bank that can be used for developing benchmarks for classrooms, schools, and LEAs should be developed, maintained, and disseminated by DPI. Professional development should demonstrate how the benchmark tool can support formative assessment practices and measure essential standards.

The assessment tool should be **centralized** and contain a large and comprehensive repository of tasks/items that align to every objective within the Essential Standards for all content areas. The item bank should contain secure and non-secure items. Principals and district-level staff should have access to secure tasks/items to create common benchmark assessments. Teachers should have access to non-secure items to develop common classroom assessments or for classroom activities. By providing the item bank, the State will level the playing field by providing every school system with access to items that are aligned to the Essential Standards. The assessment tool and professional development will provide guidance on how to create benchmarks, how to interpret the data, and what steps to take next for students who are not on the pathway to meeting the standards.

Next Steps: An RFP should be developed to secure a vendor for this project. Until a state item bank can be in place, DPI should provide a list of approved vendors and/or a set of criteria for evaluating vendors.

ii. Qualities of Benchmark Assessment Tool

The benchmarking assessment tool will be characterized by four qualities.

Quality	Why Is This Important?	Achieved By ...
Is aligned to Essential Standards	• Guarantees instruction, assessments and tests are parallel to enhance student achievement • Contributes to transparency by allowing teachers and students access to multiple items that align to particular standards and objectives.	• Issuing an RFP for development of a customized benchmark assessment system • Including items from all curriculum areas
Is used by the teacher, school, and LEA	• Allows customization and ownership of use	• Providing access to all schools and systems • Partitioning the item bank for secure and non-secure items • Providing professional development on how to interpret and use the data
Includes various item types including constructed response, performance and multiple choice	• Allows students to show what they know and how they think in a variety of ways	• Requiring the vendor to develop constructed response, performance tasks, and multiple-choice items • Requiring the use of computer simulations when appropriate
Is diagnostic	• Identifies learning issues for targeted groups and subgroups based on their progress • Evaluates efficacy and gaps in adopted curriculum and instructional strategies	• Providing professional development modules on using assessment data to guide instructional decision-making • Requiring the vendor to develop enough secure and non-secure items that benchmarks can be developed that provide diagnostic information • Including instructions that tell the user how to build the benchmark from the item pool so that diagnostic information is valid • Including information to the user on what to do next with the results

Proposed Statewide Benchmarking Tool

Teacher Accessible Portion	LEA Leadership Accessible Portion
Used by teachers in classrooms at their discretion and with the help of centralized professional development. Also, contributes to transparency by making available multiple items for every objective.	For creation of common standards-aligned benchmarks implemented across classrooms at particular grade-levels

d. Statewide Summative Assessments

i. Overview

Summative assessments are a measure of achievement to provide evidence of student competence or program effectiveness. Summative assessments can be found at the classroom, LEA, and state level. Large-scale summative assessments typically occur annually and are used to determine state, LEA, and school progress over time. Data from large-scale summative assessments can be disaggregated and used to determine trends in achievement by various groups of students.

Statewide summative data (e.g. EOG and EOC scores) can be used reliably as a supplemental piece of information that is combined with a number of other, and often richer, pieces of information (e.g., formative assessment data, teacher tests, teacher observation, as well as LEA or school-level benchmark assessment data).

ii. Recommendations and Next Steps

General Summative Assessment Recommendations

1. **Use constructed-response and performance task items when such items are appropriate based on developed criteria**
2. **Phase-in shift to computer-based testing**
3. **Increase transparency measures, both after the fact by release of testing forms and testing material, and beforehand with performance indicators for each objective in the essential standards and a rich, standards-aligned benchmarking tool**
4. **Convene an Innovative Assessment Research Team**
5. **Develop a guide or tool for administering 21st century and computer-based assessments**

	Type of Item	Advantages	Disadvantages	Recommendation: A combination of all three
ITEM FORMAT	**Multiple-choice items (MC)**	• Samples wider span of the content domain • Produce more reliable scores • Make developing, administering and scoring of tests more efficient and economical • Allow reuse of MC items • Are transparent and reliable • Span the levels of cognitive complexity • Can be scored rapidly, accurately, and inexpensively • Provide objective scores	• May result in drill and kill teaching • Are inappropriate for some purposes (abilities like writing & creative thinking are not easily assessed with MC items)	**Next Steps:** Δ **Develop Criteria** for determining which Essential Objectives will be assessed with constructed response. Criteria (in form of a decision tree or rubric) will allow us to make effective choices about which objectives are best assessed with CR (e.g. an objective that requires a student to "create" will be best assessed with CR.) **Presented in August 2009.** Δ **Convene Innovative Assessment Research Team** This internal team will research and make concrete, actionable recommendations based on national and international research on technological innovations in assessment that should be pursued including computer-based simulations, computer-based accommodations and computer adaptive testing – in short, determine how technology can help teachers, schools and the state collect better, more authentic student achievement data. **Report Presented in July 2009.**
	Constructed-Response (CR): Written items (e.g. essays, short-answer, gridded response)	• Reflect the kind of academic and professional tasks that a child will be asked/required to do • Serve as professional development when scored • Encourage teaching the standard so that students master material rather than encourage "test prep" • Reflect the demonstration of knowledge and skill required by the Graduation Project.	• Have high costs in development, scoring and ongoing high costs because CR items often cannot be re-used • Require more time per item thus compromising breadth or reducing the # of assessment items aligned to a particular objective • May contain scorer bias (threat to validity of score interpretations & uses) • Have lower reliability • Result in slower score turnaround	
	Constructed Response: Performance Tasks (PT) (e.g. demos, experiments, oral presentations)			
	Option	**Advantages**	**Disadvantages**	**Recommendation: Option 1 (phased-in)**
TEST PRESENTATION	**Option 1.** Computer-based administration	• Is cheaper in the long-term • Offers faster access to data; impacts speed of scoring • Provides opportunities for innovative testing • Has increased flexibility and standardization of accommodations for special needs students	• Has up-front costs • Has implications in terms of hardware, software, connectivity (e.g., local bandwidth), availability of computers within a school and district • Results in a need to develop viable alternate administrations for students with disabilities (system would need to be built to support accommodations)	**Next Steps:** Δ **Convene Innovative Assessment Research Team.** See above. Δ **Develop Guide to Administering 21st century and Computer-Based Assessments.** This guide will define best practices for implementing 21st century testing within the school building with key guidance on hardware, bandwidth and scheduling. This guide will provide concrete steps to be taken based on different hardware availability, student body size and scheduling arrangements and will use data collected from LEA case studies to ensure that all LEAs are equipped to move to a mostly or entirely computer-based testing environment by 2013.
	Option 2. Paper & pencil administration	• Is a known quantity – we have it down, can do it well, and get valid and reliable results to hold schools accountable	• Requires a lot of man hours at DPI and in LEAs • Results in more expensive scoring with constructed-response	

iii. Qualities of Summative Assessments

Summative assessment will be characterized by six qualities.

Quality	Why Is This Important?	Achieved By ...
Is Used Primarily for School, LEA and State Accountability	• Aggregates data to compare across classrooms, schools and LEAs • Ensures teachers are teaching and students are learning the NCSCOS driven by the Essential Standards. • Ensures teachers use richer data than EOG and EOC results to diagnose and to inform instruction.	• Developing valid and reliable assessments • Providing training and tools that help build assessment literacy and ensure that schools have the resources and skills to diagnose and formatively assess via professional development and benchmarking tool
Uses 21st century Technology	• Provides students the ability to utilize the tools necessary to live in a digital world and make real-world connections • Includes built-in accommodations	• Developing computer-based assessments that include simulations and results of research as appropriate • Exploring the possibility of built-in accommodations • Convening Innovative Assessment Research Team
Is Transparent	• Informs stakeholders of what students are expected to know and understand • Ensures that every teacher in the state knows what he or she must prepare students to know, understand or be able to do to achieve mastery of the Essential Standards and demonstrate that mastery on all assessments.	• Providing benchmarking tool with extensive standards-aligned items of various types to provide many clear examples of what a student should be able to demonstrate if they have mastered a particular objective • Releasing prioritization and weighting of objectives on summative assessments • Releasing a form of each assessment annually
Is Aligned to Essential Standards	• Guarantees instruction, assessments and tests are parallel to enhance student achievement	• Revising assessments when Essential Standards are developed • Continuing to have assessment and curriculum staff involved in the development of Essential Standards and assessments
Includes Various Item Types	• Reflects the kind of academic and career tasks that a child will be asked/required to do • Encourages teaching the standard so that students master material rather than encourage "test prep" • Demonstrates knowledge and skills required by the Graduation Project	• Revising assessments to include performance tasks and constructed response as well as multiple-choice • Developing a rubric to determine when non-multiple-choice item types are most appropriate
Is Technically Sound	• Provides validity and reliability that are necessary for comparability and accountability • Allows access and decreases the number of students needing alternate assessments	• Incorporating appropriate psychometric analysis and research studies to ensure validity and reliability of results. • Incorporating universal design principles

e. Ongoing Authentic Assessments

The NC Graduation Project, NC Writing Assessment System and a proposed portfolio system complete the Balanced Assessment system. None of these three authentic assessments fit nicely in the category of formative, benchmarking or summative assessment. Instead they serve *both* functions as outlined in the SBE goals, to inform instruction *and* to evaluate. Each is characterized by **authentic evidence.** While not standardized to the degree of the statewide summative or proposed benchmarking tool, these three bodies of evidence represent the most authentic student assessment.

i. NC Graduation Project

Alignment to Framework:
Long-Term 1 .....inclusion of skills, understandings, and learning experiences necessary to satisfactorily complete the graduation project

Long-Term 2 ....the new assessment system must be aligned to the graduation project

The NC Graduation Project (NCGP) is a multi-faceted, multi-disciplinary performance assessment completed over time and used as the primary measure for student accountability. The NCGP, consisting of four components (a research paper, product, portfolio, and an oral presentation), culminates in a student's final years of high school. It provides students the opportunity to connect content knowledge, acquired skills, and work habits to real world situations and issues. The Essential Standards will prepare a student to succeed on the graduation project.

ii. NC Writing Assessment System

Alignment to Framework:
Immediate Improvement 7:
Change the current approach to writing assessment. To elevate the importance of writing throughout the curriculum, the current 4th, 7th, and 10th grade writing assessments are to be replaced with a K-12 writing assessment system that includes authentic and on demand writing assignments, appropriate to each grade level and backmapped from the graduation project....

The new NC Writing Assessment System entails a paradigm shift in how writing is assessed. This new year-long assessment system will consist of four authentic, content-specific writing tasks/assignments and two on-demand writing tasks/assignments. The authentic writing tasks/assignments are to be submitted for scoring as finished written products.

The NC Writing Assessment System will be piloted at Grades 4 and 7 during the 2008-2009 school year. In Grade 7, the pilot school systems will be involved in the use of a centrally hosted electronic system to compose and store student writing tasks/assignments. The other school systems will locally store their students' word-processed writing tasks/assignments in portfolios. Teachers will provide feedback and score those writing tasks/assignments, and the LEAs will collect and store scored data for NCDPI. Through the use of this electronic system, the NCDPI will have the capabilities to monitor compliance and to audit, ensuring that the assessment system produces results that are valid and reliable.

In Grade 4 students will use a paper-pencil based system. Teachers will provide feedback and also score the writing tasks/assignments. Those scores will then be entered into an electronic data collection system. DPI will monitor for compliance and audit to ensure the results provided are valid and reliable.

Professional development for the NC Writing Assessment System will be delivered to educators and stakeholders primarily electronically through the use of a Moodle (online course management system). This professional development will consist of two courses – the first specifically designed around the instruction of writing and the involvement of all teachers K-12 focusing on instructional delivery. The second course focuses on the writing assessment delivery. This course consists of assessment of student writing: the use of the electronic system(s), scoring rubrics, scoring applications, and sample student responses. Upon the successful completion of each course, educators/participants can electronically print a "certificate of completion" including a specific number of contact hours to be turned in for CEU credit.

Future Writing Timeline (from August report)

2009-10	**Grade 4** Paper & Pencil (computer-processed optional) **Grade 7** Electronic Centralized Assessment System **Grade 10** Same as 07-08 for AYP
2010-11	**Grades PreK-5** Paper & Pencil (computer-processed optional) **Grades 6-8** Electronic Centralized Assessment System **High School** TBD

iii. Portfolios

Reflective thinking and goal setting are two dispositions required of 21st century students. A portfolio is a way for students to demonstrate their ability to perform these skills. Portfolios are a collection of student work from throughout the year that showcase accomplishments and progress in acquiring knowledge and skills over time. A portfolio includes examples of a student's application of higher order thinking skills.

Portfolios can help students monitor their own progress, are particularly valuable in assessing dispositions (from SBE goals) and can house formative and summative data. A portfolio of student work can complement and inform instruction. If a portfolio is used to monitor student progress, there is ongoing review and reflection on the work by both teachers and students so that evaluation of skills, growth, and pacing can be adjusted as needed. To measure 21st century dispositions, K-12 students should develop portfolios.

Recommendation: An Innovative Assessment Research Team researches the benefits of electronic portfolios and recommends action to SBE in July of 2009

iv. K-2 Literacy and Math Assessment

The beginning years of math and early reading development are essential to the growth and achievement of students in high school. From the time a student enters kindergarten, he or she is getting ready for high school graduation. The K-2 Literacy and Math assessments support achievement with on-going individualized assessments throughout the developing years. The NC K-2 Literacy and Math assessments measure the reading, writing and mathematics skills of students in kindergarten, first and second grade. These assessments allow teachers to gather formative, benchmark and summative data and provide:

- Information to teachers about the progress of each student for instructional adaptations and early interventions
- Information to teachers about the status of each of their incoming students
- Information to parents about the status of their children relative to grade-level standards at the end of the year
- Information to schools and school districts about the achievement status and progress of groups of students in grades K,1, and 2.

IV. Accountability

Challenging • Attainable • Balanced

Alignment to Framework:

Long-Term 6: Examine the K-8 accountability model with a 21st century focus. This examination should include consideration of whether the model appropriately reflects 21st century skills and understandings and how the model affects school designations and recognition. While additional components may be considered, the focus must remain on student achievement and academic growth.

Long-Term 7: Develop a new high school accountability model that includes the high school graduation rate, participation in the high school Future-Ready Core, student performance in core subjects, and other measures of readiness for postsecondary education and skilled work. To more meaningfully and transparently reflect progress toward graduating students who are future-ready and prepared for life in the 21st century, the DPI is directed to develop a new accountability model for high schools. An advisory committee with appropriate technical expertise should guide the development of the model. The focus of the new model must remain on student achievement and academic growth.

a. Overview

The purpose of the ABCs Accountability system is to ensure that adults in the educational system are responsible for achieving challenging yet attainable achievement goals for their students every year and that parents and the public have a clear, comparable understanding of the performance of students within North Carolina's public schools.

The accountability model must:

1) Determine what is both **challenging and attainable** for student achievement/growth and have a strong statistical and practical argument for how measures are set.
2) Ensure a **balanced** approach that accounts for aggregated measures but remains grounded in student achievement and growth.

b. Developmental Growth and the Technical Advisory Committee

In line with the *FFC*'s emphasis that the accountability model remain focused on student achievement *and growth*, we want to explore growth models that determine what is **challenging and attainable** for each year as accurately as possible. In line with the *FFC*, and to ensure that we are using the most valid and reliable mechanisms to set standards, a Technical Advisory Committee (TAC) will be formed to study growth models for both K-8 and 9-12.

While a technical discussion of growth is beyond the purview of this proposal, we are recommending the TAC first study the feasibility of a **developmental growth model** for reading and math. In a developmental growth model, K-8 accountability will retain its fundamental focus on growth and performance. The primary change will be in how growth expectations are set. Growth expectations will be based on longitudinal data analyses that produce "growth curves" spanning grades 3-8. This allows not only estimates of year-to-year change (as in previous NC growth models), but also the growth that should be expected from the end of third grade to the end of eighth grade (or any subset of those grades). This shift in focus from annual change to longitudinal growth is the significant difference between the proposed K-8 model and past NC growth models. A feasibility

study will be conducted for application of this model K-12 exploring the possibility of using EOCs in the model.

TAC Research Recommendation 1: A TAC is convened to explore the adoption of a new growth model, focusing first on the feasibility of using a K-12 developmental growth model for reading and mathematics. The same committee would explore alternative growth models or refining or continuing the current growth model under the new essential standards beyond the feasibility study.

TAC Research Recommendation 2 (9-12): Measures of career and post-secondary readiness are considered in the accountability model. The TAC will research the balance of measures of career and post-secondary readiness, graduation rate and student achievement/growth to ensure the appropriate targets are in place that meet criteria of equity and transparency. Initial assessments of readiness to be explored will include SAT, ACT and ASVAB.

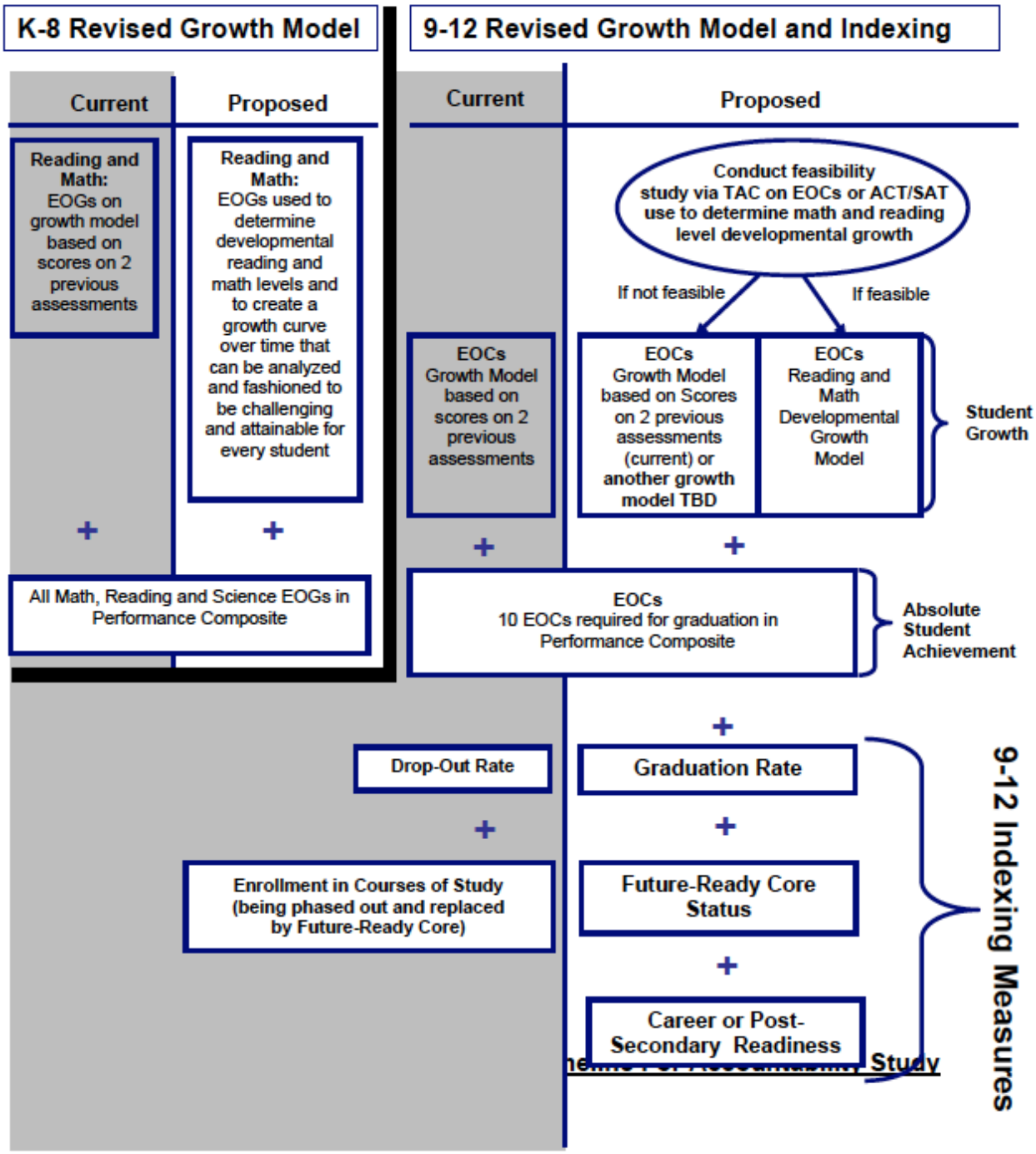
c. Action Recommendations and Current vs. Proposed Models

The recommendations below are taken directly from the *Framework for Change* and should be confirmed for the new accountability model moving forward.

Action Recommendation 1 (HS): Replace drop-out rate with graduation rate. The TAC determines rationale and statistical method to ensure the appropriate targets are in place that meet criteria of equity and transparency.

Action Recommendation 2 (HS): Future-Ready core status replaces former courses of study. The TAC determines rationale and statistical method to ensure the appropriate targets are in place that meet criteria of equity and transparency.

Figure I - Overview of Accountability – Current vs. Proposed



Recommended Step	Date

Convene Technical Advisory Committee (TAC) with the following objectives:
• Determine feasibility of K-12 developmental growth model
• Recommend for action a growth model that has the best statistical and practical profile and will set challenging and attainable goals for all students
• Recommend for action when and how graduation rate should become operational in the ABCs
• Recommend for action when and how Future-Ready Core should become operational in the ABCs
• Develop wide-ranging study of pros and cons of possible measures of post-secondary readiness (include ACT, SAT, ASVAB)
• Recommend for action the use of Post-Secondary Readiness Measures
• Recommend for action a statistical method and rationale for achieving balance between the components of the accountability model
• Develop an informative rationale for what type of incentives should be tied to
  ○ Improvement Measures (Achievement, Grad Rate, etc.)
  ○ Absolute Measures (Achievement, Grad Rate, etc.)
• Develop an Activation Time Line, based on research and recommendations, for the phase-in of any approved revisions to the K-8 student achievement and growth model and for the phase-in of each of the four components of the new 9-12 accountability model
• Study and recommend action on revision of gateways and retesting policies
• Consider the pros and cons of a diverse set of additional components that might be added to the accountability model beyond the four from the *Framework For Change*. If a strong rationale can be developed for an additional component(s), then recommend and determine a method for inclusion in the model.
	Nov 08

TAC Progress Update	**Feb 09**
TAC Progress Update	**Apr 09**
TAC Progress Update	**Jun 09**
TAC Reports on Recommendations for Discussion	**July 09**
TAC Reports on Recommendations for Action	**Sept 09**
TAC presents Activation Time Line for Discussion	**2 months after Board approval**
TAC presents Activation Time Line for Approval	**The month after discussion**

V. Technology

Alignment to Framework:
Long-Term 5: Update the analysis of the technology infrastructure needed to support a 21st century curriculum and assessment system and to move additional testing to appropriate technology formats. This analysis will allow the transition from a paper-based assessment system to one that takes greater advantage of technology.

An analysis of the technology infrastructure will be necessary to pursue goals of a 21st century assessment system. The most immediate areas that need to be formally assessed and planned for are:

1) What needs to happen at the school level to allow most or all tests to be computer-based in the future? What guidance do we need to provide schools in order to implement computer-based assessments? Major current constraints to be addressed include:
    a. Electrical capacity of school
    b. Bandwidth
    c. Wireless or hardwiring of school
    d. Hardware (availability of computers to accommodate large-scale simultaneous testing in a school)
    e. Personnel and hardware trade-offs (i.e., consuming counselors' time with test coordination or tying up computer labs for weeks at a time)
2) In what ways might North Carolina use technology to assess student achievement more reliably and validly (to be explored by Innovative Assessment Research Team)?

To prepare for the increased use of technology to deliver professional development and online student assessment, DPI is recommending:

Recommendations:

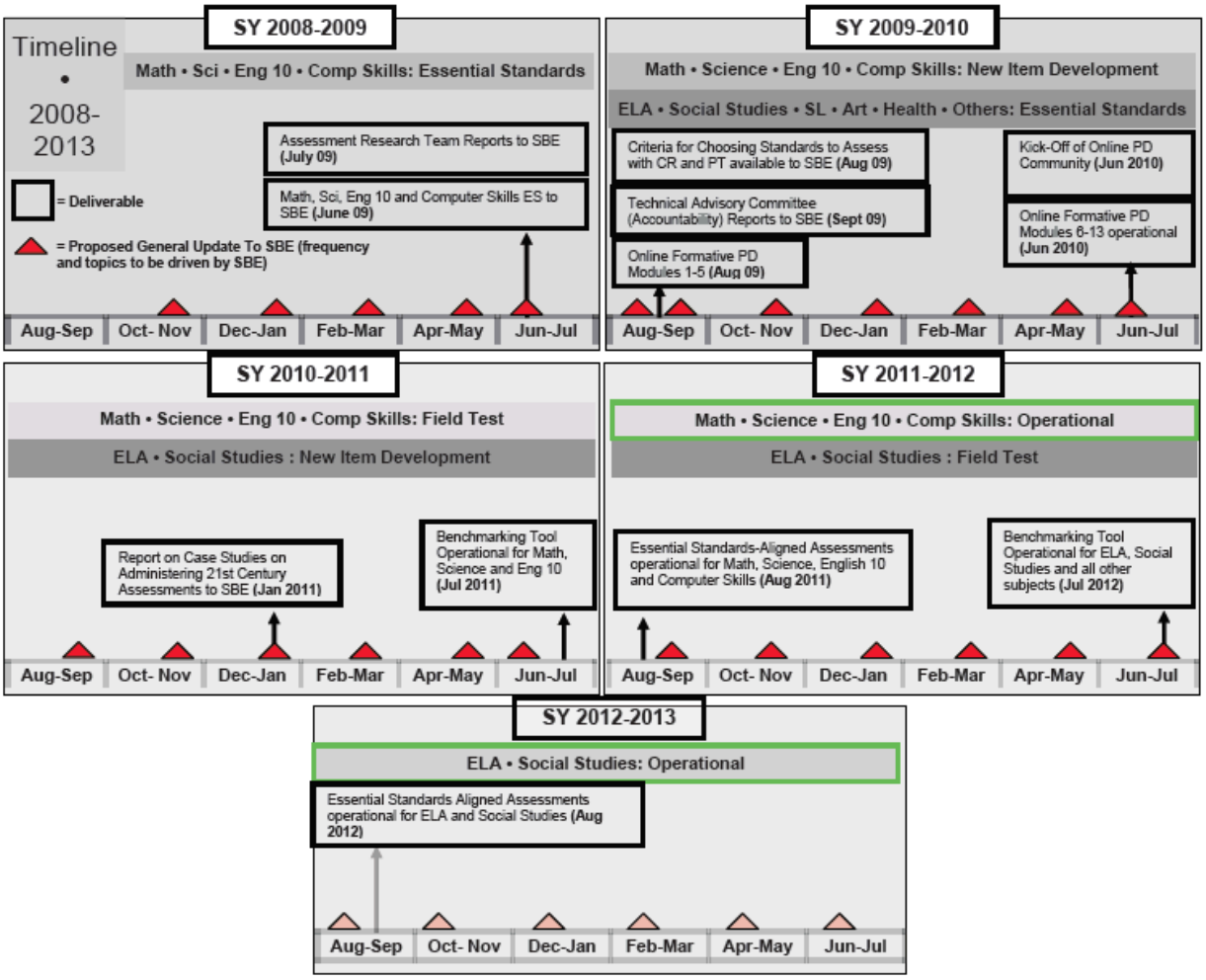
A. Conduct Case Studies for Administering 21st Century Assessment
An internal group will be formed that will conduct case studies of schools that are successfully implementing extensive online testing. Case studies will inform an approach to issues related to scheduling, bandwidth and hardware so that more students can move onto computer-based testing.

B. Roll Out Informed by Case Studies
Next steps that might be considered to prepare for universal or near-universal online testing administration are…

Action 1: Provide incentives for high schools that administer online testing to encourage more schools to build their organizational and hardware capacity.
Action 2: Set a date 3 or 4 years in future after which EOCs will not be offered offline and push high schools to build hardware and organizational capacity to administer online testing.
Action 3: Move all EOGs online.
Action 4: Move all EOGs online and provide incentives for K-8 schools that administer online testing to encourage more schools to build their organizational and hardware capacity.

VI. High-Level Timeline and Deliverables

A more detailed, operational timeline in excel format is currently being developed and will be available in November.



VII. Next Steps

The following are suggested next steps.

DPI is hoping to start immediately the following recommendations with SBE approval:

- O **Begin the Essential Standards revision process for Math, Science, Eng 10 and Computer Skills (using Revised Bloom's Taxonomy)**
- O **Begin development of formative assessment PD modules/online learning community**
- O **Begin the RFP for the development of a centralized benchmarking tool**
- O **Convene committee to plan phased-in shift to computer-based testing**
- O **Convene the Technical Advisory Committee to begin accountability research based on recommendations and proposed objectives**
- O **Convene the Innovative Assessment Committee**
- O **Conduct Case Studies on administering 21st century assessment**

Other Suggested Next Steps:

- O **Decide on expectations and routines for on-going reporting from DPI on implementation and development**
- O **Determine 21st century technologies for increasing SBE involvement in monitoring work of response to *FFC***
- O _____
- O _____
- O _____

VIII. Appendices

Appendix A – Immediate Action Item Update

Below is DPI's response to each of the 11 Immediate Action Items.

1. **Release one form of each test on an annual basis.** *At the conclusion of the 2008–09 testing year, one form of the 2008–09 general tests for each grade level and subject tested will be released to the school districts and the public to provide transparency of the State Testing Program. This release does not include alternate assessments because sufficient numbers of forms of these tests are not currently available.*

2. **Enact a moratorium on the content standards revision/test development cycle.** *DPI content standards revision cycles are on hold. DPI has a plan to identify Essential Standards in each content area. Once the Essential Standards are identified and approved by the SBE, Test Development will begin work on new test editions.*

3. **Make results from new tests comparable to prior tests.** *DPI will begin this action step in fall 2008 with the release of spring 2008 reading assessment results for grades 3–8. Scale scores and proficiency on both the old standard and the new standard are scheduled to be released in November/December 2008.*

4. **Move to a five-year graduation rate for Adequate Yearly Progress (AYP) purposes.** *The USED did not grant permission to DPI for a five-year cohort graduation rate. Therefore, DPI will continue to use the four-year cohort graduation rate for AYP. However, DPI recommends the five-year cohort graduation rate for use in the new high school accountability model.*

5. **Count retest scores in performance composites.** Any student who scores at Achievement Level III on a retest of an end of-grade test (EOG) or end-of-course (EOC) test for grades or courses included in the Student Accountability Standards [SAS] is to be counted as proficient for the school's ABCs performance composite and Adequate Yearly Progress (AYP) purposes. *Effective*: 2008-09 school year.

   *Some LEAs have argued that this item should be expanded to allow retesting at all grade levels and for all courses with EOC tests. The USED has advised DPI that retest scores can be used at all grade levels and for all EOCs **IF** the SBE mandates that retesting be required for all grades and EOC courses and not remain as a local option. This ensures that AYP decisions are made equitably across the state. The June 30th deadline for data transmission to DPI might preclude some LEAs from having their 2nd retest scores available. Therefore, to maintain consistency and equity, only the 1st retest-score will be used for calculations. According to the USED, this will ensure equity across the state in*

making AYP determinations. Retest scores are not included in growth calculations and do not affect financial incentive awards (bonuses).

The USED also does not allow the use of the Standard Error of Measurement (SEM) and a confidence interval for AYP. Therefore, students who meet the Achievement Level III standard using the SEM must be retested and score proficient without the SEM for their retest scores to be included in the performance composites and for AYP.

With the anticipation of the new assessments based on Essential Standards and the use of constructed-response (CR) items, the SBE should re-evaluate the issue of retesting because of the extended time needed to score the CR items. This could potentially involve moving the initial testing earlier in the school year.

6. **Eliminate the redundancy in End-of-Course (EOC) and End-of-Grade (EOG) testing by allowing EOC scores to count as EOG scores in middle grades.**

   This item presents some challenges to us because of NCLB. Currently, the USED has advised us that the same score for a student cannot be used in two grades; for example, Algebra I being used for an 8th grader, as their 8th grade math score, could not then be used at the 10th grade level as a banked score for high school AYP purposes. The USED did indicate that they are having further discussions about whether certain other courses could be substituted; for example, for the 8th grader with Algebra I, the potential for using Algebra II or Geometry at the 10th grade level for the high school AYP might be possible. [As a side note, the SBE will need to amend the Student Accountability Standards policy to address the use of the higher-level courses if the USED approves their use for AYP.] Regardless, this item presents implementation issues at the middle schools. If the USED does allow this, could a school elect to have a student who fails the Algebra I EOC assessment take the eighth grade EOG for AYP purposes?

7. **Change the current approach to writing assessment.** *During its August 2008 meeting, the SBE approved the NCDPI's proposed 2008–2009 Writing Assessment System Pilot. All students at grades 4 and 7 will participate in the Writing Assessment System Pilot. During the 2008–09 school year, all students at grades 4 and 7 will complete two content-specific writing tasks/assignments and two on-demand writing tasks/assignments.*

   Grade 4 students will complete their writing tasks/assignments using paper and pencil with the use of word processing tools as a local or an accessibility option. Schools will store student work in local portfolios.

   Grade 7 students will participate in the Writing Assessment System Pilot using word processing tools in order to complete their writing tasks/assignments. Schools will store student work in local portfolios. In addition, grade 7 students

from selected LEAs will participate in an electronic pilot. These students will store their work in an electronic portfolio centrally hosted by the NCDPI.

To assist educators in understanding and implementing the new Writing Assessment System Pilot at Grades 4 and 7, visit www.ncpublicschools.org/sbe_meetings/revisions/2008/pdfs/gcs2rev.pdf.

8. **Replace the current English I EOC with a high school English assessment given at grade 10.** *The NCDPI is determining which Essential Standards in English should be measured at grade 10. As soon as the Essential Standards are identified and approved by the SBE, the test development plan will be finalized. The test development plan will include an item format tryout during the 2008–09 school year. Schools will have an opportunity to volunteer to participate. Depending on the decisions the SBE makes about the high school accountability model, this assessment could be selected or adapted from commercially available assessments. Because of the work involved in determining, approving and implementing the Essential Standards, the new assessment will not be available until the 2011-12 school year.*

9. **Revamp the current computer skills test to ensure it measures 21st century Information Communication Technology (ICT) literacy.** *The current test has been reviewed and measures the strands set forth and specifically defined in the North Carolina Computer/Technology Skills* Standard Course of Study *adopted by the SBE in February 2004. To ensure the test measures 21st Century Information Communication Technology (ICT) literacy, the SBE will need to adopt new content standards.*

   Students are required to meet computer skills proficiency requirements in order to receive a North Carolina high school diploma. The vision of the Standard Course of Study *the student was instructed in determines the test edition the student must take in order to meet the requirement for graduation. Students who entered grade 8 for the first time in the 2005–06 school year and beyond take the Online Test of Computer Skills (test edition 3).*

   Effective for the 2008–09 school year, select students are allowed to take the online computer skills test as early as the fall of the sixth-grade year. Allowing this option to sixth- and seventh-graders is solely at the discretion of the LEA. If allowed, prior to registering any students (i.e., students at grades six and seven) to take the online test of computer skills, students and their parents/guardians must be made aware and understand that the North Carolina Online Test of Computer Skills is a test designed to measure the competencies of the K–8 Computer Skills Curriculum adopted by the State Board of Education in 2004 and is intended for eighth grade students.

The new content standards should be backmapped and linked to the high school graduation project. Because of the new link to the NC Graduation Project, the SBE should amend the SBE policy that requires passing the Online Test of Computer Skills as a graduation requirement. However, the test would still be used to meet the NCLB Title II Part D, Enhancing Education Through Technology requirement of ensuring that every student is technologically literate by the time the student finishes the eighth grade.

10. **Eliminate the misalignment of assessment for the integrated math courses.** *The NCDPI is determining which Essential Standards in the Integrated Mathematics courses should be measured. As soon as the Essential Standards are identified and approved by the SBE, the test development plan will be finalized. The test development plan will include an item format tryout during the 2008–09 school year. Schools will have an opportunity to volunteer to participate. Because of the work involved in determining, approving and implementing the Essential Standards, the new assessments will not be available until the 2011-12 school year.*

11. **Shorten the timeframe for reporting results after new tests are administered.** *The NCDPI is exploring options to shorten the timeframe for reporting results after new tests are administered. The NCDPI is committed to shorten the timeframe without jeopardizing the validity and reliability (quality) of the assessments. This will require strict adherence by the LEAs to meeting the June 30th deadline for submitting data to NCDPI. In years when new tests are administered, the NCDPI will make the process transparent to the public and have test results back in the schools prior to October.*

***Framework for Change* Item Long-Term #3**

3. Allow LEAs to develop and pilot 21st century assessment models. The NCDPI is to present a plan for approving assessment pilots that allows LEAs to develop alternative approaches to assessment that are consistent with the Board's 21st century mission and goals.

The State Board of Education may consider alternative assessment models for high school EOCs not required for graduation. Upon SBE recommendation, NCDPI will include the development of criteria for the piloting of 21st century assessment models in the objectives being addressed by the Innovative Assessment Research Team.

Appendix B

Proposed Formative Assessment and Professional Development Modules

FA Modules

- What is FA and how is it used for learning in NC?
- The Process of Deconstructing NCSCOS-Teacher and Student Friendly Language
- I know what they don't know—now what?: Data Driven Decisions
- Descriptive Feedback and Grading
- Assessment Methods-Designing and Selecting Assessments to Do What You Want
- Writing Lesson Plans to Incorporate Formative Assessment
- Student Ownership: Peer Assessment, Self-Assessment and Goal Setting
- Transforming the Classroom Assessment Environment: Helping Teachers, Students and Parents Understand Formative Assessment
- Effective and Ineffective Questioning in the Classroom
- Collecting and Documenting Evidence of Learning
- Teaching Scenarios: Is This Formative Assessment?
- Administrator Roles: What Should I See in the Classroom and How do I Support FA?

In addition, these modules should be developed for the new Comprehensive, Balanced Assessment System

- The Power of E-Portfolios
- What is A Comprehensive Balanced Assessment System: Assessment Literacy 101
- Using Benchmark Assessment Data to Determine if Students are on the Pathway
- Using Statewide Assessment Data to Reflect on Previous Performance and to Plan for Future Instruction

Appendix C

***Framework for Change* Quick Reference: This is a synopsis of the recommendations organized by the Long-Term Items 1 – 7 from *The Framework For Change*.**

Framework For Change Item	Synopsis of Recommendations	Page Reference
1. Overhaul the PreK-12 Standard Course of Study (SCOS) to focus on Essential Standards in order to narrow and deepen the curriculum.	• **Math, Science, Eng 10 and Computer Skills have Essential Standards** identified in 08-09, and statewide summative assessments and benchmarking tools for these subjects are **operational in 2011-2012. Social Studies** and the rest of **ELA** follow a year behind. • Essential Standards are aligned specifically to **21st century skills**, back mapped to align to the **NC Graduation Project** and are based on **Revised Bloom's Taxonomy**. • Essential Standards use a uniform format and are aligned clearly to performance indicators so that the standards are **clear and transparent**. • Statewide summative assessments will align to the Essential Standards	**Pages 8-10**
2. Develop a next generation assessment system which includes formative, benchmark and summative assessments based on the new standards.	• **Constructed-Response and Performance Tasks** items are included on assessments and criteria to determine when use of a constructed response or performance is most appropriate are developed. • A centralized Essential Standards-aligned, **online benchmarking tool** is developed or contracted for statewide use. • Online Professional Development modules on **formative assessment** will be available, all by June 2010. • An **Innovative Assessment Committee** is convened to research how computer-based assessment could advance evaluation or instructional information (reporting July 2009) • All new assessments will be available online when age appropriate and DPI will conduct case studies of **Administration of 21st Century Assessments** and provide best practice tools for online administration to LEAs.	**Page 20** **Page 18** **Page 15, 37** **Page 21** **Page 21,30**
3. Allow LEAs to develop and pilot 21st century assessment models.	**See Appendix A**	**Page 36**

4. Create a comprehensive, customized professional development system to provide teachers and administrators with the skills and understandings needed to use data to inform instructional practice and make formative assessments a daily practice in the classroom.	• Online Professional Development modules on **formative assessment** will be available, all by June 2010.
	• PD Modules
	  ◦ Using benchmark assessment data to determine If students are on the pathway
	  ◦ Using statewide assessment data to reflect on previous performance and to plan for future instruction
		Page 15,37
		Page 37

Framework For Change Item	Synopsis of Recommendations	Page Reference
5. Update the analysis of the technology infrastructure needed to support a 21st century curriculum and assessment system and to move additional testing to appropriate technology formats.	• All new assessments will be available online when age appropriate and the NCDPI will develop **A Guide To Administering 21st Century Assessments** based on case-studies that provide best practices on online administration.	**Page 30**
6. Examine the K-8 accountability model with a 21st century focus.	• A **Technical Advisory Committee** to begin work on research of new accountability model (reporting Sept 2009) focusing first on a feasibility study of a **developmental growth model.**	**Page 26-29**
7. Develop a new high school accountability model that includes the high school graduation rate, participation in the high school Future-Ready Core, student performance in core subjects, and other measures of readiness for postsecondary education and skilled work.	• A **Technical Advisory Committee** to begin work on research of new accountability model (reporting Sept 2009) focusing first on a feasibility study of **developmental growth model** and determining how to find a model that meets criteria. • **Graduation Rate, Future-Ready Core Status** and **Career and Post-Secondary Readiness** will be incorporated into the new 9-12 accountability model, phased in as soon as possible based on the work of the Technical Advisory Committee	**Page 26-29**

Basic Timeline

	Action or Product	Date
Essential Standards and Tests	Math, Science, English 10 and Computer Skills Essential Standards to SBE	June 2009
	Math, Science, English 10 Item Development	2009-2010
	Math, Science, English 10 Field Test	2010-2011
	Math, Science, English 10 Operational	2011-2012
	English and Social Studies and Other Subjects Essential Standards to SBE	June 2010
	English and Social Studies Item Development	2010-2011
	English and Social Studies Field Test	2011-2012
	English and Social Studies Operational	2012-2013
Tools and Key Reports	Assessment Research Team Reports to SBE	July 2009
	Criteria for Choosing Standards to Assess with Constructed Response to SBE	August 2009
	Online Formative PD Modules 1-5	August 2009
	Technical Advisory Committee (Accountability) Reports to SBE	Sept 2009
	Kick-Off of Online PD Community	June 2010
	Online Formative PD Modules 6-13	June 2010
	Report on Case-Studies on Administering 21st century Assessments to SBE	Jan 2011
	Benchmarking Tool Operational for Math, Science and Eng 10	July 2011
	Benchmarking Tool Operational for ELA and Social Studies	July 2012

APPENDIX C: CONSTRUCTS

Page 1 - Question 9 - Rating Scale - Matrix [Mandatory]

Please read the following statements and indicate your agreement or disagreement with each one using the scale given.

	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
I have received adequate training on how to assess my students during instruction.	5	4	3	2	1
My students can describe what learning targets they are to achieve.	5	4	3	2	1
I check for student understanding daily on a minute-by-minute basis.	5	4	3	2	1
In a parent teacher conference, I communicate how well a student is doing by sharing the grades in my grade book.	5	4	3	2	1
In a parent teacher conference, I communicate how well a student is doing by sharing evidence of learning that does not involve a grade.	5	4	3	2	1

Page 1 - Question 10 - Rating Scale - Matrix [Mandatory]

Please indicate how often you do the following:

	Daily	Weekly	Monthly	Quarterly	Rarely/Never
I use checklists when gathering information about student learning.	5	4	3	2	1
I use rubrics for assessing my students.	5	4	3	2	1
I write learning targets on the board and go over them with my students.	5	4	3	2	1
I provide students specific information (without using grades or rubrics) about where they are in meeting the learning targets.	5	4	3	2	1
I plan or modify classroom instruction based on the information I receive from classroom assessment.	5	4	3	2	1
I give students opportunities to self-assess and set goals for future learning.	5	4	3	2	1
I give students opportunities to reflect on and share their learning progress with others.	5	4	3	2	1
I give students opportunities to formatively assess their peers.	5	4	3	2	1
I give students opportunities to summatively assess their peers.	5	4	3	2	1
I give students opportunities to provide input on assessment design.	5	4	3	2	1

APPENDIX D: PRE SURVEY

Formative Assessment Module Pre-Survey: 2010-2011

Created: August 10 2010, 5:39 AM

Last Modified: January 27 2011, 11:04 AM

Design Theme: Basic Blue

Language: English

Button Options: Labels

Disable Browser “Back” Button: False

Formative Assessment Module Pre-Survey: 2010-2011

Page 1 - Heading

Please complete the following pre-survey, which will take approximately 15 minutes. The information collected will help us better understand formative assessment practices.

The information you provide is confidential. Responses to the survey will be summarized by a team of independent evaluators-your individual responses will not be seen by people outside the evaluation team. Information collected from the surveys will be displayed in reports as group averages to provide a “picture” of the impact of this newly developed professional development on formative assessment.

Thank you for providing us with complete and thoughtful information.

Page 1 - Heading

Part I-Demographics & Background

Page 1 - Question 1 - Choice - One Answer (Drop Down) [Mandatory]

Which district, charter school, or educational organization do you work in?

- Alamance-Burlington Schools
- Alexander County Schools
- Alleghany County Schools
- Anson County Schools
- Ashe County Schools
- Asheboro City Schools
- Asheville City Schools
- Avery County Schools
- Beaufort County Schools
- Bertie County Schools
- Bladen County Schools
- Brunswick County Schools
- Buncombe County Schools
- Burke County Schools
- Cabarrus County Schools
- Caldwell County Schools
- Camden County Schools
- Carteret County Schools
- Caswell County Schools
- Catawba County Schools
- Chapel Hill-Carrboro City Schools
- Charlotte-Mecklenburg Schools
- Chatham County Schools

- zChatham Charter
- Cherokee County Schools
- Clay County Schools
- Cleveland County Schools
- Clinton City Schools
- Columbus County Schools
- Craven County Schools
- Cumberland County Schools
- Currituck County Schools
- Dare County Schools
- Davidson County Schools
- Davie County Schools
- Duplin County Schools
- Durham County Schools
- Edenton/Chowan Schools
- Edgecombe County Schools
- Elizabeth City/Pasquotank Schools
- Elkin City Schools
- Franklin County Schools
- Gaston County Schools
- Gates County Schools
- Graham County Schools
- Granville County Schools
- Greene County Schools
- Guilford County Schools
- Halifax County Schools

- Harnett County Schools
- Haywood County Schools
- Henderson County Schools
- Hertford County Schools
- Hickory City Schools
- Hoke County Schools
- Hyde County Schools
- Iredell-Statesville Schools
- Jackson County Schools
- Johnston County Schools
- Jones County Schools
- Kannapolis City Schools
- Lee County Schools
- Lenoir County Schools
- Lexington City Schools
- Lincoln County Schools
- Macon County Schools
- Madison County Schools
- Martin County Schools
- McDowell County Schools
- Mitchell County Schools
- Montgomery County Schools
- Moore County Schools
- Mooresville City Schools
- Mount Airy City Schools
- Nash-Rocky Mount Schools

- New Hanover County Schools
- Newton-Conover City Schools
- Northampton County Schools
- Onslow County Schools
- Orange County Schools
- Pamlico County Schools
- Pender County Schools
- Perquimans County Schools
- Person County Schools
- Pitt County Schools
- Polk County Schools
- Randolph County Schools
- Richmond County Schools
- Roanoke Rapids City Schools
- Robeson County Schools
- Rockingham County Schools
- Rowan-Salisbury Schools
- Rutherford County Schools
- Sampson County Schools
- Scotland County Schools
- Stanly County Schools
- Stokes County Schools
- Surry County Schools
- Swain County Schools
- Thomasville City Schools
- Transylvania County Schools

- Tyrrell County Schools
- Union County Public Schools
- Vance County Schools
- Wake County Public School System
- Warren County Schools
- Washington County Schools
- Watauga County Schools
- Wayne County Schools
- Weldon City Schools
- Whiteville City Schools
- Wilkes County Schools
- Wilson County Schools
- Winston-Salem/Forsyth County Schools
- Yadkin County Schools
- Yancey County Schools
- Charter: Alpha Academy
- Charter: American Renaissance School
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- Charter: Crossnore Academy
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- Charter: Downtown Middle
- Charter: East Wake Academy
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- Charter: Grandfather Academy
- Charter: Gray Stone Day
- Charter: Greensboro Academy
- Charter: Guilford Preparatory

- Charter: Haliwa-Saponi Tribal School
- Charter: Healthy Start Academy
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- Charter: Kestrel Heights School
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- Charter: Orange Charter
- Charter: PACE Academy
- Charter: Piedmont Community Charter
- Charter: Pine Lake Preparatory
- Charter: PreEminent Charter
- Charter: Provisions Academy
- Charter: Quality Education Academy
- Charter: Queen’s Grant Community
- Charter: Quest Academy
- Charter: Raleigh Charter High
- Charter: Research Triangle Charter
- Charter: River Mill Academy
- Charter: Rocky Mount Preparatory
- Charter: Roxboro Community School

- Charter: Sallie B. Howard School
- Charter: Sandhills Theatre Arts Renaissance
- Charter: Socrates Academy
- Charter: Sterling Montessori Academy
- Charter: Success Charter
- Charter: Sugar Creek Charter
- Charter: Summit Charter
- Charter: The Academy of Moore County
- Charter: The Hawbridge School
- Charter: The Learning Center
- Charter: The Mountain Community School
- Charter: Thomas Jefferson Class Academy
- Charter: Triad Math and Science Academy
- Charter: Two Rivers Community School
- Charter: Union Academy
- Charter: Vance Charter School
- Charter: Voyager Academy
- Charter: Washington Montessori
- Charter: Woods Charter
- Charter: Other but not listed above
- Organization: College/University
- Organization: North Carolina Department of Public Instruction (NCDPI)
- Organization: North Carolina Virtual Public School (NCVPS)
- Organization: Regional Education Services Alliance/Consortia (RESA)
- Organization: Other but not listed above

Page 1 - Question 2 - Choice - Multiple Answers (Bullets) [Mandatory]

What is your current position? (Check all that apply for 2010-2011)

- ❑ Teacher (PreK-2)
- ❑ Teacher (3-5)
- ❑ Teacher (6-8)
- ❑ Teacher (9-12)
- ❑ Teacher Assistant
- ❑ School Support Staff
- ❑ Principal (PreK-5 or K-5)
- ❑ Principal (6-8)
- ❑ Principal (9-12)
- ❑ Other School Administrator
- ❑ Curriculum/Program Coordinator
- ❑ Testing Coordinator
- ❑ Other Central Office Administrator
- ❑ Other, please specify

Page 1 - Question 3 - Choice - Multiple Answers (Bullets) [Mandatory]

What do you teach? (Check all that apply for 2010-2011)

- ❑ Not in teaching role
- ❑ Art
- ❑ Career Technical Eduation
- ❑ Dance
- ❑ English/Language Arts

- ❑ ESL
- ❑ Health
- ❑ Math
- ❑ Music
- ❑ Physical Education
- ❑ Science
- ❑ Second (World) Language
- ❑ Social Studies
- ❑ Special Education
- ❑ Technology
- ❑ Theatre Arts
- ❑ Other, please specify

Page 1 - Question 4 - Choice - One Answer (Bullets) [Mandatory]

How many years of teaching/educational experience do you have, including 2010-2011?

- ○ 1-3 years
- ○ 4-6 years
- ○ 7-10 years
- ○ 11-20 years
- ○ 21 years or more

Page 1 - Question 5 - Choice - One Answer (Bullets) [Mandatory]

What is your gender?

- ○ Male

- ○ Female

Page 1 - Question 6 - Choice - One Answer (Bullets) [Mandatory]

What is your ethnicity?

- ○ American Indian (including Alaskan native)
- ○ Asian
- ○ Black (non-Hispanic)
- ○ Hispanic/Latino
- ○ Native Hawaiian and other Pacific Islander
- ○ White (non-Hispanic)
- ○ Other, please specify

Page 1 - Question 7 - Choice - Multiple Answers (Bullets) [Mandatory]

Where do you usually access a computer or the Internet?

(More than one option may be selected)

- ❑ Home (wireless)
- ❑ Home (cable/high speed DSL)
- ❑ Home (dial-up)
- ❑ School/Work (classroom or office based)
- ❑ School/Work (library or common area)
- ❑ Public Library
- ❑ Other, please specify

Page 1 - Question 8 - Choice - Multiple Answers (Bullets) [Mandatory]

Please check all that apply in regards to your current formative assessment background.

- ❑ I have received training on formative assessment during my teacher preparation program and/or through district/school professional development.
- ❑ I have led training sessions related to formative assessment or formative assessment tools.
- ❑ I have attended sessions on formative assessment sponsored by NCDPI at conferences, meetings, etc.
- ❑ I have visited the NCDPI Formative Assessment website (http://www.ncpublicschools.org/accountability/educators/vision/formative).
- ❑ I have read the State Superintendent of Public Instruction's brochure on the vision for a 21st Century assessment system.
- ❑ None of the above
- ❑ Additional Comment

Page 1 - Heading

Part II-Philosophy & Practice

Please answer the questions in this section based on your classroom or school.

Page 1 - Question 9 - Rating Scale - Matrix

Please read the following statements and indicate whether they are True or False.

	True		False	
I use classroom assessment information to guide and revise teaching.	☐	2	☐	1
I know about what students learn in my class from quizzes and tests.	☐	2	☐	1

To be useful, a classroom assessment must be graded.	☐			2	☐				1
Statements such as "good job," "excellent," or "way to go" are useful in providing feedback to students regarding their mastery of class concepts.	☐			2	☐				1
Statements such as "try harder," "concentrate more," or "apply yourself" are useful in providing feedback to students regarding their mastery of class concepts.	☐			2	☐				1
Students should be allowed to assess their own mastery of class concepts.	☐			2	☐				1
Students should not be involved in the assessment process.	☐			2	☐				1
Classroom discussion and discourse will provide teachers with feedback on how well they are conveying ideas to students.	☐			2	☐				1
Frequent testing (e.g. daily graded quizzes) helps motivate students to learn.	☐			2	☐				1
The purpose of formative assessment is to make ongoing judgments about the quality of work students produce.	☐			2	☐				1
Formative assessment is just another thing to do and I do not have time for it.	☐			2	☐				1

Page 1 - Question 10 - Rating Scale - Matrix

Please read the following statements and indicate your agreement or disagreement with each one using the scale given.

	Strongly Agree		A g r e e		Not sure		Disagree		Strongly Disagree	
I have received adequate training on how to assess my students during instruction.	☐	5	☐	4	☐	3	☐	2	☐	1
My students can describe what learning targets they are to achieve.	☐	5	☐	4	☐	3	☐	2	☐	1
I check for student understanding daily on a minute-by-minute basis.	☐	5	☐	4	☐	3	☐	2	☐	1
In a parent teacher conference, I communicate how well a student is doing by sharing the grades in my grade book.	☐	5	☐	4	☐	3	☐	2	☐	1
In a parent teacher conference, I communicate how well a student is doing by sharing evidence of learning that does not involve a grade.	☐	5	☐	4	☐	3	☐	2	☐	1

Page 1 - Question 11 - Rating Scale - Matrix

Please indicate how often you do the following:

	D a i l y		Weekly		Monthly		Quarterly		R a r e l y / N e v e r	
I use checklists when gathering information about student learning.	☐	5	☐	4	☐	3	☐	2	☐	1

I use rubrics for assessing my students.	☐	5	☐	4	☐	3	☐	2	☐	1
I write learning targets on the board and go over them with my students.	☐	5	☐	4	☐	3	☐	2	☐	1
I provide students specific information (without using grades or rubrics) about where they are in meeting the learning targets.	☐	5	☐	4	☐	3	☐	2	☐	1
I plan or modify classroom instruction based on the information I receive from classroom assessment.	☐	5	☐	4	☐	3	☐	2	☐	1
I give students opportunities to self-assess and set goals for future learning.	☐	5	☐	4	☐	3	☐	2	☐	1
I give students opportunities to reflect on and share their learning progress with others.	☐	5	☐	4	☐	3	☐	2	☐	1
I give students opportunities to formatively assess their peers.	☐	5	☐	4	☐	3	☐	2	☐	1
I give students opportunities to summatively assess their peers.	☐	5	☐	4	☐	3	☐	2	☐	1
I give students opportunities to provide input on assessment design.	☐	5	☐	4	☐	3	☐	2	☐	1

Page 1 - Question 12 - Open Ended - Comments Box

Please share any additional comments here:

Thank You Page

Standard

Screen Out Page

Standard

Over Quota Page

Standard

Survey Closed Page

Standard

APPENDIX E: POST SURVEY

Formative Assessment Module Post-Survey: 2010-2011

Created: October 26 2010, 1:21 PM

Last Modified: October 27 2010, 11:00 AM

Design Theme: Basic Blue

Language: English

Button Options: Labels

Disable Browser “Back” Button: False

Formative Assessment Module Post-Survey: 2010-2011

Page 1 - Heading

Please complete the following post-survey, which will take approximately 15 minutes. The information collected will help us better understand formative assessment practices. The information you provide is confidential. Responses to the survey will be summarized by a team of independent evaluators-your individual responses will not be seen by people outside the evaluation team. Information collected from the surveys will be displayed in reports as group averages to provide a “picture” of the impact of this newly developed professional development on formative assessment. Thank you for providing us with complete and thoughtful information.

Page 1 - Heading

Part I-Demographics & Background

Page 1 - Question 1 - Choice - One Answer (Drop Down) [Mandatory]

In which district, charter school, or educational organization do you work?

- ○ Alamance-Burlington Schools
- ○ Alexander County Schools
- ○ Alleghany County Schools
- ○ Anson County Schools
- ○ Ashe County Schools
- ○ Asheboro City Schools
- ○ Asheville City Schools
- ○ Avery County Schools
- ○ Beaufort County Schools
- ○ Bertie County Schools
- ○ Bladen County Schools
- ○ Brunswick County Schools
- ○ Buncombe County Schools
- ○ Burke County Schools
- ○ Cabarrus County Schools
- ○ Caldwell County Schools
- ○ Camden County Schools
- ○ Carteret County Schools
- ○ Caswell County Schools
- ○ Catawba County Schools
- ○ Chapel Hill-Carrboro City Schools
- ○ Charlotte-Mecklenburg Schools
- ○ Chatham County Schools

- zChatham Charter
- Cherokee County Schools
- Clay County Schools
- Cleveland County Schools
- Clinton City Schools
- Columbus County Schools
- Craven County Schools
- Cumberland County Schools
- Currituck County Schools
- Dare County Schools
- Davidson County Schools
- Davie County Schools
- Duplin County Schools
- Durham County Schools
- Edenton/Chowan Schools
- Edgecombe County Schools
- Elizabeth City/Pasquotank Schools
- Elkin City Schools
- Franklin County Schools
- Gaston County Schools
- Gates County Schools
- Graham County Schools
- Granville County Schools
- Greene County Schools
- Guilford County Schools
- Halifax County Schools

- Harnett County Schools
- Haywood County Schools
- Henderson County Schools
- Hertford County Schools
- Hickory City Schools
- Hoke County Schools
- Hyde County Schools
- Iredell-Statesville Schools
- Jackson County Schools
- Johnston County Schools
- Jones County Schools
- Kannapolis City Schools
- Lee County Schools
- Lenoir County Schools
- Lexington City Schools
- Lincoln County Schools
- Macon County Schools
- Madison County Schools
- Martin County Schools
- McDowell County Schools
- Mitchell County Schools
- Montgomery County Schools
- Moore County Schools
- Mooresville City Schools
- Mount Airy City Schools
- Nash-Rocky Mount Schools

- New Hanover County Schools
- Newton-Conover City Schools
- Northampton County Schools
- Onslow County Schools
- Orange County Schools
- Pamlico County Schools
- Pender County Schools
- Perquimans County Schools
- Person County Schools
- Pitt County Schools
- Polk County Schools
- Randolph County Schools
- Richmond County Schools
- Roanoke Rapids City Schools
- Robeson County Schools
- Rockingham County Schools
- Rowan-Salisbury Schools
- Rutherford County Schools
- Sampson County Schools
- Scotland County Schools
- Stanly County Schools
- Stokes County Schools
- Surry County Schools
- Swain County Schools
- Thomasville City Schools
- Transylvania County Schools

- Tyrrell County Schools
- Union County Public Schools
- Vance County Schools
- Wake County Public School System
- Warren County Schools
- Washington County Schools
- Watauga County Schools
- Wayne County Schools
- Weldon City Schools
- Whiteville City Schools
- Wilkes County Schools
- Wilson County Schools
- Winston-Salem/Forsyth County Schools
- Yadkin County Schools
- Yancey County Schools
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- Charter: American Renaissance School
- Charter: Arapahoe Charter School
- Charter: ArtSpace Charter
- Charter: Bethany Community Middle
- Charter: Bethel Hill Charter
- Charter: Brevard Academy
- Charter: Bridges Charter School
- Charter: C. G. Woodson School of Challenge
- Charter: Cape Fear Center for Inquiry
- Charter: Cape Lookout Marine Science High

- Charter: Carolina International School
- Charter: Carter Community Charter
- Charter: Casa Esperanza Montessori
- Charter: Charlotte Secondary School
- Charter: Charter Day School
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- Charter: Maureen Joy Charter
- Charter: Metrolina Reg Scholars Academy
- Charter: Millennium Charter Academy
- Charter: Mountain Discovery Charter
- Charter: Orange Charter
- Charter: PACE Academy
- Charter: Piedmont Community Charter
- Charter: Pine Lake Preparatory
- Charter: PreEminent Charter
- Charter: Provisions Academy
- Charter: Quality Education Academy
- Charter: Queen’s Grant Community
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- Charter: The Hawbridge School
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- Charter: Two Rivers Community School
- Charter: Union Academy
- Charter: Vance Charter School
- Charter: Voyager Academy
- Charter: Washington Montessori
- Charter: Woods Charter
- Charter: Other but not listed above
- Organization: College/University
- Organization: North Carolina Department of Public Instruction (NCDPI)
- Organization: North Carolina Virtual Public School (NCVPS)
- Organization: Regional Education Services Alliance/Consortia (RESA)
- Organization: Other but not listed above

Page 1 - Question 2 - Choice - Multiple Answers (Bullets) [Mandatory]

What is your current position? (Check all that apply for 2010-2011)

- ❑ Teacher (PreK-2)
- ❑ Teacher (3-5)
- ❑ Teacher (6-8)
- ❑ Teacher (9-12)
- ❑ Teacher Assistant
- ❑ School Support Staff
- ❑ Principal (PreK-5 or K-5)
- ❑ Principal (6-8)
- ❑ Principal (9-12)
- ❑ Other School Administrator
- ❑ Curriculum/Program Coordinator
- ❑ Media Coordinator
- ❑ Testing Coordinator
- ❑ Other Central Office Administrator
- ❑ Other, please specify

Page 1 - Question 3 - Choice - Multiple Answers (Bullets) [Mandatory]

What do you teach? (Check all that apply for 2010-2011)

- ❑ Not in teaching role
- ❑ Art
- ❑ Career Technical Eduation
- ❑ Dance

- ❑ English/Language Arts
- ❑ ESL
- ❑ Health
- ❑ Math
- ❑ Music
- ❑ Physical Education
- ❑ Science
- ❑ Social Studies
- ❑ Special Education
- ❑ Technology
- ❑ Theatre Arts
- ❑ World Language
- ❑ Other, please specify

Page 1 - Question 4 - Choice - One Answer (Bullets) [Mandatory]

How many years of teaching/educational experience do you have, including 2010-2011?

- ○ 1-3 years
- ○ 4-6 years
- ○ 7-10 years
- ○ 11-20 years
- ○ 21 years or more

Page 1 - Question 5 - Choice - One Answer (Bullets) [Mandatory]

What is your gender?

- ○ Male
- ○ Female

Page 1 - Question 6 - Choice - One Answer (Bullets) [Mandatory]

What is your ethnicity?

- ○ American Indian (including Alaskan native)
- ○ Asian
- ○ Black (non-Hispanic)
- ○ Hispanic/Latino
- ○ Native Hawaiian and other Pacific Islander
- ○ White (non-Hispanic)
- ○ Other, please specify

Page 1 - Question 7 - Choice - Multiple Answers (Bullets) [Mandatory]

Where do you usually access a computer or the Internet?

(More than one option may be selected)

- ❑ Home (wireless)
- ❑ Home (cable/high speed DSL)
- ❑ Home (dial-up)
- ❑ School/Work (classroom or office based)
- ❑ School/Work (library or common area)
- ❑ Public Library
- ❑ Other, please specify

Page 1 - Heading

Part II-Philosophy & Practice

Please answer the questions in this section based on your classroom or school.

Page 1 - Question 8 - Rating Scale – Matrix [Mandatory]

Please read the following statements and indicate whether they are True or False.

	True		False	
I use classroom assessment information to guide and revise teaching.	☐	2	☐	1
I know about what students learn in my class from quizzes and tests.	☐	2	☐	1
To be useful, a classroom assessment must be graded.	☐	2	☐	1
Statements such as "good job," "excellent," or "way to go" are useful in providing feedback to students regarding their mastery of class concepts.	☐	2	☐	1
Statements such as "try harder," "concentrate more," or "apply yourself" are useful in providing feedback to students regarding their mastery of class concepts.	☐	2	☐	1
Students should be allowed to assess their own mastery of class concepts.	☐	2	☐	1
Students should not be involved in the assessment process.	☐	2	☐	1
Classroom discussion and discourse will provide teachers with feedback on how well they are conveying ideas to students.	☐	2	☐	1
Frequent testing (e.g. daily graded quizzes) helps motivate students to learn.	☐	2	☐	1
The purpose of formative assessment is to make ongoing judgments about the quality of work students produce.	☐	2	☐	1
Formative assessment is just another thing to do and I do not have time for it.	☐	2	☐	1

Page 1 - Question 9 - Rating Scale – Matrix [Mandatory]

Please read the following statements and indicate your agreement or disagreement with each one using the scale given.

	Strongly Agree		Agree		Not sure		Disagree		Strongly Disagree	
I have received adequate training on how to assess my students during instruction.	☐	5	☐	4	☐	3	☐	2	☐	1
My students can describe what learning targets they are to achieve.	☐	5	☐	4	☐	3	☐	2	☐	1
I check for student understanding daily on a minute-by-minute basis.	☐	5	☐	4	☐	3	☐	2	☐	1
In a parent teacher conference, I communicate how well a student is doing by sharing the grades in my grade book.	☐	5	☐	4	☐	3	☐	2	☐	1
In a parent teacher conference, I communicate how well a student is doing by sharing evidence of learning that does not involve a grade.	☐	5	☐	4	☐	3	☐	2	☐	1

Page 1 - Question 10 - Rating Scale – Matrix [Mandatory]

Please indicate how often you do the following:

	Daily		Weekly		Monthly		Quarterly		Rarely/Never	
I use checklists when gathering information about student learning.	☐	5	☐	4	☐	3	☐	2	☐	1
I use rubrics for assessing my students.	☐	5	☐	4	☐	3	☐	2	☐	1
I write learning targets on the board and go over them with my students.	☐	5	☐	4	☐	3	☐	2	☐	1
I provide students specific information (without using grades or rubrics) about where they are in meeting the learning targets.	☐	5	☐	4	☐	3	☐	2	☐	1
I plan or modify classroom instruction based on the information I receive from classroom assessment.	☐	5	☐	4	☐	3	☐	2	☐	1
I give students opportunities to self-assess and set goals for future learning.	☐	5	☐	4	☐	3	☐	2	☐	1
I give students opportunities to reflect on and share their learning progress with others.	☐	5	☐	4	☐	3	☐	2	☐	1
I give students opportunities to formatively assess their peers.	☐	5	☐	4	☐	3	☐	2	☐	1
I give students opportunities to summatively assess their peers.	☐	5	☐	4	☐	3	☐	2	☐	1
I give students opportunities to provide input on assessment design.	☐	5	☐	4	☐	3	☐	2	☐	1

Page 1 - Question 11 - Rating Scale – Matrix [Mandatory]

Please rate how beneficial each module was for you using the scale given.

	Very Beneficial		Beneficial		Not Sure		Not Beneficial		N / A
Module 1: The Importance of Formative Assessment	☐	4	☐	3	☐	2	☐	1	☐ N/A
Briefly explain your rating for this modu									
Module 2: Clear Learning Targets and Criteria for Success	☐	4	☐	3	☐	2	☐	1	☐ N/A
Briefly explain your rating for this modu									
Module 3: Collecting and Documenting Evidence of Learning	☐	4	☐	3	☐	2	☐	1	☐ N/A
Briefly explain your rating for this modu									
Module 4: Analyzing Data and Descriptive Feedback	☐	4	☐	3	☐	2	☐	1	☐ N/A
Briefly explain your rating for this modu									
Module 5: The Role of the Administrator	☐	4	☐	3	☐	2	☐	1	☐ N/A
Briefly explain your rating for this modu									

Page 1 - Question 12 - Open Ended - Comments Box

What advice would you offer the group evaluating the pilot and modules as they plan the next steps with the formative assessment initiative?

Page 1 - Question 13 - Open Ended - Comments Box

What does your school and/or district do to support teachers in implementing the use of formative assessment in the classroom?

Page 1 - Question 14 - Open Ended - Comments Box

Please share any additional comments here:

Thank You Page

Standard

Screen Out Page

Standard

Over Quota Page

Standard

Survey Closed Page

Standard

APPENDIX F: PRE-SURVEY RESPONSE RATES

Pre-Survey Response Rates Disaggregated by District Personnel and Percentage of Total Responses

Assigned District Research Code	Response Count	Total Positions Reported by NCDPI 2010-2011*	Response Rate by District	Total Response Rate
1	81	2269	3.57%	0.19%
2	70	516	13.57%	0.16%
3	97	181	53.59%	0.22%
4	25	357	7.00%	0.06%
5	277	346	80.06%	0.64%
6	190	570	33.33%	0.44%
7	141	540	26.11%	0.33%
8	32	264	12.12%	0.07%
9	448	742	60.38%	1.04%
10	180	311	57.88%	0.42%
11	507	582	87.11%	1.18%
12	876	1168	75.00%	2.03%
13	1787	2496	71.59%	4.14%
14	847	1200	70.58%	1.96%
15	85	2601	3.27%	0.20%
16	747	1390	53.74%	1.73%
17	122	204	59.80%	0.28%
18	508	896	56.70%	1.18%
19	152	330	46.06%	0.35%
20	354	1614	21.93%	0.82%
21	6	1531	0.39%	0.01%
22	15	12083	0.12%	0.03%
23	282	899	31.37%	0.65%
24	Charter	-	-	-
25	319	420	75.95%	0.74%
26	40	143	27.97%	0.09%
27	529	1747	30.28%	1.23%
28	245	316	77.53%	0.57%
29	18	652	2.76%	0.04%
30	941	1424	66.08%	2.18%
31	43	5296	0.81%	0.10%
32	211	406	51.97%	0.49%
33	349	581	60.07%	0.81%
34	757	1884	40.18%	1.75%
35	317	620	51.13%	0.73%
36	575	930	61.83%	1.33%
37	61	3036	2.01%	0.14%
38	175	286	61.19%	0.41%
39	462	743	62.18%	1.07%
40	441	688	64.10%	1.02%

41	111	131	84.73%	0.26%
42	577	844	68.36%	1.34%
43	145	2990	4.85%	0.34%
44	157	230	68.26%	0.36%
45	49	156	31.41%	0.11%
46	24	803	2.99%	0.06%
47	246	364	67.58%	0.57%
48	37	7383	0.50%	0.09%
49	164	435	37.70%	0.38%
50	916	1780	51.46%	2.12%
51	626	786	79.64%	1.45%
52	366	1354	27.03%	0.85%
53	344	380	90.53%	0.80%
54	256	442	57.92%	0.59%
55	638	819	77.90%	1.48%
56	56	114	49.12%	0.13%
57	177	1831	9.67%	0.41%
58	228	384	59.38%	0.53%
59	466	3140	14.84%	1.08%
60	125	172	72.67%	0.29%
61	324	615	52.68%	0.75%
62	11	968	1.14%	0.03%
63	381	861	44.25%	0.88%
64	24	380	6.32%	0.06%
65	217	1277	16.99%	0.50%
66	263	488	53.89%	0.61%
67	106	288	36.81%	0.25%
68	185	453	40.84%	0.43%
69	336	671	50.07%	0.78%
70	139	257	54.09%	0.32%
71	166	483	34.37%	0.38%
72	1052	1292	81.42%	2.44%
73	40	497	8.05%	0.09%
74	67	170	39.41%	0.16%
75	1333	1763	75.61%	3.09%
76	471	2521	18.68%	1.09%
77	10	366	2.73%	0.02%
78	52	298	17.45%	0.12%
79	1767	2134	82.80%	4.10%
80	23	779	2.95%	0.05%
81	107	187	57.22%	0.25%
82	289	760	38.03%	0.67%
83	106	201	52.74%	0.25%
84	396	511	77.50%	0.92%
85	1628	2305	70.63%	3.77%
86	16	277	5.78%	0.04%

87	848	1783	47.56%	1.97%
88	383	755	50.73%	0.89%
89	11	307	3.58%	0.03%
90	871	2596	33.55%	2.02%
91	709	1367	51.87%	1.64%
92	781	2122	36.80%	1.81%
93	673	1005	66.97%	1.56%
94	621	927	66.99%	1.44%
95	471	823	57.23%	1.09%
96	552	949	58.17%	1.28%
97	241	752	32.05%	0.56%
98	659	898	73.39%	1.53%
99	81	231	35.06%	0.19%
100	74	277	26.71%	0.17%
101	4	399	1.00%	0.01%
102	65	95	68.42%	0.15%
103	2369	3594	65.92%	5.49%
104	502	831	60.41%	1.16%
105	41	13457	0.30%	0.10%
106	173	307	56.35%	0.40%
107	211	254	83.07%	0.49%
108	364	496	73.39%	0.84%
109	1103	2013	54.79%	2.56%
110	91	157	57.96%	0.21%
111	149	235	63.40%	0.35%
112	602	970	62.06%	1.40%
113	497	1146	43.37%	1.15%
114	365	5374	6.79%	0.85%
115	91	605	15.04%	0.21%
116	226	297	76.09%	0.52%
Total Districts Responding: 115**	42357	142624	-	100%

Total Response Rate Percent: 29.70%

*Note: Total positions reported by NCDPI for 2010-2011 included the following: official administrators/managers, principals, assistant principals, teachers, guidance, psychological, librarian/audiovisual, consultant/supervisor, other professional, and teacher assistants.

**Note: There are a total of 115 districts in this study. NCDPI included a charter school in the district reporting section that was removed during analysis.

APPENDIX G: POST-SURVEY RESPONSE RATES

Post-Survey response rates disaggregated by district personnel and percentage of total responses.

Assigned District Research Code	Response Count	Total Positions Reported by NCDPI 2010-2011*	Response Percent by District	Total Response Rate
1	42	2269	1.85%	0.16%
2	46	516	8.91%	0.18%
3	66	181	36.46%	0.26%
4	1	357	0.28%	0.00%
5	69	346	19.94%	0.27%
6	99	570	17.37%	0.38%
7	55	540	10.19%	0.21%
8	16	264	6.06%	0.06%
9	463	742	62.40%	1.80%
10	76	311	24.44%	0.30%
11	146	582	25.09%	0.57%
12	653	1168	55.91%	2.54%
13	560	2496	22.44%	2.18%
14	142	1200	11.83%	0.55%
15	9	2601	0.35%	0.03%
16	176	1390	12.66%	0.68%
17	31	204	15.20%	0.12%
18	330	896	36.83%	1.28%
19	150	330	45.45%	0.58%
20	60	1614	3.72%	0.23%
21	1	1531	0.07%	0.00%
22	3	12083	0.02%	0.01%
23	63	899	7.01%	0.24%
24	Charter	-	-	-
25	182	420	43.33%	0.71%
26	20	143	13.99%	0.08%
27	616	1747	35.26%	2.39%
28	29	316	9.18%	0.11%
29	8	652	1.23%	0.03%
30	167	1424	11.73%	0.65%
31	26	5296	0.49%	0.10%
32	164	406	40.39%	0.64%
33	193	581	33.22%	0.75%
34	307	1884	16.30%	1.19%
35	431	620	69.52%	1.67%
36	524	930	56.34%	2.04%
37	17	3036	0.56%	0.07%
38	115	286	40.21%	0.45%

39	364	743	48.99%	1.41%
40	342	688	49.71%	1.33%
41	55	131	41.98%	0.21%
42	254	844	30.09%	0.99%
43	19	2990	0.64%	0.07%
44	65	230	28.26%	0.25%
45	22	156	14.10%	0.09%
46	5	803	0.62%	0.02%
47	116	364	31.87%	0.45%
48	5	7383	0.07%	0.02%
49	77	435	17.70%	0.30%
50	250	1780	14.04%	0.97%
51	610	786	77.61%	2.37%
52	134	1354	9.90%	0.52%
53	179	380	47.11%	0.70%
54	125	442	28.28%	0.49%
55	544	819	66.42%	2.11%
56	15	114	13.16%	0.06%
57	84	1831	4.59%	0.33%
58	221	384	57.55%	0.86%
59	170	3140	5.41%	0.66%
60	108	172	62.79%	0.42%
61	268	615	43.58%	1.04%
62	1	968	0.10%	0.00%
63	238	861	27.64%	0.92%
64	3	380	0.79%	0.01%
65	106	1277	8.30%	0.41%
66	85	488	17.42%	0.33%
67	83	288	28.82%	0.32%
68	108	453	23.84%	0.42%
69	143	671	21.31%	0.56%
70	123	257	47.86%	0.48%
71	95	483	19.67%	0.37%
72	789	1292	61.07%	3.07%
73	6	497	1.21%	0.02%
74	56	170	32.94%	0.22%
75	1381	1763	78.33%	5.36%
76	315	2521	12.50%	1.22%
77	3	366	0.82%	0.01%
78	12	298	4.03%	0.05%
79	1394	2134	65.32%	5.42%
80	11	779	1.41%	0.04%
81	50	187	26.74%	0.19%
82	57	760	7.50%	0.22%
83	76	201	37.81%	0.30%
84	50	511	9.78%	0.19%

85	739	2305	32.06%	2.87%
86	4	277	1.44%	0.02%
87	1141	1783	63.99%	4.43%
88	413	755	54.70%	1.60%
89	4	307	1.30%	0.02%
90	214	2596	8.24%	0.83%
91	578	1367	42.28%	2.25%
92	367	2122	17.30%	1.43%
93	423	1005	42.09%	1.64%
94	597	927	64.40%	2.32%
95	437	823	53.10%	1.70%
96	322	949	33.93%	1.25%
97	306	752	40.69%	1.19%
98	414	898	46.10%	1.61%
99	56	231	24.24%	0.22%
100	20	277	7.22%	0.08%
101	8	95	8.42%	0.03%
102	1603	3594	44.60%	6.23%
103	344	831	41.40%	1.34%
104	17	13457	0.13%	0.07%
105	202	307	65.80%	0.78%
106	10	254	3.94%	0.04%
107	249	496	50.20%	0.97%
108	1047	2013	52.01%	4.07%
109	54	157	34.39%	0.21%
110	154	235	65.53%	0.60%
111	361	970	37.22%	1.40%
112	100	1146	8.73%	0.39%
113	134	5374	2.49%	0.52%
114	35	605	5.79%	0.14%
115	116	297	39.06%	0.45%
Total Districts Responding: 114**	25742	142225	-	100%

Total Response Rate: 18.10%

*Note: Total positions reported by NCDPI for 2010-2011 included the following: official administrators/managers, principals, assistant principals, teachers, guidance, psychological, librarian/audiovisual, consultant/supervisor, other professional, and teacher assistants.

**One school district failed to respond to the post-survey. NCDPI included a charter school in the district reporting section that was removed during analysis.

APPENDIX H: INSTITUTIONAL REVIEW BOARD APPROVAL

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
4N-70 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · **www.ecu.edu/irb**

Notification of Exempt Certification

From: Social/Behavioral IRB

To: William Hill

CC: Bill Grobe

Date: 11/18/2013

Re: UMCIRB 13-000256
School Professionals Perceptions of Formative Assessment as Related to Student Achievement

I am pleased to inform you that your research submission has been certified as exempt on 11/16/2013. This study is eligible for Exempt Certification under category #4.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.
This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.
The UMCIRB office will hold your exemption application for a period of five years from the date of this letter. If you wish to continue this protocol beyond this period, you will need to submit an Exemption Certification request at least 30 days before the end of the five year period.
The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

APPENDIX I: ANOVA RESULTS

ANOVA Results at the Item Level

Constructs and Variables	*df*	F	Significance
True / False Formative Assessment Statements			
I use classroom assessment information to guide and revise teaching	25943	247.178	.000
I know about what students learn in my class from quizzes and tests.	25943	65.786	.000
To be useful, a classroom assessment must be graded.	25943	123.375	.000
Statements such as “good job,” “excellent,” or “way to go” are useful in providing feedback to students regarding their mastery of class concepts.	25943	198.033	.000
Statements such as “try harder,” “concentrate more,” or “apply yourself” are useful in providing feedback to students regarding their mastery of class concepts.	25943	171.661	.000
Students should be allowed to assess their own mastery of class concepts.	25943	73.776	.000
Students should not be involved in the assessment process.	25943	101.333	.000
Classroom discussion and discourse will provide teachers with feedback on how well they are conveying ideas to students.	25943	7.178	.007
Frequent testing (e.g. daily graded quizzes) helps motivate students to learn.	25943	170.123	.000
The purpose of formative assessment is to make ongoing judgments about the quality of work students produce.	25943	162.676	.000
Formative assessment is just another thing to do and I do not have time for it.	25943	52.586	.000
Conceptual Knowledge Construct			
I have received adequate training on how to assess my students during instruction.	25943	1371.46	.000
My students can describe what learning targets they are to achieve.	25943	4537.05	.000
I check for student understanding daily on a minute-by-minute basis.	25943	1499.63	.000
In a parent teacher conference, I communicate how well a student is doing by sharing the grades in my grade book.	25943	466.281	.000
In a parent teacher conference, I communicate how well a student is doing by sharing evidence of learning that does not involve a grade.	25943	1230.37	.000
Procedural Knowledge			
I use checklists when gathering information about student learning.	25943	6226.37	.000
I use rubrics for assessing my students.	25943	7816.68	.000
I write learning targets on the board and go over them with my students.	25943	5901.83	.000
I provide students specific information (without using grades or rubrics) about where they are in meeting the learning targets.	25943	6094.75	.000
I plan or modify classroom instruction based on the information I receive from classroom assessment.	25943	1773.35	.000
I give students opportunities to self-assess and set goals for	25943	13399.4	.000

future learning.			
I give students opportunities to reflect on and share their learning progress with others.	25943	9786.26	.000
I give students opportunities to formatively assess their peers.	25943	21395.7	.000
I give students opportunities to summatively assess their peers.	25943	15659.5	.000
I give students opportunities to provide input on assessment design.	25943	20467.3	.000
How Beneficial are Modules			
The importance of Formative Assessment	25943	978.031	.000
Clear Learning Targets and Criteria for Success	25943	921.382	.000
Collecting and Documenting Evidence of Learning	25943	948.643	.000
Analyzing Data and Descriptive Feedback	25943	660.181	.000
The Role of the Administrator	25943	1842.35	.000

n = 29545,
p = .05