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High School English Teachers' Perceptions of Rigor in Student Assignments

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High School English Teachers' Perceptions of Rigor in Student Assignments

By
Cynthia S. Misenheimer

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

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Abstract

High School English Teachers' Perceptions of Rigor in Student Assignments.
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Teacher/Student Assignments/High School/Perception/Senior High School

This research was designed to examine the perceptions of high school English teachers as to the amount of rigor present in their student assignments as evidenced by a rubric based upon the revised Bloom's taxonomy.

The researcher developed a rubric to assess the amount of rigor based upon the revised Bloom's taxonomy. Teachers of standards and honors level English classes in high schools from two school systems were asked to assess four of their student assignments that they considered challenging utilizing the rubric. They were also asked to rank the assignment with a level of rigor from one for low rigor to six for high levels of rigor.

The research design was causal-comparative, utilizing quantitative data. Two external raters, high school English teachers not involved in the initial grouping, scored the same assignments using the rigor rubric. The researcher calculated the interrater reliability of the external raters, calculated the mean score for each teacher based on the teacher's ratings of the four assignments and compared the mean with the mean of the external raters with a t-test.

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Chapter 1: Introduction

Nature of the Problem

Gary Marx (2006), the author of *Sixteen Trends: Their Profound Impact on our Future*, pointed out that the Industrial Age has given way to the Global Knowledge/Information Age, thereby resulting in the need for increased social and intellectual capital (p. 6). This need for increased intellectual capital calls for a well-educated population (Marx, 2006, p. 6). Marx also called for the creation of a new model for schools that are unlike the schools of today that still prepare students for employment in an industrial society. The skill set required for preparing students for the Global Knowledge/Information Age will be different because students will need to possess basic entrepreneurial and management skills, collaborate with others, work in teams, and have the ability to separate truth from fiction by exploring conflicting information that is expanding exponentially (Marx, 2006, p. 82). Those students who do not acquire the new skills to prepare for the new economy will become “the new disadvantaged” in society (Marx, 2006, p. 82).

Futurists and forecasters Cetron and Davies (2003) also commented on the changing skill set needed by students to be prepared for the future. He stated that there is a need for higher-level teaching skills that will enable teachers to become mentors and catalysts for learning. These will be teachers who do not lecture as their primary methodology of teaching, but help students learn to collect, evaluate, analyze, and synthesize information in rigorous cooperative learning settings (Cetron & Davies, 2003, p. 19).

Futurists Coates and Jarratt (1992) agreed with Cetron and Davies (2003) in that the role of the educator will be to help their students become *intellectual entrepreneurs*

who can find relationships between what may appear to be disparate pieces of information.

Willard R. Daggett, CEO of the International Center for Leadership in Education, stated that our “old model of education did not seek to educate everyone, but rather select and to sort. The world today requires a different core of knowledge developed by a rigorous and relevant curriculum” (Daggett & Nussbaum, 2008, p. 1).

Tony Wagner (2008a), the co-director of the Change Leadership Group at the Harvard Graduate School of Education and author of *The Global Achievement Gap*, conducted research by questioning leaders in education, nonprofits, businesses, and philanthropy to determine what skills students would need to be competitive in the new global economy. Wagner discovered that there are seven skills that are needed for American students to be successful in the workplace and help the U.S. remain competitive in the world:

1. Critical thinking and problem solving, which includes the ability to ask the right questions.
2. Collaboration and leadership, which includes working in virtual teams involving the use of technology. Students need the leadership skills that allow them to influence others.
3. Agility and adaptability, which includes the ability to be flexible, use various tools to solve problems, and the ability to adapt quickly to change.
4. Initiative and entrepreneurialism, which includes the ability to take risks.
5. Effective oral and written communication, which includes the ability to be precise, clear, and focused and the ability to “write with a real voice.”

6. Accessing and analyzing a vast amount of information daily, and an awareness of how quickly information is changing.

7. Curiosity, imagination and empathy. (p. 2)

As a result of the changes in the global marketplace, the gap between the skill set that is required today and what schools are teaching cannot be tolerated in today's global economy if the United States is to remain a competitive nation within the world (Wagner, 2008b, p. 2). U.S. students must possess the skills to be able to compete with workers from other countries. In his paper *Preparing Students for Their Future*, Willard R. Daggett (2005b) identified a need for the development of skills to prepare students to be adaptable to change as the digital informational systems give way to bio- and nano-technologies. He pointed out a need to encourage and increase the enrollment of students in science and engineering since China is now positioned to become the world leader in bio-and nano-technology research and development (Daggett, 2005b, p. 7). As noted by Peter D. Hart Research Associates (2005), China's supremacy is especially true in fields of engineering and computers, both of which require a solid background in mathematics and science. If educators do not act to narrow the gap, it will only become larger (Peter D. Hart Research Associates, 2005, p. 3).

The economic advantage of education is obvious, yet our educational system continues to limit those who will have access to the knowledge, skills, and preparative work that is needed for the future (Daggett, 2005a, p. 2). According to a report from the Alliance for Excellent Education (2009), it is estimated that persons who have at least some postsecondary education will hold 87% of the new jobs in high-wage, high-growth occupations by 2014. A U.S. Census Bureau (2004) report entitled *Educational Attainment in the U.S.*, reported that workers with bachelor's degrees earned an average

of \$57,206 a year. Those with only a high school diploma earned an average of \$27,915 a year. In 2005, the census data reported that a person with an associate's degree earned \$8,500 a year more than those with only a high school diploma. Over the past decade, the gap has widened in U.S. workers' income between college graduates versus those with only a high school diploma. Carnevale and Desrochers (2003) stated, "the U.S. now has the dubious distinction of having the greatest income disparity of any other economically advanced country in the world" (p. 6). Paul Krugman (2002) agreed, stating that "the present division between rich and poor is at its widest since the 1920's and virtually all of this vast and widening income gap has roots in a knowledge and skills gap that is also the largest in the developed world" (p. 6).

Are American students receiving the skills in school that Tony Wagner identified? Peter D. Hart Research Associates (2005) purported in *Rising to the Challenge: Are High School Graduates Prepared for College and Work?* that we are not equipping students with the skills necessary for the 21st Century work place. Employers surveyed as part of this research study estimated that 39% of their employees lacked the skills and abilities they needed for entry level jobs. An estimated 45% were not prepared to advance beyond the entry level according to the employers, and only 18% of college professors felt that their students came to college well or very well prepared for college-level work (Peter D. Hart Research Associates, 2005, p. 88). Another report, *Crisis at the Core: Preparing all Students for College and Work*, found that only 22% of the 1.2 million students tested by ACT in 2004 met their benchmarks for college readiness (ACT, 2005b, p. 3).

In a report prepared by the National Governors Association, the Council of Chief State School Officers, and Achieve, Inc. (National Governors) (2008) entitled *Benchmarking for Success: Ensuring U.S. Students Receive a World-Class Education*,

there is the dire warning that “as an increasing variety of work tasks can be digitized and performed nearly anywhere in the world, more jobs are going to the best educated no matter where they live, which means that Americans will face more competition than ever for work” (p. 5). This report also pointed out that “the world’s knowledge and innovation economy favors workers who have postsecondary education or training, strong fundamental skills in math and reading, and the ability to solve unfamiliar problems and communicate effectively” (National Governors, 2008, p. 5). This report also stated, “recent economic studies show that high skills lead to better wages, more equitable distributions of income, and substantial gains in economic productivity” (National Governors, 2008, p. 5). The report predicted that:

Higher math performance at the end of high school translates into a 12% increase in future earnings. If the U.S. raised students’ math and science skills to globally competitive levels over the next two decades, its global gross domestic product (GDP) would be an additional 36% higher 75 years from now. (National Governors, 2008, p. 5)

Benchmarking for Success also stated that our American educational system has not responded adequately to these new challenges based upon the fact that “the U.S. is falling behind other countries in the resource that matters most in the new global economy: human capital” (National Governors, 2008, p. 5). The report based this upon their data that indicated that:

American 15 year olds ranked 25th in math and 21st in science achievement on the most recent international assessment conducted in 2006. At the same time, the U.S. ranked high in inequity, with the third largest gap in science scores between students from different socioeconomic groups. (National Governors, 2008, p. 5)

Furthermore, an even more disturbing trend noted in *Benchmarking for Success* also stated that:

The U.S. is rapidly losing its historic edge in educational attainment. As recently as 1995, America still tied for first in college and university graduation rates, but by 2006 had dropped to 14th. That same year it had the second-highest college dropout rate of 27 countries. (National Governors, 2008, p. 6)

ACT (2005b) pointed out that the gap between high school and college preparedness is a result of the lack of rigor in the high school core curriculum. This testing agency contended that all high school students need to be educated to a comparable level whether they are entering the workforce or college (ACT, 2005a). ACT's (2005a) education division also stated that their findings identified a need for greater rigor in the classroom so that students will be prepared for college and work by the time they graduate from high school (p. 2). Taking the correct number of courses, though they may be noted as higher-level courses, does not guarantee that the rigor will be at a sufficient level as to prepare students for college-level work (ACT, 2005a, p. 2). Many of the reform efforts in high schools seek to make schools more welcoming, more rigorous, and more focused by using critical thinking, synthesis, and application of knowledge skill sets. Reform efforts that do not include a focus on rigorous instruction limit any academic gains for students. Although there has been a focus on reform efforts in high schools, ACT's (2007) current research indicated that due to the lack of rigor in high school classes, students are losing momentum as they progress through high school (p. 11). Based upon an ACT (2007) study of 284,898 students who indicated they would graduate in 2003, 2004, or 2005, this loss of momentum appears to be the most evident in Grades 11 and 12 (p. 12).

Not being prepared for college-level work can be expensive, as Alliance for Excellent Education (Alliance) (2009) has reported. According to Alliance, not being prepared has generated the cost of \$1.4 billion for remedial courses at community colleges nationwide, and “taxpayers are essentially paying twice for the coursework and skill development students are expected to receive in high school” (p. 3).

Not only are our students who remain in school not prepared to be competitive in the global economy, those who drop out of high school have grim prospects for their future. Editorial Projects in Education Research Center (2007) found that approximately 1.2 million United States students drop out of high school each year, about 7,000 every school day, or one every 26 seconds, costing society dearly (p. 1). The Alliance for Excellent Education (2009) estimated that high school dropouts from the class of 2006-2007 would cost the U.S. more than \$329 billion in lost wages, taxes, and productivity over the course of their lifetime (p. 1). This is quite a significant loss of human potential for the maintenance of a free and democratic society and capitalist economic system. To further demonstrate this, Educational Testing Service (ETS) (2005) found in their study, *One Third of a Nation: Rising Dropout Rates and Declining Opportunities*, that the completion rate for U.S. high schools peaked in 1969 at 77.1% and had dropped to 69.9% by 2000. More students are dropping out of U.S. high schools earlier, between ninth and tenth grade than at any other time since the 1960s (ETS, 2005, p. 10).

What could cause such a loss of human potential? *The Silent Epidemic: Perspectives of High School Dropouts* reported that of almost 500 dropouts, most of these students (88%) were not failing (Bridgeland, Dilulio, & Morison, 2006). The report cited multiple reasons students indicated for dropping out. Reasons varied from lack of rigor, student reports that classes were not interesting, and the students expressing that they

wanted more “real-world learning opportunities,” in smaller classes with more individual instruction (Bridgeland et al., 2006, p. 5). Furthermore, students reported that they were not motivated to work hard, but they would have worked harder if more had been demanded of them by their teachers (Bridgeland et al., 2006, p. 4).

Purpose

The purpose of this study was to examine multiple high school English teachers’ perceptions of rigor in student assignments. The goal of this research was to examine the perceptions of the level of rigor as rated by high school English teachers submitting *challenging* student assignments and compare the ratings for rigor of those assignments by two independent English teachers rating the same assignments.

Background and Significance of the Problem

Bruce Torff (2005) stated in his research findings, “a possible factor in the rigor gap is teachers’ beliefs about how the mind works and how teaching should proceed and in particular, beliefs about critical thinking. Critical thinking is a key element in rigorous instruction” (p. 13). Critical thinking is defined for the purposes of his study as “cognitive skills and strategies that increase the likelihood of a desired outcome...thinking that is purposeful, reasoned, and goal-directed—the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions” (Torff, 2005, p. 13). Torff’s research indicated that teachers are more likely to support use of high critical thinking (higher order thinking) activities with learners perceived as upper track, high achieving, or high advantage. Research confirms that students perceived as not being high achieving are afforded limited access to high critical thinking activities, which would indicate a problem in contemporary educational practices and contribute to unfavorable academic performance. This cycle could result in

further attribution of these learners as low track, low achieving, or low advantage (Torff, 2005, p. 14).

Between the years of 2002 and 2004, researchers from the American Institutes for Research (2005) completed a research study, *Rigor, Relevance, and Results: The Quality of Teacher Assignments and Student Work in New and Conventional High Schools*. They wished to explore the nature of teaching practices and the quality of students' work. They initially examined samples of assignments and student work gathered from English/language arts and mathematics classrooms from eight large Washington state high schools. The next year samples were gathered from 12 new high schools and four additional comprehensive high schools (that were planning for redesign) located outside Washington State. Each participating teacher was asked to provide four assignments that were typical of the assignments given to their students on a day-to-day basis, and four others that challenged their students and showed what their students knew and could do at high levels. For three of the assignments, teachers provided the work that their students produced. To gauge the rigor of teachers' assignments, the researchers had teams of *master teachers* score them with rubrics gauging the extent to which the assignments required students to move beyond the reproduction of information to construct knowledge, communicate clearly, and use language and mathematics conventions accurately and effectively. The rigor score was designed to capture the intellectual demands of assignments. Teachers judged the quality of students' work by examining the extent to which student products demonstrated the construction of knowledge, deep conceptual understanding of important content, reasoning and problem-solving facility, effective communication, and accurate use of language and mathematics conventions (American Institutes for Research, 2005, p. 2). Interview and observation data were used

to help explain some of the factors that prompt and stand in the way of rigorous and relevant learning opportunities and high-quality student work. The results of the research indicated that “assignments given in the new high schools are more rigorous than the assignments given in the comprehensive high schools” (American Institutes for Research, 2005, p. 3). The English/language arts assignments in new schools tended to entail the construction of knowledge and elaborate communication. Mathematics assignments in new schools tended to be more rigorous but the difference was very small. Also, the researchers stated, “rigor and relevance are not incompatible” (American Institutes for Research, 2005, p. 3). Most rigorous assignments were also relevant.

The researchers also found differences between the quality of student work produced; the students in the new high school produced higher-quality work in English/language arts as demonstrated by “a deep conceptual understanding of content, clear communication, facility with language, and the construction of new knowledge” (American Institutes for Research, 2005, p. 4). This pattern was not true for mathematics. The research also indicated “students who do higher-quality work in school do better on standardized achievement tests” (American Institutes for Research, 2005, p. 4). The researchers went on to comment, “there is proof from some of the classrooms in this study that low-income, historically underserved students can rise to the challenge of highly relevant, rigorous assignments” (American Institutes for Research, 2005, p. 5).

ACT (2006) examined student progress from the eighth to the twelfth grade through their Educational Planning and Assessment System (EPAS). Their findings revealed that students actually lose momentum toward college readiness as they progress through the grade levels (ACT, 2005a). The rate of failure is exceeding the rate of

success in meeting the benchmarks as they progress, especially in the last 2 years of high school. ACT (2005a) also reported that they have found a clear relationship between the rigor of the high school coursework students take, and their readiness for college and the workplace. The more rigorous the high school coursework, the more likely the student is to earn a college degree (ACT, 2005a).

According to the President of MDRC, Gordon Berlin (2008), in many communities, especially in cities, approximately half of all high school students become dropouts. Of those who do complete high school, few are ready for higher education, training, or entering the workforce. In an additional study, Laird, Kienzl, DeBell, and Chapman (2007) found that one in four high school freshmen will be held back or will drop out each year (p. 1).

According to ACT (2005b), one in six students tested were not on target to be ready for college-level work after graduating from high school. The percentages were worse for African Americans, Hispanic students, and those whose families earned less than \$30,000 (ACT, 2005b, p. 2). They also found that high school grades had no correlation with preparedness for college level work (ACT, 2005b, p. 20).

In an attempt to correct the dropout and rigor problems existing in high schools throughout the U.S., states have called for increased graduation requirements (ACT, 2005a). ACT (2005a) examined high school diploma requirements in all 50 states to examine the extent of the core content. They found that just over half of the states require high school students to take any math courses to graduate. Twelve of 26 states require algebra II, and only four require any math beyond algebra II. Only 17 of 30 states require biology, only one requires chemistry, and two require physics (ACT, 2005a, p. 15). Due to this lack of required rigorous course offerings, ACT (2005a) pointed out that

students may graduate with a diploma; however, they are lacking the preparation they need for the academic demands of college (ACT, 2005a, p. 9). Adelman (2004) stated that the best predictor for college graduation other than test scores or high school grades is the rigor of the high school curriculum.

Too few high school graduates are receiving the needed skills in their high school experience and are therefore forced to take remediation courses in college according to ACT (2007) and Achieve, Inc. (2007). Their research augmented the findings of the American Diploma Project (2004). Adelman (2006) found that students who take these types of remediation courses at the college level are less likely to complete a degree program. College readiness translates into work readiness as well. American Diploma Project (2004), Cavanagh (2004), and National High School Alliance (2006) have found that those students planning to join the workforce after high school graduation need as rigorous a curriculum as their college-bound counterparts and they also need higher order critical thinking skills.

The Education Trust (2010) released their report, *Shut Out of the Military: Today's High School Education Doesn't Mean You're Ready for Today's Army*, stating that the data from the Army's enlistment examination, The United States Army's Armed Services Vocational Aptitude Battery (ASVAB), revealed that too many students who take this exam do not have the reading, mathematics, science, and problem-solving abilities that are necessary to receive a passing score (Education Trust, 2010, p. 1). The ASVAB consists of nine individual timed subtests, which take approximately three hours to complete: Word Knowledge, Paragraph Comprehension, Arithmetic Reasoning, Mathematics Knowledge, General Science, Mechanical Comprehension, Electronic Information, Auto and Shop Information, and Assembling Objects (Education Trust,

2010, p. 2). To enlist in the U.S. Army, recruits must score at least a 31 out of 99 in the first stage of the ASVAB. The Marines, Air Force, Navy, and Coast Guard require higher scores (Education Trust, 2010, p. 2). The study completed by the Education Trust was based on the *first public analysis* of data from the U.S. Army's ASVAB utilizing the scores of approximately 350,000 high school graduates, ages 17-20 who took the exam between 2004 and 2009. An analysis of the ASVAB scores revealed that:

Among young people who are recent high school graduates, more than one in five does not meet the minimum standard necessary to enlist in the U.S. Army.

On average, young people of color taking the ASVAB are far less likely to qualify for enlistment than are other young people. For example, more than twice as many African Americans do not qualify compared to white applicants. And even when candidates of color pass, they often do so with lower scores than those of their white peers. Among those recruits of color who are accepted for service, these lower scores exclude them from the assignments that provide the kinds of high-level training and education skill development, and advancement opportunities, necessary to compete in the active duty and civilian workforces. Also, because ASVAB scores paint a remarkably accurate picture of levels of readiness for a wide range of occupations in civilian life, as well as in the armed forces, poor performance strongly suggests that these young men and women also are not prepared to succeed in the civilian workforce. (Education Trust, 2010, p. 1)

If the U.S. is to maintain and increase its economic competitiveness throughout the world, the country's educational leaders at the college and high school levels must view this gap in preparation as a crisis (ACT, 2005b). Somerville and Yi (2002) stated

that 70% of the 30 fastest-growing jobs will require an education beyond high school, and 40% of all new jobs will require at least an associate's degree beginning in the year 2007.

In summary, a report provided by The National Center for Public Policy and Higher Education (2004) best summarized our future needs in the United States:

State residents holding college degrees are the basis of a state's educational capital; that is the skill set of scholastically recognized knowledge and practice. High levels of educational capital provide the foundation of a state's economic development and the preferred quality of life for its residents. An educated population earns higher incomes, makes fewer demands on social services, makes more informed health and lifestyle choices, and is more comfortable handling decisions about personal finance and retirement. (p. iv)

Hypotheses

H₀₁ There is no difference in the mean scores of teachers' perceptions of the level of rigor in their students' assignments and the level of rigor as evidenced by the rigor rubric.

H₀₂ There is no difference in the mean scores of teachers' perceptions of the level of rigor in their students' assignments and the level of rigor as evaluated by a team of external raters.

H₀₃ There is no difference in the mean scores of the reported amount of rigor in student assignments between standards and honors level high school English classes as measured by the rigor rubric.

H₀₄ There is no difference in the mean scores of the reported amount of rigor in student assignments between grade levels as measured by the rigor rubric.

H₀₅ There is no difference in the mean scores of the reported amount of rigor in student assignments between experienced teachers and novice teachers as measured by the rigor rubric.

Definitions of Terms

Achieve, Inc. An independent, bipartisan, nonprofit organization that was created by governors and corporate leaders with the intent of assisting states and the private sector raise standards and performance in U.S. schools. It was founded in 1996 at the National Education Summit.

ACT. American College Testing.

ADM. Average Daily Membership.

ANOVA. Analysis of variance.

Assessment. Measuring student learning through various methods.

Authentic intellectual work. Construction of knowledge, through the use of disciplined inquiry, to produce discourse, products, or performances that have value beyond school.

Cognitive challenge. The mental action or process of acquiring knowledge and understanding through thought, experience, and the senses.

College readiness. The ability to successfully complete college assignments without the need for remedial classes.

Core curriculum. The courses all students take in schools, i.e., math and English.

Critical thinking skills. Involves logical thinking and reasoning, including skills of comparison, classification, sequencing, cause/effect, and patterns.

Depth of Knowledge. A model developed by Norman Webb (2005) to align

standards with assessments based upon four levels consisting of recall and reproduction, skills and concepts, strategic thinking, and extended thinking. The model is based upon the complexity of the task, rather than its difficulty, and the type of thinking that is involved in a task.

Educational capital. The worth of scholastically recognized knowledge and practice.

Global economy. Economies of all the world's countries.

Intellectual capital. The collective knowledge of individuals within an organization.

MDRC. Manpower Demonstration Research Corporation.

NAEP. National Assessment of Educational Progress.

Perceptions. The way an individual looks at or views items, situations, or ideas.

Quadrants. Dividing information into four sections.

Relevance. Connecting learning to *real world applications* and across disciplines.

Rigor. “The use of advanced thinking skills as defined by the new Bloom’s taxonomy; the need to consider the important concepts of a discipline and the effective and appropriate communications of those thoughts” (Edmunds, McColskey, & Lewis, 2006, p. 3).

Rubric. A scoring tool that lists the criteria for a piece of work or assesses a level of evaluation.

Social capital. Connections within and between social networks.

Student assignments. Products that students produce through a variety of mediums assigned by the teacher.

Taxonomy. The science of naming or classifying.

Chapter 2: Review of the Literature

Introduction

The purpose of this study was to examine teachers' perceptions of rigor in student's assignments in high school English classes.

As noted in Chapter 1, research by ACT (2007), America Diploma Project (2004), Cavanagh (2004), Tony Wagner (2008a), Daggett and Nussbaum (2008), and National High School Alliance (2006) have stated that students need more rigor in their classrooms, teachers need to assign more rigorous class work, and students need to take more rigorous courses.

Benjamin Bloom's (1956) taxonomy is frequently cited for an understanding of rigorous student work. Bloom (1956) developed a classification of levels of intellectual behaviors in learning. This taxonomy contained three overlapping domains: the cognitive, psychomotor, and affective. Within the cognitive domain, he identified six levels. These domains and levels are still useful today to develop the critical thinking skills of students. The levels at the top of the taxonomy are the most rigorous because they require the most complex cognitive challenge. Bloom (1956) believed the more students were able to perform at the higher levels of the taxonomy, the more rigorous work they would produce. In the 1990s Anderson et al. (2001) revised Bloom's taxonomy. A comparison is listed below.

Table 1

Original and Revised Bloom's Taxonomy

| Original Bloom's Taxonomy | Revised Bloom's Taxonomy |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Evaluation—making a judgment according to a criteria (the highest level) | Creating—creating a new product, idea, or a new way of doing something (the highest level) |
| Synthesis—putting parts together to create something new | Evaluating—making decisions, drawing conclusions and justifying them |
| Analysis—breaking down the information into parts | Analyzing—breaking down the information into parts |
| Application—applying learned concepts, knowledge or skills to a new situation | Applying—using new knowledge, skills, and concepts in a new situation |
| Comprehension—understanding the meaning of the information | Understanding—being able to explain ideas or concepts |
| Knowledge—recall of previously learned information (the lowest level) | Remembering—recall of previously learned information (the lowest level) |

To extend Bloom's taxonomy listed above, the Rigor and Relevance Handbook (ICLE) and Quick Flip Questions (EDUPRESS) adapt each level to include:

1. Knowledge—the student is asked to recall previously learned information by mechanical recording, reporting, or reproducing facts, rules, definitions, and the mechanical application of algorithms.

2. Comprehension—the student is asked to demonstrate his/her understanding of facts and ideas by stating main ideas, organizing, explaining, comparing, translating, interpreting, and inferring.

3. Application—the student is asked to demonstrate his/her understanding by applying acquired knowledge, facts, techniques, and/or rules to a new situation or in a different way.

4. Analysis—the student is asked to break information into parts and examine it by identifying patterns, relationships, motives, and/or causes. The student makes inferences and provides evidence to support them.

5. Synthesis—the student is asked to compile information together in a different way than its original form by combining elements that lead to a new design, product, performance, plan, and/or alternative solutions.

6. Evaluation—the student is asked to define his/her findings, judgments, and/or opinions by validating them using supporting criteria, logic, and/or other evidence.

In the early 1990s the International Center for Leadership in Education created the Rigor/Relevance Framework to help teachers ensure rigor and relevance by examining the curriculum and assisting in planning instruction and assessments (Daggett, 2005a). The framework consisted of four quadrants based upon Bloom's taxonomy. Instruction focused on Quadrant A focuses on the learner as *passive* and the teacher as the *worker*. Instruction and/or assessment that require low rigor and low relevance would fall into the A Quadrant. Quadrant B work is more complex and student work requires more time. Instruction and/or assessment that requires low rigor but high relevance would fall into the B Quadrant. Quadrant C learning requires students to think in complex ways and higher on the taxonomy. Instruction and/or assessment that requires high rigor but low relevance would fall into the C Quadrant. Quadrant D learning is demanding, requiring students to apply thinking and knowledge to solve problems. Instruction and/or assessment that require high rigor and high relevance would fall into the D Quadrant.

and relevance with high levels of difficulty. Quadrant A concepts can be quite complex but taught in isolation, which could result in merely understanding the concept in one discipline. “Students cannot perform at Quadrant ‘B’ and ‘D’ without first mastering Quadrant ‘A’ skills and knowledge through the process” (Daggett, 2005a, p. 3).

Debating one side against another of an issue is a Quadrant D activity because the debater is required to develop a rigorous knowledge base (Daggett, 2005a, p. 4). Daggett also pointed out that state assessment tests primarily are in the A Quadrant. It would be very difficult and costly to develop state assessments that fall into the D Quadrant because they would have to be interdisciplinary (Daggett, 2005a, p. 4).

Daggett (2005a) went on to explain that the difference in the four quadrants of the Rigor/Relevance Framework when applied to academic complexity relates to students’ aptitudes, interests, and learning styles (p. 5). Daggett also purported that:

Students who are quick to master theories (A/C) will struggle with applications (B/D) unless they are properly contextualized.... If the rigor and relevance of Quadrants “B” and “D” become the predominant instructional practice, all students will benefit. Students with Quadrant “A” and “C” learning styles and aptitudes would be challenged to develop skills they need to compete in the global job market. Although they may be great students and score well on tests, many are not prepared for success in the workforce. (p. 5)

Newmann, King, and Carmichael (2007), in *Authentic Instruction and Assessment*, reported that studies at the Wisconsin Center for Education Research at the University of Wisconsin-Madison (Center on Organization and Restructuring of Schools [CORS] and Research Institute on Secondary Reform for Youth with Disabilities [RISER]), the University of Minnesota, and at the Consortium on Chicago School

Research have focused on authentic intellectual work (AIW). Their framework sets standards for teaching academic subjects that:

Maximize expectations of intellectual rigor for all students, increase student interest in academic work, support teachers' taking time to teach for in-depth understanding rather than superficial coverage of material, provide a common conception of student intellectual work that promotes professional community among teachers of different grade levels and subjects, and most importantly, equip students to address the complex intellectual challenges of work, civic participation, and managing personal affairs in the contemporary world.

(Newmann et al., 2007, p. vii)

The focus on authentic intellectual work results from the authors' beliefs that for most students the usual work demanded in school is rarely considered meaningful, significant, or worthwhile. Learning tasks call for specific memorized information, retrieval of given information, or application of routine computational procedures, but rarely do they call for higher-level thinking, interpretation, or in-depth conceptual understanding (Newmann et al., 2007, p. 2).

The three criteria that Newmann et al. (2007) provided as a foundation for authentic intellectual work that they felt necessary for success in contemporary society were the "construction of knowledge, through disciplined inquiry, to produce discourse, products, and performances that have meaning beyond success in school" (p. 5). For work to be considered authentic intellectual work it must meet all of the above criteria. Newmann et al. (2007) cited the need for more authentic intellectual work based upon the work of Cappelli et al. (1997) and their study of cognitive demands in the workplace that document the importance of workers' problem-solving skills, in-depth understanding of

problems and specific vocational content on the job, and elaborated nuanced forms of communication (p. 11).

Newmann et al. (2007) conducted research from 1990 to 2003 throughout the United States on authentic intellectual work with diverse student populations in Grades 3-12 in the subjects of mathematics, language arts, social studies, and science. The purpose of their research was to determine whether students who experienced authentic intellectual work through higher levels of instruction and assessment experienced higher achievement, and to attempt to determine what conditions within schools and beyond helped or hindered schools' promotion of authentic intellectual work (Newmann et al., 2007, p. 14). The researchers addressed the issue of equity within their research by estimating and statistically controlling for the influence of students' social backgrounds (socioeconomic status, race, gender) and prior school achievement. Their research indicated that students who experienced higher levels of instruction and assessment that promoted authentic intellectual work showed higher achievement than students who experienced lower levels of instruction and assessment aimed toward authentic intellectual work. Their research also indicated that the achievement benefits occurred on both direct assessments of authentic intellectual performance and conventional standardized tests of basic skills and curriculum content. Results were positive and consistent, regardless of students' race, gender, or socioeconomic status, grade level or subject (Newmann et al., 2007, p. 16).

Robert Marzano, a Senior Scholar at Mid-Continent Research for Education and Learning, best known for his *Dimensions of Learning* and *Dimensions of Thinking*, pointed out that the most effective learning occurs when we use knowledge to perform meaningful tasks (Marzano & Pickering, 1997, p. 9). The Dimensions of Learning

(DOL) model has six reasoning processes including “decision making, problem solving, invention, experiential inquiry, investigations, and system analysis” (Marzano & Pickering, 1997, p. 1). Marzano and Pickering (1997) identified the following levels for Thinking Skills:

Table 2

Marzano’s Thinking Skills Levels

| Level | Application |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Evaluating (the highest level) | Incorporates assessing the reasonableness and quality of ideas, establishing criteria for judging, and verifying the accuracy of claims (p. 7). |
| Integrating | Includes connecting and combining information, summarizing, and restructuring which means changing existing knowledge structure to incorporate new information (p. 6). |
| Generating | Refers to producing new information, meaning, or ideas; inferring, predicting, and elaborating by adding additional details, examples, or other relevant information (p. 5). |
| Analyzing | Includes clarifying information by studying parts and relationships, determining the characteristics of an entity, identifying relationships and patterns, identifying the main idea or central element, and identifying errors and logical fallacies (p. 4). |
| Applying | Involves using information for practical purposes, demonstrating prior knowledge within new situations, bringing together appropriate information for problems, and using generalizations to solve problems (p. 3). |
| Organizing | Involves comparing, noting similarities and differences, classifying, grouping and labeling; ordering—sequencing by criterion; and representing—changing the form but not the substance (p. 2). |
| Knowing (the lowest level) | Is defining the problem, setting goals for solving problems, formulating questions, and storing information in long-term memory (p. 1). |

Norman Webb (2005), senior research scientist from the Wisconsin Center for

Education Research created the Depth of Knowledge (DOK), a model for cognitive complexity. The complexity of the task rather than its difficulty determines the Depth of Knowledge. The DOK level describes the kind of thinking involved in a task, not the likelihood that the task will be completed correctly. Webb (2005) identified four levels of assessing the DOK of content standards and assessment items.

Table 3

Depth of Knowledge

| Level | Application |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Recall (lowest level) | Focuses on recall of a fact, information, or procedure. Can involve computer simple algorithms e.g. sum, quotient in mathematics. Requires students to demonstrate a rote response, use a well-known formula, follow a set procedure (such as a recipe), or perform a clearly defined series of steps. In English language arts this would represent only surface understanding of text, often-verbatim recall or slight paraphrasing. |
| 2 Skill or Concept | Uses information or conceptual knowledge; usually two or more steps procedures in mathematics. This level requires student to make decisions of how to approach a problem and to compare, classify, organize, estimate, or order data (Webb, 2005, p. 3). In English language arts it requires both comprehension and subsequent processing of text. |
| 3 Strategic Thinking | Requires reasoning, developing a plan or a sequence of steps, some complexity, more than one possible answer. Requires conjecture or restructuring of problems in mathematics. Students would go beyond explaining or describing <i>how and why</i> to justifying the <i>how and why</i> through application and evidence. The cognitive demands are complex and abstract, demanding more complex reasoning. In English language arts it requires going beyond text. Involves inference, prediction, elaboration and summary. Involves developing compositions with multiple paragraphs. |
| 4 Extended Thinking | Requires an investigation, time to think, extended time to complete a problem in math, but time spent not on repetitive tasks. Requires students to make several connections and apply one approach among many to solve a problem. Involves complex restructuring of data, establishing and evaluating criteria to solve problems in mathematics. In English language arts it involves taking information from one text and applying this information to a new task. May require generating hypotheses and performing complex analyses and connections among texts (Webb, 2005, p. 3). |

As noted above, the DOK assesses the degree of depth or complexity of knowledge standards and assessments required, and how deeply a student needs to understand the content with different ways of responding and interacting with the content. The level of the DOK is determined by the task, and defined by complex thinking and reasoning skills, not grade level or ability of the student. Webb (2005) maintained that multiple-choice questions can be written at a DOK level 3 or 4; however, to design a question in this format is difficult. An item at DOK level 3 or 4 requires complex reasoning, strategic and extended thinking about the concepts of the content and a real world context, and especially at a level 4 that requires research, investigation, and application often over an extended period of time (Webb, 2005, p. 4).

School systems in various states, including Mississippi and Kentucky, have adopted Dr. Webb's (2005) Depth of Knowledge framework to help ensure higher level thinking skills and to increase the rigor of their state curriculums.

Lee, Smith, Perry, and Smylie (1999) completed research for the Chicago Annenberg Research Project analyzing *academic press* within schools upon the premise that it contributes to higher student achievement. Academic press, for the purposes of their research, was defined as rigor and accountability. *Press* may be exerted through the amount of homework teachers assign; the numbers, types, and difficulty of courses students are required to take; the amount of class time devoted to instruction; the challenge of academic work; the presence of specific standards for student achievement; assessment programs used to judge students; and achievement that holds teachers and students accountable for their performance (Lee et al., 1999, p. 908).

In their study, Lee et al. (1999) sought to determine whether there were differences in student achievement in schools where academic press was high or low.

They utilized teacher surveys to determine the schools' focuses on academics and student achievement. Students were also surveyed to determine whether their teachers challenged them to reach high levels of academic achievement. Students' Iowa Tests of Basic Skills (ITBS) scores were used as a point of comparison in order to represent one year's gain in achievement. Data on schools' academic press came from the Consortium's surveys of sixth- and eighth-grade students and teachers in the Chicago Public Schools. Also included in the analysis were the student's gender, race and ethnicity, grade level and age relative to grade level, educational resources of the family, and history of mobility. The size of the school, the proportion of low-income students, student mobility rate, racial and ethnic composition, and the school's overall achievement level were included in the analysis. The study indicated that there was a strong relation between levels of school academic press and school average gains in both reading and math achievement on the ITBS (Lee et al., 1999, p. 915). In schools where academic press was low, reading achievement rose on an average of 5.7 months and math achievement rose 9 months, but in schools where academic press was high, reading achievement increased an average of 1 year, 3.7 months and math achievement increased an average of 1 year, 6.4 months (Lee et al., 1999, p. 918). The researchers surmised that students who attend schools with higher levels of academic press learn more than students who attend schools with low press, even after taking into account their previous levels of achievement (Lee et al., 1999, p. 920). Lee et al.'s (1999) findings also indicated that students who attended the most racially isolated, lowest achieving, economically poorest, and largest schools in Chicago were the least likely to experience academic press (Lee et al., 1999, p. 921).

Another study that explored student achievement though analyzing student

assignments was the Legislative Counsel Bureau of Nevada who contracted with The Standards Company LLC to collect and analyze student assignments in English language arts and mathematics from Grades 3 through 8 during the period of March to May 2008. The study was designed to discern the amount of alignment to the academic content standards, the amount of cognitive rigor defined as higher-order thinking skills and academic rigor, and a grade analysis. Each school collected student work for 5 consecutive days during this period. To measure the rigor associated with each assignment The Standards Company used the revised Bloom's taxonomy and Depth of Knowledge developed by Norman Webb to correlate the complexity of problems students were expected to be taught. An analysis of the data indicated that the most marked difference between low and high performing schools appeared when examining cognitive rigor (The Standards Company, 2008, p. 12). The depth of knowledge levels in mathematics was much lower for low performing schools than high performing schools, except in the third grade. This trend did not appear in English language arts. Recommendations made to the schools for the improvement of student assignments were that low Bloom's taxonomy levels indicated that students were exercising a limited type of thinking when completing activities. Low depth of knowledge levels are associated with short, straightforward, and relatively unsophisticated activities in which content items appearing in student work are largely performed in isolation with respect to other items (The Standards Company, 2008, p. 47).

In another study examining student assignments, Matsumura, Garnier, Pascal, and Valdes (2002) conducted a study of 181 teachers in 35 schools in the Los Angeles Unified School District comparing the quality of classroom assignments in language arts classes. They found that the secondary students who received higher quality assignments

produced higher quality written work and scored higher as a group on the reading and language portions of the Stanford Achievement Test when adjusted for student background and prior achievement (Matsumura et al., 2002, p. 12).

In a comparison of 12 high-achieving schools (as evidenced by the National Assessment of Educational Progress (NAEP) and also referred to in the study as the High Schools that Work (HSTW) Assessment) to 12 low-achieving rural high schools with similar demographics, the study found that the high-achieving schools had implemented the principles of the HSTW model, which calls for rigor, relevance, and relationships to improve student achievement. The NAEP study found that African American and White students at the high-achieving schools had significantly higher achievement in reading, mathematics, and science. African American students in the high-achieving schools scored 29 points higher in science than African American students at the other schools. Students at high-achieving schools outperformed the low-achieving schools whether the parents had no college education or some college education (Loveless, 2008, p. 35).

When examining student achievement, Loveless (2008) found through an analysis of NAEP data since 2000, high-achieving students have made only modest academic progress as compared to greater gains by low-achieving students. Farkas and Duffett (2008) stated that the greater gains by low-achieving students are a result of teachers and schools placing a greater emphasis on low-achieving students. In their study, 40% of the teachers who were surveyed stated, “that the content and curriculum of honors and accelerated classes is ‘too often watered down and lacking rigor’” (Farkas & Duffett, 2008, p. 61). Assignments may be perceived by students as boring and *busy work*. The 2008 High School Survey of Student Engagement (HSSSE) found that fewer than half of the respondents (45% in 2007, 46% in 2008) stated they are challenged academically in

most or all of their classes. Many students, even those with future aspirations, may opt to just get by and not work to their potential due to low teacher expectations (Quint, Thompson, Bald, Bernstein, & Sztejnberg, 2008).

The end result of a classroom devoid of cognitive challenge or rigor is a spectrum of student problems, from dropouts to underprepared graduates (ACT, 2005b). Achieve (2008b) reported that 64% of students surveyed indicated that high school would improve a great deal if there were more opportunities to take more challenging courses. Nine out of 10 students believed that providing opportunities to take more challenging courses would be an improvement (Achieve, 2008b, p. 4).

The low expectations of teachers can have devastating results as the Southern Regional Education Board's (SREB) (2004) research indicated. The findings show that many teachers expected advanced students to perform at the proficient level, and on-grade level students to perform at the basic level of proficiency. Per SREB, these expectations are much too low (p. 5). All courses, not just advanced and honors level courses, need to include reasoning and analytical skills because these skills are essential skills for the future (ACT, 2005b). Southern Regional Education Board contended that all students should have a rigorous academic core curriculum; teachers should provide their students with challenging, yet meaningful work, and teachers should hold all students to high expectations. SREB believed that providing a rigorous education can improve the economic and social well-being of American citizens (p. 5).

In addition to the economic and social benefits of receiving rigorous instruction, Adelman (2004) found through a U.S. Department of Education study that "the rigor of high school course work is more important than parent education level, family income or race/ethnicity in predicting whether a student will earn a postsecondary credential" (p.

16).

The expectations of teachers, and the elementary and middle school a student attends, can have a tremendous impact on a student's trajectory for rigorous courses. Achieve, Inc. (2008a) found that this lack of rigor throughout elementary, and particularly middle school, can have a disastrous impact on high school students. Samuel Stringfield, co-director of the Nystrand Center of Excellence in Education at the University of Louisville, supported the call for more rigorous work, but stated that what makes the biggest difference in raising high school student achievement is attending a middle school that has rigorous academic work (Stringfield, 2002, p. 69). These findings can have devastating results as James Kemple and his colleagues at MDRC found in their research (Kemple, Poglinco, & Snipes, 1999). In a study tracking a cohort of 100 ninth-grade students from four urban school districts, only 56 were promoted on time and were attending school as tenth graders. Twenty of those students had dropped out; the remaining 24 had been kept back in ninth grade.

To raise the level of rigor in high schools and to prepare students for success in college there has been a call for more rigorous course work. ACT (2006) defined more rigorous coursework as taking more courses in English, mathematics, social studies, and natural sciences. Their studies provided empirical evidence that all high school students need to be educated to a comparable level whether they are entering the workforce or college (ACT, 2006). The lack of rigor in the high school core curriculum, according to the Alliance for Excellent Education (2009), has resulted in an expenditure of \$1.4 billion for costs of remedial courses at community colleges. The Alliance pointed out that taxpayers are essentially paying twice for the coursework and skill development students are expected to receive in high school (p. 11).

The following course pattern has been defined as *rigorous* by the High Schools That Work Consortium, The College Board, and ACT: 4 years of English; 4 years of mathematics, including algebra 1 and 2, geometry, and preferably at least one other advanced mathematics course such as trigonometry, precalculus, calculus, or statistics; 3 years of laboratory science such as biology, chemistry, and physics; 3 years of social studies; and 2 years of a world language (ACT, 2005a, p. 2). These organizations also agreed that an academically rigorous curriculum should be coherent across grade levels and teach analytical thinking, learning, comprehension, and writing skills. ACT (2005a) went on to state that there is a misalignment in the public school system that “actually works against the goal of ensuring rigor...” (p. 15). They suggested raising the level of rigor through the types of advanced math and science classes students are required to take. They also cited the broad nature of topics that high school teachers think are important, contrasted with that which college professors feel are important, who prefer depth and rigorous treatment of fundamental content knowledge and skills according to ACT’s research.

A growing number of states have now made completion of a college-preparatory program a requirement for a high school diploma. Bottoms, Presson, and Han (2004) reported that increasing rigor by increasing graduation requirements has become a common strategy for school systems. Some systems have established differentiated diploma tracks. Students earning a higher-level diploma must take additional courses. For example, beginning in the fall 2011, completion of Indiana’s Core 40 curriculum—a rigorous college-preparatory curriculum that is aligned with the entry expectations of the state’s public higher education system—will be an admission requirement for Indiana students entering in-state public colleges and universities (Bottoms et al., 2004, p. 2).

More rigorous course work may be provided to students, but are the schools' course offerings accessible to all? The study *Gaining Traction-Gaining Ground* (Education Trust, 2005) focused on high-impact schools (those schools that produced unusually high academic growth from those students who entered significantly behind their peers) and found that these schools had removed barriers for students to take high-level courses. Traditionally at low-impact schools, higher-level courses were only open to those who had a prior record of high academic achievement.

A survey by the National Action Council for Minorities in Engineering found that minority students many times did not have rigorous courses available to them. Two thirds of minority boys indicated their interest in challenging math courses, but the courses were not available to them. Seventy-five percent of minority girls expressed interest, yet 45% said rigorous math courses were not available to them.

For those students who do attend high-achieving schools, Loveless (2008) reported that these schools had higher graduation requirements and a more rigorous academic curriculum. They also reported that more students experienced higher classroom expectations and the requirement of quality work in high-achieving schools. These schools also had more students experiencing challenging assignments in mathematics and science as compared to low-achieving schools. In addition, 38% of students in high-achieving schools (compared to 24% at low-achieving schools) completed four credits of college-prep English. Seventy-two percent (compared to 40%) completed four mathematics courses, and 44% (compared to 22%) completed three sciences, including two lab sciences (Loveless, 2008, p. 21).

To many in the teaching profession and general public, Advanced Placement (AP), and/or International Baccalaureate (IB) courses are synonymous with rigor. The

AP program, which is administered by the College Board, offers 37 courses in 20 subject areas. The AP program began in 1955 as a way to serve students their final 2 years of high school by allowing them to count courses toward a college degree. In 2007, the College Board began requiring teachers of AP classes to submit syllabi and receive individual approval before the AP label could be included on a student transcript. Teachers design the courses, but the course must meet various curricular and resource requirements specified by the College Board. To label a course *AP*, a high school must demonstrate how the course meets or exceeds college-level curricular and resource requirements. There are AP exams that are graded on a scale of one to five by external panels of teachers.

The International Baccalaureate Diploma Program (IB), begun in 1968, offers 129 courses in six core subject areas to students in over 120 countries. Teachers design their syllabi according to IB specifications and almost all courses are 2 years in length. Students completing the IB Diploma Program take exams in all six subject areas. These exams are graded on a scale of one to seven. There are additional IB requirements, which include at least 150 hours of extracurricular involvement, a 4,000 word, extended essay, and a 1,600-word *theory of knowledge* essay. The IB curriculum is based more on the European model of education and was first piloted in international schools. Since 2008, enrollment in AP and IB courses has drastically increased to more than double the number a decade ago (Byrd, 2007, p. 21). This increase of students accessing these courses was partly explained by admissions offices at selective colleges expecting students to have taken the most challenging courses available to them. The Thomas B. Fordham Institute conducted a study in 2007 entitled *Advanced Placement and International Baccalaureate: Do They Deserve Gold Star Status?* The study, led by

Shelia Byrd (2007), examined AP and IB courses in English, math, history, and biology. Each course was judged on the criteria of the *level of intellectual challenge*. The study concluded that these courses were in fact “mostly gold and mostly worthy of emulation” (Byrd, 2007, p. 21). The study’s author suggested that the elements that made them *intellectually challenging* were the high academic standards and goals and the rigorous exams that were well aligned with the standards (Byrd, 2007, p. 22).

One of the most frequently asked questions pertaining to the call for increased rigor in high schools is, “Will it not increase the disengagement of students and increase the dropout rate?” Barbara Blackburn (2008) stated in her book *Rigor is not a Four-Letter Word* that students experience a sense of pride and fulfillment when completing assignments that are challenging, yet doable (p. 27). Students must know what high quality work samples are (Blackburn, 2008, p. 27). There is a need for high goals, performance expectations, a clear definition of success, and constant feedback (Blackburn, 2008, p. 27).

There is a widespread belief that students’ peers often discourage high school students from taking more difficult courses (Achieve, 2008b, p. 6). The survey from Achieve (2008b) found that peer discouragement was not the case with minority students for not attempting upper level math courses, but regrettably that teachers were twice as likely as friends to discourage them from attempting upper level math courses (Achieve, 2008b, p. 6).

Also, many students who had plans for postsecondary education did not take college preparatory classes due to nonadvisement. Where do students receive their advice on what courses to take in high school? Achieve (2008b) found that most students rely on their parents. However, understandably, parents are mostly concerned with

students fulfilling the requirements for a diploma. Students whose parents did not attend college are at a particular disadvantage for enrolling in rigorous courses (Achieve, 2008b).

A national survey of recent graduates by Achieve, Inc. (2008b) revealed that 62% of college students indicated they would have taken more difficult courses in high school had they “known then what they know now” (p. 12). Seventy-two percent of students who did not go to college said they regret not taking more difficult courses in high school. They indicate they would have been willing to work harder in high school if they had a reason to believe it was important and would pay off (Achieve, 2008b, p. 26).

Similar results were found in the study *State of our Nation's Youth* (Horatio Alger Association, 2006); 64% of students indicated that they believed that having the opportunity to take more challenging courses would greatly improve high school. In a similar survey from the National Governor's Association (2008), 65% of students agreed or strongly agreed that they would work harder if high school offered more demanding and interesting courses. In the same theme, only 24% of high school graduates indicated they experienced high expectations and were academically challenged while in high school.

While many students do take challenging courses while in high school, Achieve, Inc. (2008a) found that 73% of the students who took nine to 10 math and science courses in high school were well prepared for college. Sixty-seven percent indicated that they were prepared with eight courses. Only 33% indicated they were prepared with four or fewer math and science courses.

Summary

This review of literature is a compilation of the vast amount of information

written on rigor, student course completion, predictions for future success of students in colleges and universities, the reasons for high school dropouts as they pertain to rigor and the impact on the future work force of our country. The research indicates the need for increased rigor in classrooms, course work, student assignments, and assessments. The review of literature also indicates that the lack of rigor is resulting in a high school dropout problem and a lack of preparedness for college. Furthermore, lack of college readiness causes the need for more remedial courses, and possibly the threat of our students not being able to compete in a global economy.

Chapter 3: Methodology

The intent of this quantitative research study was to examine the relationship between high school English teachers' perceptions of the amount of rigor present in student assignments, and the amount present as evidenced by the use of a rubric that utilizes the revised Bloom's taxonomy and assigns levels of rigor to each of the levels of the taxonomy.

Hypotheses

H₀₁ There is no difference in the mean scores of teachers' perceptions of the level of rigor in their students' assignments and the level of rigor as evidenced by the rigor rubric.

The rigor rubric (Appendix A) is based upon the revised Bloom's taxonomy; the teachers were not told this upfront, but they may have realized it if they worked with the taxonomy previously. Based upon their ratings and comments justifying the level of rigor, the researcher was able to discern whether their perceptions of what rigor is and whether the definition of rigor as evidenced by the rigor rubric were in agreement.

H₀₂ There is no difference in the mean scores of teachers' perceptions of the level of rigor in their students' assignments and the level of rigor as evaluated by a team of external raters.

The external raters evaluated the same assignments that the teachers provided and assessed. They utilized the same instrument to assess the level of rigor that the teachers used. The level of rigor that the external rater gave the assignment and the level of rigor the teacher assigned was compared. Because there were two external raters, their scores on the same assignments were checked for interrater reliability.

H₀₃ There is no difference in the mean scores of the reported amount of rigor in

student assignments between standards and honors level high school English classes as measured by the rigor rubric.

H₀₄ There is no difference in the mean scores of the reported amount of rigor in student assignments between grade levels as measured by the rigor rubric.

H₀₅ There is no difference in the mean scores of the reported amount of rigor in student assignments between experienced teachers and novice teachers as measured by the rigor rubric.

The researcher utilized hypotheses instead of research questions because the hypotheses “are predictions the researcher makes about the expected relationships among variables” (Creswell, 2009, p. 132). Creswell also stated that hypotheses “are used often in experiments in which investigators compare groups” (p. 133).

The coding used for data allowed for interpretation of differences between standards and honors levels of interpreted rigor, different grade levels, all grade-level teachers, and years of teaching experience.

Sampling

For the purposes of this study a convenience sample was used. Gall, Gall, and Borg (2007) stated that many quantitative researchers “select a sample that suits the purposes of their study and that is convenient” (p. 175). A convenience sample is “a group of cases that are selected simply because they are available and easy to access” (Gall et al., 2007, p. 636). Gall et al. stated that if a convenience sample is used, “the researchers and readers of their report must infer a population to which the results might generalize” (p. 175).

Participants

The target population in this study was comprised of English teachers presently

teaching English I-IV standards and honors levels in nine rural traditional high schools and one Early College in two different school systems in the piedmont region of North Carolina. The first school system included 20 elementary, seven middle, six traditional high schools, an Early College, and an alternative high school. As of October 2010 there were 20,192 students enrolled in the various schools, with a 59.5% free and reduced lunch rate. The school system's ethnic membership as of October 21, 2010 was .29% American Indian, 1.04% Asian, 11.72% Hispanic, 19.31% Black, 65.35% White, and 2.30% Multi-racial.

The second school system included 15 elementary, three middle, four traditional high schools, an Early College, and an alternative high school. As of October 2010 there were 9,905 students enrolled in the various schools, with a 43.8% free and reduced lunch rate. The school system's ethnic membership as of October 2010 was 0.2% American Indian, 4.0% Asian, 5.1% Hispanic, 14.5% Black, 73.9% White, and no indication of Multi-racial.

There was the potential for approximately 74 participants in the combined school systems. All identified English I-IV teachers were contacted via email to request their participation in the research study.

The six traditional high schools from the first school system that participated in the study had the following ethnic, free and reduced lunch rates, and total membership.

Table 4

The Six High Schools' Ethnic, Free and Reduced Rates, and Total Membership

| School | ADM | Free & Reduced | Am. Ind. | Asian | Hisp. | Black | White | Multi |
|--------|------|----------------|----------|-------|-------|-------|-------|-------|
| A | 1109 | 39.9% | 0.5% | 0.7% | 2.7% | 6.6% | 88.3% | 1.3% |
| B | 1167 | 45.4% | 0.3% | 1.4% | 7.3% | 6.2% | 84.1% | 1.2% |
| C | 659 | 68.0% | 0.9% | 2.7% | 5.3% | 47.8% | 39.6% | 3.7% |
| D | 888 | 62.5% | 0.0% | 1.4% | 12.1% | 47.5% | 35.6% | 3.4% |
| E | 964 | 44.1% | 0.6% | 0.0% | 9.1% | 6.3% | 82.1% | 1.9% |
| F | 1091 | 48.7% | 0.3% | 0.3% | 10.7% | 22.2% | 64.1% | 2.5% |

Note: For school month ending 10/21/10.

The second school system that participated in the study had the following ethnic, free and reduced lunch rates, and total membership.

Table 5

The Three High Schools' and Early College's Ethnic, Free and Reduced Rates, and Total Membership

| School | ADM | Free & Reduced | Am. Ind. | Asian | Hisp. | Black | White |
|--------|-----|----------------|----------|-------|-------|-------|-------|
| G | 484 | 51% | 0.6% | 2.0% | 5.1% | 19.6% | 72.7% |
| H | 144 | 50% | 0.0% | 8.1% | 11.1% | 11.8% | 69.0% |
| I | 545 | 61% | 0.1% | 6.0% | 3.0% | 49.0% | 41.9% |
| J | 699 | 42% | 0.1% | 6.9% | 0.7% | 13.7% | 78.6% |

Note: National Center for Education Statistics, U.S. Dept. of Education.

The high school principals voiced their support of the research study. The

superintendent of the first school system was contacted through email to ask permission to complete the research study (Appendix B).

Due to the concern by the researcher of a low participation rate for the research study because of the timing in early May, the second school system's superintendent was contacted to request approval to approach the high school principals to include their teachers in the study. Emails were then sent to English teachers in each high school in the second system with the rigor rubric, instructions, and cover sheets attached.

Research Design

This research design was based upon a research study by F. M. Newmann and Associates (1996) referred to as the CORS 24-School Study, conducted for the Center on Organization and Restructuring of Schools, and the Chicago 12-School Study. From 1990-1995, the Center on Organization and Restructuring (CORS) studied three mathematics and three social studies classes in eight elementary, eight middle, and eight high schools across the United States, that were making significant efforts in restructuring their schools. In addition to observing and rating four lessons per year based upon the standards for authentic instruction, each teacher also submitted four assignments that the teacher considered *challenging* assessments. The researchers and other teachers not participating in the study scored the quality of assignments and student work according to standards for authentic assignments and for authentic student work (Newmann, 1996, p. 19).

The Chicago 12-School Study in the spring of 1997 focused on 74 language arts and mathematics teachers in Grades 3, 6, and 8 in 12 Chicago elementary schools. The teachers submitted four student assignments, two of which they considered challenging assessments. Chicago language arts and mathematics teachers at the same grade levels

but not participating in the study scored the quality of demands for authentic intellectual work in the assignments (Newmann et al., 2007, p. 20).

This research design was causal-comparative, utilizing quantitative data. Causal-comparative was chosen because the independent variables (IV)—school setting, grade level taught, years of teaching experience—were groups that already existed for the participants, not assigned by the researcher. Gall et al. (2007) stated that causal-comparative research is used when “the researcher does not manipulate the independent variable in order to observe its effect on the dependent variable” (p. 306).

Each English teacher who agreed to participate in the study was asked to submit a total of four student assignments that they consider challenging for their students. The term *challenging* was chosen instead of *typical* due to a study by Matsumura et al. (2002) in which they found that by requesting challenging assignments the researcher would have a greater chance of receiving assignments with greater rigor (p. 215). Another reason for requesting challenging assignments was so that the participants would be able to determine that the researcher was not looking for assignments that were necessarily longer in length, more time consuming, or generated more pieces of paper, but were in fact rigorous in nature. The reason for requesting four student assignments was also based on the same research study in which the researchers determined that this number would result in a more reliable sample of student assignments (Matsumura et al., 2002, p. 217). Teachers scored their own student assignments using the rigor rubric.

Two external raters, high school English teachers not involved in the initial grouping, scored the same assignments using the rigor rubric. Both external raters were Nationally Board certified professionals, held Master’s degrees, and had taught both middle school and high school level students. Both were highly regarded by their

colleagues, one having been the Teacher of the Year for a school system, and the other a runner up for the same honor. One rater had 13 years of experience as a teacher in California, Kansas, and North Carolina. The other rater had 14 years of experience in teaching, had been a facilitator for Best Practices Workshops and a recipient of the Terry Sanford Award for Creativity and Innovation in Teaching and Administration. One rater taught English I and II Honors, while the other taught English III and IV Honors.

The researcher calculated the interrater reliability of the external raters. The researcher calculated the mean score for each teacher based on the teacher's ratings on the four assignments and compared the mean with the mean of the external raters with a *t*-test. Gall et al. (2007) stated, "in most causal-comparative studies, researchers compare the mean scores of two samples to determine whether they are significantly different from each other" (p. 317).

Procedures

The principals of the high schools in the two school systems involved in the study supplied the researcher with the names of their English I-IV honors and standards level teachers for the second semester. The English teachers who taught English I-IV standards and/or honors level received an initial email from the researcher stating the name of the research project, the purpose of the study, the timeline proposed for the study, and the researcher's request for a response regarding participation (Appendix C). Within a week the researcher sent a second email to those who had not responded. The cover sheet (Appendix D), the rigor rubric, and the instructions (Appendix E) were attached to the email. Also, teachers were told that they could return the completed materials either electronically, by fax, through the school system courier, or the materials would be picked up at their schools. Within a week a third email was sent to those who

had not responded.

The cover sheet asked the teacher's name, the school name, grade level, honors or standards level, years of experience in teaching, and how long they had been teaching this particular grade level and subject.

After collecting the student assignments, they were coded by grade level, teacher name, school, teachers' years of experience, and whether the class was standards or honors level, and then they were entered into a spreadsheet. The external raters then received copies of the student assignments with no identifying marks and a copy of the rigor rubric to score. After scoring, each number was entered into the spreadsheet to correspond with the same assignment with data from the original teacher.

Instrument

For the purposes of this study the researcher modified a rubric developed by the Iowa Department of Education, Area Education Agency, AEA 267 R4 Team Middle School Cohort 1 (2009). The reason for modifying the rubric for this study was to include an alignment with the definition of rigor that the researcher had chosen for reference; "the use of advanced thinking skills as defined by the new Bloom's taxonomy; the need to consider the important concepts of a discipline and the effective and appropriate communications of those thoughts" (Edmunds et al., 2006). The original rubric did ask participants to answer yes or no to questions about a student assignment, but the researcher decided that requesting a written response requesting a specific example from the assignment would result in richer data. A seventh category was added asking if the student assignment "provides an extended written or oral response" (Edmunds et al., 2006, p. 27). This is a response to the data on preparing students for the 21st Century and college. The rubric asked teachers to answer yes or no if their student

assignment asked the student to consider significant/important ideas related to the subject matter; bring together parts of knowledge/experience(s) to form a whole and build relationships for new situations; break down a concept or idea into parts and show relationships among the parts; apply knowledge/skills/experiences to solve a problem or to complete a task in a new or different situation; understand the main idea, interpret or summarize; and/or recall or recognize information. Student assignments that rate high on Bloom's taxonomy could include all of these elements.

Also added to the rubric was a question as to the level of overall rigor present in the student assignment, ranging from one for low to six for high. Six levels were chosen based upon the revised six level Bloom's taxonomy. The rater was asked why they rated the assignment with that level. This question was an attempt to explore the teachers' perceptions of rigor.

A professional researcher employed with a testing agency through a university in North Carolina validated the rubric through an exchange of email. The validating researcher has a B.A. in history from Yale University, an M.Ed. in Elementary Education from UNC at Greensboro, and a Ph.D. in Education from the University of North Carolina at Chapel Hill. The researcher has designed and implemented numerous mixed methodology evaluations for projects ranging from single district projects to multi-state programs. The researcher is also a co-principal investigator for a grant from the National Science Foundation examining the extent to which high school reform efforts have been able to increase the number of students entering and persisting in college preparatory mathematics and science courses. The validator is also involved in an experimental design to investigate the impact of the Early College High School model on student outcomes.

Limitations

In the process of obtaining teachers' names who teach English I, II, III, and IV, there was a required honors audit in one of the school systems initiated by the North Carolina Department of Public Instruction. Teachers who taught honors level English were required to submit samples of their student assignments. Some did not submit acceptable levels of work and some did not submit at all. The high school principals were informed by the Director of Secondary Education that those teachers would not be permitted to teach those classes second semester if this was not corrected, which changed the individuals in this study.

The research study was conducted in May, traditionally a very stressful time for high school teachers, resulting in a lower participation rate.

The method of collecting data through a rubric and not including interviews did not allow for additional information on outliers or extremes.

The researcher does realize that there was bias due to the fact that teachers evaluated their own assignments. At one time the researcher had questioned whether it would add to the validity of the study to collect assignments from teachers and redistribute them to other teachers who had volunteered to participate in the study to have them rate the assignment (not their own) using the rigor rubric. This would remove much of the bias inherent in self-assessment. After careful consideration, this method was discarded due to the cumbersome task of asking volunteers to complete a two-step procedure, and the time constraints of collecting, coding, and redistributing. The use of the two external raters was added to evaluate teachers' perceptions of rigor.

Data Analysis

Below is an excerpt from the spreadsheet that was used for entering data once it

was received. The spreadsheet included coding for the teacher's name, the coding of the school in which the teacher taught, the teacher's years of experience, the grade level that represented the assignment, and whether the assignment was for an honors or standards level class. The researcher asked teachers for four different assignments and there were seven different questions to answer with comments, followed by question 8, and an overall rigor rating of one to six. The spreadsheet allowed room for the two external raters to do the very same procedure with each submitted assignment.

Table 6

Example of Data Entry Spreadsheet

| Teacher | School | Yrs. | Grd. | H or S | A | Q1 | Comments | Q2 | Comments | Q3 |
|---------|--------|------|------|--------|---|----|----------|----|----------|----|
| 01 | A | 1 | 9 | 0 | 1 | 1 | | 0 | | 1 |
| 02 | A | 1 | 9 | 0 | 2 | 1 | | 0 | | 1 |

The researcher calculated the mean (M) and the standard deviation (SD) for the six IV groups: honors, standards, experienced, novice, school, and grade level. A one-way analysis of variance (ANOVA) was conducted on the total score mean to determine if a difference existed between the teachers' rigor ratings and the external raters based upon the rigor rubric. This data addressed H₀₁ and H₀₂ utilizing an alpha level of .05 and significance less than .05 (Gall et al., 2007).

A one-way ANOVA was utilized to determine the difference between the rigor ratings of standards and honors classes, between grade levels (English I, II, III, & IV), novice and experienced teachers. This data was used to address H₀₃, H₀₄, and H₀₅. For the purposes of this study, novice was defined as 5 or less years of teaching

experience.

The Bonferonni correction was utilized due to the fact that when a one-way analysis of variance (ANOVA) and the grouping variable is significant, the researcher will desire to know where the significance is. If, for example, grade/assignment level has four levels, the researcher needs to compare all those different possibilities. But, each of those comparisons at an $\alpha=0.05$ level means the researcher actually has an overall alpha of $0.05 \times 6 \text{ comparisons}=0.30$. Bonferonni takes the overall alpha, 0.05, and divides by the number of comparisons. With six comparisons, $0.05/6=0.0083$. The Bonferonni is common in educational research due to the fact that a problem arises with multiple *t*-tests. With multiple *t*-tests the probability exists that one or more significant differences will be found by chance alone. The Bonferonni controls for Type I errors which occur when the researcher rejects a true null hypothesis by finding significance that is not really there. When there is a clear null hypothesis the Bonferonni is recommended (Gall et al., 2007).

Summary

Chapter 3 described the methodology of this study. Detailed in this chapter were the hypotheses; the type of sampling; the research design; the participants, including the external raters; the instrument that was used; the procedures for the data analyses, including the statistical measures for determining significance; and the limitations of the study.

Chapter 4: Results

This research study examined the relationship between high school English teachers' perceptions of the amount of rigor present in student assignments and the amount present, as evidenced by the use of a rubric that utilizes the revised Bloom's taxonomy. An analysis of data collected in this study will be presented in this chapter.

Description of the Sample

The participants in this study consisted of high school English teachers who were teaching English I, II, III, and IV honors and/or standards level in nine traditional high schools and one Early College in two school systems in the piedmont section of North Carolina.

Every English teacher from the 10 high schools was asked to participate in the study. The total number invited to participate was 74. The researcher emailed teachers, who were previously identified by their principals, with a cover sheet, an explanation, the purpose of the study, instructions, and the rigor rubric. The teachers were told they could return the assignments, completed rubrics, and cover sheets either electronically, through the school system courier, by fax, or the materials would be picked up at their schools. A second email was sent after a week to those who had not responded, and a third on the third week. At the end of the third week, 24 teachers, 32% of the participating teachers, had returned materials, for a total of 82 assignments. Not all participants submitted a total of four assignments, and some assignments were unusable due to the limited amount of information provided by the teacher.

Data Analysis of Hypotheses

The table below shows the mean (M) for each rater (teacher, Expert Rater A, and Expert Rater B). Scores on questions 1 through 7 of the rigor rubric were coded 1 for *yes*

and 0 for *no*. Higher scores indicate more positive responses and therefore a high level of rigor in student assignments. Scores for question 8 of the rigor rubric call for an overall score of rigor for the assignment. The standard deviation (SD) was calculated on each independent variable (IV).

Table 7

Means for Teacher, Expert Raters on Questions 1-7 and 8 of Rigor Rubric

| Variable | N | M | SD | Min | Max |
|-----------------------------------|----|------|------|-----|-----|
| Teacher | | | | | |
| Score as evidenced by rubric (Q8) | 82 | 4.79 | 0.90 | 3 | 6 |
| Perception of Rigor (Q1-Q7) | 82 | 6.22 | 0.93 | 3 | 7 |
| Expert Rater A | | | | | |
| Score as evidenced by rubric (Q8) | 82 | 3.06 | 1.49 | 1 | 6 |
| Perception of Rigor (Q1-Q7) | 82 | 4.59 | 1.74 | 0 | 7 |
| Expert Rater B | | | | | |
| Score as evidence by rubric (Q8) | 82 | 3.00 | 1.30 | 1 | 6 |
| Perception of Rigor (Q1-Q7) | 82 | 3.60 | 1.51 | 0 | 7 |

The interclass correlation (ICC) for absolute agreement was 0.646 between Expert Rater A and Expert Rater B for the rubric (Q8). ICC values are found in Table 8.

Table 8

Interclass Correlation for Expert Rater A and Expert Rater B

| Teacher | Expert Rater A | Expert Rater B |
|---------|----------------|----------------|
| Teacher | --- | --- |
| Rater A | 0.193 | --- |
| Rater B | 0.105 | 0.646 |

Hypothesis 1. There is no difference in the mean scores of teachers' perceptions of the level of rigor in their students' assignments and the level of rigor as evidenced by the rigor rubric.

To determine if a statistically significant difference existed in the mean scores of the level of rigor evidenced by the rubric (Q8), a one-way Analysis of Variance (ANOVA) was conducted. The dependent variable (DV) was the score on the rigor rubric and the independent variable (IV) was the rater. The independent variable had three levels: teacher, Expert Rater A, and Expert Rater B. The ANOVA found differences on the rigor rubric by rater as indicated in the ANOVA source table below ($F(2,243)=54.02, p<0.0001$). The effect was large, as indicated by the partial eta square value ($\eta^2_p=0.31$). Using the Bonferonni adjustment for type I error rates, teachers were found to score significantly higher than Rater A ($M_{diff}=1.73$) and Rater B ($M_{diff}=1.79$) on the rigor rubric. Rater A was not found to score significantly different than Rater B on the rigor rubric. Degrees of freedom (df), sum of squares (SS) and mean square (MS) are included in Table 9.

Table 9

ANOVA Source Table for Differences in Rigor Rubric by Rater

| Source | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i> | <i>p</i> |
|--------|-----------|-------------|-----------|----------|----------|
| Rater | 2 | 169.911 | 84.955 | 54.02 | <0.0001 |
| Error | 243 | 382.171 | 1.573 | | |
| Total | 245 | 552.0813008 | | | |

Hypothesis 2. There is no difference in the mean scores of teachers' perceptions of the level of rigor in their students' assignments and the level of rigor as evaluated by a team of external raters.

A one-way Analysis of Variance (ANOVA) was conducted on mean (*M*) scores of the level of rigor using questions 1 through 7 from the rigor rubric. The dependent variable (DV) consisted of the summated scores of questions 1 through 7, and the independent variable (IV) was the rater. The independent variable (IV) had three levels: teacher, Expert Rater A, and Expert Rater B.

The ANOVA found differences of perception of rigor by rater as indicated in the ANOVA source table below ($F(2,243)=69.93, p<0.0001$). The effect was large, as indicated by the partial eta square value ($\eta^2_p=0.37$). Using the Bonferonni adjustment for type I error rates, teachers were found to score significantly higher than Rater A ($M_{diff}=1.63$) and Rater B ($M_{diff}=2.62$). Rater A was found to score significantly higher than Rater B ($M_{diff}=0.99$).

Table 10

ANOVA Source Table of Perception of Rigor by Rater

| Source | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i> | <i>p</i> |
|--------|-----------|-----------|-----------|----------|----------|
| Rater | 2 | 287.569 | 143.785 | 69.93 | <0.0001 |
| Error | 243 | 499.671 | 2.056 | | |
| Total | 245 | 787.240 | | | |

Table 11

*Analysis of Frequency of Scores by Teacher, Expert Rater A, and Expert Rater B
N=82*

| <i>Rigor Level</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> | <i>6</i> |
|--------------------|----------|----------|----------|----------|----------|----------|
| Teacher | 0 | 0 | 7 | 21 | 34 | 20 |
| Expert Rater A | 11 | 23 | 21 | 13 | 5 | 9 |
| Expert Rater B | 7 | 25 | 27 | 13 | 4 | 6 |

Hypothesis 3. There is no difference in the mean scores of the reported amount of rigor in student assignments between standards and honors level high school English classes as measured by the rigor rubric.

A one-way Analysis of Variance (ANOVA) was conducted on mean (*M*) scores of the level of overall rigor for student assignments reported in question 8 of the rigor rubric. The dependent variable (DV) was the score on the rigor rubric and the independent variable (IV) was the level of the class, honors or standards. The

independent variable had two levels: honors and standards.

The ANOVA found no mean differences on the rigor rubric by rater as indicated in the ANOVA source table below ($F(1,80)=0.30, p=0.5879$). The effect was very small, as indicated by the partial eta square value ($\eta^2_p=0.0037$).

Table 12

ANOVA Source Table of Difference by Rater for Honors and Standards Classes

| Source | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i> | <i>p</i> |
|--------|-----------|-------------|-----------|----------|----------|
| Rater | 1 | 0.241 | 0.241 | 0.30 | 0.5879 |
| Error | 80 | 65.234 | 0.815 | | |
| Total | 81 | 65.47560976 | | | |

Hypothesis 4. There is no difference in the mean (*M*) scores of the reported amount of rigor in student assignments between grade levels (9, 10, 11, and 12) as measured by the rigor rubric.

A one-way Analysis of Variance (ANOVA) was conducted on mean (*M*) scores of the level of rigor reported on question 8. The dependent variable (DV) was the score on the rigor rubric and the independent variable (IV) was the grade level. The independent variable had four levels: ninth, tenth, eleventh, and twelfth grade.

The ANOVA found no mean differences on the rigor rubric by rater as indicated in the ANOVA source table below ($F(3,78)=1.07, p=0.3679$). The effect was very small, as indicated by the partial eta square value ($\eta^2_p=0.0394$).

Table 13

ANOVA Source Table of Differences of Rigor by Grade Level

| Source | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i> | <i>p</i> |
|--------|-----------|-----------|-----------|----------|----------|
| Rater | 3 | 2.582 | 0.861 | 1.07 | 0.3679 |
| Error | 78 | 62.894 | 0.806 | | |
| Total | 81 | 65.476 | | | |

Hypothesis 5. There is no difference in the mean scores of the reported amount of rigor in student assignments between experienced teachers, those with 6 or more years of teaching experience, and novice teachers, those with 0 to 5 years of experience, as measured by the rigor rubric.

A one-way Analysis of Variance (ANOVA) was conducted on the mean (M) scores of the level of rigor reported on question 8 of the rigor rubric. The dependent variable (DV) was the score on the rigor rubric and the independent variable (IV) was the years of teaching experience. The independent variable had two levels: experienced and novice.

The ANOVA found no mean differences on the rigor rubric by rater as indicated in the ANOVA source table below ($F(1,80)=0.06$, $p=0.8088$). The effect was very small, as indicated by the partial eta square value ($\eta^2_p=0.0007$).

Table 14

ANOVA Source Table of Differences of Rigor Between Experienced and Novice Teachers

| Source | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i> | <i>p</i> |
|--------|-----------|-----------|-----------|----------|----------|
| Rater | 1 | 0.0481 | 0.0482 | 0.06 | 0.8088 |
| Error | 80 | 65.427 | 0.818 | | |
| Total | 81 | 65.476 | | | |

Summary

In this chapter, the description of the participants and the distribution method for the materials for the research study were described. Chapter 4 also presented the five hypotheses for this study. Based upon the analysis of data there was not found to be a significantly different rigor rubric score between Expert Rater A and Expert Rater B, $p < 0.0001$. There was a significant difference between the rigor ratings of the Expert Raters and the teachers, with the teachers rating the rigor of their student assignments much higher than the experts. The effect was large with $p = 0.37$. When comparing standards and honors level classes there was very little difference in the level of rigor in student assignments between these two levels of classes, with a small effect of $p = 0.0037$. When questioning the difference in rigor between grade levels—ninth, tenth, eleventh, and twelfth grades as measured by the rigor rubric—there was a very small effect, $p = 0.0394$, between the measured rigor between grades. When comparing experienced teachers, those with 6 or more years of teaching experience, and novice teachers, those with 0 to 5 years, and the amount of rigor in their student assignments, there was no difference with a small effect of $p = 0.0007$.

Chapter 5: Discussion

Introduction

ACT (2005b) purported that the gap between high school and college preparedness is a result of the lack of rigor in the high school curriculum. This testing agency contended that all high school students need to be educated to a comparable level whether they are entering the workplace or college (ACT, 2005b). ACT's (2005b) education division also stated that their findings identify a need for greater rigor in the classroom so that students will be prepared for college and work by the time they graduate from high school (p. 2).

Bruce Torff (2005) stated in his research that "...critical thinking is a key element in rigorous instruction" (p. 13). His research also indicated that teachers are more likely to support the use of high critical thinking (higher order thinking) activities with learners perceived as high achieving. Those not perceived as high achieving had limited access to high critical thinking activities (Torff, 2005, p. 14).

ACT (2007), America Diploma Project (2004), Cavanagh (2004), Tony Wagner (2008a), Daggett and Nussbaum (2008), and National High School Alliance (2006) have stated that students need more rigor in their classrooms; teachers need to assign more rigorous class work; students need to take more rigorous courses.

Definition of Rigor for this Study

For the purposes of this study the following definition of rigor was used: "the use of advanced thinking skills as defined by the new Bloom's taxonomy; the need to consider the important concepts of a discipline and the effective and appropriate communications of those thoughts" (Edmunds et al., 2006, p. 3).

Overview of the Study

The purpose of this study was to examine the relationship between high school English teachers' perceptions of the amount of rigor present in student assignments, and the amount present as evidenced by the use of a rigor rubric that utilizes the revised Bloom's taxonomy. High school English teachers of honors and/or standards level in Grades 9-12 were invited to participate in the study as follows: by submitting four assignments that they considered challenging for their students; completing the rigor rubric rating for the assignments from one (least amount of rigor) to six (highest level of rigor); and justifying their answers by citing examples in the student assignment. Two external raters also reviewed each student assignment submitted by the teachers and completed the rigor rubric for each assignment. Teachers were requested to justify their rigor ratings of the assignment by referring to the assignment to enable the researcher to compare each teacher's perception of rigor comments and the comments made by the external raters.

This research design is causal-comparative, utilizing quantitative data. The independent variables (IV) in this study included the level of the class (honors or standards), the raters (the teacher, the two Expert Raters), the grade level (ninth, tenth, eleventh, and twelfth), and experienced and novice teachers based upon years of teaching experience. The dependent variables (DV) in this study included the rigor rubric, the summated scores of questions 1 through 7, and the summated scores for question 8. Each independent variable was analyzed using a one-way ANOVA to determine if any difference in mean scores existed. The Bonferonni adjustment for type I error rates was utilized to increase validity due to the need to run multiple *t*-tests on the same data. Using statistical analysis, the researcher sought to examine the perception of the level of

rigor in assignments given in honors and standards classes, by more or less experienced teachers, and by grade levels, by utilizing the 82 assignments submitted from high school English teachers in two school systems.

Results

The hypotheses in this study compared the mean score of each independent variable separately using a one-way ANOVA. Upon completion of the data analysis of this research study, three of the five hypotheses were accepted. There was no difference in the mean scores ($M=0.241$) of the reported amount of rigor in student assignments between standards and honors level high school English classes as measured by the rigor rubric. There was no difference in the mean scores ($M=0.861$) of the reported amount of rigor in student assignments between grade levels (9, 10, 11, and 12) as measured by the rigor rubric. There was no difference in the mean scores ($M=0.0482$) of the reported amount of rigor in student assignments between experienced teachers, those with 6 or more years of teaching experience, and novice teachers, those with 0 to 5 years of experience, as measured by the rigor rubric. Therefore, null hypotheses H_{03} , H_{04} , and H_{05} are accepted.

There was a significant difference in the mean score ($M=84.9555$) of teachers' perceptions of the level of rigor in their students' assignments and the level of rigor as evidenced by the rigor rubric. Therefore, H_{01} —there is no difference in the mean scores of teachers' perceptions of the level of rigor in their students' assignments and the level of rigor as evidenced by the rigor rubric—is rejected. These findings suggest that teachers rated the level of rigor in their student assignments higher than the rigor rubric indicated. The teachers perceived there was more rigor present than actually existed based upon the rubric.

There was also a significant difference in the mean score ($M=143.785$) between what teachers rated as the overall rigor of their student assignments and what the external raters rated the same assignment. Therefore, H_{02} —there is no difference in the mean scores of teachers' perceptions of the level of rigor in their students' assignments and the level of rigor as evaluated by a team of external raters—is rejected. These findings indicate that teachers perceived much more rigor present in their student assignments based on the rigor rubric than the external raters examining the same assignments, as evidenced by the comparison of frequency (Table 11) of ratings given by the teachers compared to Expert Rater A, and Expert Rater B.

Teachers were asked to justify their ratings of the level of rigor on the rigor rubric by citing examples from the assignment. When examining the comments and contrasting scores between the teachers and that of the expert raters, several interesting pieces of data emerged. Of the 82 assignments submitted and reviewed, only three assignments received scores of 6, the highest level of rigor, by both the teacher and the external raters. The following are comments made by the external raters that justified their agreement ratings:

1. The assignment caused students to consider components of a novel and hold them up for analysis to similar elements in society.
2. Cultural literacy and higher-level thinking are musts to complete each different topic of this assignment.
3. This assignment asks students to question, construct meaning, analyze, encourage peers, and use the text.
4. Socratic seminar guidelines, questions, rubric, and prewriting all combine to create a perfectly rigorous assignment.

There were also three instances in which the external raters rated the assignment higher in rigor than the teacher did based upon the rigor rubric. The raters noted in each instance that the assignment was a complex project requiring higher order thinking by the students with some type of written and/or oral presentation.

A review of the data reflects eight instances in which teachers rated their assignment as a 6 in rigor (the highest level) and the external raters rated it as a 1 (the lowest) or a 2. The external raters used the following comments to justify their low ratings:

1. This assignment is superficial.
2. Doesn't require depth of understanding or higher order thinking by the student.
3. This assignment is a focused retelling of historical information.
4. This is not rigorous, complex, or multi-layered. It is reflective.
5. Although students consider multiple literary concepts, the depth of thinking is quite superficial.
6. Students develop an essay but critical thought was done for them.
7. They simply find evidence within the text. This is not a complex task that requires much thought.
8. Lacks specificity and connection to the curriculum.
9. This assignment tests whether students can follow directions.
10. Can be completed without reading the novel.
11. This is a reorganization of an already completed assignment.
12. This is a reflective activity.
13. The requirements do not demand complexity of thought.

Comments by teachers who rated the overall rigor 3-4 (middle range) of their

student assignments were:

1. Many of the questions were recall and recognition.
2. Students had to use specific examples from sermon to support their personal responses.
3. Students must analyze and provide written responses that include fact and opinion.
4. It doesn't require a great amount of writing and can be done quickly and easily as we read.
5. Idea is to gather reliable sources and support given topic.
6. This assignment is focused on students applying what they have learned, creating a product, and showing their comprehension of the main ideas or terms.
7. The oral presentation factor and opportunity for audience interaction creates a higher level of thinking, planning, and interaction with peers.
8. It is a 4, but it is an introductory assignment to Epic Literature to help them conceptualize an Epic Hero.
9. This assignment requires students to think critically about the novel in a fun way. Rather than asking them to write, they are generating ideas through pictures and symbols.
10. This creative assignment requires that students use comprehension and analysis skills to paraphrase the quotes.
11. Any student could complete this assignment as long as they read both the book and the article thoroughly. This assignment requires students to reflect on society's values.

Comments from teachers who rated their student assignments as a 5 on the rigor

rubric (near the top of the range) were:

1. The assignment is difficult and requires higher order critical thinking but the graphic organizer is provided to lead students and help them understand that there is a logical process involved in analysis. This assignment lacks independent research, which would make it a difficulty of 6.

2. Reflections must be grammatically correct and choosing the work is sometimes a difficult task for students.

3. It is difficult because it requires such a large amount of skills. Not only do students have to recognize literary techniques but they have to be able to appreciate and analyze the purpose and meaning behind the techniques. They also have to utilize technology to make a music video and write an essay about those choices and their analysis.

4. Student must apply previously learned concepts and rules to create a new essay in a timed setting.

5. It requires that they internalize the elements of the story and be able to effectively utilize them in an original format.

6. Requires excellent knowledge of structure of English language.

7. Students are required to think independently about the novel and pull evidence in order to support their analysis interpretation.

8. We've just read the ancient model which contains very formal poetry. I expect my Honors students to mimic the style as well as include all of the elements.

9. This assignment incorporates multiple objectives.

Comments from teachers who rated their assignments with a 6 on the rigor rubric, the highest level, were:

1. Students must research, present, gather info from presentations, form connections, see patterns, express their understanding in an extended written format.
2. Students have a difficult time finding contemporary songs that fit folk ballad characteristics.
3. Students need to be able to analyze text as well as create, not only comprehension questions, but higher-level questions.
4. Requires analysis on several levels, interpretation of meaning and character, literary review, creativity, and time.
5. It takes a lot of research, interpretation, summary, and application skills.
6. I think this is a challenging assignment for a standard class. It allows them to become more engaged in each text.

Question 4 of the rigor rubric asks if the assignment does in fact apply knowledge/skills/experiences to solve a problem or to complete a task in a new or different situation. Teachers responded yes or no and this question had the largest discrepancy of answers between the teachers and the expert raters. By reviewing the student assignment, the raters could not perceive where the assignment required students to do this, although the teachers overwhelmingly stated that it did.

Some general observations based upon the review of comments teachers made in justifying the overall rigor rating (Q8), and questions 1 through 7 were:

1. If an assignment is reflective it is rigorous.
2. Retelling of information is perceived as rigor.
3. Assignments calling for creativity are perceived as more rigorous.
4. Assignments that require the typing of the paper are perceived as more rigorous.

5. If students struggled with the assignment it is perceived as rigorous.
6. Longer assignments are perceived as more rigorous.
7. Assignments that take more time, in some instances an entire semester, are perceived as more rigorous.
8. Assignments that evaluate a student's organizational skills are considered more rigorous.
9. If the assignment has an art component it is perceived as more rigorous.
10. Assignments requiring students to supply examples are perceived as more rigorous.
11. Having to answer questions makes an assignment more rigorous.
12. Requiring the assignment to be grammatically correct raises the rigor.
13. Assignments that require the student to follow the MLA format are perceived as more rigorous.
14. Research papers with more emphasis on thesis development are considered more rigorous.
15. Research papers that require more typed pages are perceived as more rigorous.

Conclusions

Increasingly, high schools are charged with the role of preparing all students to be college ready when they graduate. This is a reaction to the findings of the National Center for Public Policy and Higher Education (2004), which estimated that persons who have at least some postsecondary education will hold 87% of the new jobs in high-wage, high-growth occupations by 2014. To have all students college ready, they must receive rigorous classroom instruction while in high school, in all classes. The interpretation of

the data from this research study causes one to question whether students will be prepared to be successful in higher education. In the past we have selected and sorted students into tracks, placing those who were to attend college in supposedly much more rigorous courses. It was believed that those who were not destined for college after high school graduation had no need for these same classes as college-going populations. This is no longer true. The effect of not preparing everyone can be very expensive. As the cost to attend college continues to rise every year, not being prepared can result in students spending more time in college taking more developmental level classes for which they receive no college credit, but cannot progress in their courses sequence without attending. This increases the amount of student loans a student must secure, the pay back amount, and the number of semesters needed to complete a degree program. Also as a result of being placed in remedial or developmental classes, ACT (2007), Achieve (2007), American Diploma Project (2004), and Adelman (2004) have found that students who take these courses at the college level are less likely to complete a degree program.

The budget reductions in colleges and universities have caused higher education institutions to reduce their number of faculty members, limit course offerings, and eliminate degree programs and class sections. Having to schedule sections of remedial classes in these same colleges and universities due to the lack of rigor in high school classrooms, according to the Alliance for Excellent Education (2009), has resulted in an expenditure of \$1.4 billion for costs of remedial courses at community colleges. The Alliance pointed out that taxpayers are essentially paying twice for the coursework and skill development students are expected to receive in high school (p. 11). When funds are scarce, high school preparedness may be scrutinized even more closely than in previous years.

Willard Daggett (2005b), Tony Wagner (2008a), and Cetron and Davies (2003) have indicated that the skills of developing, collecting, evaluating, analyzing, and synthesizing information are needed for all students to be successful in the workplace and to help the U.S. remain competitive in the world. All of these skills call for students to be taught in a rigorous cooperative learning setting. The findings from this research study indicated that this is not happening in the majority of the teacher's classrooms participating in this study. Students are being asked to complete assignments that fall on the lower range of Bloom's taxonomy, while the skills needed for college and the workplace are in the upper range.

Farkas and Duffett (2008) stated in their study, and 40% of the teachers who were surveyed stated, that the content and curriculum of honors and accelerated classes is too often watered down and lacking rigor. Assignments may be perceived by students as boring and busy work. It was noted by the expert raters in this study that there were at least 10 assignments that were superficial and they termed them busy work. There were an equal number of assignments that the raters questioned as to what was the point of the assignment, many times noting nothing academic was expected. This is certainly troubling in light of the fact that the teachers in this study were requested to submit assignments that they considered challenging for their students.

The 2008 High School Survey of Student Engagement (HSSSE) found that fewer than half of the respondents (45% in 2007, 46% in 2008) stated they were challenged academically in most or all of their classes. Many students, even those with future aspirations, may opt to just get by and not work to their potential due to low teacher expectations (Quint et al., 2008). Interesting to note in this research study was the fact that the majority of the teachers who participated in the study and submitted assignments

were from honors level classes. This calls into question if the HSSSE were administered currently, would the survey yield the same results of low academic challenge based upon the data from this study, due to the low level of critical thinking skills being required of students in the submitted assignments?

There is a great deal of information written by numerous individuals on the topic of rigor but very few actual research studies have been conducted on the overall rigor in schools, classrooms, teacher assignments, and assessments.

Limitations

A possible limitation to this research study could have been the low rate (35%) of participation by high school English teachers. Due to the low rate of participation, the researcher was unable to compare the mean scores of teachers in schools with higher rates of educationally disadvantaged populations (free and reduced lunch) with those who have lesser rates to discern the level of rigor in each type. A higher participation rate may also aid in validity and the ability to generalize these findings across other high school English teachers.

Possibly contributing to the low rate of participation was the fact that the research was completed in May, traditionally a very stressful time for high school teachers, especially those involved in supervising graduation projects, preparing to administer the end-of-course test in English I, and those teaching high school seniors.

The opportunity to talk to the teachers when requesting their participation as opposed to sending an email possibly would have been beneficial. Having the ability to talk one-on-one with the teachers would have also aided the researcher in being able to receive clarification of comments as needed.

Neither the rigor rubric nor the cover sheet questioned teachers to the extent of

their knowledge of rigor, how they define rigor, or if they have received any professional development pertaining to rigor. It possibly would have been helpful to have obtained this information.

This research study only examined high school English teachers, not any other grade configurations nor subject area.

Implications

The purpose of this research study was to examine high school English teachers' perceptions of rigor in student assignments. The findings reflected a perception by teachers that there was more rigor present in their student assignments than was reflected by the rigor rubric or the expert raters. This would imply a need for professional development on rigor in the classroom, assessment, and student work. With the growing implementation of Professional Learning Communities (PLC) in high schools, this would certainly be an opportune time and setting for staff members to spend time participating in the study of rigor. There are some excellent materials and books written on rigor, how to raise rigor in the classroom, and how to conduct a school rigor assessment. These could be undertaken in PLC time.

Also during PLC time or at another time, a book or article study on why rigor matters would be warranted. There are some excellent books and materials available based upon the tenets of why rigor matters, the skills students need to be successful now and in the future, and the predictions of future trends in this global economy.

The research study also indicated that there was no discernable difference in the level of rigor between honors assignments and standards class assignments. A review of the requirements for such course curricula by the Department of Public Instruction in North Carolina would certainly be feasible based on the research findings evidenced in

this study.

Principals, as instructional leaders, need to be aware of and observe the level of rigor in the classrooms of their teachers as they complete walkthroughs, teacher evaluations, and have conversations with teachers pertaining to classroom instruction and expectations. Principals must also voice their expectations for rigor in all classrooms.

The research study also found no discernable difference in the level of rigor between experienced and novice teachers. The professional development mentioned above would certainly help remedy this situation. Schools of education from colleges and universities also need to include the study of rigor in their educational course work.

High school teachers have often complained that the end-of-course tests that they are required to administer have constrained their teaching. Teachers have been accused of *teaching to the test*, resulting in a narrowing of the curriculum and the use of instructional methods that produce the best results on the tests, defined by some as *drill and kill*. It will be interesting to note with the elimination in North Carolina of the majority of end-of-course tests, if this will result in teachers adopting more rigorous teaching models, and feeling freer to use methods that are project-based, and more student-centered.

Although this research study only examined rigor in a relatively small sample of high school classrooms, it would be advantageous to examine rigor in elementary and middle school classrooms. Skills build on skills learned from previous years. An elementary and middle school learning experience devoid of rigor certainly makes achieving rigor at the high school level more difficult.

Conclusion

During this study, the researcher has learned that much of the research provided in

the literature review regarding rigor, academic press, and 21st Century skills has proven accurate and relevant to the study and findings therein. The assignments obtained from high school English teachers used in this study were self-rated high on the rigor rubric with low ratings for the most part from the independent raters. This finding further substantiates the research and opinions of Wagner (2008a) who identified the seven skills needed for American students to be successful in the future and for this country to remain competitive. The first skill he identified was “critical thinking and problem solving” (Wagner, 2008a, p. 2). Only 12% of the submitted high school English assignments required students to think critically or problem solve. Wagner also stated that students need to have the skills for “effective oral and written communication” (p. 2). Only 14% of the submitted assignments required students to complete the assignment through extensive writing as opposed to short answer, and only 6% required students to provide an oral presentation. The skills most frequently required to complete the majority of the submitted assignments were to answer text-based questions, provide a short response after reflecting on the text, and retelling of the story.

Absent from the assignments were the following higher order thinking skills as identified from the revised Bloom’s taxonomy: creating, evaluating, and analyzing. Only 9% of the assignments required students to create a new product or idea, and only 8% required students to evaluate and justify their answer, while 24% did call for some type of analysis by the student.

Newmann et al. (2007) stated that their focus on authentic intellectual work (AIW) resulted in the belief that for most students the usual work demanded in school is rarely considered meaningful, significant, or worthwhile. Learning tasks call for specific memorized information, retrieval of given information, or application of routine

computational procedures, but rarely do they call for higher-level thinking, interpretation, or in-depth conceptual understanding (Newmann et al., 2007, p. 2). The review of the submitted assignments would support their statement. The expert raters commented that many of the submitted assignments teachers considered rigorous merely called for students to *regurgitate* basic information, perform tasks that were superficial or busy work, and caused them to ask when reviewing the assignment, “what’s the point?”

Norman Webb’s (2005) Depth of Knowledge (DOK) examined the complexity of a task assigning four levels: recall (lowest level), skill or concept, strategic thinking, and extended thinking (highest level). There were only three submitted assignments that would be classified in the extended thinking category requiring the student to take information from one text and apply it to a new task, such as generating hypotheses and performing complex analyses and connections among texts (Webb, 2005, p. 3). Most of the submitted assignments would be categorized as level 2 skill or concept because they require the student to comprehend and process the text.

Lee et al. (1999) completed research on academic press defined as rigor and accountability. In this situation academic press would be the challenge of the academic work. There were only 10 submitted assignments that the expert raters agreed were level 5, evaluation, or level 6, creating, as measured by the revised Bloom’s taxonomy. Utilizing the researchers’ definition of academic press, a conclusion could be that the majority of the submitted assignments were low in academic press.

This research study further substantiates the previous field of study that has been completed on the topic of rigor. The findings, discrepancies in the perception of the level of rigor by high school English teachers as evidenced by the rigor rubric, reveal a need for a greater understanding of the rigor framework, the purpose and meaning of academic

rigor, and reveal the need for targeted training for teachers in developing rigorous assignments. Such training should include a review of the revised Bloom's taxonomy, the Rigor/Relevance Framework, and the application of the Depth of Knowledge model.

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Appendix A
The Rigor Rubric

Teacher's Name:

Grade Level:

Honors or Standards level:

For each student assignment please answer the following questions.

This assignment asks students to:

1. consider significant/important ideas related to the subject matter.

Yes or No

Please give a specific example from the assignment:

2. bring together parts of knowledge/experience(s) to form a whole and build relationships for new situations.

Yes or No

Please give a specific example from the assignment:

3. break down a concept or idea into parts and show relationships among the parts.

Yes or No

Please give a specific example from the assignment:

4. apply knowledge/skills/experiences to solve a problem or to complete a task in a new or different situation.

Yes or No

Please give a specific example from the assignment:

5. understand the main idea, interpret or summarize.

Yes or No

Please give a specific example from the assignment:

6. recall or recognize information.

Yes or No

Please give a specific example from the assignment:

7. provide an extended written or oral response.

Yes or No

Please give a specific example from the assignment:

8. In reviewing this student assignment what would you rate the level of rigor (overall) using a scale of 1= low in rigor to 6= high in rigor?

Why did you rate the assignment with this level?

Appendix B
Letter to Superintendent

October 25, 2010

Dear _____:

I am in the process of completing work that needs to be done to go before the doctoral dissertation committee to receive their permission to complete my research study. My dissertation, *High School English Teachers' Perceptions of Rigor in Student Assignments*, will involve collecting student assignments from high school English teachers, having those teachers complete a survey about each assignment rating the level of rigor they think is present, and collecting the results for analysis. In order to do this research effectively, I will need input from high school teachers; therefore, I am writing to request your permission to obtain high school teachers' names who teach Honors and Standard level English in our school system and perform my research study. I appreciate your help in this matter.

Sincerely,

Cindy S. Misenheimer

Appendix C

Letter to Teachers

Dear High School English Teacher,

Your principal has indicated that you are teaching honors and/or standards level English I, II, III, or IV this semester. I am completing my dissertation entitled *High School English Teachers' Perception of Rigor in Student Assignments*.

To complete my research study I need your help. I know you are very busy and have many responsibilities. Hopefully, if you will help me it will not take too much of your time.

If you are willing to help, I would like for you to select 4 student assignments that you consider challenging and complete a rubric that I will furnish. This shouldn't take but a few minutes to do. I would then collect the rubric and student assignments from you.

All that is submitted to me will be coded for confidentiality, removing your name and the name of your school. Your principal has approved and lent their support to the research study. _____ has also approved the study.

I hope you will be willing to assist me with this task. If you would please respond to me by email. I will send you the follow-up information.

Cindy S. Misenheimer
Principal
Rowan County Early College

Appendix D

Cover Sheet for Student Assignments

Cover Sheet for Research Study

Teacher's Name:

School Name:

Grade Level of the assignment:

Standards or Honors Level:

Number of years of teaching experience:

Number of years teaching this grade level or level of English:

Appendix E
Instructions for Teachers

Thank you for agreeing to participate in the research study entitled *High School English Teachers' Perceptions of Rigor in Student Assignments*. I know how valuable your time is.

- Please select four (4) student assignments that you consider challenging for your students.
- Please complete the rubric provided for each of the four (4) student assignments.
- Please complete the cover sheet for each of the student assignments. Staple the completed rubric; cover sheet and student assignment together.
- You may send the completed materials electronically to misenhcs@rss.k12.nc.us, through the school system courier to Cindy Misenheimer, Rowan County Early College, or I will pick it up at your school, whichever you prefer, just let me know.

Even though the cover sheet contains your name and school, those will be removed and the information coded so it remains confidential when publishing the results of the study. If you wish to know the results of the study I will be glad to share that with you. If you have any questions please email me at misenhcs@rss.k12.nc.us or call me at the Early College 704-216-7253.

Once again thank you so much for your help with this research study and thank you for what you do every day to educate our students.

Cindy S. Misenheimer