

ABSTRACT

Michael Royce Swinson. THE AFFECT OF INCREASED ASSESSMENT FOCUS THROUGH PROFESSIONAL LEARNING COMMUNITIES ON INSTRUCTIONAL PRACTICE (Under the direction of Dr. William A. Rouse, Jr.). Department of Educational Leadership, July 2019.

The purpose of this study was to determine the impact of utilizing a focused planning approach to test design and analysis within an assessment centered professional learning community (PLC) in one Local Education Agency in North Carolina.

The data in this study was collected from one school in a rural county in eastern North Carolina. Five teachers were chosen from three separate academic departments and a mixed methods approach was used to gather data from a state standardized End of Course assessment in Biology, North Carolina Final Exam in American History II and Civics, and a state Career Technical assessment in Animal Science I. Classroom end of unit exams in Biology, American History II, Civics, and Animal Science I, were also used to calculate growth within the classroom during the study. Qualitative data was collected from within the PLC meetings themselves and with formal interviews with teachers to capture teacher perception and recommendations.

Quantitative and qualitative data was collected from teachers as they utilized a logic model centered on design and analysis of test questions. Quantitative data was collected throughout the process from exams administered in Biology, American History II, Animal Science I, and Civics. Throughout the design and implementation process, teachers provided feedback and qualitative data to peers within the group. Peer data within the PLC was shared to improve the program itself throughout each stage of the logic model and research data given solely to the researcher was to answer each of the three study questions.

A final review of data from participants in a PLC focused on assessment concludes that this process has a positive impact on student achievement and teacher instructional change.

Growth on North Carolina End of Course exams and Final Exams in eighty percent of the participant group coupled with qualitative teacher perception data concludes that following participation in the assessment PLC, teachers collaborate with colleagues more with respect to building classroom assessments, believe a PLC approach to building classroom assessments will improve student achievement results, and have greater command of practical use for Bloom's Taxonomy.

THE AFFECT OF INCREASED ASSESSMENT FOCUS THROUGH PROFESSIONAL
LEARNING COMMUNITIES ON INSTRUCTIONAL PRACTICE

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the Faculty of the Department of Educational Leadership

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by

Michael Royce Swinson

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DEDICATION

I wish to dedicate this dissertation to my family. They have all persevered through my days and nights of coursework and attending classes and provided encouragement and support in anything I have ever worked towards. My children have all been patient and my sisters always have provided a base structure and safety net for me which allowed me to try anything with no fear of failure. My mother has been the sounding board for everything in my life and has always been the key to it all – she was the avid reader and academic example that showed me the importance of knowledge. Thank you for your unconditional support!

I also thank the teachers that have been a greater part of my life than you could ever imagine – please know that you taught me how to succeed and how to recover from failure. I speak highly of you all to whomever will listen and know in my heart that I received a solid academic structure for my own professional goals.

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Last but not certainly not least, I dedicate the completion of this dissertation and program of study to my father who was always my greatest teacher and example through the years. I do so wish that I could share this moment with you in person – I am proud to have had the opportunity to have you in my life guiding me in all that I was driven to do. I Love you and miss you very much!

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CHAPTER ONE: INTRODUCTION

Since even before the implementation of No Child Left Behind (No Child Left Behind [NCLB], 2002), educators have been administering summative assessments to students at the end of each academic term as a way to evaluate student achievement and teacher effectiveness. Teachers have been preparing students to make academic achievement gains on various state subject assessments as well as national tests such as the American College Testing (ACT) assessment and Scholastic Aptitude Test (SAT). School leaders work with teachers to plan and teach the standards for their content area, furthermore, schools are provided student achievement data by state departments of instruction, which allows school administrators to focus on teacher accountability by discussing with teachers their need to improve instruction based upon assessment of students. These assessments are used by school leaders to evaluate teacher effectiveness and provide state agencies data for evaluating the overall affect on schools. The summative feedback of student achievement received by school systems and disseminated to teachers, typically have little direct impact on student success or achievement. For example, with North Carolina State assessment, most student achievement results are not given to teachers until months after the tests were taken. This does not take away any impact they may have, but rather, suggests that the classroom assessments given during the teacher instruction cycle have more immediate impact in terms of long term student improvement. Discussions on classroom summative and formative assessment, between teachers and students, peers, and administration and teachers, needs to occur while instruction is still ongoing and relevant. But change within student achievement rarely occurs when discussions do not focus on the process of teaching and learning in classrooms (Black & Wiliam, 1998). In part to solve that problem, professional learning communities (PLC) are a collaboration tool which are able to act as a teamwork

medium between administration and teachers to provide the support for discussion. Professional learning communities that are created within schools and run with fidelity have the structure to support an atmosphere of collegiality and foster positive change in teacher instructional practices. This environmental design allows teachers and school leaders to analyze, communicate, and make decisions that impact both instructional change and classroom student assessment. Leadership within an effective professional learning community allows teachers to share in decision making and maintain a shared responsibility for student testing results and achievement (Huffman & Hipp, 2003).

The percentage of tested high school graduates in the US meeting ACT college readiness benchmarks in the subject areas of math and science have shown little improvement across states over the last few years with math decreasing by one percentage point from 43 to 42 in 2015, decreasing again by one point from 42 to 41 in 2016, and staying at 41 for 2017. Science increased by one point in 2017 rising from 36 to 37 which has not strayed much from scores over the last five years as it reached a high of 38 (in 2015) and a low of 36 (in 2013 & 2016). Over the last five years, ACT college readiness scores in mathematics have averaged 42.2 and science has averaged 36.8. In North Carolina, high school juniors are all given the opportunity to take the ACT and the average score for each school is an indicator used by the state as a factor to assign each school a grade that indicates college and career readiness. Reported scores from the 2016-2017 school year showed a North Carolina composite mean score of 19.1 out of 36. The math and science mean was 19.3 (*The condition of college & career readiness 2017: National*, 2017). These averages are just above 50% of the possible points available and indicate further need for continued improvement within instruction in the content areas covered on the ACT.

Another national measure of student proficiency which also measures student achievement in the United States is the National Assessment of Educational Progress (NAEP). NAEP results are gathered using representative samples of students in grades 4, 8, and 12. In the most recent NAEP long term trend assessment in mathematics, students in the 50th percentile and lower made some achievement overall since the assessment began in the early 1970s, however, students above the 50th percentile have made very small gains in achievement (*The nation's report card: Trends in academic progress 2012. NCES 2013-456*, 2013). Data collected from these formal assessments is only a first step in making changes in schools. Bernhardt (2004) states that the two most important outcomes from NCLB (2002) were that the continued collection of data was important but not as important as continuous improvement within schools based on instructional analysis of summative and formative assessment data.

Standardized test scores in North Carolina for the 2016-2017 school year reveal that the performance composite college and career level readiness is less than half for all students taking North Carolina End of Year exams as indicated by a proficient level score of 4 or 5 (49.2%). A need exists for major improvements on each assessment in North Carolina as overall percentage growth is small and has not moved above the 50% mark for combined grade levels.

Problem of Practice

In the Beaufort county school system (BCS), there exists a need to improve student academic achievement. As realized on North Carolina End of Course (EOC) tests, the district's percentage of college and career ready students, those scoring a proficiency from level 4 to 5 on North Carolina End of Course tests in 2016-2017, was 7.1 percentage points below the NC state average. Further, all three traditional high schools in the district fall below the district average in college and career ready proficiency (see Table 1). An even more notable trend in the North

Table 1

College & Career Ready (Level 4 or 5) EOC Achievement Level Percentages

LEA/School	14-15	15-16	16-17
NC	47.9%	49%	50.9%
BCS	38.6%	34.8%	35.5%
WHS	30.8%	26.9%	24.2%
NHS	37.5%	33.8%	32.3%
SHS	26.7%	24.2%	28.1%

Carolina EOC testing data is the increase over the last three years of the percentage of Biology proficiency level 1 scores. The system's traditional high school data fails to at least mirror the state in the area of Biology (see Table 2).

The Washington High School (WHS) data reflects the most growth in the percentage of level 1 scores. WHS reported over 50% of their students scoring in this lowest category with a change of 18 percentage points while the other two traditional high schools in this district reported a 6 percentage point growth in this category. A primary need exists at each of these high schools to improve their Biology NC EOC test scores. Hence, the study will focus on the explanation of improving WHS student achievement on the North Carolina EOC test in Biology.

The emphasis typically leans to the curriculum and instruction components with little true focus on improving teacher assessments of student performance or the formative assessment process. Students are given assessments throughout the semester based on the curriculum concepts and objectives with the assessments themselves normally built in isolation of other teachers in their content area and without discussion. Hence, one way of improving student assessment and using that data to inform instruction may be by the use of a professional learning community that focuses on assessment design, implementation, and analysis of results.

Other areas to be studied within this project will be additional core courses that are assessed using the North Carolina Final Exam (NCFE). Three other courses will utilize the assessment focus project. Civics, American History II, and Animal Science I will add five total teachers working in three departmental groups. Growth in all of these courses has shown a decline over the past year with the exception of American History II which has shown a slight increase following a drop of 1.5 across the growth percentage value. Table 3 shows the school value added scores for these courses at the high school that will be used to conduct the

Table 2

Level 1 All EOC/Biology Percentages

LEA/School	14-15	15-16	16-17
NC	23.1/24.2%	23.1/23.2%	21.7/23.4%
BCS	28.8/32.2%	34.6/34.1%	34.9/42.2%
WHS	36.8/34.5%	42.3/37.2%	45.2/55.1%
NHS	25.3/22.9%	25.7/17.1%	32.9/28.4%
SHS	30.1/32.2%	38.4/40.6%	33.9/38.3%

Table 3

School Value Added Growth Measure

Subject	14-15	15-16	16-17
American History II	1.1	-0.4	0.2
Civics	1.3	-2.2	-2.3
Biology	-0.7	-0.5	-2.5
Animal Science I	-7.3	-9.1	-7.2

research. The value added data provides information concerning overall student growth in a tested subject, which gives a good indication on how effective the program was in meeting student needs in that course.

The school being studied is currently focusing on literacy with an emphasis on incorporating higher level questions into instruction. This was initiated by a school leadership team that began analyzing the NC EOC grades of students who had low Lexile scores, a measure of student reading comprehension, and were predicted to make proficiency within subjects as low as 0.1%. Test scores were being analyzed and ways to begin to make changes in assessment outcomes following Common Core curriculum adoption and implementation were discussed by school and district leadership. At Washington High School, the school being studied, standardized test scores were significantly lower than the state and the lowest in the district. Discussions among school leaders indicated that some form of attention had been given to teacher assessments in each high school as a response to addressing low scores however a defined plan for direct attention to classroom assessment was not revealed nor was any plan for improving and sustaining the process outlined. This project includes an initial plan for evaluating teacher made tests through administrative processes and subject and course professional development communities within the school, with the goal of improving the rigor of the assessment and the level of questions students are exposed to following instruction. Curriculum connection and teacher focus on testing to the standards taught and pushing students to think about the subject while analyzing higher order thinking questions is the intent of this problem of practice solution. Changes to instruction as a result of building student assessment goals towards a higher formative level at the end of each unit is an expected outcome. An expected limiting factor to this will be changing the culture within the classroom for not only the teachers involved

but also for the administrators leading this program. In reference to change within schools, Torres, Zellner, and Erlandson (2008) state that school administrations hesitate to make changes to policies or procedures if the changes are perceived to be ones that may be disruptive as this may become a threat to the existing culture at the school.

To address the problem of practice outlined in this paper a professional learning community will be established, which will review all teacher unit summative assessments within the Biology, Civics, American History II, and Animal Science I classrooms. PLC members will review the initial test of each teacher involved and note levels of questions per Bloom's Taxonomy (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). The professional learning community (PLC) will be made up of teachers within different departments who will also review the assessment, discuss possible question level changes to the assessment within the PLC, and meet with the teacher to communicate the suggested changes. The classroom teacher will make changes, communicate the changes made and track changes quantitatively. The teacher will give the exam and analyze results so that planning of any remediation instruction can be completed and given.

By moving to a focus of assessment design and analysis, teachers continue to engage with curriculum and instruction and students are to be given more rigorous examinations with questions at higher levels of thinking. In order for students to be able to perform on teacher made assessments, change will have to be made to instruction with a cycle of improvement being implemented. Teachers will gain valuable experience in evaluation of not only their students work but their own work as well. This project will be completed at Washington High School and begin in the content departments of social studies, science, and career technical education. The intent of this study is to evaluate this project's effectiveness and refine for replicated placement

in other departments within the school, and further expand to the other high schools in the local District that were not included in this original program evaluation.

Study Plan

The purpose of this study is to determine if a focused planning approach to test design and analysis and utilizing professional learning communities, has an impact on classroom assessment scores and NC state standardized testing proficiency and growth. A survey of prior teacher knowledge of Bloom's Taxonomy and assessment will be administered to teachers involved prior to program start. A mixed methods approach has been chosen and will focus on quantitative scores from classroom end of unit exams in Biology, American History II, Civics, and Animal Science I. Qualitative data from teachers and administrators directly involved in the study will also be collected and analyzed. The researcher will establish professional learning communities used to make recommendations to formative assessments, communicate the timeline for conducting the collection of data, provide a revised Bloom's Taxonomy reference for the PLC's to use in review, and collect data throughout the test design process concerning changes in overall level within the assessments. Further collection of quantitative data consisting of percent change in Bloom's Taxonomy levels of questioning on teacher made unit summative assessments from Animal Science I, Biology, American History II, and Civics will be collected, along with student test results from eighty-six American History II students, seventeen Animal Science I students, sixteen Civics students, and twenty-nine Biology students. Qualitative data will be collected from all five teachers at key points within the logic model of test design and analyzed. The qualitative data will be used to assess whether changes in methodology and instruction is being impacted by the professional learning community approach to test design and changes to questions on classroom unit tests.

Study Questions

This study will examine three questions. These questions are as follows:

1. Does the classroom assessment design process affect student developmental score growth on NC EOC exams?
2. Do focused professional learning communities on teacher assessment impact student achievement based on the results from classroom unit summative tests?
3. Do focused professional learning communities on teacher assessment impact teacher instructional practices?

CHAPTER TWO: LITERATURE REVIEW

Introduction

If a program is to be put into place within a school setting which utilizes teachers within a professional learning community (PLC), then the outlined program and elements of the logic model require a discussion. The construct itself is simple, build professional learning communities made up of teachers with which review each other's work to make instructional improvements, however, the individual framework deserves attention at a closer level of examination. The logic model (see Figure 1) outlines the flow from start to finish of a PLC dedicated to improving classroom assessment. The design begins with a backwards planning approach in which teachers, after choosing what objectives are to be taught, build their unit test. Once the teacher has built the assessment, they begin planning their instructional sequence while the PLC members review the test noting levels of Bloom's revised taxonomy for each question and making suggestions to revise existing questions and make them more challenging. Once the PLC members have submitted their suggestions, the classroom teacher then reviews again the changes ensuring that they remain connected to the original set of objectives in the unit being taught. Changes to the instructional sequence are made to ready students for the assessment and instruction is given to the class over the specified period of time prior to the examination being given. Following the assessment, data analysis is performed by the teacher and the cycle starts over either for new objectives being taught or within remediation for students who did not master the original unit goals.

This review of literature connects to the basic elements of this program to be evaluated and moves through the topics of classroom assessment, Bloom's Taxonomy, and professional learning communities and their impacts on instructional practice. Each of these topics has

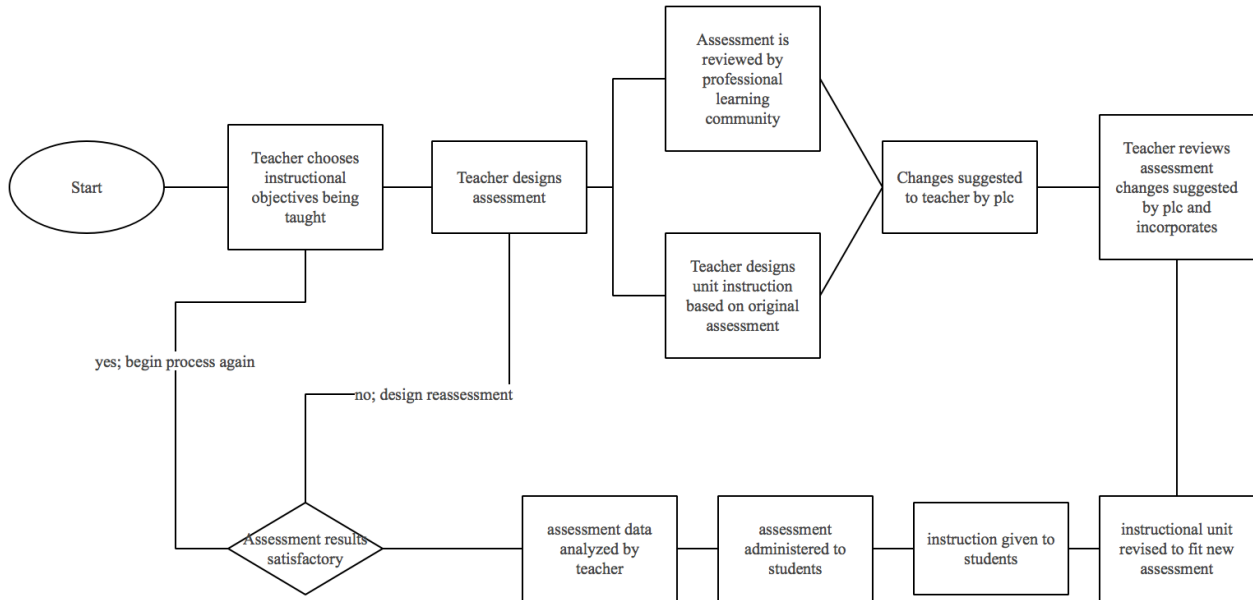


Figure 1. PLC Assessment Review Logic Model.

direct relationship to the elements of the project being evaluated and specifically to the research questions being posed and logic model being implemented.

Classroom Assessment

In the United States, much emphasis is placed on obtaining high student scores on individual state summative assessments within courses offered in public schools. Accountability within schools, districts, and state organizations often take precedence with improvement to the educational system being judged by scores on end of course assessments. Districts further test high school students with required benchmark exams two to three times a semester to measure areas in need for remediation or reteaching, however these examinations do not provide ongoing evidence collection that might measure mastery of objectives within the curriculum and sub categories within those objectives. There is also the use of formative assessment in which the data is used to modify instruction prior to the end of unit assessment. Formative and summative assessment make up two very broad categories of assessment in the classroom under which other common practices by teachers fall.

Assessment Terminology

Butler and McMunn (2006), state that to have an understanding of assessment, one must understand the terminology. Frey and Schmitt (2007) contend that in order to understand, use, and improve assessment within classrooms, that it is necessary to define common terms across the literature. They focus on the three terms, performance assessment, authentic assessment, and formative assessment. Performance assessment is considered an alternative assessment form and gives teachers a true indication of what students really know as it is able to be used to go past basic knowledge, as traditional forms of assessment such as multiple choice tests rarely do, and assess higher order thinking skills connected to real life situations (Henderson, & Karr-Kidwell,

1998). Wiggins (1993) defined authentic assessment as one that utilizes real-life situations to test knowledge of a particular content area or set of objectives, and that assesses students on their ability to construct meaning effectively. Requiring students to construct their answers as opposed to merely choosing a multiple choice answer choice forces students to use higher order thinking and pushes students into an active stance mirroring typical day to day problem solving and response (Inger, 1993). Inger (1993) goes on to state that critics of authentic assessment rely on an argument that instruction loses time in the classroom since authentic assessment consumes additional time for both teachers and students. Types of authentic assessment include, but are not limited to portfolios, student interviews, self-assessments, writing samples, and performance tasks. In an earlier article, Wiggins (1989) further defined authentic tests to always include structure and logistics, intellectual design features, grading and scoring standards, and fairness and equity as characteristics. These characteristics are difficult to implement within most assessment programs. Also, authentic assessment is sometimes linked directly to performance assessments since the students are completing tasks in which they use the knowledge gained during instruction. Performance assessment is sometimes thought to be a larger domain in which authentic assessments reside. Wiggins (1998) describes performance assessments as having the standards of authenticity, credibility, and being user-friendly. Although performance assessments should be authentic when possible, this is not a requirement in order for an assessment to be considered to be a performance test.

Formative assessment is used by teachers to determine what a student knows and to help improve instruction. This improvement can only occur prior to the summative assessment, and when the program still is capable of being improved due to the analysis of the ongoing assessments prior to end of course tests (Scriven, 1967). Bloom (1969) shifted Scriven's

proposed definition and moved the lens from an overall program evaluation to an assessment of individual learners. Popham (2008) defines formative assessment as a planned process in which assessment elicited evidence of students' status is used by teachers to adjust their ongoing instructional procedures or by students to adjust their current learning tactics. Formative assessments have been defined as consistent and quickly scored tests that inform practice (Cohen & Leonard, 2001). Wiliam and Black (1996) note that the term formative assessment is not the one most frequently used; Instead, it is often represented by classroom evaluation or formative evaluation, just to name a few. Black and Wiliam (1998) note additionally that feedback between students and teacher is a consistent factor in success with formative assessment used in the research they reviewed. The attention given to formative evaluation by teachers can lead to significant learning gains and further state the research shows conclusive evidence that formative assessment does improve learning. Bennett (2011) discusses that the definition of formative assessment has supporters that state it is only a test, and those that oppose that view as being too strict, as well as those whom believe that as long as instruction is changed based on the analysis of the assessment, then it is considered formative.

This evaluation of an assessment PLC at the high school level has teachers focused primarily on assessment improvement however, they need to be able to assess, as they move through their instruction, whether mastery of material is taking place. This change in instruction is a key research question in evaluating the effectiveness of the specific PLC.

Assessment Design

Within the establishment of a classroom assessment, teachers need to know what they are going to assess and how in order to build instruction. During instruction, teachers assign mastery level tasks to check student understanding of the pieces needed to fully comprehend a unit. These

tasks, when used to improve instruction, are to be considered formative as the changes should promote further learning. The validity of the formative assessment is dependent on the effectiveness of instruction that follows (Heritage, 2007). Teacher differences when implementing formative assessment were studied in a multiple-case study (Box, Skoog, & Dabbs, 2015) involving three high school science teachers. A curriculum development model of personal practice theories was used with the teachers as one of six components for data collection. Teacher knowledge played a large role towards the teacher's ability to implement successfully, formative teaching techniques into the classroom. The study revealed that three teachers had differences among their personal practice assessment theories that limited or facilitated formative assessment use in the classroom.

A description used by Black and Wiliam (1998) suggests that teacher assessment questions are not generally shared and that groups of teachers do not normally review the questions prior to giving the assessment. Their review of research spanned over 500 articles or chapters all relating to assessment in the classroom. Winger (2005) proposed in his study that university instructors couple summative and formative assessment together, taking time to go over exam questions with students and gathering quantitative and qualitative data during the process. He saw an increase in test scores of up to 10% when using what he termed the Formative Summative Assessment (FSA) method as opposed to about a 2% increase in his control group which did not use this method. The involvement of the students within this process was key to improving how they approach preparation for assessment.

Stiggins (2001) summarizes the poor state of affairs of the classroom assessment to be used as a useful tool. What he wrote almost twenty years ago continues to be the case today, as for all of the validity and reliability required of state standardized assessment, this is not the case

for weekly and daily classroom assessment. Teachers are not held to the guidelines of the 1999 American Educational Research Association and, to their defense, are not schooled in the processes of proper assessment during their formal education and licensure processes. Norton, Norton, and Shannon's (2013) survey study focused on assessment design views by new university lecturers and suggested that approaches to assessment are different dependent on disciplinary context. Teachers at the K-12 level vary in terms of their formal schooling and content disciplines, and differences in acceptance of school assessment improvement models may correlate.

Prospective teachers need programs in place at the university level or through professional development that emphasize assessment for learning. A pilot project out of Australia (Grainger & Adie, 2014) that worked with preservice teachers within a University course in assessment utilized peer-assessment activities and peer moderation processes where teachers were active participants. Despite the small sample size of 96 respondents, it was concluded that a majority of preservice teachers that participate consistently with peer assessment activities have increased confidence with assessment as they move forward into the profession. In a separate study (Izci & Caliskan, 2017), 118 prospective teachers were assigned a course considering assessment for learning and final analysis of data showed that the course did not have any significant impact on the perceptions of the teachers with respect to conception of assessment. Their choices of assessment tasks however, was impacted and showed that the course did have bearing with respect to using alternative assessments. Teacher conception of the use of assessment tends to be based on their experience with assessment as a student and even when exposed to alternative methods and uses of assessment tends to gravitate back to the more traditional. Siegel and Wissehr (2011) conducted a small study of 11 preservice secondary

teachers enrolled in a methods course in which their assessment literacy was analyzed through an individually written teaching philosophy, course journals, and a science unit they designed within the course. The results found that the teachers were open in their journals about using new assessment methods and analyzing data for use in the classroom and characterized this within their statement of teaching philosophy, however, a majority of their units reflected that they reverted back to traditional forms of assessment and purpose when planning to teach. This study provided many forms of assessment examples through lecture and practical experience within the course and concluded that exposure itself to many different forms of assessment is no guarantee that these will transfer to classroom use.

Instructional Change

Black and Wiliam (1998) contend that classroom policy towards formative assessment as a major piece within the classroom aspect of learning and student achievement should be emphasized. In our problem of practice model, it is a goal of this project to improve classroom instruction using an assessment focus within a PLC. This implies teacher improvement in instructional planning and implementation of the plan, in order to raise student understanding of material to match increased rigor on unit assessments, will occur as a byproduct of being involved within this professional development working group. In a set of case studies (Coffey, Sato, & Thiebault, 2005) examined individual and personal change in teaching practice following a larger professional development led by University faculty with thirty middle grades teachers. The teachers who were involved with these case studies had previously been a part of a grant funded by the National Science Foundation and led by faculty at Stanford University entitled, The Classroom Assessment Project to Improve Teaching and Learning (CAPITAL), which examined the use of assessment improvement as a focus of teacher change. Coffey et al.

(2005) contend that new approaches presented within professional development must understand and take into consideration differences with each teacher's personal priorities along with understanding the school and district context in which they teach. Programs introduced without allowing for this may show change initially however do not always remain as a sustainable change agent within instructional practice.

In support of the program being implemented in this project, Koloi-Keaikitse (2016) recommends that school administrators look to improve assessment development of teachers by involving them in workshops specifically rooted in assessment techniques that improve instruction and student learning needs. Their Botswana study addressed one key research question - *how do teachers' levels of assessment training predict the frequency to which they use different classroom assessment practices*. A sixty-seven question survey was given to a sample of 265 teachers from primary, middle, and secondary schools in Botswana to measure the relationship between the amount of assessment training they had received and the extent to which they used classroom assessment practices in daily teaching. Results indicated that failure to train teachers in assessment or provide in-service workshops or programs focused on assessment, negatively impacted teacher assessment skills and their ability to enact change within classroom practice. In lieu of formal workshops or programs, professional learning communities consisting of teachers with similar interest in assessment and improvement of instruction towards improvement of instructional processes have shown to be very effective in helping teachers grow significantly in the areas they choose as focus (Popham, 2009).

Bloom's Taxonomy

Instruction occurs at the lowest level of Bloom's taxonomy, knowledge, in a majority of classrooms (Davidson & Decker, 2006). In this study, teachers following the logic model are to

engage with Bloom's taxonomy and improve formal assessment items which should in turn, improve instructional levels within each lesson through teacher planning changes. A review of the research finds most articles citing what Bloom's Taxonomy is and not necessarily how it can be used to improve instruction directly. Understanding how the levels progress and how best to scaffold instruction based on the levels is outlined in this section.

According to Krathwohl (2002), Bloom's Taxonomy was originally conceived from educator conferences centered on curriculum design and assessment as a way to create test item banks that could be shared amongst university faculty so that each could have consistency in measuring the educational objectives. These conferences were held from 1949 to 1953 from which a first publication was completed in 1956 entitled: *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain*. The six major categories of cognitive domain as outlined by Bloom's Taxonomy are knowledge, comprehension, application, analysis, synthesis, and evaluation. The idea across these domains is that a student will have mastered each lower category in a hierarchical fashion before being able to access and master the next. Marzano and Kendall (2007) state that over the past half-century, Bloom's Taxonomy has been an influence as much on evaluation as any other educational category.

The original six categories ranged from simple to more complex and were understood to follow a scaffold of development for the classroom learner. The intent of Bloom's original layout of the six hierarchies was to illustrate the connections between them. The educational behaviors required in the knowledge class are also required in all advanced classes such that at the evaluation stage, behaviors from all subsequent levels would be used to form that class. Madaus, Woods, and Nuttall (1973) tested relationships amongst non adjacent levels in an attempt to show no significant relationships between them. The results of their study showed that there are

relationships amongst non adjacent levels and they do not function independently, however the extent of that significance is dependent on level of the student and taxonomy level.

Paul (1993) mentions the neutrality of Bloom's taxonomy and how it is easily misinterpreted by educators. Along similar lines, Wineburg and Schneider (2010) wrote about a study they completed concerning the linear structure of Bloom's taxonomy and it's misinterpretations at face value. Students, given some basic knowledge and then exposed to a new artifact, will rely on their prior knowledge to make inferences and determinations on their view of the artifact. This is exactly the progression as outlined in the pyramid of Bloom's taxonomy which places knowledge at the base. Through their analysis of different lenses and views based on the response to the new document following knowledge of the subject, they conclude that new knowledge is always being gained dependent on context and questions that naturally arise. The point made is that the linear familiarity that most teachers have with Bloom's taxonomy is not complete and their interpretation of student progression towards critical thinking is sometimes flawed.

Anderson and Krathwohl (2001) revised the original taxonomy keeping six categories, changing the name of three categories, and swapping evaluation from the top level to one below. The three levels that retained their classification changed only from noun to verb form to assist teachers trying to use the hierarchy within their planning and instruction. In a study by Jenson, Mcdaniel, Woodard, and Kummer (2014), researchers tested the effect of assessment questioning specifically in two sections of an introductory biology course. Quizzes and exam questions were labeled as low-level or high-level dependent on their revised Bloom's classifications. Throughout the courses, questions remained low for one section and high for the other with a common final exam, with low and high level questions given as a summative assessment at the

end of the course. Lower-level questions for this study were written only at the remember level and the higher-level questions were constructed at the apply, analyze, and evaluate levels. As would be expected, the outcomes of the study implied that students exposed to higher order thinking questions allowed them to have a much deeper understanding of the material and thus score higher on the final assessment, which was common between the two groups. Exposure to lower level questions on a consistent basis with no movement upward in Bloom's levels, provided a disservice to students as they did not seem to apply knowledge well on the summative final and scored lower than those exposed to higher level questions in their course. Backwards design, which is a part of the logic model of this research project, highlighted the connection between planning to objectives, building an assessment that measures instruction, and providing instruction that includes activities aligning with the assessments. When teachers teach process skills through activities in instruction, this is mirrored in the assessment results and allows teachers to build more rigorous summative assessment with higher level questions included.

Professional Learning Communities

The original construct of a professional learning community (PLC) is one that began in the business sector and related to the capacity of business organizations to learn. It has since transitioned and grown in education and allowed for the creation of collaborative work nodes for teaching professionals. Many in education label their department meetings, school process committees, etc., as PLC's without regard to any real construct in it's design. A good working definition for professional learning communities in education was discussed by Dufour (2004), in which he described the process as collective inquiry and local study which works towards increased achievement for school improvement. He goes on to state that in order for PLC's to be effective for student achievement they must also have the same learning effectiveness for the

educators which serve them (Dufour, DuFour, & Eaker, 2008). Dufour (2004) makes mention that PLC's must be reflected upon to their purpose and design as use of the term PLC without attributing certain characteristics and outcomes to the group causes the designation to lose meaning. PLC's must have some results backed in data that indicate change in teaching practices with the end result ultimately being student gains in academic achievement.

Professional learning communities are touted to be an entity within schools that connect teachers to ongoing collaborative professional development that will ultimately raise student achievement. In a study by Grossman, Wineburg, and Woolworth (2001), the researchers established a single professional learning community by combining an English and Social Studies department and documented how they developed. Their research conclusions were that PLCs grow in stages which were necessary to its success. Teachers within PLCs learn to be open to using different approaches to student instruction and to becoming an actual collective devoted to being responsible for student learning.

Hord (1997) summarizes from the literature five initial characteristics of professional learning communities within schools:

1. the collegial and facilitative participation of the principal who shares leadership and thus, power and authority through inviting staff input in decision making.
2. a shared vision that is developed from an unswerving commitment on the part of staff to students' learning and that is consistently articulated and referenced for the staff's work.
3. collective learning among staff and application of the learning to solutions that address students' needs.

4. the visitation and review of each teacher's classroom behavior by peers as a feedback and assistance activity to support individual and community improvement.
5. physical conditions and human capacities that support such an operation.

This PLC framework discussed the professional learning community as an extension of the school improvement plan within the context of local professional development. Hord (1997) goes on to define the professional learning community framework as one in which administrators and teachers collaborate and set their focus on student learning.

Administrators at all levels want to know that when PLC's are initiated in their districts, instructional change and measurable improvements in student achievement will occur. Supovitz and Christman (2003) discussed their analysis of large scale evaluations of two major district reform initiatives designed to study teacher communities and their development with improving instruction. Supovitz (2002) was involved with the mixed methods research conducted in these two different locales and worked to answer the question of how much impact these communities of practice had on teacher instruction and student achievement. Findings reported positive change occurred within the working relationships of the communal culture of the schools. Change in instructional practice however, was only relevant in communities that had an instructional intervention as a focus within the PLC's. Evidence further suggested that student performance gains existed in all communities that engaged in structured, sustained, and supported instructional discussions.

A review on eleven professional learning community research studies (Vescio, Ross, & Adams, 2008) revealed that teacher instructional change and student achievement were affected positively when PLC's were well-developed. The authors reviewed the studies and looked for patterns between participation in PLC's and change in classroom instruction. Based on their

review, educators support and value the use of PLC's in making improvements within instructional practices and student achievement. This is based on teacher interpretations across all eleven studies. With respect to student achievement, scores improved over time in six of the studies in which a focus of student learning was a central idea. An interesting note within this review was that the Hawthorne Effect, that the changes occurred not as a result of participation in a PLC but rather due to being involved with an innovation, could not be entirely discounted in the achievement and change in instruction.

According to Timperley (2006), in order for any professional learning community to be sustainable, it must receive ongoing support from leadership. In a recent international study (Zheng, Yin, Liu, & Ke, 2016), the relationship between leadership practices and PLC's was studied and determined that leadership practices and trust in colleagues was significant in fostering positive effects on PLC's. Two hundred and fifteen teachers from elementary schools in Yunnan province in China responded to a questionnaire consisting of a Professional Learning Scale, Leadership Practice Scale, and Trust in Colleagues scale. Following statistical analysis, results show that leadership practices have significant impact on teacher work within PLC's. The more open principals are to teachers learning and trying new ideas, the more the teachers are willing to change instructional practice in their classroom. An additional international study (Seo & Han, 2012) investigated PLC's implemented in Korean schools. The researchers studied whether Korean schools exhibited characteristics of Professional Learning Communities and if development of these communities related to teacher, student, and parent satisfaction of these schools. A survey instrument was given to teachers, students, and parents from 265 elementary and secondary schools in Korea. Results showed that schools in Korea showed less inclination to collaborate and that elementary schools are more suited to implementation of PLC's than are

secondary schools. Teacher satisfaction in Korean schools has a correlation to success of a PLC and that student and parent satisfaction is negligible to the success. This study was interested in the satisfaction in their schools as it relates to new innovations such as the addition of PLC's to drive positive change.

Cranston (2009) completed a research study that examined school principal conceptions of professional learning communities. The researcher agrees that there has been conceptual problems with research on professional learning communities. Cranston (2009) gathered data from principals using natural occurring activities in the school setting. Twelve principals formed two focus groups and were interviewed over a six month period. The following eight themes emerged from the qualitative study:

- professional learning communities are about a process
- structural supports enable the development of professional learning communities
- trust as the foundation for adult relationships
- congenial relationships dominate conceptions of community
- professional teaching is derived from attitudinal attributes
- teacher evaluation shapes how principals think about learning in professional communities
- teacher evaluation impacts principal and teacher relationships in professional learning communities

The study concluded that administrators need to understand the complexity of establishing successful PLC's. The researcher goes on to state that full understanding of this list and actions in advance of establishing PLC's as well as taking risks and moving away from comfortable collaborations is key to schools being able to maximize success stemming from PLC's.

A study by Wells and Feun (2008) examined the level of implementation across six high schools of professional learning communities. The researchers studied the level of six separate high schools whom each sent a team to receive specific PLC training over the course of one school year. The teams represented leadership at each of the schools and developed training plans to lead efforts of PLC implementation at their home schools. The PLC training focused on using collaboration as a tool, and data analysis. Six of the twenty-four original schools that went through the training then participated in a University study the following year that looked at personal responses of the leadership teams that underwent the previous years training to assess the degree of implementation of PLC principles. The researchers allowed the leadership teams to implement PLC's within their schools the year following the training. The leadership teams were then individually given a survey created by the researchers and based on the following dimensions which were from the work of Hord (1997):

- Supportive and shared leadership
- Collective creativity
- Shared values and vision
- Supportive conditions
- Shared personal practice

Each team member, thirty-two total, was interviewed one-on-one using the designed survey with both quantitative and qualitative data collected. The results showed that implementation of PLC's within a school can be a slow process. The teachers involved in the training and setup of teams at their schools wanted to collaborate, plan, and work together, however were reluctant to analyze data and work to improve results. Most notably and connected to this study, teachers were tasked with putting together assessments after analyzing student data

that would work to remediate and review material that was not mastered. A second study was completed and revealed results that were not much different from the first. Teachers eventually settled into a routine with meeting to collaborate however still did not work to make substantial changes to instruction or assessment. Results further indicated that it takes a period of more than three years to establish successful, working, PLC's at a school and that strong leadership from the administration of the school, specifically the principal, is needed.

School improvement seems to always be an active component of initiating PLC's within a school. Faculty, both teachers and administration, may all have a desire to begin and sustain a professional learning community, however, each may have their own separate reasons for doing so. While most of the research reviewed points to the positive effect that PLC's have with student achievement, each also points to different attributes of the PLC itself that causes this change and to where the change occurs. School leaders need to be able to communicate a vision for what the PLC will look like and what results will occur. Stoll and Louis (2007) stated that discussions and the ability of leadership to market the PLC as a model as opposed to a stand-alone program of instructional change is key to the ability of the members of the team having potential to succeed.

CHAPTER THREE: RESEARCH METHODOLOGY

Purpose of Study

The purpose of this study is to evaluate the establishment of a program concerning assessment practice in which administrators and professional learning communities review teacher assessments and make suggestions for change to rigor by increasing the level of questioning. The researcher will collect quantitative data consisting of percentage of questions in each level of Bloom's Taxonomy on the original assessment, percent change in Bloom's Taxonomy levels on teacher made unit summative assessment revised questions, and percent from each level of questions answered correctly on each revised assessment. This data will be taken from Animal Science I, Biology, American History II, and Civics classes. Additional quantitative data will be from end of semester state standardized summative exams. Teachers will also provide qualitative data concerning change within their instruction based on assessment changes, and to what effect participation in a PLC devoted to assessment across different content disciplines had on the changes. This chapter describes the purpose of this study, the research design used, participants, collection and analysis of data, procedures, and reporting of results.

Research Design

In this study the research will evaluate how a PLC, setup in one particular school across three content disciplines, functions. This study will utilize a modified version of Stufflebeam's CIPP program evaluation process to assess how a classroom assessment PLC, tasked with making unit tests more challenging, functions. The CIPP process was originally developed in the 1960s for use specifically within educational settings and incorporated four distinct evaluation categories within its framework. CIPP, which is an acronym for the processes of Context, Input, Process, and Product, is designed to assist with the improvement of educational and academic

programs. Each of these evaluation categories provides different information at key stages of the process and assists with program decision making. This research includes quantitative and qualitative aspects and is a multi-method design in terms of data collection. The CIPP evaluation is a method utilized to improve what is being done in the classroom, school, and ultimately the district, as well as serve as an accountability tool (Stufflebeam, 1971). Stufflebeam (1971) also states that the CIPP model was designed to answer four specific questions: What should we do? How should we do it? Are we doing it correctly? And did it succeed? Considering the dynamic environment that exists within a school, the CIPP evaluation model and its learning by doing emphasis is a good fit for a program examining assessment and identifying corrections within project features on an ongoing basis. This program evaluation utilizing the CIPP model will monitor the implementation process of this pilot program within a school utilizing summative test scores.

The CIPP process for this project will begin by working with five teachers across four separate courses in which student achievement declined over the last three years. Teacher focus on classroom assessment change will be contained within a single PLC involving all five teachers. Assessments will look to have Bloom's Taxonomy levels raised on classroom summative test questions, all written originally by the teacher of record for the course, and improved with collaboration of the other teachers in the PLC. PLC members will individually look at the submitted classroom tests and then meet to discuss proposed changes to be suggested to the teacher of record. The teacher who designed the original classroom assessment will incorporate the changes and change instruction to meet the increased rigor of the assessment. The teacher will then implement their instruction and formative assessment plan. Summative assessments will be given and results analyzed by the teacher who will make a decision on

success of the summative assessment or the need for remediation on specific items. If there is need for remediation, a new assessment is designed by the teacher for the items not mastered, and the cycle of utilizing the PLC to examine individual test questions will occur again.

Quantitative data will be collected in this project. Teachers will document the number of changed questions throughout the analysis of each classroom assessment. Teachers will also document their analysis of student work of each unit summative assessment and classify percentages correct of each level of questions. Areas of concern will be levels of questions that scored low percentages overall. These will become discussion topics within the PLC with respect to changes made and instructional changes needed to improve percentages of correct responses on future assessments. Qualitative data will be set through grounded theory (Glaser & Strauss, 1967). This qualitative methodology constructs the theory grounded in data that will allow for the discovery of factors in the success or non-success of the program. The data will be collected through the use of teacher interviews and analyzed to classify similarities and differences. The researcher will then group them under like conceptual headings and themes that will form the structure of the details used to answer the study questions for this program and ground the theory for improvement.

Findings will be reported to the group of teachers involved with the PLC, with some of the data collected shared during the process for improvement purposes. The concluding discussion will be shared with district leadership in an effort to improve PLC processes and use of assessment as a central theme within future professional development. Further action within the school such as expansion of the project to other departments will be discussed within the school's leadership and school improvement team.

Participants

The participants in the study will be from the same high school and from three different departments. One science teacher teaching Biology, a career technical teacher with an Animal Science I course, and three social studies teachers, one of which is teaching only American History II, one who is teaching American History II and World History, and one who is teaching two Advanced Placement (AP) courses and Civics. The teachers were chosen for participation based on interest in the study and placed by experience level and knowledge of the curriculum. Two of the social studies teachers have already implemented an informal assessment review within their classes in a previous semester, the other just completed a graduate degree in curriculum and instruction. Within the science department, the Biology teacher selected met or exceeded growth on their individual state standardized exams from the previous year. Three of the teachers have four years or less of teaching experience, one has five years experience, and the remaining teacher has over 15 years and serves as a mentor for beginning teachers within the building. Quantitative data collection from these participants will be collected following review of each classroom test. Qualitative information will be compiled and analyzed from interviews between the participants and the researcher.

Teachers selected completed a survey given prior to the project's start. From that survey, years of experience, years of service to the current school, knowledge of assessment, knowledge of Bloom's Taxonomy, and years of participation in a professional learning community working group data was gathered. Average years of teaching service was nine with average number of years in the current school at three and one-half. The assessment knowledge portion of the survey (see Table 4) showed teachers to be knowledgeable in all categories pertaining to the study. Teachers also agreed that there was not currently a sustained policy concerning

Table 4

Teacher Assessment Survey Data

Assessment Practice Survey Questions	Weighted Average (Total Points Gained/Total Points Possible)*Max Point Value (5)
I have used a backwards design process where the assessment is written following my selection of objectives to be taught and prior to instruction	4.2
I have experience reviewing assessment questions for rigor and Bloom's Taxonomy level	4
I complete a data analysis on all of my unit assessments	3.4
I build my classroom assessments by myself	3.6
I collaborate with colleagues when I build my classroom assessments	3.6
There is currently a school level policy concerning classroom assessment at my school	2.6
We currently have a professional development program in place to address classroom assessment	1.8
I believe a PLC approach to building my classroom assessments will improve student achievement results	4.0

classroom assessment and that no professional development programs addressing classroom assessment existed. The lack of current policy and professional development adds weight for the need of this program.

One hundred eighty-six American History II students, seventeen Animal Science I students, sixteen Civics students, and twenty-nine Biology students will be in the courses where the assessment analysis will be taking place. Success rate on revised assessments will be collected and used by teachers to establish remediation parameters.

Knowledge of Bloom's Taxonomy, according to the survey, showed to be a considerable teacher participant strength in terms of knowledge (see Table 5). Two of the questions produced a few responses showing lack of expertise and that was in identification of the difference in Bloom's original taxonomy and the Revised Bloom's Taxonomy, and in the use of Bloom's in constructing test items. Overall, teachers still seem to have the knowledge in place needed for writing revisions of an assessment utilizing Bloom's Taxonomy.

Data Analysis

The researcher will collect ongoing formative data throughout the program with the use of qualitative interviews and quantitative evidence of change within each subject's assessment. All five of the teachers involved in the PLC will be asked questions at specific intervals of the logic model. Transcripts of responses will be initially coded and analyzed in detail to get at the essence of what the interviewee is saying about the program in each sequence of the model. It is the intent of the researcher to try and understand what the underlying issues are and make improvements as the program progresses. Quantitative data that is collected will be analyzed for any patterns among responses such as teachers changing many questions or changing only a few, teachers paying attention to the proportion of leveled questions on each assessment, etc. Any

Table 5

Teacher Bloom's Taxonomy Survey Data

Bloom's Taxonomy Knowledge Survey Questions	Weighted Average (Total Points Gained/Total Points Possible)*Max Point Value (5)
I have knowledge of Bloom's Taxonomy and its use	4.6
I know the difference between Bloom's Taxonomy and Revised Bloom's Taxonomy	3
I purposefully use Bloom's Taxonomy when I plan instruction	3.8
I purposefully use Bloom's Taxonomy when I write my assessments	3.6
I have knowledge of questions aligned with levels of Bloom's Taxonomy	3.8

patterns that appear to emerge will be noted and interview questions within each sequence may shift slightly to address these themes. The goal of the data collection is for the researcher to establish the level of effectiveness of the program and to provide some formative feedback to participants along the way, analyzing shifts in the program that are produced due to these changes.

Context and input evaluation. The first two components in this evaluation process were designed using an analysis of previous years data to include the teacher working conditions survey, testing data taken from the North Carolina Education Value-Added Assessment System (EVAAS), and a literature review. Examination of these front-end items assisted in the culmination of a set of procedures to be utilized in the program pilot study. The first phase in the CIPP process, Context Evaluation, was used to analyze low state assessment scores and specific teacher survey data centered on professional development and leadership within the school. Among achievement indicators for the state, Washington High School dropped in three proficiency assessment categories. The largest drop occurred within Biology proficiency scores which dropped 15 percentage points. An even deeper inspection shows that level 1 scores, the lowest category of achievement on these assessments, rose by 18 percentage points with over 55% of the Biology students falling in this lowest level. Hence, within the End of Course subjects to work with, Biology was an easy choice based on the data. Also of interest within the state assessment system was overall growth within not only indicator subjects, but also throughout the other state tested courses within our high school. The Educator Effectiveness Growth Estimate for Washington High School, which includes scores for career technical courses and core subjects that do not have an end of course assessment but utilize North Carolina final state exams, was -13%, significantly lower than the minimum cutoff score for meeting

growth which is -2. Teachers for this project were chosen based in part on the course taught and their individual growth score within their subject. One science teacher, one career technical teacher, and three social studies teachers were ultimately selected from a list of volunteer participants. The science teacher selected met growth in their individual scores last year. This teacher will be teaching Biology. The career technical teacher did not previously meet growth expectations and will be teaching Animal Science I. Social Studies teachers selected for this pilot project include two teachers who did not meet expected growth and one who did. Of the three Social studies teachers, two will be teaching American History II and the other Civics, as part of this PLC cohort.

Additionally, the most recent teacher working conditions (TWC) survey was reviewed for discrepancies and needs for improvement with any category that related to assessment or instructional growth. The main question of interest from the TWC survey was the following: Question Q2.2 states, in an AVERAGE WEEK, how much time do you devote to the following activities during the school day (i.e., time in which you are under contract to be at the school)? Subcategories h, i, and k were substantially low in time spent: 2.2h, professional development being 69% less than 1 hour; 2.2i, preparation for required federal, state, and local assessments being 45% less than 1 hour; and 2.2k, utilizing results of assessments being 65% less than 1 hour.

A comprehensive literature review was also completed and centered on classroom assessment, assessment terminology, assessment design, instructional change, use of Bloom's Taxonomy in assessment, and professional learning communities. Several key points emerged in the review that support this program and the aspects included within. Black and Wiliam (1998) state that teachers need to focus more on assessment and this additional attention by teachers can

lead to significant learning gains. They also go on to state that teachers do not typically review questions prior to assessments being given and that school program policies towards classroom testing as a major piece in the instructional process should be emphasized. Professional development is needed for teachers and it should address an emphasis on assessment and assessment design (Grainger & Adie, 2014). Utilizing Bloom's Taxonomy is an essential need due to the influence it has on questioning and assessment as much as any other category as discussed by Marzano and Kendall (2007). Probably most significant was a study by Jensen et al. (2014), which established results that showed significant increase in biology scores in an introductory class when students were exposed to higher level questioning using Bloom's revised taxonomy as a guide. The shared theme amongst all literature reviewed, was that a problem of practice opportunity does exist in terms of low achievement scores for students on standardized tests and that a need for improvement on assessments should be addressed.

Conversations within the building among faculty have touched on assessment evaluation but one issue has been the lack of leadership, either external or within the teaching staff themselves, to sustain the program, gather data, and make decisions on whether to continue, improve, or scrap altogether. With this in mind, the PLC will meet at least once a week to discuss specific assessment items and finalize any suggestions for increasing level of questioning before giving to individual teachers for use. Teacher leaders and admin will share leadership responsibilities in this respect and all push to sustain the program in its initial trial. Given discussions, analysis of data, and a comprehensive literature review, three study questions were composed by the researcher to guide the program:

1. Does the classroom assessment design process affect student developmental score growth on NC EOC exams?

2. Do focused professional learning communities on teacher assessment impact student achievement based on the results from classroom unit summative tests?
3. Do focused professional learning communities on teacher assessment impact teacher instructional practices?

Process and product evaluation. The logic model is broken into five separate sequences of events each of which has its own formative evaluation data collection process. The sequences are as follows:

1. Teacher chooses objectives to be taught and teacher designs unit summative assessment
2. Assessment is reviewed by PLC and teacher designs instructional unit
3. Changes to assessment question levels given to teacher; teacher makes changes
4. Instructional unit changes made to reflect updated assessment and instruction given
5. Unit summative assessment given to students and results analyzed by teacher

In each of these five sequences, qualitative data will be collected through teacher interviews (see Appendix D). The interviews will be conducted by the researcher during each phase of the process and teacher interviews separated from others to minimize any bias during questioning. Audio responses to questions will be the primary data source and will be coded by the researcher into Nodes which will further be broken into themes and cases for classification.

During the first sequence, teachers will submit their assessment as electronic copies for the PLC members and the researcher to review. PLC members, during what is considered the second sequence, will review the initial assessment individually making suggestions for change. They will all consistently use a Bloom's Taxonomy reference resource that gives a short explanation of each level of thinking, key words appropriate for each level, and includes example

questions using verbs associated to that level of thinking. Teachers will log how many questions they made changes to and how many levels they moved each question. The researcher will log the percentage of questions from the original assessment at each Bloom Level, and then log changes to this percentage created by the suggestions given by each individual teacher and the group. Finally, the PLC will meet to discuss the changes and solidify which revised questions they choose to share with the teacher. The third sequence is the point in which the teacher receives the approved changes from the PLC and incorporates them. If the teacher decides not to include any of the changes, they will be asked to justify their decision while being interviewed at the end of that sequence. Sequence four is the part of the process in which the teacher will modify their current plan to ensure students receive instruction that will prepare them to be able to successfully answer the unit summative assessment questions. Instruction will then take place followed by sequence five of the project processes which incorporates the assessment being given and an analysis of the work completed by students.

As the timeline progresses, feedback from the teachers involved in the assessment PLC will be given through the collection of qualitative feedback during every sequence. Questions concerning problems with the process or learning cycle, either teachers learning or applying the process, will be administered and feedback will be shared with teachers for each subsequent round. The goal of the program is not that teachers just merely go through the motions but to become a positive factor in increasing student achievement on unit assessments within classrooms. Within the Product category of the CIPP process, questions given at the end of each cycle will measure whether goals of the program were accomplished, whether the program is one that stands alone as is or is in need of revision, and answers whether teachers continue to use what they have learned implicitly without need of school leadership intervention.

Summary

Within the CIPP evaluation model being used in this study, questions have been addressed at each of the four levels of the evaluation process. The information gained at each level is to be applied formatively to the program itself during the process as well as being used to sum up the program's value summatively. Guidance will be given following analysis of the data on how successful the program was and to what extent changes need to be made to continue its sustainability. The outcomes will be compared with the goals and questions of this study to determine the effectiveness of the program in its current state. All of these results will be shared with stakeholders at the school, district and community levels through direct feedback and participation within the school improvement committee.

CHAPTER FOUR: RESULTS OF THE STUDY

As stated in chapter one, this study examined a focused planning approach to test design and analysis utilizing a professional learning community and its impact on developmental score growth on summative classroom unit assessments, end of course examinations, and North Carolina final exams. Quantitative and qualitative data was collected from teachers as they participated in utilizing a logic model centered on design and analysis of test questions. Quantitative data was collected throughout the process from exams administered in Biology, American History II, Animal Science I, and Civics. Throughout the design and implementation process, teachers provided feedback and qualitative data to peers within the group and to the researcher. Peer data within the PLC was shared to improve the program itself throughout each stage and research data given solely to the researcher was to answer each of the study questions of this research.

Study Questions

The following three study questions were used to inform the study:

1. Does the classroom assessment design process affect student developmental score growth on NC EOC exams?
2. Do focused professional learning communities on teacher assessment impact student achievement based on the results from classroom unit summative tests?
3. Do focused professional learning communities on teacher assessment impact teacher instructional practices?

Participant Data

The participants in this study were from one high school in a rural eastern North Carolina county. Five teachers from three separate academic departments were chosen based on their

knowledge of assessment theory and Bloom's Taxonomy. All of the teacher participants had interest in improving student unit test scores within their disciplines and also in implementing a program that would be able to grow and extend across more content areas. Two of the teacher participants had already worked on assessment review, both in design of the tests and analysis of results. Their work was completed independent of the current research study and prior to the start of this PLC process. Another teacher participant had recently completed a graduate degree in curriculum and instruction and of the last two teacher participants selected, one of those teacher participants had met growth on their individual state standardized exams from the previous academic year and one teacher participant did not meet growth on their individual state standardized exams from the previous academic year. The group of five teacher participants were also diverse in terms of experience. Two of the teacher participants had more than four years of teaching experience and the other three teacher participants had less than four years of teaching experience. Classroom unit assessment data and North Carolina End of Course tests and Final Exam standardized assessment data were analyzed from one hundred eighty-six students enrolled in American History II, seventeen students enrolled in Animal Science I, sixteen students enrolled in Civics, and twenty-nine students enrolled in Biology (see Table 6). Additional quantitative data was collected by teachers during assessment review, the time in which they reviewed other teacher assessments, within the professional learning community and included original percentages of Bloom's question levels on each unit assessment reviewed, revised assessment percentages of the same, and percentage of correct answers of each level of questions answered by students on unit assessments. Finally, qualitative data was collected from each team member through individual interviews. Additionally, monthly focus group meeting highlights were coded and added to the qualitative results and findings.

Table 6

Course Student Enrollment Data

<u>Courses</u>	<u>Number of Students Taught</u>	<u>Years of Teaching Experience</u>
American History II	186	<4
Civics	16	>4
Biology	29	<4
Animal Science I	17	>4

Analysis of Data

Data collected in this research study consisted of four separate input categories: Front-End Analysis survey; Course Standardized Assessment Data; PLC Quantitative Data; and PLC Qualitative Data. Prior to research a Front-End analysis survey was given to teacher participants to determine their knowledge level of the guiding categories used in the logic model and within discussions predicted to occur within the PLC. Benchmark student data from each course was collected from the state and used to set a baseline for growth on state assessments as well as to mark growth with the current data that followed the semester of research with the PLC. Student test data from end of year North Carolina state examinations in each course studied within the PLC was gathered at the end of the fall 2018 semester. And finally, quantitative and qualitative data were both collected from the PLC during the study and following end of year student testing on the North Carolina End-of-Course tests.

Front-End Analysis Survey

The teachers participating in this study were selected based on a convenience sample of educators in the same high school that were interested with improving assessment in their classrooms. Teacher input from a front-end analysis survey, used to capture data prior to the start of research, categorized questions into Assessment Practice or Bloom's Taxonomy Knowledge (see Table 7). This data was used to determine what extent of pre-existing knowledge teachers had and informed data towards potential in all three of the research study questions. Teachers with interest took the survey and remained as selections only if they had some background with Bloom's Taxonomy use with respect to building assessments (see Table 7). All question categories received responses from all five participants in the initial survey.

Table 7

Assessment Practice Survey Questions

Survey Question	Assessment Practice	Bloom's Taxonomy Knowledge	Pre Weighted Average	Post Weighted Average
I have used a backwards design process where the assessment is written following my selection of objectives to be taught and prior to instruction	X		4.2	4.6
I have experience reviewing assessment questions for rigor and Bloom's Taxonomy level	X		4	5
I complete a data analysis on all of my unit assessments	X		3.4	3.8
I build my classroom assessments by myself	X		3.6	3.6
I collaborate with colleagues when I build my classroom assessments	X		3.6	4.2
There is currently a school level policy concerning classroom assessment at my school	X		2.6	2.6
We currently have a professional development program in place to address classroom assessment	X		1.8	3
I believe a PLC approach to building my classroom assessments will improve student achievement results	X		4.0	4.4
I have knowledge of Bloom's Taxonomy and its use		X	4.6	4.6
I know the difference between Bloom's Taxonomy and Revised Bloom's Taxonomy		X	3	4.6

Table 7 (continued)

Survey Question	Assessment Practice	Bloom's Taxonomy Knowledge	Pre Weighted Average	Post Weighted Average
I purposefully use Bloom's Taxonomy when I plan instruction		X	3.8	4.4
I purposefully use Bloom's Taxonomy when I write my assessments		X	3.6	4.2
I have knowledge of questions aligned with levels of Bloom's Taxonomy		X	3.8	4.2

The survey given prior to the start of the PLC cohort produced results showing that teacher perception of their own knowledge of assessment design and Bloom's Taxonomy was high (see Table 7). Survey results at the end of the process revealed teacher perceptions increased regarding the impact on their instructional practices. A Likert scale was used for each question with a high response as a five and the lowest numeric response as zero (5-Strongly Agree; 4-Agree; 3-Slightly Agree; 2-Slightly Disagree; 1-Disagree; 0-Strongly Disagree). The weighted average was determined using a formula placing total points gained divided by total points possible, with the resulting quotient multiplied by the max point value of five. The front-end analysis category provided data to Study Question Three: Do focused professional learning communities on teacher assessment impact teacher instructional practices?

The set of Front-End analysis questions were given to teachers prior to starting the study and again at the end during the interview process. Teacher averages rose on all but three questions and had an average change of .55. The assessment section had growth on average of .5 and the Bloom's section had average rise at .6. Two questions in the assessment section had no change from pre to post. Teacher responses showed that there is still no current formal policy at the school level that has put in place professional development centered on assessment. Also, teachers indicated that they had no change in responses concerning the building of their own assessments individually. One in the Bloom's category with no change dealt with teacher knowledge with use of the taxonomy in their classrooms. This was a high average with the initial survey and remained so at the conclusion of the study. With respect to these questions within assessment and Bloom's categories, the only question of the three that was directly addressed was the building of assessments using a team as opposed to individual approach.

Standardized Assessment Data

Data reported by the state of North Carolina on student achievement for standardized end of year exams was used to show overall developmental achievement growth by students. Three areas of reported data were used to determine impact of teacher instructional practices. Those three areas were: Teacher Value Added (TVA), Teacher Growth Measure (TGM), and Growth by Student Achievement Groups (GSAG) low, middle, and high. The TVA index score quantifies the teacher's impact on instruction in each course they teach. A score of less than negative two indicates a teacher is significantly lower than the average teacher, in the state of North Carolina, whose index score falls in a range of negative two to two. A teacher with an index score of greater than two, indicates that teacher is significantly more effective than the average teacher in the state of North Carolina. The index score for each teacher is provided by the North Carolina Department of Public Instruction (2016) and is calculated by dividing the growth measure by the standard error. TGM are estimates of student academic progress as linked to the teacher and are generated by the state using multivariate and longitudinal analyses. This analysis compares student data across multiple subjects and grades for high school students and is a fair measure for each group of like students.

Course Assessment Proficiency

Five teachers in four courses were involved in this study. One of those teachers taught Biology, which was the only North Carolina End of Course test used as part of the classroom assessment. Two of the courses used the North Carolina Final Exam, and the last course utilized a North Carolina Career Technical state exam. The North Carolina End-of- Course test measures student proficiency with a scale of levels one through five (1-denotes limited command of knowledge and skills; 2-denotes partial command of knowledge and skills; 3-denotes sufficient

command of knowledge and skills; 4-denotes solid command of knowledge and skills; 5-denotes superior command of knowledge and skills) (see Appendix D). Proficiency levels for Biology in the range of four and five indicate college and career readiness and three, four, and five are labeled grade level proficient (see Table 8). The student proficiency reported in the area of Biology are for the academic years 2016-2017 and 2017-2018. The Biology teacher involved in the research study was the only Biology teacher of record during the year the study data was collected; thus, all Biology indicator data for the 2017-2018 academic year is a result of that teachers' instruction. Biology student grade level proficiency percentages increased 7.4 percentage points at the target school following the study. The percentage of level 1 scores in Biology showed a very small increase in the school where the study was taking place. Level two scores dropped from 22.4% to 14.9%. Level 4 scores decreased from 17.6% to 14.9% while Level 3 and 5 scores went from being less than 5% to 8.5% and 6.4% (see Table 9).

Only one of the courses saw a decrease in either proficiency or growth and that was the Animal Science I course. All others showed an increase within the school Value Added Growth Measure. This is the number which reports how effectively a teacher has grown their students within that course, the differences between the previous year and the year the study was completed (see Table 10). The school value added growth measure shows data that reflects not only from teachers involved in the study, but also data from teachers outside of the research study.

Individual Teacher Value Added Growth Measures show only the data from the teachers involved in the study over multiple school years (see Table 11). The American History II teachers did not teach the course in academic year 2016-2017 and had no data to compare for growth individually. However, the data revealed growth for their students in the 2017-2018

Table 8

Grade Level Proficient (Level 3, 4 or 5) Biology Achievement Level Percentages

School	16-17	17-18
WHS	22.4	29.8

Table 9

Biology Level Percentages

Level	16-17	17-18
Level 1	55.1%	55.3%
Level 2	22.4%	14.9%
Level 3	<5%	8.5%
Level 4	17.6%	14.9%
Level 5	<5%	6.4%

Table 10

School Value Added Growth Measure

Course	16-17	17-18
American History II	0.2	0.9
Civics	-2.3	1.0
Biology	-2.5	2.7
Animal Science I	-7.2	-11.2

Table 11

Individual Teacher Value Added Growth Measure

Course	16-17	17-18
Animal Science I	-7.3	-11.6
Biology	1.4	3.0
American History II	n/a	1.6
American History II	n/a	-0.2
Civics	-2.2	-0.9

academic year. Student achievement growth data was further disaggregated among student levels as low, medium, and high (see Table 12 and Table 13). Table 12 shows the percentage of students in each category and Table 13 shows the value added growth attributed to these categories. Tables 12 and 13 reflect the individual teacher percentages and growth index scores and show that the largest percentage of students fell into the lowest category for all courses. The standardized assessment section provided data to research question 1: Does the classroom assessment design process affect student developmental score growth on state standardized tests?

PLC Quantitative Data

Quantitative results from within the PLC were reported by teachers throughout the process and used for discussion between teacher and assessment reviewer as well as the entire team. PLC members documented the quantity of questions that were in each level of Bloom's Taxonomy on each assessment they reviewed. Each assessment reviewer on the team was assigned a Bloom's Taxonomy guide to use as a reference and a shared spreadsheet was assigned to each reviewer and teacher. The teacher documented how many were in each level following changes to the assessment and, after the assessment was given to students and graded, annotated the percentage of correct responses of each level of questions. Ten assessments were reviewed and the data collected yielded percentage results (see Table 14). The PLC quantitative data category provided data to research questions 2: Do focused professional learning communities on teacher assessment impact student achievement based on the results from classroom unit summative tests?

Over 50% of the questions in the original teacher-made assessments were lower level according to teacher review cumulative data. Suggested changes adopted by the teacher who wrote the assessment, distributed questions slightly higher; however, the majority of questions

Table 12

Percent of Students in Academic Achievement Categories 2017-18

Course	Lowest	Middle	Highest
Animal Science I	40%	20%	40%
Biology	71.4%	28.6%	0%
American History II	61.9%	26.2%	11.9%
American History II	50%	28.1%	21.9%
Civics	54.9%	37.3%	7.8%

Table 13

Value Added Growth Measure in Academic Achievement Categories 2017-18

Course	Lowest	Middle	Highest
Animal Science I	-8.1	n/a	-16.8
Biology	2.2	7.0	n/a
American History II	2.1	0.8	4.6
American History II	-1.1	-0.6	2.0
Civics	-0.8	-1.5	n/a

Table 14

Quantitative Level Analysis Tool Cumulative Percentages

Bloom's Taxonomy Level	Percentage of Questions in Original Assessment	Percentage of Questions in Revised Assessment	Percentage of Each Level of Questions Answered Correctly
Level 1	.254%	.203%	.59%
Level 2	.271%	.237%	.62%
Level 3	.186%	.220%	.63%
Level 4	.102%	.153%	.55%
Level 5	.186%	.169%	.55%
Level 6	0%	.0169%	0%

still dominated the lower three levels. Success with these questions in all categories averaged just under 50% correct with the low being 0% and the high at sixty-three correct. The majority of the levels of questions answered correctly fell between 55% and 63% with the exception of level six questions in which no students answered any correctly.

PLC Qualitative Data

Data was collected from participants through formal interviews at the end of the data gathering process. Teachers had already provided quantitative data and were asked thirteen questions at the end of the process (see Table 15). The questions fell into categories associated to stages along the logic model and related specifically to the study questions for this research (see Figure 2).

The discussions following the qualitative questions had similarities in that seven broad themes emerged (see Figure 3). Four of these points could be classified under three significant themes made from the participants. All teachers highlighted the main themes of Reflection, Bloom's Taxonomy, and Level of Teachers. Within discussions of the main themes, each participant went into detail with departmental issues and trust within the level of teacher's domain, result analysis in the reflection domain and formative assessment in the Bloom's Taxonomy domain. The PLC qualitative data category provided data to all of the study questions.

Level of teachers. Teacher classification was identified as a large factor in whether or not the experience within the study was beneficial or not. Those participants with less experience tended to grow more than teachers who had already established set patterns of planning and executing their classroom assessments. Trust between members of the group when providing suggested changes on assessments and when holding conversations within the group was crucial

Table 15

Formal Interview Questions

Interview Question	Interview Key	Study Question 1	Study Question 2	Study Question 3
How did you design the original assessment? What was your process?	1			X
What was your process for reviewing the assessment? How long did it take? Did you use the reference table provided?	2			X
Did this review of another teacher's test help you in any way with designing your assessment? Was change prompted by focus in the PLC?	2			X
How did you feel about the changes suggested? Did this affect your thoughts on future design of your assessments?	3			X
If questions were changed on one of your assessments and were advanced several levels, how would you account that the students had mastered subsequent levels prior to the summative exam?	3			X
What changes did you make to your instruction following revisions to your original assessment? Why?	4			X
What additional changes to instruction would you incorporate based on results of success on your assessment?	5		X	X
How has participation in this PLC changed your assessment process?	1,2,3,4	X		X
Has participation in this PLC changed the way you view the use of Bloom's Taxonomy in your planning?	1,2,3,4	X		X

Table 15 (continued)

Interview Question	Interview Key	Study Question 1	Study Question 2	Study Question 3
Do you feel that student achievement has been impacted due to the work completed within this PLC?	5	X	X	
Was there a difference in expected student outcomes on assessment due to the process utilized from the PLC? Was this due to instructional changes made?	4,5	X	X	

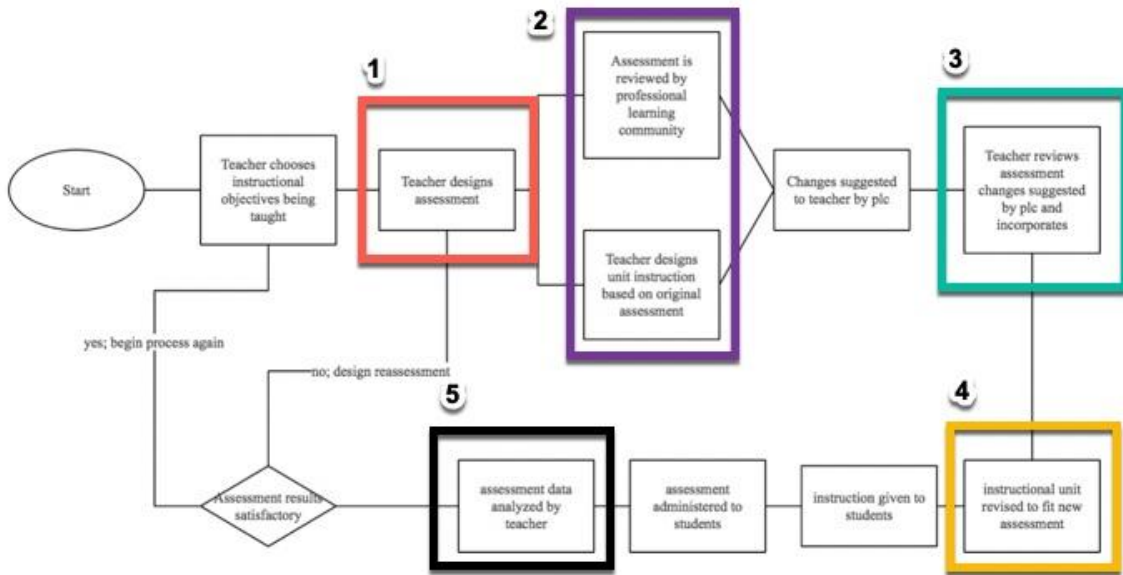


Figure 2. Interview key.

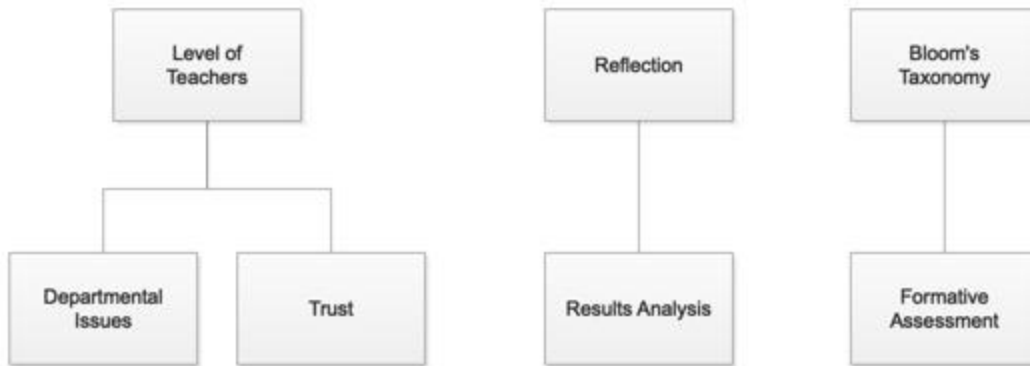


Figure 3. Qualitative themes.

to success. All members of the PLC had trust in the others, and each communicated that the group was easy to participate in due to the open personalities of participants.

The CTE participant discussed in detail, both during our weekly meetings and during the final interview, that he incorporated the changes to questions as formative assessment activities throughout the marking period and pushed rigor up with instruction prior to the assessment. His test bank of questions that were used for unit assessments and were being analyzed for change in level were too close to what the students saw on the state exam and thus the need to not change these was strong. The departments of social studies and science however, did make their changes to the assessments throughout and made that their focus. Another departmental point taken from the final interview was that like departmental members found the task of changing questions to be more challenging when they were reviewing a test outside of their content area.

Reflection. Four out of the five participants discussed in detail their analysis on the logic model and how they did not reflect on the design of the assessment as much during stage three as they did during stage five, results analysis. Using the student data was their primary focus as they prepared for remediation of topics not mastered. The trust factor was of significance within discussions and they did not fear reprisal from not making suggested changes. Although the logic model outlined a remediation plan which included designing a reassessment, all members moved forward with the next unit as opposed to spending time with items not mastered. Participants did analyze the questions and made notes for the next time that section was taught and for review prior to the assessment at the end of the semester.

Bloom's Taxonomy. All participants used the Bloom's Taxonomy booklet as a guide when reviewing assessment questions. The improvement of questions proved to be helpful in the design of their next individual assessment and within creating formative activities to use during

instructional units. Use of the taxonomy did not limit change of questions however not having knowledge of the material for other subjects and not knowing answers did limit review and kept some changes from being suggested. Pushing questions into level six, creating, was restricted somewhat as not only questions needed to be changed but so did format. This was also a limit of reviewing assessments outside of their content area. Level five, evaluate, was similar in that participants believed that changing questions to this level meant changing format or adding body to the assessment. All participants mentioned that it was easier if they stayed with moving questions from level one and two to three and four.

PLC Qualitative Data Summary Table

Teacher qualitative data was analyzed quantitatively and coded for number of times participants referenced themes (see Table 16). Keep in mind that within each main theme were the sub-themes of departmental issues, trust, results analysis, and formative assessment. The numbers reflect not only mere mention of these by name but when rich discussion followed.

Study Questions

There were three study questions for this study. Those three questions were as follows:

1. Does the classroom assessment design process affect student developmental score growth on NC EOC exams?
2. Do focused professional learning communities on teacher assessment impact student achievement based on the results from classroom unit summative tests?
3. Do focused professional learning communities on teacher assessment impact teacher instructional practices?

Table 16

Formal Interview Question Theme Summary

Interview Questions	Level of Teachers	Reflection	Bloom's Taxonomy
How did you design the original assessment? What was your process?	4	7	9
What was your process for reviewing the assessment? How long did it take? Did you use the reference table provided?	3	4	6
Did this review of another teacher's test help you in any way with designing your assessment? Was change prompted by focus in the PLC?	4	6	5
How did you feel about the changes suggested? Did this affect your thoughts on future design of your assessments?	5	7	6
If questions were changed on one of your assessments and were advanced several levels, how would you account that the students had mastered subsequent levels prior to the summative exam?	1	3	9
What changes did you make to your instruction following revisions to your original assessment? Why?	0	7	4
What additional changes to instruction would you incorporate based on results of success on your assessment?	0	6	3
How has participation in this PLC changed your assessment process?	2	7	5
Has participation in this PLC changed the way you view the use of Bloom's Taxonomy in your planning?	0	4	8
Do you feel that student achievement has been impacted due to the work completed within this PLC?	4	3	4

Table 16 (continued)

Interview Questions	Level of Teachers	Reflection	Bloom's Taxonomy
Was there a difference in expected student outcomes on assessment due to the process utilized from the PLC? Was this due to instructional changes made?	1	3	5

Research Question 1

Does the classroom assessment design process affect student developmental score growth on NC EOC exams?

State assessment data collected from each course taught by participants was used to determine student developmental score growth on NC EOC exams. Teacher Value Added, Teacher Growth Measure, and Growth by student achievement group data was collected from the state. This provided the researcher with previous year data for the teacher and course as well as current scores from testing completed at the end of the study. The TVA index score quantified the teacher's impact on instruction in each course with scores ranging from negative two to two for an average teacher in the state of North Carolina, a score less than negative two showing less than average and greater than two indicating that the teacher was significantly more effective than the average teacher. TGM is an estimate of student academic progress as linked to the teacher and compares student data across multiple subjects and grades for high school students.

With respect to this question pertaining to the NC EOC, the one teacher in the set of participants with an EOC increased in every category. Scores in proficiency increased by 7.4 percentage points from the previous year. This participant was the only Biology teacher in the building over the entire school year, thus all growth reported by the state with respect to the course belonged to that teacher. The individual proficiency levels, although showing a tiny increase with level 1 scores of .2 percent, showed a decrease in level 2 scores thus distributing all growth in the level three to five range which is considered to be grade level proficient.

School Value Added Growth Measure for the Biology teacher, the lone NC EOC course within this study, had the most growth of any of the four courses rising from -2.5 to 2.7, an increase of 5.2 points. The next largest growth in this category was Civics which went from -2.3

to 1.0, an increase of 3.3 points. Individual Teacher Value Added Growth Measure had an increase from 1.4 to 3.0 for the teacher involved with the study. Across student defined levels low, middle, and high, this teacher had positive Value Added Growth Measure in all categories of students taught.

The results indicated that the classroom assessment design process positively affected student developmental score growth on NC EOC exams.

Research Question 2

Do focused professional learning communities on teacher assessment impact student achievement based on the results from classroom unit summative tests?

Quantitative and qualitative data was collected from participants throughout the study. When reviewing assessments, participants documented the quantity of questions that were in each level of Bloom's Taxonomy on each assessment reviewed. The participant who designed the original assessment would take the suggested changes to questions and make decisions as to which they would implement, and then make appropriate changes to instruction to prepare students for the level of questions on the summative unit test. Once the assessment was completed and graded, the teacher annotated the percentage of correct responses in each level of questions. The majority of the levels of questions answered correctly fell between 55% and 63% with the exception of level six questions in which no students answered any correctly. For clarification, the level six questions made up less than 2% of all questions, on average, per test.

Data collected from interview questions at the end of the study were used to determine teacher perceptions as to whether student achievement had been impacted. Three questions from the interview directly addressed this study question. The questions provided the participants with an opportunity of an open response answer. Level of Teachers, Reflection, and Bloom's

Taxonomy were the three main themes that emerged from the qualitative interviews, and one of these gave data directly supporting that focused professional learning communities on teacher assessment did impact student achievement based on results on the classroom unit summative tests. Level of Teachers was a factor which did not affect participation in the review of other teacher's exams, however limited at times how much change was made once the reviews were handed back. Teachers with more experience tended to not incorporate as many changes as those with less. Strong ties to questions vetted over many years served as a factor in not wanting to change them. Thus, results on assessments were perceived as positively impacting student achievement more on less experienced teachers' assessments than experienced teachers involved with the study. The emphasis during growth discussion on classroom unit summative assessments was highlighted more by less experienced teachers than more experienced hence the qualitative data tends to support more perceived growth by their students.

North Carolina Final Exam and End of Course assessments given by the state were also used to determine growth by students in the classrooms involved with the study. This was an indirect sign of growth with School Value Added Growth Measure increasing in three out of four of the courses. Individual Teacher Value Added Growth Measure grew in two out of the five classrooms, with two of the classrooms not able to be tracked due to no previous content in the course being taught for two of the teachers involved in the study. Numbers were increased with every classroom teacher with the exception of one and therefore indicates that student growth did occur.

Research Question 3

Do focused professional learning communities on teacher assessment impact teacher instructional practices?

Data collected from interviews completed at the end of the study was used to determine teacher perceptions as to whether focused professional learning communities on teacher assessment impact instructional practices.

Instructional practice was identified as the entire process to include design of assessments and review and editing made upon reviewed items. The use of collaboration by review and discussion of classroom unit summative test items altered how participants proceeded to design their original assessments as well as with accepting changes. Collaboration between teacher participants in the study was cited to be a key need for the focused PLC to impact instructional practice. Changes to formative assessments occurred as some teachers did not want to change items on their summative exams yet liked the higher-level questions suggested. They would incorporate into formative assessment questions to be used throughout instruction of the unit. This was emphasized with the Career Technical Teacher as changes to unit summative bank assessment items affected review for the state exam and no changes were deemed needed on the unit test. Use of the higher order questions during instruction increased the level of already existent questions for instruction and thus impacted instructional planning and practice.

The intent of the logic model was to have teachers change existing planned instruction if necessary, after the original classroom unit summative assessments were edited. All teachers discussed their results analysis and how that was the stage in which they noted changes needed in order to bank the decisions for the next time they taught that unit. One of the questions in the interview asked how they would ensure all levels of Bloom's Taxonomy would be covered throughout instruction to prepare students for the assessment and be provided through instruction. Again, discussions of changing levels on current assessments and it's relation to

improving instruction was perceived to be something to be completed when designing future assessments and instruction as opposed to changing what was already planned.

Given that instructional practice was defined as the entire process to include design of assessments and review and editing made upon reviewed items, then the data indicates that focused professional learning communities on teacher assessment did impact teacher instructional practices.

Summary

Participant data collected through the use of surveys, state standardized assessment collection for each course, collection of data within teacher made units, and a final exit interview at the end of the study, revealed that there was change within developmental score growth on state standardized exams, teacher unit summative exams, and teacher instructional practices. The logic model used with a focused PLC allowed for change to occur within the timeframe of the study. The PLC allowed for consistency within the process and gave participants a discussion point within the PLC to drive change based on data collected following assessment changes. Additionally, teachers noted that the logic model was a tool that did not interfere with normal assessment preparation within time constraints and could easily be adopted.

CHAPTER FIVE: SUMMARY, RECOMMENDATIONS, AND CONCLUSIONS

The purpose of this study was to determine if the use of a professional learning community (PLC) with an emphasis on student assessment, impacted student test results as indicated by the North Carolina End of Course and NC Final Exam scores in Biology, Civics, American History II, and Animal Science I. Teachers from one high school in a rural district of North Carolina utilized an assessment PLC and a logic model to guide their assessment design, analysis, and implementation. Within a comprehensive literature review, it was determined that the use of a focus upon assessment is a need within schools in order to improve results. Stiggins (2001) summarized that a discrepancy exists between the validity required upon state standardized summative exams and the exams utilized within the teacher classrooms. Teachers need to be held accountable for the reliability of their assessments in the classroom as they prepare students for the end of year summative exams that testify to the ability of students to have mastered the given course curriculum. Incorporating Bloom's Taxonomy was identified to be a need in the development of assessment questions for teacher exams. Paul (1993) discussed how Bloom's Taxonomy is easily misinterpreted by educators. In a recent study, Jensen et al. (2014), tested questioning between two identical courses in which one instructor utilized lower level questions of Bloom's Taxonomy within instruction and assessment and the other instructor did same with higher order questions. The course utilizing the higher order questions had significantly higher scores on the standardized final exam used with both classes. Dufour (2004) summarized the PLC to be a process of collective inquiry and local study that works toward successful achievement of students within educational institutions. Hord (1997) defined the framework of the PLC to be that in which all educators in an educational environment collaborate and set their focus for student learning.

Hence, this project used the PLC to focus on Bloom's Taxonomy within creation and revision of the unit assessments.

Summary

Instruction occurs at the lowest level of Bloom's taxonomy, knowledge, in a majority of classrooms (Davidson & Decker, 2006). A review of the research found most research and peer-reviewed articles discussing Bloom's Taxonomy were centered on defining the taxonomy and not necessarily how it can improve instruction. Marzano and Kendall (2007) state that Bloom's Taxonomy has been influential on evaluation more than any other educational category. The misinterpretation by educators of Bloom's Taxonomy is noted by Paul (1993) and within a separate study by Wineburg and Schneider (2010). The point made is that the linear familiarity that most teachers have with Bloom's taxonomy is not complete and their interpretation of student progression towards critical thinking is sometimes flawed. Jenson et al. (2014) completed a study which compared two college level science courses taught within strictly defined levels of the taxonomy. The outcome of the study highlighted that students exposed to higher level questions within the instruction have better results on standardized assessments given at the end of the course.

Assessment is often the area of the classroom in which the teacher has little to no preparation prior to stepping into the leadership role of classroom teacher. Understanding of assessment terminology and assessment design and how the knowledge of these two builds into instructional change are areas still not widely implemented into district professional development and formal coursework in undergraduate education degrees. Within the realm of classroom formative assessment, Black and Wiliam (1998) suggest that policies concerning formative assessment within schools should be emphasized. Results from a study by Koloï-Keaikitse

(2016) indicated that if schools and school systems do not provide teachers training in assessment or to provide in-service workshops focused on assessment, teacher assessment skills and their ability to enact change within classroom practice is diminished. Popham (2009) notes that in lieu of formal workshops or school and district programs, utilization of professional learning communities (PLC) in which membership includes teachers with similar interests in assessment and improvement of instructional processes have proven to be very effective in helping teachers grow in their content area focus.

Dufour (2004) mentions that PLC's must be reflected on as to their specific purpose and must have results backed in data that indicate change in teaching practices with an end result being student growth in academic achievement. Hord (1997) outlined the five initial characteristics of professional learning communities made up of teachers. The framework acted as an extension of the school improvement plan within the context of professional development. In order for change in instructional practice to occur due to implementation of a PLC, an instructional intervention had to serve as a focus point (Supovitz, 2002). An additional objective of any professional learning community should also be sustainability over a defined period of improvement. Timperley (2006) discussed the importance of ongoing support by school leadership. Trust among colleagues should exist and when it does, there is a positive effect on the PLC. While most of the research reviewed points to the positive effect that PLC's have with student achievement, each also points to different attributes of the PLC itself that causes this change and to where the change occurs. School leaders need to be able to communicate a vision for what the PLC will look like and what results will occur.

Statement of the Problem

As explained in previous chapters, North Carolina End of Course Tests and Final Exams are in need of improvement with respect to student achievement scores. This problem of practice was addressed by establishing a professional learning community (PLC) in which teachers would focus solely on assessment. Five high school teachers at a rural eastern North Carolina school were selected based on their commitment to improvement and data from an informational survey centered on assessment and Bloom's Taxonomy. Teacher made unit summative assessments in four classes across three departments were analyzed within the PLC prior to teacher instructional units for that test. Reference tools were given to teachers in the form of a logic model that outlined the PLC process, and a Bloom's Taxonomy verb checklist to assist with classifying question types upon review. The movement to a focus of assessment design and analysis allowed teachers to continue engagement with curriculum and instruction and students opportunity to be given more rigorous examinations with questions at higher levels of thinking. In order for students to be able to perform on teacher made assessments, change needed to be made to instruction with a cycle of improvement being implemented. Three study questions were used in this study. Those three questions were as follows:

1. Does the classroom assessment design process affect student developmental score growth on NC EOC exams?
2. Do focused professional learning communities on teacher assessment impact student achievement based on the results from classroom unit summative tests?
3. Do focused professional learning communities on teacher assessment impact teacher instructional practices?

Study Design

The study used a mixed methods design. Data collected in this research study consisted of four separate input categories: Front-End Analysis survey; Course Standardized Assessment Data; PLC Quantitative Data; and PLC Qualitative Data. Prior to research a Front-End analysis survey was given to teacher participants to determine their knowledge level of the guiding categories used in the logic model and within discussions predicted to occur within the PLC. Benchmark student data from each course was collected from the state and used to set a baseline for growth on state assessments as well as to mark growth with the current data that followed the semester of research with the PLC. Testing data from end of year state examinations in each course studied within the PLC was gathered at the close of the semester. And finally, quantitative and qualitative data were both collected from the PLC during the study and following end of year testing.

The research evaluated how a PLC, setup in one particular school across three content disciplines, functioned. Teacher focus on classroom assessment change was contained within the single PLC that involved all five teachers. Assessments created by teachers were analyzed by other teachers within the PLC and suggestions for advancement of Bloom's taxonomy (level 1 to level 2, etc.) were made to questions. Discussions within the PLC were carried out and teachers made changes to not only their summative unit tests, but also to instruction as needed for the change. Summative unit tests were given by teachers and data analyzed to gauge success of the instruction on student achievement on the advanced exams. Final data was collected on course summative final exams as required by the state of North Carolina.

Demographic Data

The population for this study included five teachers with two of these from the Social Studies Department, one from the Science Department, and one from the Career Technical Education Department. The four courses utilized for the study were American History 2, Biology, Civics, and Animal Science I. These teachers were from the same high school in a rural eastern North Carolina school district. Teachers selected completed a survey given prior to the project's start. From that survey, years of experience, years of service to the current school, knowledge of assessment, knowledge of Bloom's Taxonomy, and years of participation in a professional learning community working group data was gathered. Average years of teaching service was nine with average number of years in the current school at three and one-half. Eighty-six American History II students, seventeen Animal Science I students, sixteen Civics students, and twenty-nine Biology students were in the courses where the assessment analysis took place. Success rate on revised assessments was also collected and used by teachers to establish remediation parameters.

Analysis of the Data

Data was collected across four different categories: Front-End Analysis survey; Course Standardized Assessment Data; PLC Quantitative Data; and PLC Qualitative Data. Prior to research a Front-End analysis survey was given to teacher participants to determine their knowledge level of the guiding categories used in the logic model and within discussions predicted to occur within the PLC. Benchmark student data from each course was collected from the state and used to set a baseline for growth on state assessments as well as to mark growth with the current data that followed the semester of research with the PLC. Testing data from end of year state examinations in each course studied within the PLC was gathered at the close of the

semester. And finally, quantitative and qualitative data were both collected from the PLC during the study and following end of year testing.

Study Question 1

Does the classroom assessment design process affect student developmental score growth on NC EOC exams? Two areas of interest were analyzed on the North Carolina End of Course Exams and they were proficiency, student mastery of material, and actual student growth in the content area. The data from the state in the research study's only End of Course class, Biology, showed a 7.4% increase in proficiency, students earning a level 3, 4, or 5, on the summative assessment. Note that the Biology course had only one teacher in the year of the study and she was involved within the PLC. The course also had only standard courses, no honors courses were offered during that year. The student proficiency increase shows that students were challenged sufficiently in their courses and were grade level proficient 7.4% more than in the previous year's data. Although level 1 score percentages actually rose by .2%, the level 2 percentages dropped 7.5%. This 7.5% decrease was distributed across the grade level proficient score ranges of 3 and 5. Level 3 scores rose to 8.5% and level 5 rose to 6.4%. Level 4 percentages decreased by 2.7 % which indicates the level 3 and level 5 scores increased by about 4.8%. The state does not report accuracy on percentages lower than 5% thus, exact distributions cannot be determined. With respect to overall student growth for this teacher in the Biology course, there was an increase in the school value added growth measure of 5.2, the highest increase across all subjects in the study. The increase in both proficiency and School Value Added growth indicates that the classroom assessment design process did affect growth on NC EOC Exams. School Value Added Growth Measures from each of the other three courses indicate growth in American History II, Civics, and Biology only. Animal Science I decreased by 4 percentage points. Growth was had in

three out of the four courses, therefore it is still a significant change overall. Analyzing the data further reveals the highest growth with middle students in Biology, high students in American History II, and low students in Civics.

Study Question 2

Do focused professional learning communities on teacher assessment impact student achievement based on the results from classroom unit summative tests? Quantitative results from classroom unit summative assessments were gathered but had no previous data to compare to in terms of growth impact. The average correct response percentages for questions across all levels of Bloom's Taxonomy were between 55% and 63%. Teacher perception of impact on student achievement was analyzed in three of the formal interview questions with results varying with only 20% of the participants. The Career Technical Teacher did not find huge changes within unit assessments however felt that instruction had improved significantly with the addition of formative questions raised in level. Due to the structure of questions within the CTE domain of test bank practice items, it was not practically feasible to alter these to higher levels of Bloom's Taxonomy. This teacher instead incorporated changes into formative assessments and activities during instruction and had significant positive change within mastery prior to unit summative assessment. This teacher's qualitative perception of increased mastery did not transfer over the end of year summative assessment results, as student scores dropped from the previous year. The other teachers within the PLC also noted perceived changes to mastery through instruction and this was matched with results from NC state standardized summative assessment data in each course as growth was evident in all of their content areas.

Teacher's beliefs, according to data received from questions posed on the survey and in final interviews, showed that a PLC focus approach to building classroom assessments, will

improve student achievement results. This was an increase of .4 percentage points from the pre-survey data. Their final thoughts on improvement were based on results seen in the classroom and their perception of growth on the individual units.

Study Question 3

Do focused professional learning communities on teacher assessment impact teacher instructional practices?

Nine out of the thirteen questions received data that directly related to instructional change. According to the qualitative data collected from teachers, instructional change did occur due to the participation in the assessment PLC. Three themes emerged and were consistent across all independent teacher interviews: Level of Teachers; Reflection, and Bloom's Taxonomy. Changes to instructional practices occurred more with teachers having less than 5 years of experience. It was not that teachers with more years of experience were any more apt not to change, however, they were more inclined to return to what they have already established as norms over their years of practice. Qualitative data was also clear in that teachers with less than five years of experience were more apt to reflect on their question levels and ask for assistance or break off together and work. The ability to trust members of the group was crucial as without it, grouping and teamwork following the changes to assessments would be less likely to occur.

Working outside of a participant assigned content teaching area extended some difficulty with making suggestions to assessments outside of their teaching discipline. This resulted in more time being needed to review the assessments and less desire to complete due to reflection on their own teaching in their respective courses. Four out of the five teachers had more reflection and more time to think about instructional changes for the future rather than in the

instructional unit itself. It was after students had already taken the unit summative assessments that the teachers made additional notes and held discussions on what to do the next time they taught the unit. Instructional change did occur with utilization of Bloom's Taxonomy and although knowledge of Bloom's Taxonomy stayed the same according to survey question data, purposeful use of the Taxonomy to plan instruction became a larger focus.

Recommendations

Based upon the findings and conclusions of this study, the following recommendations are presented in two areas. These two areas are: (1) Practice, and (2) Research Practice.

Practice

Use of teachers at any experience level will provide positive return however, best practice indicates that teachers with less years of service made stronger student achievement gains and are more apt to change assessment questions and instructional practices. With respect to content disciplines, this also would be more suited if the PLC members were from same content departments. Time spent analyzing questions outside of a teacher trained discipline was time consuming and tended to increase teacher perception of this process being of less use practically. Questions for local tests should also be maintained for future use as perceived dismissal of the questions following the process may also diminish desire to participate in future cohorts. It was the perception of the group that sharing of questions and discussion within the PLC following initial test analysis was a morale and esprit de corps boost.

The timeline of giving tests to the reviewer was also of importance as teachers view their time as valuable and desired the tests be returned quickly for changes to occur. Instruction had already started in most instances due to turn-around time and thus this limited the teacher's ability to change instruction as effectively as they would have liked. Trust within the group

worked to provide a stable, collaborative environment in this research study and was the difference maker in terms of success.

In this study, teachers were paired with one individual whom reviewed their assessment and made suggestions for change. Future cohorts may wish to discuss assessment questions in terms of curriculum objectives, thus banking questions for the entire department for later use. This team approach may foster a desire to continue this improvement process and not limit suggestions from only a single reviewer. Groups of unit assessments and unit assessment questions at higher levels would be available for the specific course and courses that precede or are follow-on courses. Questions should be labeled by Bloom's Taxonomy level.

With respect to analysis of results with revised assessments, it is suggested that data continue to be maintained on percentage of correct responses. As mentioned before, teamwork at this level would also be a recommendation as discussions of the results, questions themselves, and instructional practice leading to the results, would improve future instructional units centered on the objectives used as well as provide a launching point for remediation and review. This discussion could also assist in determining which objectives or skills require intervention and questions from the original unit assessment to be used again or in a second revised edition.

It is recommended that previous years data from the state system should be reviewed and discussed prior to beginning this PLC process. Ongoing conversations concerning what the goals are with respect to the data would assist with the vision of each teacher's instruction. No specific growth goals were set at the start of this study however, it is recommended that percentage goals be set based on student data for each teacher's classroom. Use of scanning devices and programs that categorize test results are also of value and recommended. Two teachers within the

participant group used these for their multiple-choice items and saved time within the grading which was then spent on further analysis of student results.

Goals should be set as to what percentage of each level of questions should be on each assessment. Within the final individual discussions, it was asked of teachers when they were able to assess mastery of levels within each unit. Certainly, if levels are higher on the unit assessment, then formative assessment during instruction would include prior levels to ensure students mastered required material and levels prior to the more rigorous summative assessment. As mentioned before, having a local database of vetted questions that were classified by level would assist with ensuring student mastery of material in each category. Certainly, this does not imply that only higher-level questions be on the final unit assessment, but instead the set percentage by the PLC of how many questions at each level should be on the summative unit exam within each department could be planned more efficiently.

Additionally, University education programs should include more assessment courses and training into their coursework requirements. None of the participants in this study had extensive work with assessment in their undergraduate degree and would return to habits of practice that indicated lack of preparation in creativity or training for creating solid summative assessments. A positive network between Universities and placement schools in surrounding counties should be established with the sole purpose of continuing assessment training for new teachers.

Research

The following future research recommendations are made:

1. Replication within specific courses;

It is recommended that this study be replicated and suggested changes from this recommendation section be implemented. This study could be replicated within the same school

or another rural high school. A similar study to Jensen et al. (2014) should be completed across two identical courses within a department over a semester, allowing one teacher to continue as they have previously within the instruction and assessment of the course and the other to be an active part in a focused assessment PLC. Teachers involved in the review of classroom assessments would act as outside agencies within the logic model and their classroom assessment results would not be a part of the study.

Replication of this study across departments would be beneficial as data could be examined both within courses and also as departments. Within this study, data did not improve within the CTE course but did within courses in Social Studies and Science. This study should be performed in isolation within departments requiring each to provide data specific only to their content area. Is participation in a focused PLC centered on classroom assessment more impactful for teachers in core departments or CTE? Is the study beneficial to teachers within an Art department, JROTC, or neither? If so, then the question further expands to why and could be more beneficial and help tailor the courses to meet specific needs of students and allow improved mastery of material and positive academic achievement.

2. Replication in other schools within the LEA;

Leadership across schools differs and a study could be used to determine how school leadership affects the outcomes of the study within relationships of assessment practices at different schools under different leadership styles. Expansion of the study would determine the leadership styles of administration at each school and add survey questions focused on leadership within focus groups and final interviews. Leaders themselves would serve a distinct separate role of each cohort within the PLCs established at each individual school.

The current survey system in this study did not take into effect any impact from administrative leadership at the school. The surveys, both at the beginning of the study and the final set of interview questions would have to change to include questions of leadership support with respect to classroom assessment practices, and evaluation. Qualitatively, is the comfort level of providing data pertaining to leadership at a school or practices within a classroom skewed any at all by the type of leaders in place.

Conclusions

Data was collected throughout the study and analyzed to answer the study questions. Survey data, North Carolina State Final Exam and End of Course examination data, and data from the PLC, both quantitative and qualitative, was examined. A final review of data from participants in a PLC focused on assessment concludes that this process has a positive impact on student achievement and teacher instructional change. Growth on North Carolina End of Course exams and Final Exams in eighty percent of the participant group coupled with qualitative teacher perception data concludes that following participation in the assessment PLC, teachers collaborate with colleagues more with respect to building classroom assessments, believe a PLC approach to building my classroom assessments will improve student achievement results, and have greater command of practical use for Bloom's Taxonomy. Biology grade level proficiency achievement level percentages rose 7.4 percentage points with level three and level five percentages being the most significant changes and three of the four also showed an increase within the school Value Added Growth Measure with an average of 3.06 points. Even with the one course that did not show growth from the previous year, scores still rose on average by 1.3 points.

Although question distribution on assessments showed small changes in terms of higher-level questions being implemented, teacher perception still indicated that the use of a PLC devoted to assessment improved student unit assessment summative scores more than if they had not participated. Their qualitative data gathered throughout the process and within the final individual interviews showed that although questions were changed on assessments and moved up into higher levels, 66% of questions remained in the lower three levels of Bloom's Taxonomy on average. Improvement of a working knowledge of Bloom's Taxonomy was indicated through improvement from survey data taken at the beginning of the study. Instructional change desired result was achieved, however not at the point in the logic model that was anticipated. Teachers reflected more on the instructional process and assessment questions in a focused manner after the student's results were analyzed and not prior to instruction so that change in assessment drove change in instruction.

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APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office 252-744-2914 · Fax 252-744-2284 · www.ecu.edu/ORIC/irb

Notification of Initial Approval: Expedited

From: Social/Behavioral IRB

To: [Michael Swinson](#)

CC:

[Art Rouse](#)

Date: 4/23/2019

Re: [UMCIRB 18-002419](#)

THE AFFECT OF INCREASED ASSESSMENT FOCUS THROUGH PROFESSIONAL LEARNING
COMMUNITIES ON INSTRUCTIONAL PRACTICE

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) occurred on 4/23/2019. The research study is eligible for review under expedited category # 6&7. The Chairperson (or designee) deemed this study no more than minimal risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a Final Report application to the UMCIRB prior to the Expected End Date provided in the IRB application. If the study is not completed by this date, an Amendment will need to be submitted to extend the Expected End Date. The Investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Name	Description
Assessment Dissertation chapters 1-3 w/references	Study Protocol or Grant Application
informed consent document	Consent Forms
Qualitative Questions.pdf	Interview/Focus Group Scripts/Questions

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

APPENDIX B: LETTER OF SUPPORT FOR ASSESSMENT PLC



Beaufort County Schools

Mark Doane, Interim Superintendent

321 Smaw Road

Washington, North Carolina 27889

252-946-6593

www.beaufort.k12.nc.us

December 17, 2017

Mr. Swinson,

In the Beaufort County School system, there does not currently exist a program focusing on an individual professional learning community (PLC) with emphasis on assessment design and implementation. The design of this PLC holds merit and I would like you to complete your study and share with the instructional team as this could possibly be added to the current rotation of professional development discussions at the high school level.

Sincerely,

A handwritten signature in cursive script that reads "Mark Doane".

Mark Doane
Assistant Superintendent

APPENDIX C: LETTER OF SUPPORT FOR IMPLEMENTATION



Beaufort County Schools

Mark Doane, Interim Superintendent

321 Smaw Road
Washington, North Carolina 27889
252-946-6593
www.beaufort.k12.nc.us

November 27, 2018

Mr. Swinson,

With the completion of your study concerning implementation of assessment focused professional learning communities, county leadership would like for you to share your evaluation of this project's effectiveness in raising classroom assessment scores within instructional units and individual teacher growth data stored in the NC EVAAS system. Possible implementation of this problem of practice may also be discussed at that time.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark Doane'.

Mark Doane
Interim Superintendent

APPENDIX D: INTERVIEW QUESTIONS FOR TEACHERS

Relating to 1 of the Logic Model (teacher designs original assessment)

1. (Teacher) How did you design the original assessment?
2. (Teacher) What was your process?

Relating to 2 of the Logic Model (assessment reviewed by PLC; teacher designs instruction based on original test)

1. (PLC) What was your process for reviewing the assessment? How long did it take? Did you use the reference table provided?
2. (PLC) Did this review of another teachers test help you in any way with designing your assessment? Was change prompted by focus in PLC?
3. (PLC)

Relating to 3 of the Logic Model (teacher reviews and incorporates changes)

1. (Teacher) How did you feel about the changes suggested? Did this affect your thoughts on future design of your assessments?
2. (Teacher) If questions were changed on one of your assessments and were advanced several levels, how would you account that the students had mastered subsequent levels prior to the summative exam?

Relating to 4 of the Logic Model (instructional unit revised based on test revisions)

1. (Teacher) what changes did you make to your instruction following revisions to your original assessment? Why?

Relating to 5 of the Logic Model (assessment data analyzed)

1. What additional changes to instruction would you incorporate based on results of success on your assessment?

~~~~~  
Relating to participation in PLC

1. How has participation in this PLC changed your assessment process?
2. Has participation in this PLC changed the way you view the use of Bloom's Taxonomy in your planning?
3. Do you feel that student achievement has been impacted due to the work completed within this PLC?
4. Was there a difference in expected student outcomes on assessment due to the process utilized from the PLC?
  1. Was this due to instructional changes made?

