ABSTRACT

MARSHALL, JOY MORGAN. Teachers’ Use of Test-Item Banks for Student Assessment In North Carolina Secondary Agricultural Education Programs. (Under the direction of Elizabeth B. Wilson).

Higher expectations are on all parties to ensure students successfully perform on standardized tests. Specifically in North Carolina agriculture classes, students are given a CTE Post Assessment to measure knowledge gained and proficiency. Prior to students taking the CTE Post Assessment, teachers have access to a test item bank system that contains questions that can be incorporated throughout instruction. Agriculture teachers’ decisions to utilize test item bank questions within instruction are based on their motivations and internal and external factors.

The purpose of this study was to determine how agriculture teachers in North Carolina use test item bank questions in their classroom and the impact test item banks have on experiential learning. Five specific objectives centered this study:

1. Determine the extent North Carolina agriculture teachers utilize test item bank questions for both formative and summative assessments.
2. Describe the internal and external factors that influence teachers to use test item banks.
3. Determine other types of assessments being used by agricultural education teachers.
4. Determine agriculture teachers’ perceptions regarding the use of test items banks.
5. Determine agriculture teachers’ perceptions regarding the influence test item bank usage on experiential learning in the classroom or lab.
A questionnaire that incorporated Likert-type items, multiple response items, and an open-ended was created to determine teachers’ use of test item banks in their classroom and the item banks influence on experiential learning was created. Prior to the questionnaire being distributed to the pilot participants, university faculty and a panel of experts reviewed the questionnaire. Test-retest deemed no significant differences. The finalized questionnaire was distributed using Qualtrics to all 338 North Carolina high school agriculture teachers who were not identified as first year teachers. In the end, 225 teachers completed the survey for a response rate of 67%.

The results indicated that test item banks do play a major role in the North Carolina high school agriculture classroom. The majority of teachers received training on how to use test item banks, and 47% use the bank questions at least once a week on formative assessments. Teachers are comfortable with developing their own tests; however, 36% of teachers use only test item bank questions for their summative tests. The majority of teachers indicated that their CTE Post Assessment scores were important to their county, principal, and CTE director and this was an influence in their decision to use test item banks.

In addition to test item banks, teachers reported using worksheets, discussions, questioning, and lab activities the most as formative assessments. In addition to summative tests, major projects and papers were also given. Overall 97% of teachers believe summative tests should include appropriate levels of higher level thinking. While teachers utilize multiple choice items the most, fill in the blank, short answer, and matching were also reported to be used frequently on summative tests. Teachers (69%) do not believe the CTE Post Assessment accurately measures student knowledge.
The experiential learning component was also evaluated and the majority of the teachers believe experiential learning is an important part of agriculture education. A large majority (87%) believe that experiential learning activities enhance student performance on the CTE Post Assessment.

Test item banks are an integral part of the agriculture classroom and teachers viewed the banks positively. Teachers balance preparing students for the post assessment and incorporate experiential learning activities. Future studies should be conducted to compare test item bank usage in high stakes states and low stakes states. In addition, teachers should be trained not only on how to use the item banks, but also how to incorporate the test items into instruction.
Teachers’ Use of Test-Item Banks for Student Assessment in North Carolina Secondary Agricultural Education Programs

by

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DEDICATION

This dissertation is dedicated to my loving parents who made education a priority.
BIOGRAPHY

Joy Morgan Marshall grew up in Oxford, North Carolina and from the start she was involved in various aspects of agriculture. Many hours were spent in tobacco fields and on the family farm with her horses and cows. This created her initial love for agriculture which encouraged her participation in both 4-H and FFA. Joy always wanted to be a teacher and would play school with neighborhood friends as a little girl. During her junior year of high school, she attended the “Institute for Future Agriculture Leaders” at North Carolina State University and a Phi Delta Kappa Teaching Camp at Indiana University, which solidified her career choice of becoming a teacher. After high school, Joy chose to pursue a degree in Agricultural Education at North Carolina State University. After receiving her bachelor’s degree, she continued at the university to receive her Master’s degree.

She began her teaching career in her home county teaching agricultural education at the middle school level. She remained at the middle school for two years, before transferring to the high school level. At the high school, Joy was an advisor for the FFA chapter and taught animal science, equine science, horticulture, and biotechnology classes. She enjoyed teaching students and watching the impacts that FFA makes in the lives of youth.

After teaching for five years, Joy returned to North Carolina State University to pursue her doctorate and achieve a lifetime goal. While at the university, she was a teaching assistant for multiple courses within the Agricultural and Extension Education Department and an instructor for an assessments course within the College of Education.
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CHAPTER 1: INTRODUCTION

Introductory Statement

Content knowledge and a strong skill base combined with the ability to plan and deliver effective instruction, an understanding of diverse learners, and willingness to utilize professional collaboration has for many years been an essential characteristic of an effective teacher (Witte, 2012). With the implementation of many education reforms, teachers today are under pressure to educate students in a way that will ensure mastery on standardized tests given at the end of the semester or year. What once was a review of inputs and processes for accountability systems has become one of assessing learning outcomes (Belcher, McCaslin, Headley, 1990). These reforms and standardized tests have led to classroom assessments becoming a key characteristic required of teachers. The standardized testing programs are considered to be external assessments because, generally, those individuals who mandate standardized tests are not teaching in classrooms (Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths, Wittrock, 2001). Yet today, more standardized tests are given as a result of accountability measures, and teachers are feeling the pressures to produce desired outcomes.

According to Levinson (2011), “Millions of dollars are raining down on districts to pay teachers for their students’ performance gains on standardized tests and to implement new systems for holding students, teachers, and administrators accountable for students performance on these tests” (p.3). Within a school there are high expectations on all parties
for students to successfully perform on these assessments. High expectations combined with
the analysis of assessment data has not only influenced hiring decisions but also pressured
school leaders to address ineffective teachers and make other personnel decisions (Bergeson,
2004; Haladyna, Nolen, & Hass, 1991). The pressures of standardized tests are present
among the teachers as well as the entire school system.

Higher standards have placed increased emphasis on quality teaching and learning
(Bergeson, 2004; Haladyna, Nolen, & Hass, 1991). In the classroom setting, some teachers
strategically emphasize the content that will be on the standardized test more heavily because
of pressures from administration and school expectations. However, classroom assessments
should be a process of analysis and reflection that allows teachers to make adjustments in
their instruction to increase learning, motivate students, and raise test scores in the future
(Sindelar, 2011).

Even though standardized tests are often viewed with negativity, these tests are an
effective way to evaluate the learning of the millions of students enrolled in the education
system. When considering the term “effective” meaning: in terms of cost, overall an
appropriate indicator of student knowledge, and a universal way to ensure equality to all
students. The aim of assessments should be to provide teachers and students insight and help
instead of one that leads to consequences or rewards (Shepard, 2000).

While one typically assumes that the core academic courses feel the most pressure,
many elective classes with an end of the year assessment feel the pressure as well.
Agricultural education classes are a part of the career and technical education cluster and
serve as elective classes for students at the high school level. Career and technical education classes provide students with the technical knowledge and skills that are needed for college or the workplace and promote academic achievement (Rojewski, 2002). These courses contain cognitive and performance based objectives which are designed to integrate the experiential learning component and incorporate critical thinking skills.

Those performance based objectives are often associated with the component of experiential learning. Experiential learning places the emphasis on “learning by doing” with instructional strategies such as laboratory activities, problem solving units, field trips, supervised agricultural experience programs, and any other activity that promotes the development of hands-on skills with learners (Roberts, 2006; Phipps and Osborne, 1988). This important concept has been a foundational component within agricultural education that encourages the student to become more active in learning (Knobloch, 2003).

While these classes are offered as electives, some states also require a standardized test to measure student knowledge. The Carl D. Perkins Career and Technical Education Act of 2006, also known as Perkins IV, required states to measure technical skill attainment, using valid and reliable instruments that also include industry recognized standards (Meeder, 2008). Specifically in North Carolina, agricultural education students take a standardized test known as “CTE Post Assessment Test.” A grade of 77% or higher must be achieved in order for the student to be “proficient” on the assessment. This state assessment consists of multiple choice questions and is based on course objectives identified in the curriculum blueprint.
In addition to standardized achievement proficiency, teachers have been encouraged to incorporate 21st century skills into instruction. These 21st century skills are considered to be those competencies that promote the learning of knowledge, skills, and dispositions, students need to be successful in the future (Voogt & Roblin, 2010). Teachers should implement these skills in the classroom and then be able to assess the students based on the outcomes on various assessments. These skills, when incorporated into teaching, should improve the quality of teaching and learning (2010). Skills such as problem solving, critical thinking, literacy, global awareness, and more are no longer separate components, but components that are intertwined within the curriculum (Rotherham & Willingham, 2009).

While there are many arguments related to high stakes testing, these statewide testing policies do impact classroom instruction (Abrams, Pedulla, Madaus, 2003). Standards are not intended as instructions on “how to teach,” but as a guide of the knowledge that should be possessed by the students at the completion of the class. However, research shows that more attention is given to the content and those subjects that will be tested (Volante, 2004). Along with this content, teachers feel the need to teach students how to take tests. As one could imagine, this also influences the pace of the class and the critical thinking that should be taking place (Abrams, Pedulla, Madaus, 2003).

An in-depth review of literature study performed by Cimbricz (2002) that focused on articles related to state mandated testing, teachers’ beliefs, and practices found that state mandated testing plays a major impact on teachers’ instructional practices. Teachers’ views of state mandated testing were also influenced by a teacher’s knowledge of the subject
matter, personal views on learning, status within the school, and their interpretation of state testing. When analyzing research articles, the perception of state testing was mainly negative compared to those non-research based articles being a mixture of positive and negative beliefs. The main drawbacks of state mandated testing analyzed from the articles studied included:

“1) Narrowing of the curriculum and instruction
2) Fostering of anxiety, confusion, fear, shame, anger, and/or mistrust
3) Deskilling of teachers and/or a perception of powerlessness
4) The invalidity and inadequacies of these tests as accurate measurements of what is taught and learned
5) Loss of instructional time due to test preparation and testing”


Even with the above mentioned drawbacks, the role of standardized testing is important within the school and can provide teachers with valuable data that can influence instruction and future assessments. Assessments when used correctly aid student learning and can be a measure for future growth for students.
Conceptual Framework

A model by Morrison, Ross, and Kemp (2013) related to instruction, assessments, and motivation was revised and modified by the researcher to develop the conceptual framework for the study. Their model is presented as an oval to emphasize that there is no one specific sequence for completing instructional design, but explained that effective instructional design does promote learning and improvement in performance. In their oval model, items such as internal and external factors, planning, implementation, evaluations, and instructional strategies, were all discussed and interrelated. There were three overlapping circles that the 18 different items were located on. “Knowing the basic principles of instructional design can help to ensure that what is produced serves a necessary purpose, meets the needs of students, is delivered in an appropriate mode, and is continually evaluated and improved” (Morrison, Ross, & Kemp, 2013). The overall theme of the model promoted the above stated principles.
Planning and implementing instructional strategies within a classroom is a daily practice for teachers, and requires teachers to engage in a variety of decisions. These decisions are considered when developing assessments that will adequately measure student knowledge on a daily basis while being influenced by an assortment of internal and external factors. Some of these factors include: school pressure, parental involvement, student learning styles, class size, student ability levels, etc. Through the use of reflection and the teacher’s motivation, formative assessments, summative assessments, and instructional activities are planned and implemented. This reflection process allows for teachers to modify their assessment strategies to improve learning while taking into account the internal and external motivations that also affect student performance. The outcomes of these
assessments continue to influence the planning and implementation of instructional strategies because the data identifies areas of success and improvement (Guskey, 2003). The continuation of influencing factors and data combined with high expectations creates a cycle that is used frequently by teachers in their classroom. Earl (2003) further emphasized this point by stating, “Using assessment for optimum learning for students is a process of growth, change monitoring, and more changes for teachers along with their students. Teachers need to understand their own learning habits, including what motivates and influences them. The process never ends.” (p.119)

**Formative and Summative Assessments**

Formative assessments are designed to monitor a student’s progress during the learning process at various points to ensure that modifications can be made to instruction and proper feedback can be given both throughout and at the end of a formative assessment (Ornstein & Lasley, 2004). Michael Scriven is credited for being the first to use the term formative assessment in 1967 in a monograph series on evaluation for the American Research Association (Stiggins, 2001). Scriven used this term to indicate that the program at this stage can still be improved during this formulation stage unlike programs in their final stage like summative evaluations (Marzano, 2006; Popham, 2008). Formative assessments should be used frequently by teachers to check for understanding and guide learning. However, summative assessments are those assessments that take place at the end of a course and can be used to evaluate a student and the teacher on the extent in which all learning objectives
have been achieved (Ornstein & Lasley, 2004; Goodlad, 1998). Summative assessments are used as an accountability component rather than improvement and feedback tool taking place at the end of learning. Summative assessments provide data about the students’ knowledge of the course content overall. From a teacher’s standpoint, summative assessments allow teachers to evaluate their own teaching strategies, pacing, teaching goals, and curriculum strengths and weaknesses (Sindelar, 2011).

**History of Assessment and Test Item Banks**

The concept of assessment has not always been used to assign grades to students, but has been used for centuries in a variety of ways. Early Chinese civil service exams were required before taking a high public office or entering a craft guild. The majority of youth followed traditional occupations for which they “learned on the job” since school was viewed as a luxury. With the large number of immigrants moving to the United States and the industrial revolution, people were moving to urban communities and there was need to educate many people. Dewey stood firm in his beliefs that an education system that served all students was needed in order for society to grow in democratic, social, and moral ways. Prior to this concept schooling was based on social status with teachers in control of promotion. When equity started being demanded, the idea of assessment of achievement based on merit through the use of tests and exams was viewed as being a fair way to sort students. (Stiggins, 2001)
So began the concept of sorting students through the use of achievement on assessments. In England, examinations assigned youth at the age of 11 to their social fate of attending a grammar school or local comprehensive school. If a student did well, they would attend the grammar school. Where a “friends at court” system was once required to enter the University of England, now success on an exam was needed. Canada, France, and the United States followed with the development of different exams such as exit exams, Baccalaureate exams, and SAT (Scholastic Aptitude Test). Multiple choice tests could be used to help sort students, and the foundation of summative assessment was built. These standardized tests were preferred because, not only did they contain scientific credibility, they could easily be mass produced, administered, and scored (Stiggins, 2001).

Test item banks originated in the United States Military during World War I because psychologists were unable to meet the demands of classifying the great number of recruits in an efficient manner. Other areas saw the efficiency and effectiveness of these banks and this type of testing became widely used. With the development of the personal computer and word processing software test developers could store and select items to be used in tests. (Weiss, 2011)

The federal government in the late 1990’s decided that technical attainment should be measured, and the Carl Perkins Act of 1998 included this provision (Threeton, 2007). North Carolina chose to use the post-test as a way to measure a student’s technical attainment. The current act is known as the “Carl D. Perkins Improvement Act” and kept the accountability component in addition to adding the integration of academics and technical skills (2007).
When standardized measures are used, test questions should be evaluated. McCaslin (1990) discussed the need for information to be collected on the reliability and validity of assessments in the evaluation of vocational agriculture programs. Proper evaluation can only be done when those assessments being used are valid and reliable.

Today to help prepare students for summative standardized assessments, North Carolina agricultural education teachers have access to practice test questions that are prepared for the Agricultural Education courses using the state course standards. These test item banks are a part of the Elements Instructional Management System that is used by North Carolina Career and Technical Education teachers to assist in instruction of CTE curriculum. Elements is a Thinkgate software that provides “educators with information through integrated performance management tools and an easy-to-use dashboard so that educators can make intelligent decisions for the benefit of each student” (Thinkgate, 2013). The data provided by this system can individually track students, objectives, classes, test questions, and many other items to allow teachers to meet the needs of their students. The CTE Post-Assessment is given through the Elements system, and teachers have access to similar test questions for use during the school year. When teachers incorporate standardized items into course material, students are able to learn not only about the process of testing, but also are better prepared for success (2013).

This practice of including test item bank questions in instruction may occur too frequently resulting in “teaching to the test” (Posner, 2005). Popham (2001) emphasized that teachers often use “item teaching” because they feel that there is no other option. Popham
(2001) continued to discuss the use of clone items, practice tests, actual items on the tests, and other activities that teachers reported using in their classroom instruction that are practices for teaching to the test. However, these item banks can allow teachers to plan instruction that will assist students in successfully completing the final assessment. The method in which teachers utilize these test item banks is a determining factor whether the teacher is “teaching to the test” or using the banks as a classroom instructional planning tool.

**Statement of the Problem**

In the past, teachers were not only evaluated on their general classroom effectiveness, but also on personal qualities, community service, professional activities, attitude, and their professional contributions (Ovard, 1975). Today, teachers also can add student achievement on standardized tests to that list. With the increased amount of pressure among agricultural educators in North Carolina for their students to make a passing score on the CTE Post Assessment, the question of test item bank usage and its impact on experiential learning is a concern.

Because this study and the use of the Elements system are unique to North Carolina agriculture teachers, the study can only be generalized to North Carolina agriculture teachers. However, with the increase in standardized testing and the desire for higher test scores, this study could benefit other agriculture programs who have implemented the use of test item banks. With many Career and Technical programs being similar in nature to agriculture
programs, this study might also provide insight to those other areas that teach career ready skills and promote experiential learning.

The findings of this study should determine if more assessment training and professional development related to test item bank usage is needed. While this is a state mandated test, teachers should realize that higher level instruction and critical thinking should be key components on their other assessments used throughout the year. Also, the data are especially important since many North Carolina counties require the use of the test item bank system in agricultural classrooms throughout the year, and all counties are using the end of course testing as a measure of technical attainment.

**Purpose of the Study**

The purpose of this study was to determine the impact of test item-banks on instruction and the forms of assessment being used in the North Carolina agricultural classroom. To determine this impact, an in-depth study was designed to analyze the use of these test item bank questions as both formative and summative assessments in the classroom. In addition, the “learning by doing” component of the class was evaluated to see if the increased pressure influenced teachers to rely on the test item bank questions instead of developing experiential learning tasks. Furthermore, those factors influencing test item bank usage will also be investigated and discussed.
Research Objectives

1. Determine the extent North Carolina agriculture teachers utilize test item bank questions for both formative and summative assessments.

2. Describe the internal and external motivations that influence teachers to use test item banks.

3. Determine other types of assessments being used by agricultural education teachers.

4. Determine agriculture teachers’ perceptions regarding the use of test items banks.

5. Determine agriculture teachers’ perceptions regarding the influence test item bank usage on experiential learning in the classroom or lab.

Definition of Terms

Agricultural Education Classes: For this particular study, this will refer to only those agricultural education classes taught at the high school level.

Agriculture Teacher: North Carolina high school agriculture teacher who is not a first year teacher.

Career and Technical Education: The program of study that integrates academic knowledge with technical skills to prepare students with employability skills or career pathways for postsecondary education (Career and Technical Education Information, 2012).

Carl D. Perkins Act of 2006: Federal education legislation that affects Career and Technical Education at both the secondary and post-secondary level. This legislation influences the programs of study, accountability, technical skills, and funding. (Meeder, 2006)
**Course Blueprint**: A guide provided to teachers to describe the curriculum for a career and technical education course.

**CTE Post Assessment**: The state mandated test that is given to all CTE students at the end of the course to evaluate their knowledge on the subject matter.

**Formative Assessments**: Those techniques used to gain an understanding of students’ knowledge in order to make changes in teaching and learning (Boston, 2002). Examples include: questioning, discussion, classwork, and quizzes.

**Objectives**: Specific topics and points that teachers are expected to teach related to the content of the subject. These can be found in the course blueprint along with the weight, cognitive level, behavior type, and integrated skill area.

**Standards**: In some agriculture courses, objectives and competencies have been replaced with standards. These standards are the broad expectations for curriculum content.

**Standardized Tests**: Tests which are constructed and administered so that students are assessed under uniform conditions so that students’ test performances may be compared and not influenced by differing conditions (Sindelar, 2011).

**Summative Assessments**: The evaluation given to make a judgment on knowledge understanding up to a given point (Tarras, 2005).

**Test Item Bank**: An electronic collection of possible test questions that can be used by teachers to prepare students for standardized tests.

**Thinkgate Elements**: The instructional management software adopted by North Carolina that contains the CTE Assessment test item-banks.
Assumptions of the Study

The enactment of the Carl D. Perkins CTE Act of 2006 created an environment heavily focused on accountability, standards and assessments (Uy & Green, 2009). It is assumed that all agriculture teachers are using assessments in their classroom to measure student learning, and that they understand the methodology of both formative and summative assessments. Furthermore, it is also assumed that teachers have access to Elements test item bank and know how to use this item bank. In addition, it is assumed that teacher’s accurately and honestly reported their use of test item bank questions within their assessments.

Chapter Summary

In today’s world, education policies and reforms are largely focused on assessments and accountability. Research shows that these assessments specifically standardized tests greatly impact the instruction that takes place within a classroom. Not only are these assessments being used to evaluate students’ knowledge of a topic, but also are being used to evaluate teachers teaching ability with student scores strongly impacting the teacher.

To try to promote success within all of their students, teachers rely on many things to achieve this goal. Teachers must consider internal and external factors along with considering their motivations and reflecting upon the successes of the classroom when designing and implementing both assessments and classroom activities. The use of test item banks can also be used to help teachers prepare students for these tests; however, to what
extent should these item banks be used in the classroom, and are they replacing experiential learning in agricultural education?
CHAPTER 2: THEORETICAL FRAMEWORK AND REVIEW OF RELATED RESEARCH

Theoretical Framework

The National Council for Accreditation of Teacher Education (2012) reported that effective teaching requires teachers to have a deep knowledge of the subject, an understanding of how people learn, and the ability to stimulate student learning and achievement. Soloman (2002) stressed the need for well-constructed assessments that are aligned between standards, curriculum, and formative assessments. With the increased amount of pressure on teachers to prepare students to pass standardized tests, motivating factors within the classroom must be considered. Vroom’s (1964) expectancy theory has become quite prominent in the study of motivation. This theory states that a person will choose a certain behavior based on their motivations and what they believe the outcome will be (Vroom, 1964). “This theory may be expressed as M= V x I x E” (Borkowski, 2009).

Vroom (1964) explained that a person’s motivations are based on three factors: valence, instrumentality, and expectancy. Valence refers to an individual’s desire for a specific outcome. Instrumentality is the belief of the individual that his or her performance is related to the desired outcome (Borkowski, 2009). Additionally, expectancy is based on the amount of effort given by an individual toward a certain performance.

As previously mentioned, North Carolina agriculture teachers have access to test item banks for each of their state tested classes. The teachers can choose to implement these item bank questions however they wish and often chose to do so in the form of formative and
summative assessments. The teacher’s motivations for using the test item banks could stem from their desire for their students to achieve high scores on the end of course assessment or other possible rewards, which is valence component. The teacher’s belief that using the test item banks would improve students’ scores is linked to the instrumentality component. Lastly, the effort provided by the teacher could affect the outcomes associated with the CTE Post Assessment.

Motivations

A person’s motivation is an instrumental factor in their personal life and career. A study conducted by Lindner (1998) found that knowing the motivations of employees and using that knowledge to develop a reward system will help identify, recruit, employ, train, and retain a productive workforce. This descriptive study was conducted by surveying employees on their motivational factors at the Ohio State University’s Piketon Research and Extension and Enterprise Center. This same concept can be used by the education system to determine those key motivating factors and their association with possible rewards, and in turn how those rewards affect performance and effort. If high test scores are the desired outcomes, what are those performances, efforts, and related strategies that teachers implement in their classroom to guarantee high test scores will be achieved? More specifically, what are the rewards for achieving high test scores that strongly influence teachers to believe this is the needed outcome?
As mentioned in the introduction, some states have also rewarded teachers with a supplemental bonus if students performed well on the state tests. Glass (2011) conducted a study that looked at merit pay as an influencing factor of motivation for teachers. This study found that the majority of the 278 teachers in Eagle County School District in Colorado wanted a pay increase and also wanted successful students, but found that behaviors within the classroom were not necessarily changed by a simple “cash for test scores” approach. The extra cash was not a motivating factor for teachers to change their instructional strategies within the classroom.

North Carolina had one of the largest and longest running accountability programs to reward teachers for improvements in test scores. Beginning in the 1996-1997 school year, North Carolina teachers were awarded up to a $1,500 bonus if their public school showed an improvement in end of course scores. This motivating pay increase only considers improvement in scores rather than proficiency levels and did not look at CTE scores. Vigdor (2008) studied the impact of this program on North Carolina teachers and the student achievement gap. Through this study, it was found that there was improvement in test scores; however, evidence did not show that the achievement gap had narrowed (2008). Teachers also indicated avoiding jobs at disadvantaged schools because of a decreased chance to receive merit based bonuses, and increasing the disadvantage of the school.

“While intended to motivate teachers and students to achieve optimal performance levels, the high stakes nature of state testing programs can have quite the opposite effect” (Abrams, Pedulla, & Madaus, 2003, p. 20). A study conducted by Jones, Jones, Hardin,
Chapman, Yarbrough, and Davis (1999) surveyed 470 North Carolina elementary school teachers, and found that a large majority of teachers indicated a decrease in morale and an increased level of stress from teaching in a high stakes testing state. A qualitative study conducted by Smith (1991) at two Arizona elementary schools found that teachers had negative feelings about the publication of low scores. Because teachers were strongly focused on achieving high test scores, the educational experiences and modes of instruction decreased for students (Smith, 1991). Teachers may also be motivated to utilize test item banks during assessments because research shows that students that “encounter instructional activities similar to assessment tasks in form increases the likelihood they will perform better on external assessments by getting them used to different task formats and different testing conditions” (Anderson, et. al., 2001). Students who have used the test item banks throughout the year will be familiar with the process at the end of the semester and understand the format.

**Test Item Banks**

After the end-of-course standardized test and other assessments are taken by students, teachers can use the data to project higher academic goals for both the students and themselves for the following year. Those results then can be used to compare students and compare the progress with other classes of the same subject. In addition, the test scores are used by government officials to create the United States Department of Education Report Card, which allows government officials to evaluate educational effectiveness and inform
school boards, school district personnel, parents, and the public about student achievement and accountability (Haladyna, Nolen, & Haas, 1991). With all the comparisons and evaluations that take place, do teachers feel the need for students to practice for the test? When asked, do teachers believe they are actually teaching to the test by using the test item bank questions within their classroom; or, are they aligning assessments with the course outline or blueprint for the course?

Test item bank questions can be a very useful tool in the classroom; however, it has been found that a small, yet statistically significant, amount of students often receive grades that are not indicative of their true knowledge of the content because of the question format (Simkin & Kuechler, 2005). Multiple choice questions, the primary format for test-item banks, allow students to increase the probability of the right answer through elimination and do not require a deep understanding of the content. Zimmerman, Sudweeks, Shelly, and Wood (1990) explained that test items only testing basic factual knowledge do not provide teachers with information regarding the student’s ability to apply their knowledge to real world problems. The assessment questions should be tested for validity and reliability before being used in the evaluation of students (Belcher, Headley, and McCaslin, 1996). If multiple choice questions are correctly constructed, they can be effective assessment tools and can promote higher thinking skills (Killoran, 1992). Teachers must take the time to evaluate the items within the bank to ensure that the items do challenge students to use more than rote and recall.
A meta-synthesis of evaluation study conducted by Kulik, Kulik, and Bangert (1984) reviewed forty studies that were all related to the use of practice tests and achievement scores. For this review, the following variables were used: ability of subjects, grade level, type of test used, manner of publication and year. Their meta-synthesis study found that achievement was highest when the practice tests were identical to the test given. Other factors increasing achievement included the number of practice tests given and the ability level of the student. Those students with a higher ability had more significant gains when practice tests were used. Across North Carolina, it is at the discretion of the individual agriculture teacher to utilize the test item banks. Only a few school systems require teachers to log onto the system for benchmark testing, which is then used to compare the progress among high schools across a county.

**Assessment and Instructional Method Design**

The Rigor and Relevance Framework developed by Dagget (2005) points out the importance of developing test questions and assessments that directly align with the appropriate objective level. Only then can a student’s knowledge properly be measured against the objective. Many of those objectives within North Carolina agricultural education blueprints (especially those performance objectives) are at the application, analysis, synthesis, and evaluation level; however, is a multiple choice item bank a good resource for measuring students’ knowledge both formatively and summatively?
Today, assessments are a key component within any classroom. Teachers must decide how to use them in their classroom.

“When giving an assessment, a teacher has a number of decisions to make:

- Does the assessment focus only on the objective?
- Does the effectiveness of various instructional activities need to be assessed?
- Does the teacher integrate the assessment with the instruction?
- Does the teacher conduct a more independent assessment for the purpose of assigning grades?
- How does the teacher know that the assessment tasks require the students to engage in implementing rather than executing (or some other cognitive process)?”

(Anderson, et. al., 2001)

A study conducted by Cano and Martinez (1991) sought to determine the relationship between level of cognitive performance and critical thinking. Secondary high school agriculture students in Ohio were given two forms of a test based on Bloom’s Taxonomy (1956) and the other based on Dressel and Mayhew (1954). Cano and Martinez (1991) found that agricultural education students scored lowest on critical thinking abilities compared to basic abilities and application abilities on the assessments. The researchers emphasized that agricultural educators should promote critical thinking skills and seek out instructional activities at higher levels.
One of the 21st century skills is for students to have the ability and knowledge to engage in critical thinking (Partnership for 21st Century Skills, 2013). According to a review of research conducted by Natriello (1987), Crooks (1988), and Black and Wiliam (1998), instructional activities should be designed to develop students with those needed skills. When teachers incorporated effective formative assessments into their classroom practice, learning gains were produced.

Anderson, et al. (2001) stated that teachers made instructional decisions based on data gathered during formal assessments. Furthermore Anderson et al. (2001) pointed out, “because grading decisions must be not only made, but also justified, teachers may feel more comfortable relying on fairly traditional tests of factual knowledge in summative assessments” (p. 247). The emphasis on connecting formative and summative assessments yielded higher scores on the summative assessment.

Effects of Standardized Testing

A qualitative study conducted in Maine and Maryland (1998) compared the effects of standardized testing on instructional practices in math. In Maryland, a state with more emphasis on the standardized math test, it was found that three times as many teachers changed their curriculum to meet test standards. More frequently, the order in which content was introduced was changed but the instructional methods among the states seemed to remain the same. Firestone, Mayrowetz, and Fairman (1998) also found that the high stakes assessments motivational effects are limited. The teachers in Maryland exposed to
professional development opportunities mainly focused on the math standardized test preparation compared to Maine where teachers felt they were given the opportunity to seek out personally relevant opportunities.

Arizona, Kentucky, Virginia, and North Carolina teachers also indicated that a standardized test had impacted their instruction of content and daily planning (McMillan, Myran, Workman (1999); Smith, Edelsky, Draper, Rottenberg, & Cherland, (1991); Koretz, Barron, Mitchell, & Stecher, (1996); Jones et al., (1999)). Abrams, Pedulla, and Madaus (2003) found that teachers in high stakes states were more likely to use test prep materials developed by the state, released items from the state test, and teach in ways that contradict what is said to be good education practices. When the intended summative assessment becomes used as a formative assessment, the results cannot be used as indicator of student understanding (Anderson, et. al, 2009).

Urdan and Paris (1994) conducted a study of 153 teachers of kindergarten through eighth grade to determine teachers’ perceptions of standardized testing. They found that the majority of teachers had negative feelings about the test and questioned the tests usefulness because of their belief the test did not accurately reflect what students know. Participating teachers also indicated that they take time away from normal class time to prepare students for the tests and use practices that threaten the validity of the results as well as quality of learning.

A study conducted in 1998 by Gordon found that vocational teachers did not have a negative attitude toward the assessment process. However, these 144 teachers from West
Virginia indicated that standardized test scores were of least importance to them. The study also revealed teachers’ lacked proficiency at understanding the data generated from these standardized tests and needed more instruction on varied assessment methods. Participants indicated more time to plan and collaborate would benefit their assessment practices (Gordon, 1998).

Brown (1992) in a study conducted with 30 fifth and sixth grade teachers and twelve principals from states with high stakes state mandated testing, found the testing practices negatively impacted teachers practices in the classroom. Teachers indicated that those items or concepts being tested were emphasized more in the classroom with those non-tested items being eliminated. With the pressure to increase test scores, teachers also were less likely to use “innovative” strategies because of the belief that more traditional strategies better prepared students for the tests. The participants in this study also indicated that there seemed to be a disconnect between state policy makers and local educators in regards to testing mandates and practices.

**Authentic Assessments and Experiential Learning**

When selecting the appropriate assessment for an objective, lesson, or unit, teachers have several options. Traditionally, agricultural educators heavily relied on the use of performance assessments in their classrooms to enhance the hands-on component. Often these are considered hands-on activities designed to prepare students for the real world with career ready skills.
Research conducted by Gordon (1998) on West Virginia Vocational Education teachers’ perceptions of assessments revealed that performance assessments were considered of most use and allowed teachers a better understanding of their students’ knowledge. This finding also supported Kershaw’s (1993) finding on vocational education teachers in Ohio. Kershaw (1993) through the use of a descriptive-correlational study measured vocational teachers use of assessment information, relationship between assessment use and teacher attitudes, constraints, and teacher characteristics. Ohio vocational education teachers indicated that performance tests were favored compared to objective tests. In Gordon’s (1998) study, the teachers in West Virginia also indicated that the use of informal observations was used the most in their classrooms. Authentic assessments such as portfolios and projects overall can provide the teacher with a better understanding of student knowledge even though these can be difficult to score (Anderson, et. al, 2001). Students in classrooms should be evaluated and given multiple opportunities to “make meaning of their learning as it begins, progresses, and escalates” (Parr & Edwards, 2004). Good teaching practices heavily emphasize the need for differentiated learning activities. The same should be said about assessment practices. Providing students with multiple measures to display knowledge will allow for richer data that truly indicates their understanding.

With new education reforms, educators and policymakers have encouraged teachers to become a facilitator of knowledge and allow students the responsibility of being an active learner (Padron and Waxman, 1999; Knobloch, 2003). Experiential learning focuses on this concept of allowing the student to “experience” the learning, and has been found to improve
student achievement (Newmann & Wehlage, 1996; Knobloch, 2003). This type of learning elicits a wider range of learner involvement through physical activity and social engagement because of a student’s greater investment in the learning (Hamilton, 1980).

Arnold, Warner, and Osborne (2006) explored the role of experiential learning in agricultural education classrooms through a qualitative study using interviews. The researchers sought to determine agriculture teacher’s knowledge and familiarity of experiential learning, use of Kolb Model of Experiential Learning, and the teacher’s role when using experiential learning. This study supported experiential learning being used in agricultural classrooms because of its practicality, opportunity to not only teach but also test skills that can then be reflected upon. Roberts (2006) also defined experiential learning in a similar context but expanded to include that the students experience allows the student connect understandings through the process of reflections and pre-existing knowledge. Arnold, Warner, and Osborne (2006) found that teachers felt that experiential learning led to higher retention as well as actively engaging students in concepts that would be beneficial later in life instead of only providing information to pass a test. Teachers in this study also elaborated on those factors that affected the amount of experiential learning that takes place in a classroom such as class size, time, maturity levels, and teaching styles. The teachers felt that students enjoy the opportunity to practice real-life skills and lead the learning process.

The experiential learning concept could be classified as an authentic assessment because a students’ performance is being measured based on their performance on activities designed to reflect real life skills (Hambleton, 1996; Ormrod, 2000; Woolfolk, 2001).
Ormrod (2000) stressed that authentic activities should promote “problem solving, critical thinking, synthesizing knowledge, and real life application of skills.” Stiggins (2008) compared authentic and performance assessments and noted that some see the two as a synonym, while some see authentic assessment as being different because of the realistic component. Authentic learning tasks should be meaningful and connect to real life scenarios that students are currently experiencing and those that will be present in the future (Newmann and Wehlage, 1996; Woolfork, 2001). When experiential learning is used in the classroom, there is a shift from teacher directed to student led, allowing the students’ needs to take priority. This should improve interest, motivation and retention of the material (Arnold, Warner, & Osborne, 2006). Stiggins (2008) also found that students were more motivated when performance assessments similar to those require in a workplace are used. The data gained from these assessments can be a key indicator about a student’s performance in the real-life situation.

Summary
The purpose of this study was to explore the usage and incorporation of test item banks in the North Carolina agriculture teacher classroom as well as the motivations for their use and its influence on experiential learning. According to Vroom (1964) a person’s motivations are based on three factors: valence, instrumentality, and expectancy. Valence refers to an individual’s desire for a specific outcome. Instrumentality is the belief of the individual that his or her performance is related to the desired outcome (Borkowski, 2005).
Additionally, expectancy is based on the amount of effort given by an individual toward a certain performance. The literature review focused on researching those specifics related to motivations, test item banks, assessments, instructional methods, effects of standardized testing, and experiential learning. All of those components play a role in the valence, instrumentality, and expectancy related to a teachers use of the test item banks.

There was a lack of research specifically related to test item bank usage in the agriculture classroom so alternate research inquiries were used that focused on education or the workforce to develop the theoretical framework. Much of the research findings focused on the impacts of standardized testing and teacher practices in the classroom. Kulik, Kulik, and Bangert (1984) found achievement to be highest when: practice tests were identical to the test given, ability of the student, and the number of times a student had seen the questions. McNeil (2000) and Smith (1991) found that when teachers are preparing students for tests, there is a lack of instructional skills and innovative educational experiences students are exposed to decrease.

The theoretical framework focused on those aspects of test item bank usage that impact a teacher’s instruction. While no studies related to agriculture education were found concerning test item bank usage, several research studies directly analyzing agriculture programs were found in regards to experiential learning.
CHAPTER 3: METHODOLOGY

The National Research Council (2012) reported that effective teaching requires teachers to have a deep knowledge of the subject, an understanding of how people learn, and the ability to stimulate student learning and achievement. Soloman (2002) explained the need for well-constructed assessments that are aligned between standards, curriculum, and assessments. The purpose of this study was to determine the impact of test item-banks on instruction and the forms of assessment being used in the North Carolina agricultural classroom. To determine this impact, an in-depth study was designed to analyze the use of these test item bank questions as both formative and summative assessments in the classroom. In addition, the “learning by doing” component of the class was also evaluated to see if the increased pressure had caused teachers to rely on the test item bank questions instead of developing experiential learning tasks. Furthermore, those factors influencing test design will also be investigated and discussed.

This chapter will outline the methodology associated with interpreting the influence of the variable of test item bank usage among North Carolina agricultural educators. Included in this chapter are explanations of the research design, population and sample, instrument, and data collection and analysis.
**Research Design**

The research design for this study was descriptive research. Through the use of survey research, the usage of test item banks within North Carolina agriculture classrooms was investigated. Survey research allows researchers to explore and describe the present status of a population (Flowers, 2013). However, Fraenkel and Waller (2006) explained three difficulties associated with the use of survey research:

1. Ensuring that the questions are clear and not misleading.
2. Getting respondents to answer questions thoughtfully and honestly.
3. Getting a sufficient number of questionnaires completed and returned to enable making a meaningful analysis.

By having the instrument reviewed by a panel of experts and piloting the instrument, the first difficulty was addressed to ensure appropriate, related data would be collected. Within all types of research, creating a rapport and trust with participants is important in order to receive honest feedback and data. The letter to participants stated that their participation was voluntary and at any point and time the participants may opt out of the study. Because there were specific questions dealing with motivations and personal teaching, it was stressed that the survey was anonymous and no reports were going to be sent back to county administrators. Pertaining to this specific disadvantage, there is also the “subject effects” component that can influence the internal validity. Subject effects and demand characteristics are those beliefs that subjects feel are the “correct” responses, promote positive self-presentation, or are more desired (McMillian & Schumacher, 2001). The
anonymous factor was stressed in the letter sent to the participants in hopes of making participants feel that there was no “correct” answer. Participants were also asked to be reflective and truthful since answers were not tied to individuals.

When conducting survey research, the best approach is to collect data from the entire population. Sampling is used when it is not possible to include the entire population in the study. For this study the researcher used an electronic data collection method and had access to the email addresses of the entire population. Therefore, a census study was conducted.

**Population**

The population for this study included all North Carolina high school agricultural teachers who were not considered beginning first year teachers. To determine the frame for this study, the state agricultural coordinator, state FFA advisor, and regional agricultural coordinators were contacted. These individuals provided a current directory of agriculture teachers in North Carolina. Agricultural Education regional coordinators identified those teachers that were considered “first year” so they could be excluded from the study. Currently, there are 427 agriculture teachers in North Carolina with 39 of those teaching at the middle school level. Middle school teachers were not a part of the population since standardized testing and test item banks are not used for agriculture classes at the middle school level at this time. First year teachers were excluded from the study because data were collected early in their first semester of teaching and preventing them from having an
opportunity to use test-item banks at the time of the data collection. This left a population of 338. Since this study is based on North Carolina only, the entire population will be sampled.

Instrumentation

In cases where research is conducted in a specific setting, McMillian and Schumacher (2001) noted that in these situations researchers might have to develop their own measures. When researching the topic of test item bank usage in agricultural classrooms, it was found that no directly related studies had been conducted specifically about agricultural education and test item banks. Because of this, an instrument was developed. Specific objectives were written that pertained to the purpose of the study. From there, discussions with teachers and a review of literature provided the foundation for the questions on the instrument. This study also pertained directly to North Carolina agriculture teachers. The instrument developed by the researcher included specific questions and statements related to test item bank usage, formative assessments, summative assessments, experiential learning, pressures, and motivation.

Once the instrument was developed, it was reviewed by a panel of experts comprised of a CTE director, assessments coordinator, and a former CTE teacher to determine the instrument’s face validity and content validity. Face validity refers to whether or not an instrument “appears” valid for its intended purpose (Ary, Jacobs, Razavieh, & Sorenson, 2010). Content validity refers to the extent that items represent a domain of content (McMillian & Schumacher, 2001). Also, a group of four university professors reviewed the
instrument to check for poor question wording and bias. Dillman (2000) explained one form of measurement error is the result of poor question wording or questions that can yield inaccurate answers that cannot be used within the study. Suggestions and changes were made before the instrument was distributed to the pilot participants.

Since all high school Career and Technical Education teachers have access to the test item banks for their courses, the questionnaire was distributed to twenty pilot participants who are Career and Technical Education teachers (Non Agriculture) in Granville County, North Carolina. In addition to completing the questionnaire, participants were asked to submit corrections and offer suggestions specific to the questions on the instrument. Pilot participants indicated that the questions on the instrument were relevant and served a purpose due to the relationship between the test item bank and standardized tests. Ary, Jacobs, Razavieh, and Sorenson (2010) emphasized the need to only include those questions that are necessary and meaningful in the instrument. The suggestions provided by pilot participants were taken into consideration and needed changes were made.

Pilot participants also assisted the researcher in testing the reliability of the instrument through a test-retest design. Test-retest reliability is a way to measure the reliability of an instrument by administering the same test on more than one occasion to the same individuals and then comparing the performance on the two administrations (Tuckman, 1999). This allowed the researcher to analyze the tests consistency by using the same test. Pilot participants completed the questionnaire twice, fourteen days apart, to allow the researcher to establish the stability of the instrument as a measure of reliability. No significant differences
in responses were found between the two tests, so the questionnaire was determined to be stable. Internal consistency was not used as a measure of instrument reliability since all of the items were independent and not additive.

**Data Collection**

Through the use of the directory, all teacher email addresses were collected. These email addresses were placed into the *Qualtrics* distribution email. An email message explaining the study and containing the link for the *Qualtrics* survey was sent to the population (See Appendix A). Follow up email messages were sent to those participants who had not responded after 7 days, 14 days, 21 days and 28 days. Electronic data collection was selected because of the cost effectiveness compared to telephone interviews and postal procedures as well as the reduction in time required for survey implementation (Dillman, 2000). Clear directions were also provided to participants to ensure participants could easily complete the electronic questionnaire. Within *Qualtrics*, a spreadsheet identifies those individuals that have started, in progress, or completed the survey. If there was a specific county where no teachers had started the survey, a phone call was placed to combat the “spam” folder issue. Personal phone calls or email messages were made to any non-respondents after 30 days as a means of controlling non-response.

Dillman (2000) also advises that participants be given the opportunity to complete the questionnaire by “pencil and paper” if they are not familiar or comfortable with electronic surveys. Participants were made aware of this option in the initial email request seeking their
participation. No requests were made for a paper version of the questionnaire and all completed questionnaires were submitted electronically. In order to improve the response rate the participants were reminded that the questionnaire would take approximately 15 minutes to complete based on the pilot participants timing. Those participants who completed the survey were entered for a drawing for two $50 gift cards. Research claims that using incentives when conducting online surveys will increase the response rate (Cobanoglu & Cobanoglu, 2003). At the completion of the study, the response rate was 67% after 225 teachers out of the 338 population responded to the instrument. To address non-response errors, the researcher compared early to late respondents, and no significant differences were found (Miller & Smith, 1983).

The first three questions on the instrument (See Appendix B) focused on the essential demographics of the participants: level of education, lateral entry classification, and years of experience. Teachers were asked to focus their responses on one of their agricultural education courses. To help participants only focus on the specific one class, participants were asked to provide the name of the class for which they were completing the instrument for. Frequency of use answers were broken up into percentages overall or number of times per week. Questions in relation to teachers’ beliefs were based on a 4 point Likert type scale where 1= Strongly Disagree, 2=Disagree, 3=Agree, and 4= Strongly Agree. The last question allowed teachers to respond openly about their beliefs and values regarding the use of the test item banks. This open ended question provided a more in-depth explanation of responses provided by teachers.
Analysis of Data

Descriptive statistics including mean scores, measures of variance, frequencies, and percentages were used to analyze the data related to the study objectives. These objectives are associated with the extent to which North Carolina agriculture teachers utilize test item bank questions on their formative and summative assessments, their motivations for using those item banks, other types of assessments used in agriculture classrooms, teachers' perceptions of the test item banks, and teachers' perceptions regarding the influence of test item banks on experiential learning.

Summary

This study focusing on test item bank usage by North Carolina agriculture teachers utilized descriptive statistics, mean scores, and measures of variance. Because the study focused on the use of test item banks, those beginning teachers were not selected to participate in the study, leaving a population of 338 teachers. The response rate was 67% after 225 teachers responded to the instrument. Likert-type statements, using the scale of: 1) Strongly disagree, 2) Disagree, 3) Agree, and 4) Strongly agree, were used to analyze the attitudes of teachers when provided a set of statements about test item bank usage and experiential learning. Mean scores and measures of variance were used on other questions that asked for frequencies, percentages, and types of assessments used. One open ended question allowed teachers an opportunity to share additional thoughts about the test item bank.
Prior to the instrument being delivered to agriculture teachers, a group of CTE non-agriculture teachers from Granville County piloted the study. A pre and post-test were given to the pilot participants as a way to conduct test-retest reliability and no significant differences were found. Suggested changes from this group as well as a panel made up of university professors, a CTE director, a testing coordinator, and a former CTE director were made to the instrument before it was distributed to the population through Qualtrics. Reminder emails and personal phone calls were made to non-respondents to improve the response rate.
CHAPTER 4: RESULTS

Profile of the Sample

This study focused on North Carolina High School Agriculture teachers’ usage and perceptions of test item banks. For this study only non-first year teachers were asked to participate, and 225 teachers out of 338 completed the survey instrument for a 67% response rate. By not being a beginning teacher, participants should be familiar with the test item bank and methods of incorporating test item bank questions in the classroom. Teachers were asked demographic questions regarding their highest level of education, lateral entry classification, and years of employment as a high school agriculture teacher to gather specific information about the respondents. To keep the questionnaire short and to limit the amount of personal information sought, only those demographic questions that would help define the population of the study were asked (Dillman, 2000). The respondents consisted of 55% possessing a master’s degree, 40% possessing a bachelor’s degree, and 2% possessing a six year certificate. In addition, eight individuals indicated taking graduate classes beyond their bachelor’s degree. Lateral entry teachers made up 24% of the respondents. Table 1 shows the years of experience as a high school agriculture teacher. The largest percentage of participants has been teaching between one and three years with veteran teachers teaching more than 21 years ranking second.
Table 1  
**Years of Experience (N=225)**  

<table>
<thead>
<tr>
<th>Years Employed as a High School Agriculture Teacher</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than one year</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td>1-3 years</td>
<td>49</td>
<td>22</td>
</tr>
<tr>
<td>4-6 years</td>
<td>31</td>
<td>14</td>
</tr>
<tr>
<td>7-10 years</td>
<td>34</td>
<td>15</td>
</tr>
<tr>
<td>11-15 years</td>
<td>24</td>
<td>11</td>
</tr>
<tr>
<td>16-20 years</td>
<td>26</td>
<td>12</td>
</tr>
<tr>
<td>21 or more years</td>
<td>40</td>
<td>17</td>
</tr>
</tbody>
</table>

Use of Test Item Bank Questions for both Formative and Summative Assessments

Research objective one sought to determine the extent North Carolina agriculture teachers utilize test item bank questions for both formative and summative assessments. On the instrument, participants were first asked to measure the frequency of test item bank question usage on formative assessments in their agriculture course (Table 2). Of the 219 teachers that responded to this question, 47% indicated that test item bank questions were used once a week and a smaller percentage (2% and 3% respectively) indicated using them four or five times a week on formative assessments. Teachers’ (23%) also stated that the test item bank questions were used on formative assessments that took place before the CTE Post Assessment test; however, a larger percentage (31%) indicated using the item bank questions before class tests. While the majority of teachers do incorporate these item bank questions into their formative assessments, 5% of teachers responded that test item bank questions were not used at all for formative assessments.
The data collected regarding teachers’ frequency of using test item bank questions on both formative and summative assessments is displayed in Table 3. The majority of teachers indicated using test item bank questions within their assessments. While the highest number of teachers (60) used item bank questions on their formative assessments 76-99% of the time, a larger group (105) used test item bank questions every time on summative assessments. The mean score shows that the majority of teachers are using test item bank questions 51% or more of the time on both formative and summative assessments.

<table>
<thead>
<tr>
<th>Assessment Type</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formative</td>
<td>12</td>
<td>32</td>
<td>33</td>
<td>36</td>
<td>60</td>
<td>46</td>
<td>219</td>
<td>4.09</td>
<td>1.53</td>
</tr>
<tr>
<td>Summative</td>
<td>6</td>
<td>14</td>
<td>15</td>
<td>27</td>
<td>48</td>
<td>105</td>
<td>215</td>
<td>4.92</td>
<td>1.39</td>
</tr>
</tbody>
</table>

Scale: 1) Never, 2) 1-25%, 3) 26-50%, 4) 51-75%, 5) 76-99%, 6) Every
Teachers were also asked to estimate the percentage of summative test questions that were test item bank questions. This question collected responses from 217 individuals with 79 individuals responding that 100 percent of their summative test was comprised of test item bank questions while 25 indicated test item bank questions make up less than 50% of their test. Within the group of 25 teachers, nine individuals do not use test item bank questions on their summative tests.

Internal and External Factors Influencing Test Item Bank Usage

Research objective two sought to determine the internal and external factors that influence teachers to use test item banks. Teachers’ instructional strategies and assessment practices are often internally and externally motivated with self, student, and administrator expectations playing a role. A series of statements were presented to teachers asking them to: 1) Strongly Disagree, 2) Disagree, 3) Agree, and 4) Strongly Agree. Table 4 reports the mean and standard deviation for each of the statements.

Based on the table there are external influences that promote the use of test item bank questions. With the highest mean (M=3.55), 99% of teachers indicated that the CTE Post Assessment scores were important to their county; however, lower means were associated with CTE coordinators (M=2.97) and principal and other administration (M=2.75). Sixty-six percent indicated that their principal and other administration expectations influenced their usage of the test item banks and 77% indicating that CTE coordinator expectations influenced their use of test item bank questions.
The majority (92%) of agriculture teachers reported being comfortable developing their own tests (M=3.29); however, the time available to grade (M=3.06) was a major influence in teachers’ usage of test item banks. Teachers also agreed or strongly agreed using test item bank questions reduces the amount of time spent on developing tests (M=3.20) and making tests using the test item bank is easier than developing their own tests (M=3.06).

Directly related to the curriculum, 89% of the participants acknowledged that the objectives of the course were an influencing factor in their decision to use test item banks. Often modifications and accommodations need to be made for students with an individualized education plan. These modifications and accommodations are required and a majority (M=2.48) of teachers did not feel that the test item bank allowed for student modifications to be made. Furthermore, only a small majority (51%) with a mean of 2.49 felt that there was an increase in student learning when test items were used in the classroom.

Table 4

<table>
<thead>
<tr>
<th>Statement</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTE Post Assessment scores are important to my county.</td>
<td>207</td>
<td>3.55</td>
<td>0.54</td>
</tr>
<tr>
<td>I am comfortable with developing my own tests.</td>
<td>210</td>
<td>3.29</td>
<td>0.70</td>
</tr>
<tr>
<td>My performance as a teacher is based on the student performance on the CTE Post Assessment.</td>
<td>209</td>
<td>3.24</td>
<td>0.81</td>
</tr>
<tr>
<td>Using test-item bank questions reduces the amount of time spent on developing my own questions.</td>
<td>210</td>
<td>3.20</td>
<td>0.74</td>
</tr>
</tbody>
</table>
Table 4 continued

| The objectives of my course influence my use of test item bank questions. | 207 | 3.14 | 0.69 |
| Making tests using the test item bank is easier than developing my own tests. | 209 | 3.06 | 0.82 |
| The time I have available to grade tests influences my use of the test item bank. | 210 | 3.06 | 0.71 |
| My CTE coordinator expectations influence my use of test item bank questions. | 208 | 2.97 | 0.85 |
| The technology at my school is sufficient and allows me to use the test item bank. | 210 | 2.90 | 0.85 |
| The data provided by the test item bank influences my instructional design. | 209 | 2.82 | 0.70 |
| My principal or other administration expectations influence my use of test item bank questions. | 206 | 2.75 | 0.87 |
| My county or school has policies that require me to use the test item bank. | 209 | 2.75 | 0.82 |
| The cognitive level associated with each objective influences my use of the test item bank. | 204 | 2.60 | 0.62 |
| The performance level associated with each objective influences my use of the test item bank. | 206 | 2.59 | 0.63 |
| There is an increase in student learning when the test item bank is used in the classroom. | 208 | 2.49 | 0.74 |
| Test item bank questions allow for individual student modifications to be made. | 210 | 2.48 | 0.78 |

Scale: 1) Strongly Disagree, 2) Disagree, 3) Agree, and 4) Strongly Agree
Teachers were also asked two questions concerning test item bank training and asked to mark all answer options that applied. Figure 2 displays where teachers reported receiving test item bank training. Only one teacher (0%) indicated receiving training on how to use test item banks in a college class. Approximately half (51%) of the teachers attended some type of LEA development and 43% attended a school workshop designed to train teachers. Ranking third highest, 44% of teachers reported training themselves on the use of test item banks. Others reported learning during student teaching experience (12%), from another teacher (29%), or some other type of training (5%).

*Figure 2*: Test item bank training (N=211). This pie graph displays the percentage of individuals who indicated receiving a particular type of training.
Figure 3 displays the amount of training received by North Carolina high school agriculture teachers on test item banks. The number of hours teachers participated in professional development training varied. The majority (53%) received between two and four hours of training, 25% less than one hour, 10% received no training, 7% received between 5-8 hours, and 5% of teachers reported attending nine or more hours of professional development training on how to use the test item banks.

*Figure 3: Amount of test item bank training received (N=211). This chart represents the amount of training teachers indicated receiving about the use of the test item banks.*
Other Types of Assessments Being Used By Agriculture Teachers

Research objective three explored the other types of assessments being used by agriculture teachers in addition to test item banks. Table 5 presents the other types of formative assessments used by North Carolina agriculture teachers. Teachers were asked to mark all of the formative assessments used within their classroom. Based on the instrument responses, teachers used questioning (83%), worksheets (81%), lab activities (79%), and discussion (69%) as a formative assessment the most. Exit cards (29%), other (29%), Think/Pair/Share (28%), and learning logs (8%) were used the least. Teachers were not asked to explain their “other” answer selection.

Table 5
*Types of Formative Assessments Used (N=218)*

<table>
<thead>
<tr>
<th>Formative Assessment</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questioning</td>
<td>181</td>
<td>83</td>
</tr>
<tr>
<td>Worksheets</td>
<td>176</td>
<td>81</td>
</tr>
<tr>
<td>Lab Activities</td>
<td>172</td>
<td>79</td>
</tr>
<tr>
<td>Discussion</td>
<td>150</td>
<td>69</td>
</tr>
<tr>
<td>Observations</td>
<td>120</td>
<td>55</td>
</tr>
<tr>
<td>Exit Cards</td>
<td>63</td>
<td>29</td>
</tr>
<tr>
<td>Other</td>
<td>64</td>
<td>29</td>
</tr>
<tr>
<td>Think/Pair/Share</td>
<td>60</td>
<td>28</td>
</tr>
<tr>
<td>Learning Logs</td>
<td>17</td>
<td>8</td>
</tr>
</tbody>
</table>

Summative assessments are a key evaluation tool for both teacher and student accountability in the classroom. Table 6 displays the different types of summative assessments that are used in North Carolina agriculture classrooms. A large majority (86%)
do use unit tests, followed by 66% using major projects as a summative assessment. The lowest percentages were linked to final non-CTE Post Assessments (17%) and major papers (17%). While the majority of teachers did use some type of summative assessment in their class, six teachers indicated not using any other summative assessment other than the CTE Post Assessment.

Table 6  
*Types of Summative Assessments Used (N=218)*  

<table>
<thead>
<tr>
<th>Summative Assessment</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Tests</td>
<td>188</td>
<td>86</td>
</tr>
<tr>
<td>Major Projects</td>
<td>144</td>
<td>66</td>
</tr>
<tr>
<td>Midterm</td>
<td>132</td>
<td>61</td>
</tr>
<tr>
<td>Weekly Tests</td>
<td>94</td>
<td>43</td>
</tr>
<tr>
<td>Final non-CTE Post Assessment</td>
<td>37</td>
<td>17</td>
</tr>
<tr>
<td>Major Papers</td>
<td>36</td>
<td>17</td>
</tr>
<tr>
<td>No summative assessments other than the CTE Post Test</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

There are many different types of questions that can be implemented on an assessment. Some teachers chose to make their own tests and utilize multiple types of questions, while others may rely on one specific type of question. Table 7 provides the percentage of teachers who use a specific type of question on their summative assessments. Again, for this specific question teachers were asked to select all that apply. Agriculture teachers indicated that multiple choice (91%), short answer (56%), and fill in the blank (50%) questions were most frequently used on summative tests. True/false questions (37%), performance (33%), and essay (25%) were the least used of summative assessment questions.
In addition, 7% of teachers reported using no other summative assessments other than the CTE Post Assessment.

Table 7
*Types of Questions Used on Summative Assessments (N=218)*

<table>
<thead>
<tr>
<th>Type of Question</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Choice</td>
<td>199</td>
<td>91</td>
</tr>
<tr>
<td>Short Answer</td>
<td>122</td>
<td>56</td>
</tr>
<tr>
<td>Fill in the Blank</td>
<td>110</td>
<td>50</td>
</tr>
<tr>
<td>Matching</td>
<td>107</td>
<td>49</td>
</tr>
<tr>
<td>True/False</td>
<td>80</td>
<td>37</td>
</tr>
<tr>
<td>Performance</td>
<td>73</td>
<td>33</td>
</tr>
<tr>
<td>Essay</td>
<td>54</td>
<td>25</td>
</tr>
<tr>
<td>No summative assessments other than the CTE Post Test</td>
<td>16</td>
<td>7</td>
</tr>
</tbody>
</table>

Teachers were also given two perception statements in relation to their beliefs about assessments. These two statements used a Likert-type scale ranging from one to four where: 1) Strongly Disagree, 2) Disagree, 3) Agree, and 4) Strongly Agree. Table 8 reports the results from these two statements. Teachers indicated preferring to develop their own tests (M=3.29). With a mean of 3.26, a large majority (97%) believe that summative assessments should include appropriate levels of questioning related to cognitive thinking, performance, and attitudes.
Perceptions Regarding Test Item Bank Usage

Items related to research objective four examined North Carolina agriculture teachers’ perceptions of the use of test item banks. Two Likert type statements were given to participants and the following scale was used: 1) Strongly Disagree, 2) Disagree, 3) Agree, and 4) Strongly Agree. Table 9 displays the mean and standard deviation for these two statements. When asked whether the CTE Post Assessment scores accurately measure students’ knowledge and comprehension, 69% of teachers did not believe the CTE Post Assessment was an accurate measure (M=2.40) and 66% did not believe that the CTE Post Assessment questions test higher order thinking skills (M=2.21).

Table 8
Types of Assessments Used

<table>
<thead>
<tr>
<th>Statement</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer to develop my own tests instead of using test item bank questions.</td>
<td>210</td>
<td>3.29</td>
<td>0.72</td>
</tr>
<tr>
<td>I believe that summative assessments should include appropriate levels of questioning related to cognitive thinking, performance, and attitudes.</td>
<td>207</td>
<td>3.26</td>
<td>0.57</td>
</tr>
</tbody>
</table>

Scale: 1-Strongly Disagree, 2-Disagree, 3-Agree, and 4-Strongly Agree.
Out of the 76 individuals that provided feedback on the open ended question seeking information about their thoughts, beliefs, and values regarding the test item bank system, only ten teachers made comments that were positive. The majority of the comments were negative in nature and some expressed frustrations with the test item bank system. Several teachers expressed concern that the test item bank questions were not challenging and those students who were able to memorize questions performed well on the tests since it only tested students’ basic understanding. Others explained frustrations such as: they felt the need “to teach to a test” because that was the expectation and high scores were a priority, the test items are outdated and students are taught the wrong answers just to pass the test, and test item banks being just part of the “game”. This was one teachers response to the open ended opportunity to express their viewpoint on the test item bank: “I play the item bank game just enough to ensure good exam grades and then spend the rest of the time teaching a quality class that includes performance based items and increased levels of experimental and research based knowledge discovery.”
In addition to the negative perceptions, there were also positive comments about the test item banks. One teacher said that it was a good start, and students were better prepared for the post assessment because of the students’ familiarity with the system and questions. Another discussed that the test item banks “have a lot of potential to be an asset to the profession.”

**Perceptions Regarding Test Item Bank Usage and Experiential Learning**

Research objective five focused on agriculture teachers perceptions regarding the influence test item banks had on experiential learning. Five statements with a four point Likert-type scale were given to teachers to determine their attitudes related to experiential learning and test item banks. Teachers could respond with: 1) Strongly Disagree, 2) Disagree, 3) Agree, and 4) Strongly Agree. The mean and standard deviation associated with these three statements are shown in Table 10. In addition, responses from the open ended question relating to this research objective were also analyzed.

The highest mean (3.50) was associated with the statement about experiential learning being an important concept in agricultural education. With a mean of 3.06, 87% of participants indicated that experiential learning activities also enhance student performance on the CTE Post Assessment. A lower mean of 2.65 indicated that teachers did not believe that the use of experiential learning activities reduces the need to rely on test item bank questions for preparation for the CTE Post Assessment. While the majority of teachers did
not believe the CTE Post Assessment reduces opportunities for experiential learning in their course, 46% did disagree producing a 2.46 mean.

### Table 10
**Test Item Bank Usage and Experiential Learning**

<table>
<thead>
<tr>
<th>Statement</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiential learning is a concept that is very important to agricultural education.</td>
<td>217</td>
<td>3.50</td>
<td>0.69</td>
</tr>
<tr>
<td>Experiential learning activities enhance student performance on the CTE Post Assessment.</td>
<td>209</td>
<td>3.06</td>
<td>0.55</td>
</tr>
<tr>
<td>The use of experiential learning activities reduces the need to rely on test item bank questions.</td>
<td>208</td>
<td>2.65</td>
<td>0.63</td>
</tr>
<tr>
<td>The CTE Post Assessment does not reduce the opportunities for experiential learning in my course.</td>
<td>209</td>
<td>2.46</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Scale: 1) Strongly Disagree, 2) Disagree, 3) Agree, and 4) Strongly Agree

Teachers were also asked to estimate the percentage of their course that was spent on students conducting experiential learning activities. Figure 4 displays teachers’ responses to this question. The majority of teachers indicated that experiential learning makes up 26%-50% of their course. Only two teachers indicated that students were not provided experiential learning activities, while nine teachers stated that experiential learning makes up 76-100% of their course.
Figure 4. Percentage of course classified as experiential learning (N=216). Teachers were asked to estimate the percentage of their course that is classified as experiential learning.

In response to the open ended question, twenty-seven teachers discussed the impact of standardized tests and test item banks on experiential learning. Five teachers referenced their concern for students who were great at hands on activities, but did not test well, often receiving scores that were not an appropriate measure of the students’ knowledge or understanding. One teacher asked the question “Are employers interested in students that can perform or students that have knowledge of something?” Six participants noted that test item bank usage takes time away from the true hands on testing of the course. Additionally, four teachers mentioned that experiential learning is more valuable to students but is difficult to assess especially in a multiple choice format. One teacher expressed a frustration because
experiential learning does not exist as it did in classrooms many years ago because it is not a concept in the test item bank. Another teacher said “The assistant principal at my school only looks at the final test scores, so the amount of experiential learning has decreased in the program.” The teacher continued to discuss how other activities such as FFA and SAE were not used in the evaluation of the teacher, only the test scores.
CHAPTER 5: SUMMARY, CONCLUSION, IMPLICATIONS, AND RECOMMENDATIONS

Summary

Accountability has changed the face of education for not only students but also teachers and school systems. There are higher expectations than ever before for students to pass standardized tests at the end of the course. From incentives for teachers, personnel changes, and hiring decisions, teachers are feeling the pressure to ensure students are successful not only in their classroom throughout the year but at the end of the year on a multiple choice test. Specifically in North Carolina agriculture classes, students are given a CTE Post Assessment to measure knowledge gained and proficiency. Prior to students taking the CTE Post Assessment, teachers have access to a test item bank system that contains questions similar to those that are in the state’s secure test item bank. Agriculture teachers can use these questions however they would like throughout the semester. Some choose to incorporate them on summative tests at the end of each unit; others incorporate them periodically throughout the semester in their formative assessments and class activities.

Morrison, Ross, and Kemp (2001) discussed how a teacher’s classroom assessments and class are constantly being cycled in a way that combines reflections, motivations, internal and external factors, and instructional strategies. Agriculture teachers fit into this model when they are making decisions regarding the use of the test item bank in their classrooms.
This study focused on North Carolina agriculture teachers’ use of test item banks for both formative and summative student assessments as well as teachers’ perceptions of the influence of test item banks and end-of-course testing on experiential learning in agriculture classrooms. Formative assessments give teachers feedback on students’ knowledge at a certain point where that point can still be improved upon, while summative assessments provide teachers with a final score of a students gained knowledge. In addition to formative and summative assessments, agriculture teachers are also expected to incorporate performance based teaching in the form of experiential learning. Experiential learning is the “learning by doing” component that is heavily emphasized, not only in agriculture education, but also in all of career and technical education. It is a key principle that CTE was founded upon with the hopes that teachers are preparing students with the latest career ready skills and experiences to successfully enter the workforce or college setting.

The purpose of this study was to determine the impact of test item banks on assessments being used in the North Carolina agricultural classroom. In addition, the experiential learning component was studied to determine if test item banks and end of course testing had impacted the use of experiential learning tasks. Five specific objectives centered this study:

1. Determine the extent North Carolina agriculture teachers utilize test item bank questions for both formative and summative assessments.

2. Describe the internal and external factors that influence teachers to use test item banks.
3. Determine other types of assessments being used by agricultural education teachers.

4. Determine agriculture teachers’ perceptions regarding the use of test items banks.

5. Determine agriculture teachers’ perceptions regarding the influence test item bank usage on experiential learning in the classroom or lab.

While this study cannot be generalized to other populations beyond North Carolina agriculture teachers, it can serve to provide insight into the practices of teachers who have access to test item banks in those states that are considered high stakes.

After reviewing the literature, a questionnaire was developed that included questions designed to provide data related to the research objectives. The questionnaire incorporated Likert-type items, multiple response items, and an open ended question to gather information regarding teachers’ use of test item banks in their classroom and the item banks influence on experiential learning. Prior to the questionnaire being distributed to the pilot participants, university faculty, a testing coordinator, and CTE director all reviewed the questionnaire. Suggested changes and modifications were made and then it was emailed to pilot participants. The pilot test group consisted of CTE teachers (non-agriculture) from Granville County, North Carolina. Feedback and suggested changes from these teachers additionally helped mold the final draft of the questionnaire. The finalized questionnaire was distributed using Qualtrics to all 338 North Carolina high school agriculture teachers who were not identified as first year teachers. Reminder emails were sent to improve the non-response rate. In the end, 225 teachers completed the survey for a response rate of 67%. Those individuals who completed the survey were also entered into a drawing for two $50 gift
certificates. To address non-response error, results from early and late respondents were compared and there were no significant differences (Miller & Smith, 1983). The respondents were considered to be representative of the population.

The results indicated that test item banks did play a major role in the North Carolina high school agriculture instruction. Teachers use the item bank questions extensively on both formative and summative assessments in their agriculture classes. The majority of teachers did receive some type of training on how to use the test item banks with the majority receiving between two to four hours of professional development training. Only ten teachers indicated that they do not use the test item bank questions on formative assessments, compared to 47% who use the test item bank questions at least once a week on formative assessments. When developing summative tests, 92% of the teachers indicated they are comfortable with developing their own tests; however, 36% of teachers use only test item bank questions for their summative tests. Only 12% of the teachers reported that less than 50% of their summative test questions were test item bank questions.

The majority of teachers indicated that their CTE Post Assessment scores were important to their county; however, the mean was slightly lower for importance to principal and CTE coordinator. Over half of the teachers did agree or strongly agree that the CTE coordinator and principal expectations influenced their practices of using the test item bank questions. Teachers also must make modifications for students, and 52% do not feel that the test item banks allow for these modifications to be made. There was a close split on the
impact of these banks on student learning with 49% believing that using test item banks does not increase student learning.

In addition to test item banks, teachers reported using worksheets, discussions, questioning, and lab activities the most as formative assessments. In addition to summative tests, 66% of teachers assign major projects, 17% assign major papers, and 3% give no other summative assessment other than the CTE Summative Post Assessment. Overall 97% of teachers believe summative tests should include appropriate levels of questioning related to cognitive thinking, performance, and attitude. While teachers did utilize multiple choice items most frequently, fill in the blank, short answer, and matching were also reported to be used frequently on summative tests. Sixty-nine percent of teachers indicated that they do not believe the CTE Post Assessment accurately measures student knowledge.

Experiential learning is another component that is viewed as an integral part of the CTE classroom. The majority of the teachers indicated that they believed experiential learning is an important part of agriculture education and devoted class time to experiential learning activities. A large majority (87%) believed that experiential learning activities enhance student performance on the CTE Post Assessment. Unfortunately, 46% believed that the use of test item banks reduces the amount of experiential learning activities that can be completed in the class. One teacher explained this point in the open ended question as: “The test item banks must be used to please the principal and CTE Coordinator. Experiential learning is the valuable tool that uses hands on learning and pleases the student.”
Conclusions

Research Objective 1: Determine the extent North Carolina agriculture teachers utilize test item bank questions for both formative and summative assessments.

Test item bank questions have become a key component of both formative and summative assessments in North Carolina agriculture classrooms. Because the test item banks are easily assessable and provided by the state, teachers are using these item banks to prepare students for the CTE Post Assessment; however, their reliance on the test item bank questions are dominating both their formative and summative assessments. Teachers are overusing the test item bank questions on both formative and summative assessments because of the desire to produce high scores on the CTE Post Assessment. While the majority of participating teachers indicated only using the item bank questions three or less times a week on formative assessments, the means associated with frequency of use on formative and summative assessments were 4.09 and 4.92 respectively. This mean indicates that the majority of teachers are using them for 51% or more of both formative and summative. The item banks were created to be a tool to be used in addition to other instructional activities, yet it appears that item bank questions are present on the majority of both formative and summative assessments.
Research Objective 2: Describe the internal and external factors that influence teachers’ use of test item banks.

Both internal and external factors are important in influencing teachers’ usage of test item bank questions on assessments with neither being a dominant factor. Teachers are motivated to use test item banks by a variety of factors. While there is pressure from their counties to produce high scores on the CTE Post Assessment, teachers also favor the test item banks’ ability to generate questions, create assessments quickly, grade assessments instantly, and provide data related to student achievement.

North Carolina agriculture teachers have not been adequately trained on how to use test-item banks for formative and summative assessments. Of the 211 teachers, who answered the amount of training question, 44% trained themselves on how to use the test item bank system. Proper training is needed to ensure teachers are familiar with all of the functions, options, and capabilities of the system. The item banks are designed to be more than a test generator because teachers can monitor students’ progress throughout the course.

Research Objective 3: Determine other types of assessments being used by agricultural education teachers.

Teachers are using an appropriate variety of other assessments in their classroom. Using only one type of assessment is not a good educational practice, and North Carolina teachers are using an appropriate amount of different assessments from questioning, worksheets, lab activities, unit tests, quizzes, projects, and other assessments to effectively
measure student learning and comprehension. Teachers also understand the role of assessments in the classroom. The majority of North Carolina agriculture teachers believe that assessments should contain appropriate level of questioning related to cognitive thinking, performance, and attitudes.

**Research Objective 4: Determine agriculture teachers’ perceptions regarding the use of test item banks.**

Teachers overall have a positive viewpoint regarding the use of test item banks in their classroom setting; however, teachers do not have a positive viewpoint of the CTE Post Assessment. Less than half of the teachers (40%) believed that the CTE Post Assessments scores were an accurate measure of students’ knowledge and comprehension. However, because of test item banks, teachers can efficiently create and grade assessments allowing time to focus on other aspects of the agriculture program. Teachers also believe the test item banks prepare students for the CTE Post Assessment.

**Research Objective 5: Determine agriculture teachers’ perceptions regarding the influence of test item bank usage on experiential learning in the classroom and lab.**

Test item banks are not impacting experiential learning in North Carolina agriculture classrooms. Teachers view the importance of this founding concept and its role in the agriculture classroom. The highest percentage of teachers (50%) indicated that experiential
learning made up 26-50% of their class, followed by 24% choosing to implement experiential learning activities for approximately 51-75% of their class time.

**Implications**

This study provided valuable information that can be used in the school setting, teacher educator programs, and department of public instruction. Even though the majority of the findings were clear, a few points needed clarifying. Two questions asked teachers to evaluate their usage of summative assessments with one of the answer choices being “I do not use summative assessments other than the CTE Post Assessment”. These two separate questions asked teachers about the type of assessments utilized and the types of questions included on the summative assessment. For the types of summative assessments utilized question, six teachers indicated that they do not use any summative assessments; while in the following question about types of questions; sixteen teachers indicated not using any summative assessments. A definition was provided to teachers to explain summative assessments, but it is interesting that with the same response rate on those two questions there was an increase by ten individuals within the same answer choice.

Another question sought to determine where teachers received test item bank training. Only one individual selected the answer choice “class”, whereas, 25 denoted having received training during student teaching. Even though student teaching is a college class, teachers may have viewed student teaching as not being a college class since there was a separate answer selection for both.
When researching the topic of test item bank usage, research of this topic pertaining specifically to agricultural education as well as Career and Technical Education was non-existent to limited. With accountability and assessments becoming more prevalent in the world of education, this study exposes the external factors to use test item banks by North Carolina agriculture teachers. Even though this study only can make conclusions about the population of North Carolina agriculture teachers, it can be used as a research tool for other states with test item banks that give a standardized test given at the end of the semester. The results from this study were similar to previously conducted research in other fields.

Lindner (1998) found that by knowing the motivations of employees, employers could identify, recruit, employ, train, and retain employees. In this study, teachers identified that test scores were important to their county, administration, and their CTE director. These teachers have learned that keeping their job depends on test scores. Haldayna, Nolen, and Haas (1991) found that test scores were used by officials to evaluate educational effectiveness and the findings from this study further emphasize that this is what teachers feel in today’s classroom. Their effectiveness as a teacher is measured by how well students perform on the summative test at the end of the year and that pressures them to use the test item banks.

Teachers do feel pressured by their supervisors to perform and meet expectations and sometimes those expectations pressure them to do things that they don’t 100% believe encourages student learning. A majority of the teachers felt that the test item banks are not a good indicator of student knowledge and understanding, yet they still choose to include those
questions in both formative and summative assessments. Popham (2001) discussed how teachers felt they were obligated to teach to the test, even though that went against what they believed education should be. Although not asked directly, agriculture teachers did indicate that instructional practices were changed to prepare students for the test. Agriculture Teachers felt the test item bank prepared students for the CTE Post Assessment. Kulik, Kulik, and Bangert (1984) found student achievement was highest when: practice tests were identical to test given, questions were seen multiple times, and the ability level of the student was taken into consideration. Anderson, et al. (2001) found students perform better on external assessments when exposed to instructional activities similar, further supporting the findings explaining why teachers choose to incorporate test item bank questions into their class instruction. North Carolina agriculture teachers believe students will be more successful when test item bank questions are incorporated into classroom practices because the actual test items are similar to those found in the item bank.

The findings from this study show that teachers use the test item banks as a preparation tool for the summative test. These item banks are developed by the state and encouraged to be utilized in classrooms. Abrams, Pedulla, and Madaus (2003) conducted a study that found teachers are more likely to use test preparation materials that are developed by the state.

Ironically, in the open ended question a teacher mentioned that their use of innovative learning activities was decreased because of the pressure to include test item bank questions. Brown (1992) stated that those tested concepts were emphasized more heavily and teachers
were less likely to use innovative teaching strategies, therefore, further proving the teachers statement.

Related back to Vroom’s (1964) expectancy theory, teachers believe their efforts in utilizing the test item bank questions throughout their instruction and on assessments results in improved test scores. Based on the opinions from North Carolina agriculture teachers that the CTE Post Assessment questions are similar to the test item bank questions, teachers choose to use the test item bank questions frequently and within their assessments. Their belief that using the test item bank questions will lead to a certain performance directly supports Vroom’s (1964) theory.

**Recommendations for Practice**

With the current legislation that is in place, standardized testing is here to stay in education. With that being a key factor, it is important that teachers are provided with professional development that is designed to help them become effective teachers utilizing the best instructional strategies that would encourage high test scores on the standardized tests without jeopardizing students’ opportunities to participate in experiential learning and critical thinking activities. The professional development should focus on not only how to use the test item bank system, but also how to incorporate the item banks into classroom activities especially. Teachers believe there is an increase in student learning when the test item banks are used so proper training would only further allow teachers to utilize all of the features of the item bank.
Although, teachers reported being comfortable in developing their own tests, pre-service programs should devote time to teaching students how to properly develop both formative and summative assessments in a timely matter. With a high percentage of teachers indicating a high percentage of test item bank questions on summative assessments, teachers should be encouraged to use other types of questions to evaluate student learning. Specifically for those teachers who do not use summative assessments other than the CTE Post Assessment, benefits and explanations on the role of summative assessments in the classroom should be explained, demonstrated, and encouraged. Also, instruction that shows teachers how to use experiential learning activities such as projects as a measure of summative assessments could be emphasized in a college course or professional development.

Specifically for North Carolina, the CTE Post Assessment should be analyzed and higher level thinking questions should be added. While teachers are not given access to those questions in the secure bank, if more critical thinking questions were added to both the secure and non-secure this could alleviate teachers perception that the CTE Post Assessment lacks higher order thinking skills. These test item banks should also be re-evaluated and updated every three years based upon from feedback from summative assessments, teachers, and industry leaders. Because it does not appear that we can relieve the pressures or change how teachers rely on the banks, the questions can be improved to incorporate more experiential learning concepts and challenge students to use higher order thinking skills. An analysis of test item bank questions and associated cognitive level should be done to ensure test item
bank questions are at the same cognitive level as objectives. This information would establish credibility with teachers and further validate the test results are an accurate measure of student knowledge.

In addition, administrators need to be educated on the experiential learning components of an agricultural program. While test scores are one component, agriculture education is multi-faceted and those other components should be considered. When more pressure is placed on a total program, teachers would feel that they could incorporate other activities that would benefit students. This should also be the responsibility of the teacher to set up a meeting with the principal and administration to educate those individuals about the role of experiential learning. If the administration understands all of the components and are invited to various events and lab activities, this could alleviate some of the pressures.

**Recommendations for Additional Research**

Data were collected to make conclusions about the specific research objectives of this study; however, the data collected also led to other gaps in research that need to be answered. While this study focused solely on North Carolina agricultural teachers, the increase in standardized testing has impacted all states. Standardized testing is considered to be an efficient and overall effective manner to measure student understanding and knowledge, and item banks are one of the tools provided to teachers to assist in conquering that task.

An experimental study that compares student comprehension when performing experiential learning tasks with an instructional activity that incorporates test item bank
questions would provide insight on student understanding, critical thinking, and real world connections. In some aspects, fear of failure and the consequence of that failure are hindering teachers from incorporating those innovative strategies that teach real world skills in their classrooms. Teachers need to be reminded of the research conducted by Arnold, Warner, and Osborne (2006) that found experiential learning activities improve interest, motivations, and retention of material.

Another study focusing on the motivations and perceptions of teachers to incorporate experiential learning would allow teacher educators to understand the decisions to use or not to use experiential learning activities. The range for incorporating experiential learning was quite vast for this study. Several different components might impact the experiential learning such as time, facilities, budget, community support, administration, and student characteristics; however, determining those specific characteristics would assist teacher educators, CTE directors, and teachers. Curriculum development coordinators could also use those characteristics to assist in building curriculum that meets the needs of teachers.

This study showed that North Carolina agriculture teachers believe that using test-item banks improves student scores on the CTE Post-Assessment. An experimental study conducted in a state where end-of-course testing was not of such paramount importance could test this belief. Teachers could teach one class without using any test-item banks and a second class using test-item banks to determine if the scores were impacted.

With this study focusing on North Carolina, a more in-depth study analyzing the impacts of standardized testing in agricultural education classrooms across the United States
would help the profession evaluate the impacts of current legislation. After determining these impacts, more professional development and course evaluation could take place at the appropriate levels. Standardized testing is a component that plays a critical role in the education system. More research is needed to keep teachers from “teaching to a test” but one that uses the tools needed to assist in preparing students that is 21st century ready.
REFERENCES


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Appendix A

LETTER TO NORTH CAROLINA AGRICULTURE TEACHERS SEEKING PARTICIPATION

Good Morning,

My name is Joy Morgan Marshall and I am currently a student at North Carolina State University pursuing a Doctorate of Agricultural and Extension Education. Originally from Oxford, I taught agriculture related classes in Granville County for five years prior to returning to graduate school. For my dissertation research, I am focusing on the use of the Elements test item bank in the agricultural classroom. I am hoping that you would be willing to take fifteen minutes to answer the survey questions. The survey is anonymous and the information provided will hopefully help guide future education classes and professional development. If you would prefer a pencil and paper copy, please let me know. By starting the survey, you are agreeing to participate; however, you may choose to stop the survey at any point and time. Again many thanks for taking the time to assist. If you have any questions feel free to contact me.

Here is the link to the survey:

Joy Marshall
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Appendix B

Instrument

Q1 What is your highest level of education?
- Bachelors Degree
- Masters Degree
- Doctorate
- Six Year Certificate
- Graduate Courses Beyond Bachelors Degree

Q2 Are you considered a lateral entry teacher?
- Yes
- No

Q3 How many years have you been employed as a high school agriculture teacher as of August 2013?
- No high school agriculture teaching experience (this is my first time teaching)
- Less than 1 year
- 1-3 years
- 4-6 years
- 7-10 years
- 11-15 years
- 16-20 years
- 21 or more years
For the rest of the survey, please answer the questions by selecting the class in which you use the Elements test item bank questions the most in. By selecting only one class and using that one class for all of the questions, you will provide valuable feedback. What class are your answers based on?

Q4 How frequently do you use the Elements test item bank questions on/for your formative assessments?
- Never
- 1-25%
- 26-50%
- 51-75%
- 76-99%
- Everytime

Q5 In a typical week, how many times a week do you use test item bank questions for formative assessments? (Mark all that apply)
- Once a week
- Twice a week
- 3 times a week
- 4 times a week
- 5 times a week
- Before tests
- Before the CTE Post Assessment
- None

Q6 How often do you use Elements test item bank questions on your summative test?
- Never
- 1-25%
- 26-50%
- 51-75%
- 76-99%
- Every time
Q7 On average, what percentage of your test questions on a summative test are Elements questions?
- None
- 1-25%
- 26-50%
- 51-75%
- 76-99%
- 100%

Q8 What types of formative assessments do you frequently use in your course? (Mark all that apply.)
- Questioning
- Worksheets
- Exit Cards
- Observations
- Discussion
- Learning Logs
- Think/Pair/Share
- Lab Activities
- Other:

Q9 What types of summative assessments do you utilize? Mark all that apply.
- Weekly tests
- Unit tests
- Midterm
- Final non CTE Post Assessment
- Major Projects
- Major Papers
- I don't use summative assessments other than the CTE Post Assessment
Q10 What types of questions do you include on a summative assessments? Mark all that apply.
- Multiple Choice
- Short Answer
- Essay
- Performance
- Fill in the Blank
- Matching
- True/False
- I don't use summative assessments other than the CTE Post Assessment.

Q11 During the course, how often do you give your students summative assessments?
- Never
- Once a course
- Twice a course
- 3-4 times a course
- 5-6 times a course
- 7-8 times a course
- 9 or more times a course

Q38 Approximately what percentage of your selected course is spent on experiential learning activities?
- None
- 1-25%
- 26-50%
- 51-75%
- 76-100%

Q39 To what extent do you agree or disagree with this statement: “Experiential learning is a concept that is very important in agricultural education.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree
Q12 For the rest of the questions, please think in general terms regarding all your classes. Where did you receive Elements training? (Mark all that apply.)

- In a college class
- During student teaching
- From another teacher
- LEA development
- School Development Workshop
- I trained myself.
- Other:

Q13 Approximately, how many hours of professional development training did you receive on the use of Elements?

- No training on Elements
- Less than one hour
- 2-4 hours
- 5-8 hours
- 9 or more hours

Q14 To what extent do you agree or disagree with this statement: “I am comfortable with developing my own tests.”

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q15 To what extent do you agree or disagree with this statement: “Using the test item bank questions reduces the amount of time spent on developing my own test.”

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q16 To what extent do you agree or disagree with this statement: “Making tests using the Elements test item bank is easier than developing my own tests.”

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree
Q17 To what extent do you agree or disagree with this statement: “Test item bank questions allow for individual student modifications to be made.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q18 To what extent do you agree or disagree with this statement: “The cognitive objective level associated influences my use of the test item bank questions.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q19 To what extent do you agree or disagree with this statement: “The performance objective level associated influences my use of the test item bank questions.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q20 To what extent do you agree or disagree with this statement: “My principal or other administrators’ expectations influence my use of the test item bank questions.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q21 To what extent do you agree or disagree with this statement: “My CTE Coordinator expectations influence my use of the test item bank questions.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree
Q22 To what extent do you agree or disagree with this statement: “The objectives of my course influence my use of the test item bank questions.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q23 To what extent do you agree or disagree with this statement: “The time that I have available to grade tests influences my use of Elements.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q24 To what extent do you agree or disagree with this statement: “My county or school has policies that require me to use test item bank questions.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q25 To what extent do you agree or disagree with this statement: “My performance as a teacher is based on the student performance on the CTE Post Assessment.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q26 To what extent do you agree or disagree with this statement: “CTE Post Assessment scores are important in my county.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree
Q27 To what extent do you agree or disagree with this statement: “The technology at my school is sufficient and allows me to use Elements.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q28 To what extent do you agree or disagree with this statement: “There is an increase in student learning when Elements is used in the classroom.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q29 To what extent do you agree or disagree with this statement: “The data provided by Elements influences my instructional design.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q30 What other internal or external factors influence your use of test item bank questions? Please list them all.

Q31 To what extent do you agree or disagree with this statement: “I believe that summative assessments should include appropriate levels of questioning related to cognitive thinking, performance, and attitudes.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q32 To what extent do you agree or disagree with this statement: “Generally speaking, I believe CTE Post Assessment scores accurately measure students’ knowledge and comprehension.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree
Q33 To what extent do you agree or disagree with this statement: “I prefer to develop my own tests instead of using test item bank questions.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q34 To what extent do you agree or disagree with this statement: “I believe the CTE Post Assessment questions tests students higher order thinking skills.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q35 To what extent do you agree or disagree with this statement: “The CTE Post Assessment does not reduce the opportunities for experiential learning in my course.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q36 To what extent do you agree or disagree with this statement: “The use of experiential learning activities reduces the need to rely on test item bank questions.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q37 To what extent do you agree or disagree with this statement: “Experiential learning activities enhance student performance on the CTE Post Assessment.”
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Q40 What other feedback do you have regarding your beliefs and values regarding Elements and its use in the classroom setting? Or any other thoughts?