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Meeting the Standards of the Standardized Test: How Does Project-Based Learning Correlate to Traditional Learning in an Advanced Placement English Language and Composition Course?

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MEETING THE STANDARDS OF THE STANDARDIZED TEST:
HOW DOES PROJECT-BASED LEARNING CORRELATE TO
TRADITIONAL LEARNING IN AN ADVANCED PLACEMENT
ENGLISH LANGUAGE AND COMPOSITION COURSE?

by

Colette Armstrong-Grodzicki

A Dissertation

Presented in Partial Fulfillment of Requirements for the

Degree of

Doctor of Education

In

Secondary English Education

In the

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Dissertation Signature Page

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PROJECT-BASED LEARNING CORRELATE TO TRADITIONAL LEARNING IN
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DEDICATION

To my mother, Katherine Armstrong, for always instilling the value of education and following my dreams, and for always believing I could accomplish anything I put my mind to.

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ABSTRACT

MEETING THE STANDARDS OF THE STANDARDIZED TEST: HOW DOES PROJECT-BASED LEARNING CORRELATE TO TRADITIONAL LEARNING IN AN ADVANCED PLACEMENT ENGLISH LANGUAGE AND COMPOSITION COURSE?

by

Colette Armstrong-Grodzicki

Project-based learning (PBL) is defined by Markham, Lerner and Ravitz (2003) as “a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks” (p. 7). This quantitative study examined the relationship between traditional and PBL high school students’ achievement on the AP English Language and Composition national exam. The study was conducted in a large public metropolitan high school that offered PBL as a curriculum option for students wishing to learn the standards in a different way. Scrubbed data were collected through PSAT predictive scores and AP national exam scores and were analyzed to determine the correlation between student achievement and each learning method. The purpose of the study was to determine whether PBL is an effective learning method for students mastering the AP English Language and Composition standards. The results of this study

showed that predictive data were indicators of student success on the AP English Language and Composition national exam, and as such students were able to meet their achievement potential regardless of the learning method they experienced. Therefore, PBL students were able to perform adequately in relation to their predictive score data, as suggested by the literature on PBL. This was also found to be true for students enrolled in the traditional AP English Language and Composition course. Consequently, it could be concluded that offering a PBL course option to students could be beneficial to student learning and achievement on the AP English Language and Composition national exam while developing 21st Century skills as well as soft skills that provide for real world success.

Keywords: project-based learning, secondary English language arts, standardized test, achievement, College Board advanced placement

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CHAPTER 1: INTRODUCTION

The halls of North High School are like those of many suburban high schools across the country. There are lockers, flyers, water fountains, and rambunctious teenagers laughing between classes. The halls are clean and the students seem to respect the safety that these walls provide while continually testing their boundaries. Students at this school have a love for their institution and appreciate the opportunities they are given to make their own decisions as well as the freedom and trust the teachers and administrators have given to them. This school, like others around the U.S., has a mission to educate its students with an academic rigor that exudes quality and purpose. However, here students have an opportunity to learn a bit differently, and this difference can be seen when looking inside the four rooms that make up “The Lab.”

Constructed as quasi-experimental, this study gathered score data for all students enrolled in Advanced Placement (AP) Language and Composition at the participating high school during the 2012-2013 school year. The score data included predictive scores for students paired with their actual AP exam scores. The purpose of the study is to determine student achievement on the AP English Language and Composition national exam as well as to compare the success of students who learned the content through PBL and traditional learning methods. In short, this study examined the results of the 2013 AP English Language and Composition exam in order to determine whether a statistical difference existed between the Lab exam scores and the traditional classes’ exam scores in relation to the predictive score data.

The purpose of this research is to investigate the relationship of student performance with the AP English Language and Composition test and style of learning the students were exposed to in order to determine the effectiveness of PBL and traditional learning methods within in the confines of the public high school being studied.

Background

North High School is located in Suwanee, Georgia, a northeastern suburb of metro Atlanta. The school prides itself on innovative teaching, and the Lab class began as an experiment of innovation. The Lab's founding teachers and school principal had attended a national conference where they learned about the Project-based learning (PBL) model of teaching and learning. They agreed that it was a logical way to teach and a great way for students to learn, but they were not sure how to implement it in a large public high school since it was typically done in a small school setting. These educators also wondered how they could use the model to serve their student population of high achievers. So, like most curious educators, they started brainstorming. They talked about what content the model could focus on and about how to train teachers. They also discussed which students would start the program and how they would get student and teacher buy-in. They talked about how to develop the curriculum and standards to fit the PBL model and how to obtain the technology to support the program. When they finished with the *simple* issues, they discussed how to get the money to make it happen. The goal was clear, but it was also clear that the path was going to be difficult. The teachers and principal, after many long meetings, decided to create a PBL option for the incoming freshmen that would allow the rising ninth graders to receive credits in freshman

language arts, physical education, computer applications, and advanced placement human geography. The PBL course was first offered in the fall of 2010 and welcomed 71 freshmen who were not aware of PBL or how the first year of Lab would go.

The beginning was bumpy. Over the next few years many stories circulated about how the program developed, but the original idea to offer students a rigorous academic opportunity in a unique environment remained at the heart of the Lab. The freshmen who entered the program in 2010 became juniors in Fall 2012 and were no longer intimidated by the Lab or what PBL encompassed. They fully embraced the flexibility and freedom of the Lab class, but the addition of another advanced placement course (AP English Language and Composition) brought a new challenge as they stepped into the classroom that Fall. The rigor of the Lab increased, and they had to revert to the basics of what a PBL classroom was all about.

The new Lab class was under pressure to teach the standards of two AP curriculums, and it was questionable whether this was possible. In a traditional AP course, the teacher disseminates information daily in a linear manner so that students are able to absorb all of the information they need to pass the AP exam. One of the main reasons students enroll in an AP course is to take and pass the national exam in May. As a result, the Lab needed to prepare the 60 students enrolled for the rigorous test they would face on May 10, 2013.

Statement of the Problem

Within the context of public education, high-stakes standardized achievement tests have become the norm since the early 2000s (U.S. Department of Education, 2010). As a result of the development and implementation of these tests at all grade levels over

the past 20 years, teachers and students have been held accountable for high scores, as a means of showing the effectiveness of the teacher and school. Stories such as the Atlanta Public School System cheating scandal where teachers and administrators were encouraged to change student answers to raise the passing rates for schools are evidence of the emphasis school districts, superintendents, and principals have placed on the performance results of these tests (Rich, 2013). All members of the school staff are held accountable for the scores the students make on these tests; and, as a result, teachers feel they need to prepare students adequately for achieving high scores. The pressure on students to perform well encourages teachers to *teach the test* (Rich, 2013). One of the unintended consequences of this pressure is that teaching methods are reformed, which can cause teachers to focus solely on content while shifting away from soft skills, such as collaboration, leadership, personal effectiveness and mastery, communication, planning and organizing, presenting, and people development and coaching (Ngang, 2012; U.S. Department of Education, 2010).

Many standardized tests given to students in public high schools are required for graduation, but students also take voluntary tests such as the Advanced Placement exams, SATs, and ACTs. Schools are ranked and judged by the state and nation based on these voluntary test scores as well as dropout rates and teacher effectiveness. These rankings place pressure on the high level courses offered in high schools and causes test preparation to be a primary focus for many teachers, teachers whose effectiveness is judged based on the test scores their students achieve. As a result, many schools only let their best and brightest students enroll in AP classes, and they strongly encourage these students to take tests like the SAT and ACT (GCPS, 2013; Rich, 2013).

The focus on standardized tests scores is also seen at the state and national levels, with legislative support of No Child Left Behind (NCLB), Race to the Top, and the Common Core State Standards (U.S. Department of Education, 2010). All of these government initiatives emphasize testing as an essential part of holding teachers, schools, principals, districts, and states accountable for student achievement of an educational standard deemed imperative by the Department of Education (state and national) (U.S. Department of Education, 2010). The implementation of NCLB began to put pressure on schools' performance on tests in 2001 and required schools to meet adequate yearly progress, or AYP, within three years in order to remain open (U.S. Department of Education, 2010). Many schools struggled to meet the stringent standards, and were closed or reorganized with new leadership and new teachers. Race to the Top, a federally funded program aimed at reforming public schools performance, began in 2010 with a focus on reforming education in many ways (U.S. Department of Education, 2010). One of the changes focused on changing the way in which teachers received their salary to a pay-for-performance system, which would reward teachers on their students' achievement and improvement on standardized assessments. The Common Core State Standards have now implemented new standards for states to follow, and soon new standardized tests will be administered in order to determine how effective teachers and schools have been at implementing these new standards. The pressures of testing are real and impact teaching and learning.

In short, because teachers are pressured to teach in ways that promote student performance on standardized tests, it is difficult to implement experimental teaching strategies that have not been shown to improve test performance, such as PBL. The PBL

method has been shown to be effective through STEM programs (PBL programs focused on science, math, and technology) and in many small private and charter schools across the country, but it has not yet been published in a research study in large public schools. If there is a relationship between PBL and student achievement on the AP English Language and Composition national exam, this data could be used to reform educational practices with the aim of developing more effective, motivated, and intrigued students who want to learn through more comprehensive AP courses.

Research Questions

This study analyzed the relationship between PBL class performance and traditional class performance on the AP English Language and Composition national exam based on students' predictive scores data in order to determine the effectiveness of the teaching/learning methods on student achievement. The following questions guided the study:

1. How does the achievement of PBL and traditional students on the 2013 AP English Language and Composition national exam correlate to the students' predictive score data from the PSAT?
2. Is there a correlation between the predictive data and the participants' 2013 AP English Language and Composition exam scores?
3. What is the PBL students' passing rate on the AP English Language and Composition exam?
 - a. How does this compare to the passing rate of students in the traditional AP English Language and Composition course?

Purpose and Significance of Study

The purpose of the study is to determine student achievement on the AP English Language and Composition national exam as well as to compare the passing rate of students who learned the content through PBL and traditional learning methods. If PBL is shown to be an effective learning method, other school districts may be allowed to differentiate instruction with PBL in order to best serve all students. The increasing demands placed on student achievement on high stakes standardized tests have changed the culture of the classroom (U.S. Department of Education, 2010). As a result, current reforms in education are pushing teachers and school districts to think outside the box in order to help all children learn and not only prepare for the standardized tests, but for the future as well. These tests include district assessments (Gateway, AKS Benchmark), state assessments (EOCT, GHSGT, GHSGWT), and national assessments (AP national exam, SAT, ACT). Furthermore, many students are engaging in test preparation activities in order to ensure higher achievement and scores. As a result, districts are searching for ways to promote the success of their students on standardized assessments while still providing a quality education (GCPS, 2013).

Many studies on standardized testing and the relationship of student achievement to high stakes tests have been conducted over the past fifteen years as well as studies on the impact of PBL on student engagement and motivation. However, more studies are needed to determine the effectiveness of PBL in the AP classroom in regard to student achievement on the AP national exam in any subject because few studies exist regarding the use of PBL in the language arts classroom. This study is needed because it examines a different way to teach language arts skills, including the rigorous AP curriculum. If this

method is shown to be effective, every student who is not challenged or engaged by the learning styles of a traditional classroom could benefit from the results of this study. The PBL alignment with the Common Core State Standards' emphasis on real life skills, non-fiction reading, and exploration creates a logical connection to PBL. Therefore, determining whether a correlation exists between students' standardized test achievement would be an important finding in the field of education.

An abundance of research exists on the PBL method, how it works, how small schools have used the method to help students learn, how it has helped in science and math curriculums through the STEM model, how it is effective for computer classes, and how best to use the method. Studies on the use of PBL in ELL learners' construction of language and cultural knowledge, as well as studies on how PBL has helped adult learners achieve success in GED and college classes are also prevalent (Bridwell, 2013; Information Resources Management, 2010; Kim, 2012; Patterson, 2011; What Works Clearinghouse, 2012; Yuliya, Sze, & Thomas, 2010). Thus, more research on the effectiveness of PBL in a high school language arts classroom is needed to determine the effects of this learning method on the development of students' language arts skills.

Finding peer-reviewed articles written after 1990 which are relevant to this study produced few results. Searches were conducted using three databases, including Academic Search Complete, ProQuest Education Journals, and the National Council of Teachers of English (NCTE) using the search terms, "project-based learning," "English language arts," "high school," "standardized test," and "advanced placement."

Inquiries on Academic Search Complete for relevant articles provided few results. There were no results for searches using all five of the aforementioned search terms.

There were also no results when only “project-based learning” and “standardized test” were used. An inquiry using only the terms “project-based learning” and “advanced placement” found one article regarding the use of PBL in an AP United States Government and Politics class, which was not relevant to the use of PBL in an AP English Language and Composition course, but was relevant to this study in that the Lab class includes both language arts and social studies classes. When pairing the terms “project-based learning,” “English language arts,” and “high school,” one article about the use of collaborative learning in a religion class was found but was not deemed relevant to this study.

A search through the journals on the Proquest databases only found one academic article that mentioned all of the search terms. This was a review of the AVID program in California, which uses PBL in classrooms; however, this review was also deemed as irrelevant to the study because it was conducted in a small school and focused on ELL education. A total of 141 articles were found when only using the search terms “project-based learning” and “advanced placement.” When the term “English language arts” was added, 24 results remained. Of those 24 articles, there were two that addressed the STEM model, four that addressed school scheduling models, 11 that addressed ways to close the achievement gap and urban school reform, five that addressed other unrelated issues, and two that were directly relevant to the present study. The two remaining articles will be discussed in Chapter 2.

The National Council of Teachers of English (NCTE) databases elicited many articles that addressed project-based learning (999); however, many of these articles focused on service-learning and the use of project-based learning in conjunction with

conducting research for science classes. When completing an advanced search using the search terms “project-based learning,” “high school,” “achievement,” and “advanced placement” (omitting the search term “English language arts” because NCTE is a professional organization for language arts teachers), only one article was found. The single article that matched all search terms was titled “Layout 1,” which offered stories about several teachers who used PBL in their high school English classrooms; however, this article was not a research study. When completing a search with only the terms “project-based learning” and “advanced placement,” seven articles were found; however, one article was “Layout 1” and only two others were relevant to this study. There were 66 articles on the NCTE database matching the search terms “project-based learning” and “achievement” but none focused on standardized testing. When swapping the search term “achievement” for “standardized test,” six results were returned, but none were relevant for the study. This search yielded a total of five relevant articles when using different combinations of the search terms, which helped to inform this study.

Most of the articles cited language arts as an important aspect of PBL because researching and writing were a part of the assigned projects. A few articles were found concerning the use of PBL to assist in writing, but they did not encompass the whole of the language arts curriculum as outlined by the Common Core State Standards. Also they did not mention advanced placement (CCSSO & NGA). All other database searches returned no relevant search results. The lack of research shows a need for research which addresses the use of PBL in language arts classrooms as well as its effect on students’ achievement on standardized tests, including the AP English Language and Composition national exam. The paucity of research in this area validates the importance of the present

study and shows the importance of the study to advancements in the field of English education.

Context of Study

North High School is one of eighteen high schools in the County Public School district and is located in an affluent suburb of Metropolitan Atlanta. This suburb was named one of the Ten Best Places to live in 2010. One of the reasons for this is the high school's commitment to teaching and learning at high levels while promoting leadership for all students. The high school frequently exceeds standards on county, state, and national standardized tests and also excels at athletics and leadership training. When ranked with other schools in the county, North has been first for the past three years. Over the course of the past 10 years, the school has made significant improvements to students' standardized test scores and enrollment in AP classes (GCPS, 2013).

The County Public School district was also the recipient of the Broad Prize in 2012. This award is given to one school district a year that serves urban areas effectively and excels on standardized assessments and in closing the achievement gap. The County Public School District is typically ranked one of the best school districts in Georgia for academics, athletics, and college preparation, and, as such, the performance on standardized tests is an important aspect of student education in this metro county (GCPS, 2013). The county adheres to the state and national standards as determined by the Common Core State Standards, and over the past year, the county office has enlisted teachers to give input on curriculum development to meet these new standards.

The district's involvement in the local schools has also prompted a closer look at the Lab model, as North has been a model for other middle and high schools across the

district in the implementation of project-based learning. Over the 2012-2013 school year, several school board members and county supervisors visited North High School to see what the Lab was all about. These visits led to visits from 20 principals from all over the county who wanted to learn how to implement the Lab in their schools. The school system's support for the Lab classes has grown as the success of the Lab students has blossomed. This is perhaps due to the connection PBL has to the Common Core State Standards (CCSS), prompting county support for programs like the Lab.

National Standards Movement

The national standards movement gained momentum in 2001 with the implementation of No Child Left Behind (NCLB), which was written and endorsed by George W. Bush and his then Secretary of Education, Roderick Paige (the former Superintendent of the Houston Independent School District) (U.S. Department of Education, 2010). NCLB focused on improving and reforming the public education system and holding teachers and schools accountable for student learning through the use of standardized testing (Linn, 2003). The use of standardized tests was not a new concept; however, prior to 2001, the tests given were not defined as high stakes tests (tests required for graduation or grade advancing), and not all states had standardized assessments in place for students at all grade levels. The push to be accountable for all student learning and achievement at all grade levels changed the community of testing by adding high stakes to the passing rates of schools and teacher's individual classrooms (U.S. Department of Education, 2010).

The Common Core State Standards (CCSS), which were created and adopted by 42 states across the U.S. in 2010, further perpetuated this standards movement (CCSS,

2010). The CCSS created a common list of basic skills and knowledge that all students should learn each year they are in school, and the standards have created a common ground among students, teachers, and schools across the nation. Alongside the CCSS, the U.S. Department of Education offered a statewide school reformation grant to help states fund the shift from state standards to the CCSS called the *Race to the Top*. This grant initiative also focused on standardized testing, teacher and school accountability, student achievement, closing the achievement gap, and merit-based pay for teachers (U.S. Department of Education, 2010). Currently, mandatory standardized testing at North High School includes district and state tests taken throughout the student's four years of high school.

Theoretical Framework

Learning Theories

According to John Dewey (1916), learning “should be meaningful and relevant to the students because they will be eager to find out more about what they are learning and therefore can draw from these experiences” (p. 32). Dewey's educational theories are at the center of the PBL process and have led to modern theorists' contributions to PBL (Blumenfeld et al., 1991; Markham et al., 2003; Boss & Krauss, 2007). According to a study by Markham, Lerner, and Ravitz (2003), “Project-based learning is a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks” (Markham et al., 2003, p. 7). This authentic mode of learning is not new, as evidenced by Dewey's work; however, it has been revived by proponents of authentic learning who believe that PBL allows students to investigate and

seek resolutions to problems that allow them to acquire a deeper understanding of key principles and concepts (Blumenfeld et al., 1991). This idea of authentic learning can also be seen through a constructivist lens because students are able to create their own path of discovery. Lev Vygotsky's contributions to constructivism through his zones of proximal development give insight to the way the adolescent mind works (Vygotsky, 1962). This development is made possible through students' motivation as well as the teacher's ability to lead the classroom in an authentic way that connects to Bandura's work on motivation and self-efficacy (Bandura, 1977; Bandura, 1993; Blumenfeld et al., 1991). The students in the PBL environment need to have a propensity to be motivated because there are no guided checks along the way. Their motivation and ability to regulate their own behavior is intrinsically linked to students' learning success.

Constructivism

Constructivism is a philosophical and psychological perspective based on the belief that individuals construct much of what they learn (Bruning et al., 2004). Psychologists Vygotsky and Piaget were major contributors to this theoretical perspective, and much of their research on human development focused on studying this theory. Vygotsky's work, in particular, shed light on the role society has in knowledge construction in that he found that people shift toward human influences and away from environmental pressures (Schunk, 2009). The idea that constructivism has an impact on student learning has evolved in recent years because psychologists now believe that cognitive theories do not fully capture the complexities of human learning. This shift has pushed the focus of learning back to the learner rather than the knowledge and how it is acquired. Ultimately, constructivism is "an epistemology, or a philosophical explanation

about the nature of learning” (Simpson, 2002, p. 14). Constructivism assumes that the world is unknown and that no statement can be assumed true. Therefore, according to this theory, the world should be reviewed with reasonable doubt. People, as a result, create their own knowledge and truth through their learning and experiences and, as such, each person’s truth only needs to be true to them rather than anyone else (Simpson, 2002).

Constructivist ideals can be observed in the PBL classroom as students explore the content to discover their own truths about the world and themselves. The theory has affected educational thinking in that it endorses an integrated curriculum that allows students to learn about a topic from multiple perspectives (Schunk, 2009). The PBL environment created by the Lab at North High School allows for the integration of language arts, social studies, and technology to help students build knowledge through inquiry, and the learning environment is structured in a way that forces students to be actively involved with the content. Teachers who follow constructivist notions do not teach through direct instruction; rather, they challenge students to self-regulate their behavior through goal setting, monitoring and evaluating progress, and encouraging them to delve deeper into interest areas (Bruning et al., 2004). The theories behind PBL require students to explore and learn with the teacher as a facilitator, and this concept is allowing students to be constructors of their own knowledge, which follows the theory of constructivism.

Social Constructionism

Social constructionism is any approach that has, at its foundation, one or more of the following assumptions: a critical stance toward taken-for-granted knowledge on historical and cultural specificity, knowledge being sustained by social processes, and

knowledge and social action together (Burr, 2003; Gergen, 2009). The tenets of social constructionism ultimately challenge individuals to take a critical look at the ways in which people generally understand the world by inviting such individuals to question these concepts and beliefs (Burr, 2003). The urging of the social constructionists is to think about the “why and how” in order to create knowledge independent of the social constraints implied upon individuals by society. This is a hyper analytical sector of psychology and sociology that can be connected to education that pushes for students in PBL classrooms to think outside of the societal norm and to critically examine data in order to conclude their own truths without pressures from the outside to conform (Burr, 2003; Gergen, 2009). Because students work in groups in the Lab, it is intended that students are constantly under pressure to conform to the group’s goals, but many times they push to find their own truths.

Definitions

- Project-based learning. “A systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks” (Markham et al., 2003, p. 7).
- 21st century skills. Skills that help students prepare for the workforce, including skills for digital-age literacy, inventive thinking, effective communication, high productivity, global awareness, entrepreneurial and civic literacy, learning and thinking skills, technological literacy, creativity and innovation, collaboration, research and information fluency, and digital citizenship (Boss & Krauss, 2007; ISTE, 2006; North Central Regional Educational Laboratory, 2003).

- Soft skills. Skills in collaboration, leadership, personal effectiveness and mastery, communication, planning and organizing, presenting, and people development and coaching (Ngang, 2012).
- Advanced Placement. AP® is a rigorous academic program built on the commitment, passion and hard work of students and educators from both secondary schools and higher education. With more than 30 courses in a wide variety of subject areas, AP provides willing and academically prepared high school students with the opportunity to study and learn at the college level (College Board, 2010; College Board, 2013 p. 1).
 - Through AP courses, talented and dedicated AP teachers help students develop and apply the skills, abilities and content knowledge they will need later in college. Each AP course is modeled upon a comparable college course, and college and university faculty play a vital role in ensuring that AP courses align with college-level standards. For example, through the AP Course Audit, AP teachers submit their syllabi for review and approval by college faculty. Only courses using syllabi that meet or exceed the college-level curricular and resource requirements for each AP course are authorized to carry the “AP” label (College Board, 2010; College Board, 2013 p. 1).
 - AP courses culminate in a suite of college-level assessments developed and scored by college and university faculty members as well as experienced AP teachers. AP Exams are an essential part of the AP experience, enabling students to demonstrate their mastery of college-level

course work. Strong performance on AP Exams is rewarded by colleges and universities worldwide. More than 90 percent of four-year colleges and universities in the United States grant students credit, placement or both on the basis of successful AP Exam scores. But performing well on an AP Exam means more than just the successful completion of a course; it is the gateway to success in college. Research consistently shows that students who score a 3 or higher typically experience greater academic success in college and improved graduation rates than their non-AP student peers (College Board, 2010; College Board, 2013 p. 1).

- No Child Left Behind (NCLB). An act of Congress meant to close the achievement gap with accountability, flexibility, and choice, so that no child is left behind. The purpose of this act was to ensure that all children have a fair, equal, and significant opportunity to obtain a high-quality education and reach, at a minimum, proficiency on challenging State academic achievement standards and state academic assessments (U.S. Department of Education, 2010).
- Common Core State Standards (CCSS). The Common Core State Standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy (CCSS, 2010).

Organization of the Study

Chapter 1 provided an introduction to this study, its purpose, and the framework being used to examine the issues public schools are facing regarding standardized testing and effective teaching. It has also related general definitions while outlining the concept of PBL and how it is employed in the high school where the present study was conducted.

Chapter 2 provides an analysis of research relevant to this study as well as information on all of the concepts presented. The literature review focuses on the history of PBL and how it was developed and then reformed through the use of new technology. The second part of the literature review examines standardized testing and the implementation of legislation endorsing state and national assessments. Finally, there is a review of the history of the AP program, how it was created, and how the AP national exams are created, given, and graded.

Chapter 3 outlines the research design and methodology and discusses the methods of data collection and analysis that will be used for this study. The instrumentation used to analyze data is also discussed in this chapter, and focuses on how the predictive scores were determined, how the AP test was given and scored, how SPSS was used to analyze participants' scores.

CHAPTER 2: LITERATURE REVIEW

What is Project-Based Learning?

Project-Based Learning is a teaching method which has been shown to improve some students' motivation and achievement while promoting collaboration in an authentic way using 21st century skills (See Appendix A) (Blumenfeld et al., 1991, p. 390; Boss & Krauss, 2007, p. 47). Markham et al. (2003) define PBL as “a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks” (p. 7). This alternative method of teaching makes the teacher the facilitator and the student the researcher, which is more representative of the working world students will see after high school (Blumenfeld et al., 1991; Boss & Krauss, 2007; Harada, Kirio, & Yamamoto, 2008; Newell, 2003). In addition to real-world experience, PBL also encourages more critical thinking and metacognitive development, which has a direct impact on student achievement and motivation (Blumenfeld et al., 1991).

Using Technology to Learn

PBL is not new to the world of teaching. It has been an effective tool used by teachers for a century; however, the real world relevance of this learning style has been multiplied by new technologies (Blumenfeld et al., 1991; Boss & Krauss, 2007; Dewey, 1916). The Internet makes it possible to communicate with individuals across the globe in order to complete a culture project, upload information and receive immediate feedback

from peers or teachers, obtain access to research that may have otherwise been unavailable to them, produce projects and post them for the world to see, causing experts to give insights that are not only reliable but valuable as well (Katz & Chard, 1989). The students' classroom can now be the equivalent of the world, and it is through PBL that they can discover what they are passionate about and learn more while developing 21st century skills (Boss & Krauss, 2007).

In a typical PBL environment, students are challenged to "...investigate open-ended questions and apply their knowledge to produce authentic products" (Boss & Krauss, 2007, p. 12). The authentic products created through the project have real world value and should help students learn valuable cross-curricular lessons. Typically, projects are designed by teachers to provide the student with choices while encouraging them to engage in active learning and collaboration, which has been proven to increase student motivation, problem solving, and higher-order thinking skills (Stites, 1998). The North Central Regional Educational Laboratory (1997) made the recommendation that the investigation, application, and assessment of educational standards be made more meaningful (cognitively, socially, and culturally) when content is more relevant. This relevance allows students to construct meaningful educational experiences, thus stimulating student motivation to learn as a result of the connections they are making (Dewey, 1916; Prensky, 2001). In the 21st century, this approach has shifted to include technology as a means of investigation, collaboration, and publication of student work, and it has become more and more important to embed technology in students' education, as technology takes a larger role in the world (Blumenfeld et al., 1991; Boss & Krauss, 2007; Wilson, 1993).

In PBL, unlike traditional instruction, projects form the center of the curriculum instead of being add-ons at the end of a given unit of instruction. The project is the unit and it should engage students in real life problems related to the curriculum that they work collaboratively to solve (Boss & Krauss, 2007). “Technology is integrated as a tool for discovery, collaboration, and communication, taking learners places they couldn’t otherwise go and helping teachers achieve essential learning goals in new ways” (Boss & Krauss, 2007, p. 12). Thus, technology becomes the hub that allows for more relevant inquiries and plays a role in enhancing student and teacher engagement and motivation to complete and implement projects (Blumenfeld et al., 1991; Dewey, 1916). With the use of technology, students are able to construct an authentic project that provides the opportunity to learn not just from a book, but also from experts on the internet while using software that the professionals use to create their final products (Blumenfeld et al., 1991; Boss & Krauss, 2007). This exposure to technology gives students an opportunity to practice vital literacy skills through the projects they complete.

Constructing Knowledge

This opportunity to practice language arts skills in authentic situations speaks to the heart of Thatcher and Compeau’s (1999) research, which suggested that students learn best when given the opportunity for authentic self-constructed activities. This research supported Vygotsky’s (1962) constructivist approach to learning as well since students construct their knowledge through projects in the PBL classroom instead of through teachers’ direct instruction. Some have suggested that the act of lecturing is the best way to promote student learning, while others have argued that teachers can better facilitate student learning by allowing students to link their learning to the real world by

creating authentic learning situations (Boud, Cohen, & Walker, 1993). According to Boss and Krauss (2007), PBL methods should foster more independent learners who are more self-reliant and able to exceed standards through collaboration and their own heightened thinking processes. This type of learning fosters students' thinking by engaging them in "substantial opportunities for deep understanding of curricular content" thus allowing students the freedom to explore greater cognitive engagement (Blumenfeld et al., 1991, pp. 369-370).

PBL is not, however, a perfect method for every student. While projects can increase student interest and metacognitive skills, they will only do so if students are engaged in learning and not simply in performance. Blumenfeld et al. (1991) suggested that students should be motivated to learn, and part of this motivation comes from the teacher's commitment and knowledge of how to effectively implement an authentic project. They went on to argue that: "In order to realize the potential of project-based instruction, projects must be designed that sustain student motivation and thoughtfulness, and teachers must be supported in creating this type of instruction," (Blumenfeld et al, 1991, pp. 373-374). PBL experiences could heighten students' retention of content, causing students to get more from instruction than they would normally receive from a traditional lesson because students are more motivated to learn. Based on the literature, this change in instruction is effective in creating students who think critically, thus raising students' achievement and motivation (Blumenfeld et al., 1991; Boss & Krauss, 2007; Newell, 2003).

Critical Perspectives

College Board Advanced Placement Courses.

The College Board has been the host to advanced placement courses for over 60 years and has been offering a rigorous content-focused curriculum to high school students who are ready and motivated to delve into college level course work. The development of the AP program began after World War II, as the academic world realized there was a growing gap between secondary and post-secondary rigor and students' ability to meet expectations set by higher education (College Board, 2003). As a result, the Ford Foundation created the Fund for the Advancement of Education, which conducted studies which determined secondary schools and colleges should work together to create course work allowing motivated students to work to their potential while advancing as quickly as possible. One study completed by the fund included three prep schools (Andover, Exeter, and Lawrenceville) and three elite colleges (Harvard, Princeton, and Yale) who collaborated to offer high school seniors the opportunity to complete a college level course as an independent study followed by an exam in order to earn college credit early. This led to the development of a college level curriculum for high school students. The goal of this curriculum was to build courses that were rigorous enough for colleges to offer high school students course credit. The findings of the studies concluded with a pilot program launch for 11 core subjects in 1952 (College Board, 2003). Because of the success of the program during the first 3 years, the College Board was invited to take over administration of the program during the 1955-1956 school years. The program

from then on was known as the College Board Advanced Placement Program (College Board, 2003).

Over the years, the AP program has grown and developed by expanding course offerings and increasing the number of high schools who offer advanced level courses. During the 1980s and 1990s, the College Board made great efforts to include minority and low-income students by offering to fund their tests as well as teacher training so that courses could be offered in struggling schools and districts (College Board, 2003; College Board, 2013). There are currently 34 courses offered to thousands of high school students across the U.S. by the College Board, and test scores are accepted at thousands of universities across the country as well as 300 universities around the world (College Board, 2013). These courses and assessments have been constructed by high school and college teachers to give high school students advanced content that is equal to what they would receive in a college classroom. Each AP national exam developed for a course contains an essay section as well as a multiple-choice section (except for AP Studio Art, which requires a portfolio); a speaking or performance requirement is also used in courses as appropriate. The exams differ between courses depending on the focus of the content and are developed by a committee of high school and college educators; colleagues score essays annually from both academic levels in order to ensure that the level of work is on par with collegiate rigor (College Board, 2013). Students who perform well on the AP exam (those who receive a score of 3-5 out of 5) are able to earn college credit for that course at most universities. It has also been found that “students who score a 3 or higher experience more academic success in college” as well as a higher graduation rate than students who did not take an AP class or did not pass the national

exam (College Board, 2010, p. 1). Last year alone over one million students earned college credit because of their AP national exam performance, which allowed them to save thousands of dollars in college tuition (College Board, 2013).

In order to ensure that the courses offered in high schools across the nation meet the expectations of colleges as well as the College Board, all teachers of AP classes are required to complete an AP Course Audit by submitting a detailed syllabus to the College Board for review (College Board, 2010). The College Board members feel that teachers should be allowed to develop their own curriculum, and so they only offers basic guidelines that denote the expectations and standards that need to be met in order to be designated as an AP course. Teachers are able to design their course and exceed the standards given by the College Board, and they may teach the standards provided in whatever way they choose. The students who take an AP class will only receive an AP designation on their transcript if the teacher's AP Course Audit has been approved and the school has completed the necessary requirements to be an AP institution (College Board, 2013).

AP English Language and Composition. The development of AP English courses has proven difficult for the College Board Development Committees since there are many diverse methods for teaching the tenets of the subject (College Board, 2010). As a result, the committee focused on the common skills of reading and writing, which are essential to advanced study in this field, and two AP English courses were designed. AP English Language and Composition focuses on the reading of prose across many disciplines while studying language, rhetoric, and expository writing, and AP Literature and Composition focuses on the reading of literature by major authors and their time

periods, genres, and overarching themes found in poetry, fiction, and drama (College Board, 2013). Both English courses are designed to be rigorous and to meet the standards of college level work. However, students who take these AP classes should check with the university they intend to attend to determine the institution's policy on AP English course credit. Not all postsecondary institutions accept credit for both English courses offered by the College Board due to the fact that not all university English course(s) requirements align with the AP English course descriptions. The students who opt to take the AP national exam for either English course must be effective readers and writers and will only receive college credit (at most participating universities) if they receive a score of 3 or higher out of 5.

The rigor of the college-based curriculum for AP English Language and Composition pushes students to critically think about reading and writing through the development of students' metacognitive skills. The course description explains the focus of the course as:

Engage[ing] students in becoming skilled readers of prose written in a variety of rhetorical contexts, and in becoming skilled writers who compose for a variety of purposes. Both their writing and their reading should make students aware of the interactions among a writer's purposes, audience expectations, and subjects, as well as the way genre conventions and the resources of language contribute to effectiveness in writing (College Board, 2010, p. 7).

The goals of the course are diverse because composition is a diverse course at the collegiate level. Composition courses offer students the opportunity to develop writing skills to be applied across disciplines, curriculums, as well as their personal lives, so the focus of AP English Language and Composition is to provide students with the opportunity to learn how to demonstrate awareness of audience and rhetoric purpose (College Board, 2010). The writing skills highlighted in many first-year college English

classes include expository, argumentative, personal and reflective, and analytical compositions that synthesize material from multiple texts, contexts, and experiences. Thus, the AP English Language and Composition course focuses on enabling “students to read complex texts with understanding and to write prose of sufficient richness and complexity to communicate effectively with mature readers” (College Board, 2010, p. 7).

The experience of composing prose, revising work through several draft stages, and learning to be a self-aware writer is essential to creating sophisticated writers. This process can be taught through many methods, and teachers can choose to organize their AP English Language and Composition course in a myriad of ways (thematically, by assignment, genres, study of language, etc.); however, no matter the format, students must be engaging in highly rigorous reading and writing tasks in order to gain the skills necessary to pass the AP national exam (College Board, 2010; College Board 2013).

Students must become critical thinkers who are able to make concrete and metaphorical connections across subject areas while learning proper conventions, including research processes. Conducting research provides students with the opportunity to formulate varied arguments and to provide legitimate proof to support their ideas; it also allows them provide substance to their position in order to give “dialogue rather than diatribe” (College Board, 2010, p. 9).

The conventions of English are also emphasized through this course because the use of grammatical conventions allow students to develop a stylistic maturity in their writing, which is heightened through a wide range of vocabulary, sentence structures, advanced organization, balance between generalization and specific detail, and an

effective use of rhetoric (College Board 2013). Upon completion of the AP English

Language and Composition course, students should have mastered the skills required to:

- Analyze and interpret samples of good writing while identifying and explaining an author's use of rhetorical strategies and techniques;
- Apply effective strategies and techniques in their own writing;
- Create and sustain arguments based on readings, research, and/or personal experience;
- Write for a variety of purposes;
- Produce expository, analytical, and argumentative compositions that introduce a complex central idea and develop it with appropriate evidence drawn from primary and/or secondary sources, cogent explanations, and clear transitions;
- Demonstrate an understanding and mastery of standard written English as well as stylistic maturity in the student's own writing;
- Demonstrate an understanding of the conventions of citing primary and secondary sources;
- Move effectively through the stages of the writing process, paying careful attention to inquiry and research, drafting, revising, editing, and review;
- Write thoughtfully about their own process of composition;
- Revise a work to make it suitable for a different audience;
- Analyze an image as text; and
- Evaluate and incorporate reference documents into research papers (College Board, 2010, p. 10).

These skills are assessed through the AP English Language and Composition national exam, which is administered during a one-day test appointment in mid-May annually.

The AP national exam for the AP English Language and Composition course consists of a 50-55 question multiple-choice section followed by three essays: an analysis, an argument, and a synthesis; it requires students to bring references into their writing and to make connections to the world, history, and their life experiences.

Students' receive a total of 60 minutes for the multiple-choice section and 120 minutes to complete the three essays (College Board, 2013). The score for the multiple choice section is calculated by the number of questions the student got correct, and this section of the test comprises 45% of the student's total score. The essays are graded on a 9-point

rubric, and the combination of the essay scores is 55% of the student's final scores. After all scores have been calculated, the students' receive a score from 1-5 points. A score of a one (no recommendation for credit) or two (possibly qualified) is not passing as these scores denote an inadequate amount of knowledge about language as a result the score indicates that the College Board recommends that the student receive no college credit. A score of three (qualified) is the lowest passing score, and a four (well qualified) or five (extremely qualified) denotes that the student exceeded the expectations set by the course, and therefore the student should be eligible to receive college credit in English (College Board, 2010).

The reading and writing skills taught in the AP English Language and Composition class promote student success in college and the real world because the course teaches students how to read and write critically and effectively. The skills taught in this AP course are a vital part of any language arts class, but the rigor and intense writing focus of the AP course goes much more in depth. Regardless of this advanced content, the course can be taught and implemented through the PBL model since projects allow for group collaboration on writing, research, and revision in order to produce relevant and professional projects. This model of instruction and rigor of course content supports No Child Left Behind as well as the Common Core State Standards push towards real-world success.

No Child Left Behind (NCLB)

The NCLB Act, originally endorsed by President George W. Bush, came into effect in 2001. The law aimed to reform the United States public education system through the implementation of standardized tests designed to ensure that all students left

school with the basic knowledge and skills required to be successful in the real world (Linn, 2003). The law's main focus was on school improvement (especially for economically disadvantaged schools), teacher accountability for student success and failure on standardized tests, a push to close the achievement gap between white, black, and Hispanic students, and for U.S. schools to have a 100% graduation rate by 2014 (U.S. Department of Education, 2001). NCLB also limited local control over the schools by withholding funding for schools that did not comply with the requirements outlined by new law. As a result of NCLB taking effect, schools were pushed to meet the standards on state standardized tests, which measured their Adequate Yearly Progress (AYP) with the school's achievement scores. If a school did not score well on the tests and did not meet AYP for 3 years, the school would be forced to reorganize. The NCLB Act has been revised since 2001, and in 2010 the Common Core State Standards (CCSS) were introduced.

Common Core State Standards (CCSS)

The Common Core State Standards (CCSS) are educational standards sponsored by the National Governors Association (NGA) and the Council of Chief State School Officers (CCSSO) which were endorsed by the U.S. Department of Education aimed at setting a standard of learning for all students who receive a public education. These new standards were adopted by 42 states, including Georgia in 2011, for implementation in the 2012-2013 and 2013-2014 school years (CCSS, 2010). These new standards offered a list of basic academic knowledge and skills that the NGA and CCSSO deemed essential for all students to learn. As a result of this adoption, the district in this study has realigned

the Academic Knowledge and Skills (AKS) (district) standards to meet the requirements of the CCSS.

The adoption of this Common Core also comes with the implementation of a new, high-tech standardized test that all participating schools will implement, starting in 2014, to determine whether students understand and can meet the learning requirements set by the CCSS (Sparks, 2011). This high-tech test will be different from any other test students have ever taken, and according to Arne Duncan, United States Secretary of Education, this test presents “students with realistic, complex performance tasks, immediate feedback, computer adaptive testing, and [they will] incorporate accommodations for a range of students” (Strauss, 2011). However, the question of how to pay for this test has become an issue since many schools do not have funding in their budgets to update their technological capabilities (Sparks, 2011). The estimated cost of getting all schools technologically equipped to handle a test of this technological advancement is about \$25 billion, if New York City’s technology budget of \$857 million for the next 2 years is used as an estimator (Strauss, 2011). The fact that many schools may not be able to keep up on a technological level with the test does not appear to be a factor (Sparks, 2011). Also, it is expected that the tests will be completed in 2014, which leaves little time to examine their validity before students begin to take them.

The CCSS have been adopted and are currently being used in schools across the nation, including the high school in this study. The standards for language arts have been incorporated with the College Board’s standards for the AP English Language and Composition class, and students are taught how to accurately read literature, informational texts, write, speak and listen, understand the foundational skills for reading,

and to use language skills, including the standard conventions of English (CCSS, 2010). These standards are also linked to the district standards and are fully outlined through the AKS for the district being studied. The standardization of public education has been created to ensure that students are learning and that all teachers and schools are doing their part to help all students learn. The CCSS are also tied to another government grant program, Race to the Top, which is being implemented in public schools across the nation and is meant to help schools make reform efforts to meet the standards.

Race to the Top

Race to the Top is a program initiated by Arne Duncan and the U.S. Department of Education designed to encourage school reform through grant money and adherence to the Race to the Top program requirements (McNeil, 2010). The state of Georgia applied for one of the federal grants offered in 2010 and was awarded \$400 million to reform their school structure. Georgia was judged on a 500-point grading system that the Department of Education used to rate schools' reform proposals. The program awarded millions of dollars to districts that met the requirements and followed the reformation suggestions found in the NCLB Act of 2001 (McNeil, 2010).

Georgia's \$400 million award was used to reform the state education policies as well as those of 26 school districts across the state, including the district involved in this study. Georgia should have been at a disadvantage based on the rubric provided by the U.S. Department of Education because there were so few districts (26) participating in the reformation proposal; however, because the 26 districts held 41% of Georgia's public school students, approximately half of the black (53%) and Hispanic (48%) students in 68% of the lowest achieving schools, the number of districts participating was

overlooked (McNeil & Maxwell, 2010). One of the key components of the proposal was about keeping, evaluating, and re-locating great teachers and leaders in the schools (Georgia Department of Education, 2010). The proposal went on to address the implementation of the Common Core State Standards and assessment, a new data system that would aid in the tracking of student progress, intervention models to turn around “our lowest achieving schools,” and a program called STEM (Science, Technology, Engineering, and Mathematics), which focuses on strengthening teachers abilities in the concepts of PBL (Georgia Department of Education, 2010, p. 1). Georgia has until 2014 to spend the money provided in the grant and to adhere to the reformations outlined in the proposal (Cavanagh, Sparks, & Sawchuk, 2010).

Despite the fact that not all schools, districts, and states are participating in the Race to the Top program, all districts who adopted the CCSS are likely to be impacted by the programs funded by Race to the Top, and all schools across the nation will likely, in time, follow some of these ideas (Fletcher, 2010; Cavanagh et al., 2010). One element of the Race to the Top proposal is merit-based pay, and teachers are now beginning to see the merit-based pay system being implemented (Cavanagh, 2010).

The intent of laws reforming education, stated by the U.S. Department of Education as:

Adopting standards and assessments that prepare students to succeed in college and the workplace and to compete in the global economy, Building data systems that measure student growth and success, and inform teachers and principals about how they can improve instruction, Recruiting, developing, rewarding, and retaining effective teachers and principals, especially where they are needed most, and Turning around our lowest-achieving schools. (U.S. Department of Education, 2010, p. 1)

Teachers and schools have responded to these laws by providing assessment preparation in order to help students succeed on standardized tests. However, there are many kinds of

standardized tests, including voluntary standardized tests, and students who attend the school in this study are increasingly willing to take tests like the AP exams to earn college credit.

PBL and Standardized Test Performance

The effect of PBL classes on students' standardized test performance does not have a dearth of published research. However, since the national standards movement is so prevalent and the passing of the AP national exam is important to the students who choose to take it, the effect of PBL on student standardized test achievement is an area of interest for research. This literature review has outlined what PBL is, how it works, how technology is an important tool, how the national standards movement and standardized testing have been implemented on a national level, what the AP program is and why the national exam is important for student success, and has shown that there is a lack of research in the areas being examined in this study. The effects of PBL on students' achievement on standardized tests is an important aspect of deciding whether to begin or continue a PBL program in education, and this question is driven by the standards and standardized tests that assess how well students have *learned*.

PBL in Language Arts and AP Language Composition

PBL can motivate students; however, little research exists concerning its impact on the achievement of high school students who are learning language arts skills (Blumenfeld et al., 1991). The skills taught in a language arts class include reading, writing, speaking, listening, and viewing skills, which encompass all elements of language, and these elements are an essential part of the AP English Language and Composition guidelines (CCSSO & NGA Center, 2010; College Board, 2013). These

types of skills are important for PBL students to master in that they are a critical part of creating projects and being successful later in life. Projects contain an abundant amount of reading as students immerse themselves in research in order to become experts on the project's topic. Writing skills are essential because students must write up their findings as well as code and content for websites, and must create other written products to publish the information they discovered. Speaking, listening, and viewing become central components of the product creation for the project as well as the group's product presentation. Students are forced to learn effective communication strategies as they work with their group members in order to make the project run smoothly and effectively. Formal speaking skills are needed to plan and execute the group's presentation of their product to the class and community in a professional manner. Because the field of language arts is so intrinsic to the PBL model, it is important to learn how the model affects students' propensity to learn these skills and achieve competence in these areas of learning.

The Lab has chosen to focus on these high-level language arts skills by introducing AP-level course work. While there is little known research on the effectiveness of teaching AP English Language and Composition through PBL, the embedded nature of language arts in PBL appears to be a logical way to help juniors in high school refine their writing and reading skills. The refinement of these skills is necessary for students to be effective problem solvers and communicators, and these are tools needed in the PBL classroom as well as the real world.

Summary

The purpose of the study is to determine student achievement on the AP English Language and Composition national exam as well as to compare the passing rates of students who learned the content through PBL and traditional learning methods. Since more research is needed on the use of PBL and its impact on student achievement as measured by standardized testing, including AP testing, the effectiveness of the Lab class and the methodology of the teachers who designed the Lab program should be analyzed. The answers to the proposed research questions are vital to the Lab's development and growth. The statistical analysis of the AP national exam test scores and how these scores relate and compare PBL class scores to the traditional class scores is information that is essential in understanding how to help students be academically successful in a language arts classroom.

CHAPTER 3: METHODOLOGY

Overall Approach and Rationale

The present study employed a quantitative quasi-experimental research design in order to determine the effectiveness of the PBL and traditional methods in teaching AP English Language and Composition standards by examining students' achievement on the AP English Language and Composition national exam. The participant data were analyzed utilizing descriptive statistics, a Pearson's Correlation test, and a Chi-Square test in order to answer the proposed research questions. The data were scrubbed in order to provide student anonymity as well as to obtain the largest participant pool possible for this study.

Context and Access

This study took place in a large public high school in a metro area, northeast of Atlanta, GA, and data were collected after the target population took the AP English Language and Composition national exam on May 10, 2013 (College Board 2013). The exam results were reported to the high school in July 2013. The researcher was provided with scrubbed data, including paired predictive and AP exam scores, for each student in the target population who elected to take the AP exam (College Board, 2013). Access to this data was guaranteed by the school administration which, because the school is interested in the results of the study as well as how effective the PBL class is at preparing students for the AP exam, was willing to scrub the data in support of this study.

Setting

Nation

This study was set in the United States, which has adopted several nationally funded programs in the past 15 years to help the public school system do a better job of educating children. With the adoption of NCLB, the CCSS, and Race to the Top, there is now more emphasis on high stakes standardized testing. Therefore, it is important to examine how teachers can continue to effectively differentiate instruction within the standardized curriculum.

State

The Georgia Board of Education has implemented standardized testing to meet the requirements set forth by the national legislation; these tests, for grades 9-12, include End of Course Tests, which account for 20% of a student's final grade in eight core subjects (multiple choice), Georgia High School Graduation Test in four core subjects (multiple choice), and the Georgia High School Graduation Writing Test (persuasive essay). In order to graduate high school in Georgia, students must pass at least one multiple-choice exam in the four core subjects (English, math, science, and social studies) as well as the Georgia High School Graduation Writing Test (Georgia Department of Education, 2010). These tests are implemented throughout high school, and students are prepared for them through direct instruction, online tools, practice problems, and other teaching methods determined by teachers and individual school districts (Georgia Department of Education, 2010).

District

County Public School District, where this study takes place, is one of the largest in the state and served more than 165,000 students during the 2012-2013 school year (GCPS, 2013). This district is set within a suburban area outside of Atlanta in the state of Georgia. It has developed its own standards known as the Academic Knowledge and Skills Curriculum (AKS), which it based on the CCSS, and which goes more in depth to guide teachers in developing an appropriate curriculum for their students (GCPS, 2013). The district monitors teachers' implementation of the AKS through County Interim tests in all core subjects (GCPS, 2013). The district schedules the County Interim tests and students are tested in each subject a total of five times per school year. The county then uses the data collected from these tests to determine which schools are struggling to meet the standards, which schools are meeting the standards, and which schools are exceeding the standards set forth by the AKS (GCPS, 2013). Field testing for the County Interim tests began in 2010, and the district has not yet informed the schools of what it is planning to do with the data. However, they have stated that the student test data from the County Interim tests will be used in conjunction with the new teacher evaluation system that will be implemented during the 2013-2014 school year (GCPS, 2013).

Writing is also an important skill that the district has highlighted with the implementation of the Gateway Writing Test for science/language arts and social studies/language arts (GCPS, 2013). Every sophomore student in County takes this document-based assessment, and it is a graduation requirement for the district (GCPS, 2013). The students are given two hours in a standardized testing environment to answer a prompt, which gives a general topic on either science or social studies (depending on

which testing day it is) in addition to four to seven documents that provide more information about the given topic (GCPS, 2013). The prompt asks students to synthesize their prior knowledge with the four to seven documents they are given in order to show their mastery of science/language arts content and social studies/language arts content (GCPS, 2013). Students are not aware of the specific topic before testing, but they do know that the science prompt will be on something they learned in biology, and the social studies prompt will cover something from their world history course (GCPS, 2013). Students are expected to have prior knowledge about the topic as well as knowledge regarding formal writing conventions. Student essays are graded using a rubric that evaluates their ability to write with focus and development, organization, fluency, and proper conventions (GCPS, 2013). The district's testing requirements are stringent and effective at teaching students how to take these kinds of assessments (GCPS, 2013).

Area

The town where the high school being studied is located has been named one of the 10 best cities in the United States as well as one of the best cities to raise a family in (Benzie, 2013). The majority of students in this area come from middle to upper class homes, and there is very little transience in the community (Benzie, 2013). The houses surrounding the school are primarily new and were built over the past 20 years; they are well kept with lawns mowed and flowers out front. Home values in the area range from \$200,000-2,000,000 (Benzie, 2013). The school has been part of the community for over 50 years and has become a hub for community activities and support (GCPS, 2013).

School

North High School, which is divided among several buildings erected over the past 50 years, has a college campus feel as students travel to class through outdoor breezeways (GCPS, 2013). Construction was being conducted on a new three-story building in order to replace the older wings of the school at the time of the researcher's visit. The grounds are clean and the campus was open to registered visitors (GCPS, 2013). The school's population of approximately 2,600 students was composed of White (58%), Asian/Pacific Islander (16%), Black (13%), and Hispanic (13%) students (Great Schools, 2011). This school had test scores in the 90% range for all state and county standardized tests, following its mission that "All students can learn at high levels" and "All students can be leaders." The parents in the community were very involved in their children's education (Great Schools, 2011). The students attending this school have a great sense of pride and spirit and appeared to enjoy attending classes where they were safe and held to a high standard of learning (GCPS, 2013).

North High School provides over 30 Advanced Placement (AP) course options for students in order to give students an opportunity to learn at high levels in every subject (GCPS, 2013). The open door policy for entering an AP course allows any student in the school to enroll in an advanced course if the student wishes to take on the challenge of AP. Students are registered for classes each year by their teachers. The teachers for each subject are responsible for registering their students for the next content course in that subject, and each teacher gives students course recommendations for the following year based on students' academic performance in their course. After the teacher and student discuss the course options, the teacher places the student in the course they feel is most

appropriate for that student, but students are able to change their schedule, if they wish, by speaking to their counselor (GCPS, 2013). This policy puts the choice to take an advanced course in the student's hands, creating an open door for all students who wish to take an AP class.

Classrooms

The Lab allows for the 60 enrolled students to have accessibility to technology and space, which are two things that assist students in their quest for learning under the PBL method (Boss & Krauss, 2007). These students have a variety of areas to work in, which include two classrooms (containing an opened dividing wall) with laptops, a desktop computer lab, a hallway, or they could (with a pass) travel to another room in the school as deemed appropriate for their project. The classrooms and computer lab were both interior rooms with no windows. The classrooms contained tables for students to work with their group members at and the walls were filled with old projects from previous years and units. The florescent lighting in the computer lab was completely turned off, and the only light in the room came from four standing floor lamps and 30 computer monitors. The walls of the room had little on them other than 8" x 11" signs that read: "No Food or Drink Permitted in the Lab" and four posters that outlined how to use various Microsoft Office programs.

The Lab rooms were filled with the constant chatter of the 58 students since collaboration was needed for projects; there was also the sound of clicking keyboards as students worked. Students were free to enter and leave the workspace as needed to take a break or eat a snack. They were allowed to be on their phones and email accounts if they were being used to work on anything project-related. The environment was open for the

students as long as they were on task and working. The students were also allowed to talk to each other and collaborate to work out kinks in their project plan as needed. All students were able to work at their own pace and worked in ways that were more productive for them with minimal interference from teachers who were available for questions. Teachers circulated through all work areas to ensure students were working and redirected them if they were not.

The traditional students had class with one of three teachers in one of three classrooms, all of which were typical classroom sizes and did not have technology readily accessible. Each of the classrooms housing the traditional classes was decorated to show the teacher's individual style. There were posters on the walls showing language arts terms, books were available for students to read, and there were personal pictures and diplomas hanging on the walls. Two classrooms were arranged in rows of 32 desks facing the white board, and the third, the PBL classroom, had only one desk, the teachers, with six large tables seating five students at each. Although, the teaching styles of each teacher were different, all covered the same texts (*The Things They Carried* by Tim O'Brien, *The Catcher in the Rye* by J.D. Salinger, *The Crucible* by Arthur Miller, *Devil in the White City* by Erik Larson, *A Farewell to Arms* by Ernest Hemingway, *Angela's Ashes* by Frank McCourt, *The Great Gatsby* by F. Scott Fitzgerald, *The Adventures of Huckleberry Finn* by Mark Twain, *Incidents in the Life of a Slave Girl* by Harriet Jacobs, and *The Scarlet Letter* by Nathaniel Hawthorne) and added different supplemental reading as needed.

Participants

The entire target population of AP English Language and Composition students who elected to take the AP national exam at North High School participated in this study

(Creswell, 2005; Fraenkel & Wallen, 2009; Wiersma & Jurs, 2009). Because the researcher was able to obtain scrubbed data, the entire target population was included in the study. The target population included 146 gifted, 102 non-gifted, and 4 special needs students. The exact socioeconomic status of the participants was 6% of students receiving free and reduced lunch where as the school's total population of students receiving free and reduced lunch was 16% (Great Schools, 2011). There are no specific precautions being taken to protect the participants because the data were scrubbed of all identifying information prior to the researcher accessing it.

The treatment group of 41 juniors (24 boys and 17 girls; 34 White, 1 Black, 0 Hispanic, and 6 Asian) was selected because they were students in the Lab who took the AP English Language and Composition national exam in May 2013. All 41 students volunteered to be in the PBL class during the 2012-2013 school year, which provided an integrated curriculum of AP English Language and Composition, AP United States History, and Advanced Web Design, and were selected as participants. The study was officially exempted from the IRB purview because it provided anonymity to the participants; therefore participants were not required to give consent or complete any task other than take the voluntary AP national exam, which they elected to take prior to the start of the study.

The control group of 211 juniors (97 boys and 114 girls; 133 White, 14 Black, 12 Hispanic, and 52 Asian) was selected because they chose to enroll in a traditional section of AP English Language and Composition offered at North High School during the 2012-2013 school year; they also elected to take the AP English Language and Composition national exam in May 2013 prior to the commencement of this study. The students in this

group, who chose to enroll in the traditional AP course, were taught by one of three different teachers. The teachers of the traditional AP sections were a part of a course team that met in a professional learning community (PLC) frequently throughout the school year in order to share ideas for best practices.

Methods and Instruments

Data sources

All data for this study were provided by the high school administration and were scrubbed by the AP Coordinator at North High School of any identifying information prior to the researcher gaining access to it. The data included predictive score data taken from the PSAT test, which was administered on October 19, 2011, paired with actual score data from the AP English Language and Composition Exam. Data were analyzed by the researcher to determine the presence of a correlation between the teaching methods used (PBL classes versus traditional classes) and student achievement on the AP English Language and Composition Exam. The predictive data for each student were derived from the College Board's chart, which outlines student success on AP exams based on their performance on different subject tests on the PSAT. The chart provides a range of PSAT scores and the correlation those scores have with success on the AP exam for a certain subject (Ewing et al., 2006). These predictive scores allow the high school being studied to determine teacher and student success on the exam because there are no prerequisites for students who wish to take an AP class at North High School. The AP English Language and Composition scores were paired with each student's predictive score in order to determine whether a significant difference existed between the scores of

students who enrolled in a traditional class versus the scores of students who enrolled in the PBL class.

Instruments

The instruments used in this study to measure student achievement were the PSAT and Advanced Placement Language and Composition national exam. Both instruments were developed by the College Board and have been tested over the past 80 years for validity and reliability. They are both reliable measures of achievement that measure the mastery of various skills (College Board, 2010; College Board, 2013).

The PSAT measures student achievement in math, reading, and writing, and is an indicator of student success on the SAT (College Board, 2012). The PSAT has been administered to students since the mid 1900s, and it has been deemed a valid and reliable test measuring students reasoning skills and language proficiency (College Board, 2012). More specifically, the PSAT measures students' knowledge in math and language including reading and writing. The College Board has found that the PSAT is an indicator of AP success, so scores are examined to predict student success on AP tests (Ewing et al., 2006). The College Board has also found that the PSAT is an indicator of AP success (Ewing et al., 2006).

The AP English Language and Composition national exam measures student achievement in reading comprehension and modes of writing. High school teachers, college professors, and experts in the field of English education developed this instrument to measure students' language proficiency (College Board, 2003; College Board, 2010; College Board, 2013). The test has been administered for over 50 years and has yielded valid and reliable data indicating the effectiveness of the exam's ability to

measure students' understanding of language (College Board, 2010; College Board, 2013). Although there has been a dearth of research on the reliability of this test as well as the validity of the results, all studies have concluded that the AP English Language and Composition national exam produces data that supports high school students earning college credit if they earn a score of a three or higher (College Board, 2010; College Board, 2013).

Data Collection Procedures

Data (predictive and AP Exam scores) were organized, paired, and scrubbed by the AP Coordinator at North High School for each student who elected to take the AP English Language and Composition national exam. Students' predictive mean scores were compared to their mean scores from the 2013 Advanced Placement test in order to determine whether a difference existed.

Data Analysis

The participants' scores from the PBL classroom (the treatment group) and the traditional classrooms (the control group) were compared to determine whether a correlation existed between the participants' predictive scores and actual scores as well as each group's actual scores on the AP English Language and Composition national exam. The analysis for this study was minimal as a result of the design, but included the use of the Statistical Package for the Social Sciences (SPSS) software program, which helped to analyze descriptive statistics and provided results for both the Pearson's Correlation test and the Chi-Squared test. SPSS is a data analysis software program that allowed for the input of the participants' predictive and actual scores for the AP English Language and Composition national exam in order to determine whether there was a statistical

difference present in the score data. The descriptive statistics and Pearson's Correlation test were used in order to conduct an analysis of descriptive and correlational data found between the two participant group scores and to determine whether the *t*-distribution was normal, which is determined by the degree of freedom (Wiersma & Jurs, 2009). All scores were entered into SPSS and were analyzed to determine possible relationships between each group's scores. These scores were analyzed specifically for descriptive statistics and correlational relationships within and between the control and treatment groups through a Pearson's Correlation test. However, since all data were scrubbed prior to the researcher having access to them, it was not possible to analyze subgroups.

Descriptive statistics provided the researcher with information on the degrees of freedom, skewedness, kurtosis, mean, median, and the standard deviation of scores. The comparisons made between the two sets of test scores were used to determine whether a statistical difference existed. SPSS software was used in order to determine any correlational differences. These data were analyzed to determine the effectiveness of PBL in the AP English Language and Composition classroom in relation to the effectiveness of the traditional classroom at preparing students for success on the AP national exam.

Assumptions of the Study

This study makes several assumptions, such as participant anonymity, the idea that PBL is a valid method of teaching and learning, and that students who took the AP English Language and Composition exam applied themselves both in class and on the assessment. Participant anonymity was secured by obtaining scrubbed data in an attempt to eliminate any identifying information on the participants. The assumption about the validity of PBL as a teaching and learning method was addressed by the literature review,

which presented extensive arguments on the success of PBL. Finally, the assumption that students wanted to do well in class and on the AP national exam is justified by the test itself because students typically take the exam to earn college credit. Thus, it can be assumed that students would not elect to take the exam if they did not want to do their best.

Limitations of the Study

Design Validity and Reliability

The validity and reliability of this study's design hinges on the validity and reliability of the instruments and analysis that was conducted. While the College Board has tested the instruments, they are imperfect and as such can be considered a limitation to this study (College Board, 2013). As a result, the analysis of the scores generated by the instruments also provides a limitation in that the predictive scores are not same as the pretest; therefore, this study's design is imperfect.

Instruments

The design of this study compared predictive and actual scores on the AP English Language and Composition exam. The predictive data were provided by students' achievement on the reading and writing sections of the PSAT. The College Board has conducted several studies on the reliability and validity of using predictive scores in determining student success on the AP exam, and all studies show a correlation between the scores (College Board, 2003; Ewing et al., 2006).

The College Board graders assess students' scores on the AP national exam during one week in June. Scorers are chosen from high school teachers, college professors, administrators, and test creators who assess students' national exam essays

and score each essay to determine whether students will receive college credit for an English course (College Board, 2010). This method of scoring has been employed for over 50 years and has been deemed as the most reliable method of scoring for an assessment of this type. Two scorers check the validity of the scores in order to determine the final score on each essay, and if the two scorers do not agree, a senior scorer assesses the paper to determine the score (College Board, 2010). This process attempts to provide students' essay scores a valid and reliable measure of what they know about reading advanced texts and writing advanced essays in AP English Language and Composition. Despite this process, limitations of this study still exist due to the test administration and assessment being out of the researcher's control.

Research Design. As determined by the research questions, the design of this study called for an analysis of the predictive scores' relationship to each participant group's actual scores, as well as an analysis of the treatment and control groups' relationships to each other's scores. Because there was no way for the researcher to complete a valid and reliable pretest graded by the College Board graders, the most valid and reliable score to compare the actual score with was the predictive test data provided by students' PSAT reading and writing scores (Ewing et al., 2006). This design created a limitation for the study because student improvement cannot truly be measured by comparing predictive and actual score data, but there was no possible pre-test that could be given and graded by the College Board readers. This design provides a limitation to the study since student improvement cannot truly be measured by comparing predictive and actual score data. As a result, this study was limited in its design since a pre-test was not a viable option.

Teacher as Researcher

The present study was limited by the researcher's involvement with the participants as their teacher. Although applied research is an appropriate research method, there is a certain bias that comes with a teacher researching his or her own students (Creswell, 2005). However, since this study was quantitative and no identifying data were collected, this limitation did not affect the quality of the study. Also, in order to address possible bias due to the fact that the researcher was also the teacher of the students in the treatment group the data collected were scrubbed before the researcher received them and the researcher did not administer the AP English Language and Composition national exam. Finally, despite the researcher being the teacher of the course, the researcher did not assist in registering students for the AP English Language and Composition national exam. All students were given the opportunity to sign up for the exam at a Guidance Office table during their lunch or by mailing in their information to the College Board. Therefore, the possible bias created by the teacher also being the researcher was addressed by the design of the study.

School Policy

The high school studied has an open door policy regarding student enrollment in AP classes, which also created a limitation for this study. The school's policy does not require students to apply for an AP class or to meet any aptitude requirements for entry whereas many schools require students to qualify to take an AP course. As a result of this policy some students who enroll in an AP class at North High School are not successful on the AP national exam. This is due, in part, to the students not being able to meet the rigor of the assessment under the time constraints required by the College Board as well

as their aptitude. This open door policy was a limitation for the study since many of the students enrolled in the PBL course were not typical candidates for an AP course, and as such their passing rates and scores could have been affected.

Students Enrolled in PBL

An additional limitation of the study involved the percentage of students enrolled in the PBL class who elected to take the AP English Language and Composition exam (67%). The reasons behind this varied from the cost of the exam, to the student's belief that they would not pass the exam, to the students' not wanting to take multiple AP exams. Their unwillingness to take the test limited the score generalization.

Participant Data

One strength of this study was the use of scrubbed data which allowed the researcher to use all available data since consent and assent were not required. However, this study was limited by only examining the statistical relationships between test scores while excluding an examination of participants' gender and identification as gifted and talented. The exclusion of these factors as well as others factors such as student, parent and teacher perceptions, the examination of test content, testing environment, preparation activities for each group of students, teaching styles, test consequences, socioeconomic status, and cultural perspectives limits the scope and generalizability of the study. Although it would have been beneficial to have been able to examine the effects of other factors, because the study was able to use all score data from the AP English Language and Composition national exam, the researcher was able to use more complete data to determine a correlation between the learning methods and achievement.

Summary

The methodology and research design of this study were chosen due to the researcher's determination that they were the most effective methods of testing the research questions. The setting, participants, assumptions, and limitations of the study were taken into account when developing the research design, and, as such, assisted with the development of the study's theoretical framework and in turn the methodology. This design was implemented in order to analyze the relationships among participants' predictive and actual scores on the 2013 AP English Language and Composition national exam.

CHAPTER 4: RESULTS

The purpose of the study is to determine student achievement on the AP English Language and Composition national exam as well as to compare the pass rate of students who learned the content through PBL and traditional learning methods. The data were collected through predictive score data and AP national exam scores (College Board, 2010; Ewing et al., 2006). The study considered two different population groups. These included the sample of students who had experienced PBL instruction and students who experienced traditional instruction prior to taking the AP English Language and Composition national exam. Statistical analyses of the data were conducted using a Pearson's correlation test to determine the correlation between the students' achievement on the 2013 AP English Language and Composition national exam and the predictive score data from the PSAT. In line with this, this study was guided by the following research questions:

1. How does the achievement of PBL and traditional students on the 2013 AP English Language and Composition national exam correlate to the students' predictive score data from the PSAT?
2. Is there a correlation between the predictive data and the participants' 2013 AP English Language and Composition exam scores?

3. What is the PBL students' passing rate on the AP English Language and Composition exam?
 - a. How does this compare to the passing rate of students in the traditional AP English Language and Composition course?

This chapter begins with descriptive statistics of the study variables to summarize the data on the predictive and actual scores of the AP English Language and Composition exam. Following this, results of the Pearson's correlation test to address the research questions are presented.

Descriptive Statistics of Study Variables

The descriptive statistics of the study variables are presented in this section. The descriptive statistics included the statistics of mean and standard deviation. The descriptive statistics of the study variables of the predictive score and the actual score in the 2013 AP English Language and Composition exam for both the population of students who experienced PBL instruction and students who experienced traditional instruction prior to taking the AP English Language and Composition national exam were obtained and then compared. Table 1 summarizes the descriptive statistics of the study variables.

The mean comparison showed that the students who had only experienced the traditional classes had higher predictive scores ($M = 3.66$) than the actual AP exam scores ($M = 2.92$). The same observation was determined in the comparison of the predictive and actual scores of the students who experienced the PBL classes. The students who experienced the PBL classes also had higher predictive scores ($M = 3.47$) than the actual AP exam scores ($M = 2.34$). In terms of the difference of the predictive and actual scores

between the two student groups, students who had experienced the traditional classes had higher predictive ($M = 3.66$) and actual scores ($M = 2.92$) than the predictive ($M = 3.47$) and actual scores ($M = 2.34$) of students who had experienced the PBL classes. Based on the mean comparison, the students who had experienced the traditional classes only had higher scores in the 2013 AP English Language and Composition exam than those who were enrolled in PBL classes.

Table 1

Descriptive Statistics of Predictive and Actual Score in 2013 AP English Language and Composition Exam

	N	Minimum	Maximum	Mean	Std. Deviation
Predicted Score (Traditional Students- Control)	211	1.6	5	3.66	0.87
Actual Score (Traditional Students- Control)	211	1	5	2.92	1.08
Predicted Score (PBL Students- Treatment)	41	2.1	5	3.47	0.73
Actual Score (PBL Students- Treatment)	41	1	5	2.34	1.09

Analysis and Results

Results of Pearson's Correlation Test

A Pearson's correlation test was conducted to determine the correlation between the predictive score and the actual scores of the participants' 2013 AP English Language and Composition exam scores. A 0.05 level of significance was used in the hypothesis testing. The Pearson's correlation test determined that a significant correlation was present once the probability value of significance (sig.) was less than or equal to the level of significance value. The Pearson's correlation test also investigated the degree of the

correlation (positive or negative) and the strength of the correlation. The results of the Pearson's correlation test are summarized in Table 2.

The results in Table 2 revealed a significantly positive relationship between the predictive data and the actual 2013 AP English Language and Composition exam scores of the students who had experienced the traditional classes only ($r = 0.73, p < 0.001$). The strength of the correlation was strong because the r -correlation coefficient was greater than 0.7. This suggested that the actual score of the students who experienced traditional instruction prior to taking the AP English Language and Composition national exam would increase if the predictive scores also increased. It would also decrease if the predictive scores also decreased. Conversely, there was also a significantly positive relationship between the predictive data and the actual 2013 AP English Language and Composition exam scores of the students who had experienced PBL classes ($r = 0.61, p < 0.001$). However, the strength of the correlation was only moderate because the correlation coefficient was less than 0.7. This suggested that the actual scores of the students who experienced PBL instruction prior to taking the AP English Language and Composition national exam would increase if the predictive scores also increased. It would also decrease if the predictive scores decreased.

Also, the comparison of the correlations of the predictive and actual scores of the AP English Language and Composition exam between the students who experienced PBL instruction and students who experienced traditional instruction prior to taking the AP English Language and Composition national exam showed that the positive correlation in students who experienced traditional instruction ($r = 0.73$) was stronger than students who experienced PBL instruction ($r = 0.61$). This suggested a higher degree

of correlation between the predictive and actual scores of the traditional AP English Language and Composition exam as compared to the correlation between the predictive and actual score of the AP English Language and Composition exam of the students who experienced PBL instruction prior to taking the AP English Language and Composition national exam. The chances that the actual score of the students who experienced PBL instruction prior to taking the AP English Language and Composition national exam would increase if the predictive scores also increased was higher for students who experienced traditional instruction prior to taking the AP English Language and Composition exam.

Table 2

Pearson's Correlation Results between Predicted Scores and Actual Scores of AP English Language and Composition Exam

	N	Correlation	Sig.
Predicted Score & Actual SCORE (Traditional Students)	211	0.73	0.00
Predicted Score & Actual SCORE (PBL Students)	41	0.61	0.00

Passing Rate on the 2013 AP English Language and Composition Exam

The scores on the 2013 AP English Language and Composition national exam have a score range of 1 to 5. A score of a one (no recommendation for credit) or two (possibly qualified) were considered failing scores. Passing scores included three (qualified), four (well qualified), and five (extremely qualified). Table 3 summarizes the scores on the 2013 AP English Language and Composition national exam for both samples of students who experienced PBL instruction and students who experienced

traditional instruction prior to taking the AP English Language and Composition national exam.

A comparison was conducted using the percentage breakdown because the number of students who experienced PBL instruction ($n = 41$) and the number of students who experienced traditional instruction ($n = 211$) were unequal. Based on the percentage breakdown of scores, students who experienced PBL instruction had a lesser passing rate (34.1%) when combining the percentages of the passing scores of three to five as compared to the passing rate of students who experienced traditional instruction (63%). These scores suggested that the students who experienced traditional instruction prior to taking the AP English Language and Composition national exam had better performance in terms of passing rate as compared to students who experienced PBL instruction. Also, it was observed that the scores of students who experienced traditional instruction had the highest frequency in the score of three (36.5%), the lowest passing score, while the scores of students who experienced PBL instruction had the highest frequency in the score of two (46.3%), the failing score of “possibly qualified.”

Table 3

Frequency and Percentage Breakdown of Actual Scores on AP English Language and Composition Exam

	Frequency	Percent
Actual SCORE (Traditional Students- Control)		
1	16	7.6
2	62	29.4
3	77	36.5
4	35	16.6
5	21	10.0
Actual SCORE (PBL Students- Treatment)		
1	8	19.5
2	19	46.3
3	9	22.0
4	2	4.9
5	3	7.3

A Chi-Square test was conducted to determine whether a statistically significant difference was present between the percentage of the national exam passing rate for students who experienced PBL instruction when compared to students who experienced traditional instruction in AP English Language and Composition. A level of significance of 0.05 was used in the statistical testing. A statistical difference was noted if the p -value was less than the level of significance value of 0.05. The Chi-square test result is summarized in Table 4. The results of the test showed that the scores of the AP English Language and Composition exam between the students who experienced PBL instruction and students who experienced traditional instruction prior to taking the AP English Language and Composition national exam were significantly different ($\chi^2 (128) = 269.48; p < .01$). This was because the p -value was less than 0.05. Thus, there was a

higher passing rate of students who experienced traditional instruction in the AP English Language and Composition national exam compared to the passing rate of students who experienced PBL instruction, and this difference was statistically significant.

Table 4

Chi-Square Results of Different of Actual Scores of AP English Language and Composition National Exam

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	269.48	128	<0.01

The scores in the 2013 AP English Language and Composition national exam were recoded to dichotomous score groups of pass and fail. Table 5 summarized the dichotomous scores on the 2013 AP English Language and Composition national exam for both samples of students who experienced PBL instruction and students who experienced traditional instruction prior to taking the AP English Language and Composition national exam. Based on the percentage breakdown of scores, students who experienced traditional instruction had a greater passing rate (65.93%) when compared to the passing rate of students who experienced instruction (37%).

Table 5

Frequency and Percentage Breakdown of Dichotomous Scores on AP English Language and Composition Exam

		Actual SCORE (Traditional Students- Control)	Actual SCORE (PBL Students- Experimental)	Total
Dichotomous SCORE	Fail	78 (37%)	27 (65.9%)	105 (41.7%)
	Pass	133 (63%)	14 (34.1%)	147 (58.3%)
Total		211	41	252

A Chi-Square test was conducted to determine whether the percentage comparison of the dichotomous scores on the AP English Language and Composition national exam between the students who experienced PBL instruction and students who experienced traditional instruction prior to taking the AP English Language and Composition national exam showed a statistically significant difference. A level of significance of 0.05 was used in the statistic testing. The Chi-square test result was summarized in Table 6. The results showed that, whether the students passed or failed the AP English Language and Composition exam, the difference between the students who experienced PBL instruction and students who experienced traditional instruction prior to taking the AP English Language and Composition national exam was significantly different statistically ($\chi^2 (1) = 11.79; p < .01$).

Table 6

Chi-Square Results of Different of Dichotomous Scores of AP English Language and Composition national exam

	Value	D f	Asymp. Sig. (2- sided)
Pearson Chi-Square	11.79 ^a	1	<0.01

Summary

For research question one and two, the results of the Pearson's correlation test showed a significant correlation between the predictive data and the participants' 2013 AP English Language and Composition exam scores. A strong positive correlation was found between the predictive data and the participants' 2013 AP English Language and Composition exam scores for the scores of students who experienced traditional classes only. A moderate positive correlation was found between the predictive data and the participants' 2013 AP English Language and Composition exam scores for the scores of students who experienced PBL classes. The comparison of the correlations of the predictive and actual score of the AP English Language and Composition exam between the students who experienced PBL instruction and students who experienced traditional instruction prior to taking the AP English Language and Composition national exam showed that the positive correlation in students who experienced traditional instruction were stronger than students who experienced PBL instruction.

For research question three, the results of the frequency and percentage analysis showed that the passing rate of students in the traditional AP English Language and Composition course were higher as compared to the passing rates of PBL students based on the results of the 2013 actual score of the AP English Language and Composition

exam. The results showed that the students who enrolled in a traditional AP English Language and Composition course had better performance on the Advanced Placement (AP) test as compared to students who took a PBL course. The difference was significant based on a chi-square test of difference.

CHAPTER 5: SUMMARY AND CONCLUSIONS

This chapter presents a summary of the findings followed by a discussion of the implications these findings have on the use of PBL in an AP English Language and Composition classroom. Limitations and recommendations for further research are also included in this chapter.

Discussion of Findings

The purpose of the study is to determine student achievement on the AP English Language and Composition national exam as well as to compare the success of students who learned the content through PBL and traditional learning methods. In order to achieve this purpose, this study addressed three research questions:

1. How does the PBL and traditional students' achievement on the 2013 AP English Language and Composition national exam correlate to their predictive score data?
2. Is there a correlation between the predictive data and the participants' 2013 AP English Language and Composition national exam scores?
3. What is the PBL students' passing rate on the AP English Language and Composition national exam?
 - a. How does this compare to the passing rate of students in the traditional AP English Language and Composition course?

PBL and Traditional Learners Predictive and Actual Score Correlation

Analyzing the relationship between students' predictive and actual exam scores was essential to examining the effectiveness of each teaching and learning method on

student achievement on the AP English Language and Composition Exam. Therefore, determining whether a correlation existed between the two scores was needed to compare the two methods of teaching and learning to provide a baseline for the analysis of each teaching method's effectiveness on student achievement.

Question 1. The study showed that a correlation does exist between students' predictive and actual scores. When examining the descriptive statistics of each participant group's scores and also running a Pearson's Correlation test, research question one was addressed. The analysis of the data showed a positive correlation between the predictive and actual scores for both PBL and traditional students and that the predictive scores were higher than the students' actual scores for both groups. The analysis also showed that the traditional students' predictive and actual scores uncovered a stronger correlation than the PBL scores, which only revealed a moderate correlation. This may be due in part to the discrepancy in sample sizes (traditional 211; PBL 41); however, both groups' exhibited predictive and actual scores which were aligned, meaning the predictive scores were correlated to student achievement on the AP English Language and Composition national exam.

The strong correlation found in the traditional student's scores showed that the probability of their actual score increasing if their predictive score increased was higher than the chance of PBL students' actual score increasing with an increase of their predictive score. The large sample of traditional students (211) may be the cause of this strong correlation since a more accurate depiction of how traditional students would typically perform on the AP national exam for English Language and Composition was uncovered by the data. This large sample size provides concrete support for the

effectiveness of the traditional method of teaching AP English Language and Composition.

The moderate correlation found within the PBL group may be due to the small number of participants (41 students) who took the AP national exam. The sample size may not have been large enough to determine the strength of the correlation between student's predictive and actual scores because there was not enough data. However, the moderate correlation between the scores does show that some students in the PBL class were able to achieve an actual score on the AP English Language and Composition national exam that was similar to, but slightly lower than, their predictive score. The moderate correlation (0.61) was only 0.09 away from being considered a strong correlation (0.70), so there is some indication that the correlation provides sound evidence that PBL may be effective for teaching AP English Language and Composition to at least some students. Nevertheless, the need for a larger sample of PBL participants leaves questions that could only be answered by gathering more data on the use of PBL in an AP course.

Question 2. Research question two sought to examine the correlation between the predictive and actual scores of all participants in order to determine the relationship of the scores regardless of the type of course a student took. As the data show, the results of the Pearson's Correlation test yielded a strong correlation between traditional students' predictive and actual scores and a moderate correlation between the PBL students' predictive and actual scores. This shows the reliability of the predictive scores and validates this study's use of the predictive scores to analyze the scores of the treatment and control groups to determine the effectiveness of PBL in preparing students for the AP

English Language and Composition national exam. While only a moderate correlation was found (0.61) within the PBL group, this was close to the 0.7 threshold of a strong correlational relationship. Again, the findings may have been more conclusive with a larger sample size, and as a result there are unanswered questions about the effectiveness of PBL in an AP English Language and Composition course. The data does, however, show that there is a correlation between the predictive scores derived from the PSAT and actual scores from the AP English Language and Composition national exam which is strong overall. As a result, the predictive score can be used to measure the effectiveness of each learning method in preparing students for the AP English Language and Composition national exam.

PBL and AP English Language and Composition Exam Achievement

The national passing rate for the 2013 AP English Language and Composition national exam was approximately 53%, which shows the rigor of the test and puts into perspective the passing rate of the combined PBL and traditional groups, which was 41% (College Board, 2013). This below-average passing rate could be attributed to the open enrollment of the course at North High School or to the lack of preparatory instruction received by students prior to enrolling in the course; however, based on the validity of the predictive score averages; it is likely that both of these were factors. The below-average passing rate for all participants could also be attributed to the low passing rate of the PBL students (34.1%), but the moderate correlation between PBL students' predictive and actual scores supports the PBL student's achievement on the national exam. The low PBL passage rates could be attributed to the program's open enrollment policy, or to the low predicted scores based on the PBL student's PSAT scores. The PBL student's PSAT

scores yielded data showing the low aptitude of some of the PBL students, thus providing evidence that the treatment group would not be able to achieve a high percentage of students earning a passing score on the AP English Language and Composition national exam. This data may have also been skewed due to the small sample size despite the total PBL population participating in the study. Regardless of the passing rates, there was a correlation between the predictive and actual scores, which supported the traditional students' higher passing rate on the national exam when compared to PBL students' success.

Question 3. A Chi-Square test was used to analyze the passing rate for each group in order to compare the effectiveness of the different methods of instruction. The results showed that traditional students had higher predictive scores as well as higher actual scores on the AP English Language and Composition national exam. The data also showed that traditional students had a higher passing rate of 63% on the 2013 AP English Language and Composition national exam than PBL students, who had a statistically significant lower passing rate of 34.1%. The Chi-Square test showed a significant difference between the passing rates for each group and that traditional students were more likely to pass the AP English Language and Composition national exam than PBL students. However, the correlation between the predictive and actual scores for each group shows that the actual scores for each group accurately depicted what each group of students was capable of scoring. Although the PBL group had a moderate correlation between their predicted and actual scores and the traditional group had a strong correlation, both correlations were statistically significant. This statistical significance cannot conclude that one method of teaching is better than the other. However, the data

do show that the traditional students were more successful at achieving a passing score, so the traditional method of teaching may be more effective at teaching AP English Language and Composition. The statistically significant correlation of the predictive and actual scores also shows that both methods allow students to achieve actual scores similar to their predictive scores on the AP English Language and Composition national exam despite only a moderate correlation for the PBL group. The moderate correlation between PBL scores may mean that the use of PBL in an AP English Language and Composition course is a moderately effective way for students to achieve their predictive score on the AP national exam, but the data does show that PBL students had less success on the AP national exam than traditional students.

Implications for PBL in Public Schools

Currently, there are few known public school programs which provide high school students with the choice to enroll in a course using the PBL method. Many PBL programs are found in charter, private, and magnet schools with small populations and, based on this study, students who attend large public schools could also benefit from this learning style. While the data did not show an overwhelming number of students in the PBL class excelling on the AP English Language and Composition national exam, it did show that the students' scores were correlated to their predictive score data. This alignment implies that it is possible for students to learn AP English Language and Composition skills and meet their predicted achievement level in the PBL class. While this study does not specifically explore this question, it certainly shows that PBL is a teaching method that works for students who wish to learn through projects and self-discovery. Thus, more research is needed to explore whether there are students in public

schools who could benefit from implementing programs like the North Lab that engage and motivate students who may not be successful in the traditional classroom.

The results of this study show that student scores on the AP English Language and Composition national exam aligned with their predictive score data regardless of the course they chose, although a stronger correlation was found between the traditional student's scores. Therefore, this study has not shown that PBL is as effective as traditional teaching methods at preparing students to achieve passing scores on the AP English Language and Composition national exam. However, the findings do show that the PBL method is effective as was shown by the moderate correlation between the PBL student's predictive and actual scores. As a result, for PBL to gain a stronger foothold in public high schools, more research is needed on different student populations in order to determine if PBL can adequately prepare students to achieve passing scores on the AP English Language and Composition national exam.

Implications of Findings

Common Core State Standards

The CCSS emphasis on critical thinking and problem-solving as a focus for student learning is supported by PBL. One reading standard outlined by the CCSS requires 80% of a students' reading to be of nonfiction informational texts, and PBL instruction able to meet this requirement because of the class's research focus (CCSS, 2010). Therefore, one of the positive implications of the PBL method is its alignment with this CCSS goal. Another positive implication for the use of PBL in the teaching of language skills is the extra experience with speaking and listening that students receive. Since PBL focuses on working in groups, students are required to develop clear paths of

communication in order for groups to run efficiently and effectively. Students in a PBL class are also typically required to present their project and findings and to listen to other project presentations. While this does occur in traditional classrooms, there is a greater emphasis on this type of group and personal learning in the PBL environment.

All other standards outlined by the CCSS are accomplished by both the traditional and PBL methods, which include integrating how to accurately read literature and informational texts, how to write, understanding the foundational skills for reading, and using language skills, including the standard conventions of English (CCSS, 2010). The acquisition of the reading and writing standards is also supported by the results of the study due to the fact that the AP English Language and Composition national exam focuses on rigorous reading and writing performance. Thus the PBL method is an effective teaching method for students attempting to meet the standards of the CCSS, and should be explored further to determine the implications of using this method for AP courses.

Differentiation

PBL seamlessly incorporates differentiated instruction in order to help students effectively obtain knowledge (Boss & Krauss, 2007). The typical PBL environment supports differentiating instruction for all students by allowing teacher facilitators to assist students in a timely manner when they are in need of one on one instruction (Boss & Krauss, 2007). The teachers in the PBL class are able to easily conference individually with students to assess the student's remediation needs. This one on one assessment is something that a traditional teacher does not typically have time to do every day in a

regular classroom setting, and thus differentiating instruction is more difficult (Boss & Krauss, 2007).

Limitations of the Study

Control Group Size

The size of the PBL, treatment group, included only 41 participants, and as such the small sample size may be the greatest limitation to this study. The sample size was hindered by the number of students enrolled in the PBL course, as well as the number of PBL students who elected to take the AP English Language and Composition national exam. The total population of PBL students was studied, but the sample size was still too small to conclusively determine the effectiveness or lack of effectiveness of PBL on AP achievement. Thus, the moderate correlation found between PBL students' predictive and actual scores on the AP English Language and Composition exam may be a result of the size of the sample available to the researcher.

Teacher Variables

Another limitation for this study was the researcher's involvement in the PBL and one section of the traditional AP English Language and Composition courses as the instructor. Because the researcher was not only analyzing student scores, but also teaching the students, the internal validity could have been affected. However, this limitation was addressed because the data used for this study were scrubbed of identifying participant data thereby making it impossible for the researcher to pair the score data with her individual students.

The teacher also provided a limitation based on her experience using the PBL method and her experience teaching AP English Language and Composition since she

had never taught using only PBL or taught an AP course before the 2012-2013 school year. The lack of experience the teacher had could have subsequently limited her effectiveness in the classroom despite her 8 years of teaching experience which may have hurt the study's internal validity. This lack of experience with PBL as well as the AP curriculum was a limitation that could have affected student test scores negatively, thus affecting student achievement on the AP English Language and Composition national exam.

Finally, the instructional styles of the three AP English Language and Composition teachers need to be taken into consideration since they may have limited the internal validity of this study. North High School has three AP English Language and Composition teachers who all have very different styles of teaching the course. The same material is covered in each classroom, but the delivery and methodology of each teacher are not the same. This could have impacted the achievement of the participants, as some teachers could be more effective at instructing students on certain skills.

School Variables

North High School began the PBL Lab program in 2010; the program has grown and evolved in that time to better serve the students who choose to enroll in the course. In the 3 years since the Lab was developed, the current juniors, who are now in Lab III, have experienced changes in the presentation of material as the classroom teachers have learned what does and does not work in the setting of this PBL classroom for the AP public school students enrolled in the program. As a result, the students enrolled in the AP English Language and Composition section of the PBL class have been exposed to many different types of project and 21st Century skill building. The evolving nature of

this course provided a limitation as participant's instruction on reading and writing was not as rigorous as an AP English Language and Composition course required. The lack of rigor in Lab I and Lab II may be a limitation on student AP performance and achievement in Lab III.

Applicability

Despite the limitations of the study, the results can be helpful in informing school districts and language arts programs as to the effects of PBL on student achievement on the AP English Language and Composition national exam. The correlational relationships determined by the comparison of predictive and actual scores for the AP national exam for PBL students are important findings since there is limited research on the use of PBL in an AP English course. These findings should be considered and studied further in order to determine the effectiveness of PBL in an AP classroom so that students are given the opportunity to learn using the method that works best for them.

Relationship of Findings to Previous Literature

The literature suggested that PBL was an effective method of learning for students' critical thinking and 21st century skills (Blumenfeld et al., 1991; Boss & Krauss, 2007). These skills are also intrinsically connected to the skills needed in AP English Language and Composition, as described by the standards for the course and national exam (College Board, 2010). The findings show that the PBL student national exam scores are moderately correlated with their predictive scores and, as such, support the literature on PBL's possible effectiveness by showing that PBL moderately allows students to reach their achievement potential.

The students exposed to PBL were immersed in technology and used computers daily to assist in their learning of the AP standards, thus supporting the use of technology in learning AP English Language and Composition skills (Boss & Krauss, 2007; Prensky, 2001; Stites, 1998; Wilson, 1993). Student knowledge construction was supported by the projects they created in conjunction with the development of their 21st Century and language arts skills (Blumenfeld et al., 1991; Boss & Krauss, 2007; Newell, 2003). Therefore, this study adds to the research on the use of PBL in an AP English Language and Composition course. Descriptive statistics showed that both the treatment and control groups had higher predictive scores than actual scores, and while the mean difference between the scores for the control group was smaller, both group's data showed a significant difference. This statistically significant difference showed that there was a strong correlation between the scores for traditional learners and a moderate correlation for PBL learners. This was further analyzed, revealing that the traditional students experienced a higher passing rate on the 2013 AP English Language and Composition national exam. However, despite the low passing rate experienced by the PBL students on the AP exam, the moderately positive correlation for the treatment group supports the effectiveness of PBL on students' potential learning and achievement.

A second contribution of this study is that the findings support the need for further research to determine the effectiveness of PBL for AP English Language and Composition skills acquisition. Because the findings only showed a moderate correlation between PBL students predicted and actual scores, there are many questions as to the effectiveness of PBL in an AP English Language and Composition course. Therefore, more research is needed to more conclusively determine the effects of PBL on AP

English Language and Composition skill acquisition and achievement on the national exam. The findings suggest that it is possible to learn the skills required by the AP English Language and Composition curriculum, and as such, this teaching and learning method provides the possibility of a differentiated program for schools since some students may thrive in the PBL environment.

Finally, this study supports the option of PBL in a large public high school for students to learn AP English Language and Composition, as well as soft and 21st century skills. Since few programs of this kind exist, the findings of this study contribute to the body of knowledge concerning the effect of PBL as an optional program for students in large public high schools. However, the results do not provide conclusive evidence that this method is as effective as the traditional approach since there was only a moderate correlation between PBL students' predicted and actual scores. Despite the absence of a strong correlation, the moderate correlation does support the success of some students in the PBL program which lends support to the literature on the effectiveness of PBL on student learning and achievement and shows a need for more research on PBL in AP English Language and Composition classes.

Recommendations for Intervention and Change

Educational Policy Makers

The alignment of PBL with the Common Core State Standards' focus on critical thinking, reasoning skills, and non-fiction text comprehension skills should be taken into consideration by policy makers in order to provide funding for programs like the Lab and research on these programs effectiveness. Two of the key elements to a successful PBL program are teacher training and students' daily access to technology. These elements

require funding and are necessary for student learning to take place in a PBL classroom since PBL's focus on 21st century skills hinges on the availability of technology, and this technology is expensive (Blumenfeld et al., 1991; Boss & Kraus, 2007; CCSS, 2010). Based on this study's findings, this learning method could benefit students who thrive in a self-directed environment, and policy makers should consider this learning method when discussing how to help students meet the Common Core State Standards.

District and School Leaders

The PBL method only works when district, school and teacher leaders work together (Boss & Krauss, 2007). This study was conducted in a school where school and district leaders value the professionalism of teachers, and as a result supported the teachers who proposed the implementation of PBL as a viable option for their students' learning. Therefore, it is necessary that district and school leaders support teachers in providing this differentiated learning environment for students. The Lab would not have been effective without the support of the local leaders, and support is necessary for the success of students and teachers alike. The support of the district and school in funding is also a vital part of creating and maintaining a PBL program. The availability of technology for all students is essential for the development of 21st century skills and the development of critical thinking and technological literacy. The support of programs like The Lab has to come from the entire school community and should be implemented to best support a school's student population.

Classroom Teachers

In order for a PBL program to be successful, teacher training is imperative (Blumenfeld et al., 1991; Boss & Krauss, 2007). The effectiveness of a teacher as a

facilitator is directly connected to student success in any classroom, and this training is a vital piece to the success of a PBL course. Classroom teachers, therefore, need to be educated and trained to use the PBL method in order to implement this learning structure into their classrooms. Training should teach the classroom instructor different ways to build projects, assess student learning, and incorporate technology to learn the required standards for the course. The teacher should know classroom management techniques in order to help facilitate student learning of PBL. The focus of a PBL course could change the entire structure of the classroom; however, the teacher needs to have training in how to be an effective facilitator of learning in order to build a successful PBL program.

Recommendations for Future Research

The results and limitations of this study show that further research needs to be done on the effect of PBL on AP English Language and Composition national exam achievement. Thus, further research is needed to examine the effectiveness or lack of effectiveness PBL has on AP English Language and Composition achievement since the results of this study did not definitively answer the research questions. The relationships found in the study were informative, but there is a need for more research to understand how PBL can be used in an AP course.

Future research is needed concerning the implications of teacher training in PBL as well as teacher willingness to use PBL in the classroom. This teaching and learning method provides training for teachers to become facilitators of knowledge instead of disseminators of knowledge, thus pedagogically changing a teacher's philosophy (Boss & Krauss, 2007). A true shift in thinking and daily practice cannot occur without training and commitment from the classroom teacher. Research on the effect of this training and

commitment would shed relevant light on the effectiveness of this teaching and learning method and ultimately on student success in a PBL classroom.

The availability of technology in the PBL classroom is essential to helping students learn soft and 21st century skills, and future research needs to be done on how this learning shapes the learning of language arts skills (Blumenfeld et al., 1991; Boss & Krauss, 2007). Future research which focuses on the types of technological tools which are most helpful; how technology can assist with literacy and critical thinking; and how the use of technology changes learning, is needed. Many avenues are available for exploring the effect of technology on the acquisition of language skills. This area of research should be studied further to examine how to best use technology to help students be successful in a language arts classroom.

Further research on the motivation and self-efficacy of students in PBL versus traditional classrooms could also contribute valuable insight since students at North High are able to choose their learning environment. This freedom of choice may have affected the success of students' motivation and willingness to learn, and as such should be studied further to determine the impact of choice on achievement. Future research could add more depth to the learning differences taking place in each learning environment, thus shedding light on the effect of student choice on student success in a learning environment.

Finally, there is a need for research on the effectiveness of PBL on the acquisition of AP English Language and Composition skills and achievement on the AP national exam. While this study shed some light on the use of PBL in an AP English Language and Composition classroom, it also left many questions unanswered about whether

students are able to achieve success in an AP course that uses PBL. The small sample size played a large role in the inconclusiveness of this study's results, and further research on PBL's effectiveness in helping students achieve on an AP English Language and Composition exam is needed to determine the validity of this learning method.

Conclusion

One hundred years after Dewey (1916) proposed learning through experience, educators are still trying to figure out the best ways to help students learn. This study attempted to determine the effectiveness of the PBL method versus the traditional method to see how students learn AP English Language and Composition best. The results of this study, while inclusive about the effectiveness of PBL, do show that traditional learning methods typically helped students achieve passing scores on the AP English Language and Composition exam if their predictive scores were passing, thus adding to the current body of research on teaching AP English courses. This is a relevant finding as it suggests that the traditional method may be the best method to help students achieve a passing score on the AP English Language and Composition national exam.

However, this study also found that the PBL process of student engagement with the curriculum could be successful in helping some students achieve their potential on the AP English Language and Composition national exam since the Pearson's correlation test showed a moderate correlation between the PBL students' predictive and actual scores. Although the moderate correlation suggests that the PBL method may not work for some students, this lesser correlation could be attributed to the small sample size of the PBL group. If more participants had been available to test the effectiveness of PBL on AP

English Language and Composition national exam achievement the strength of the correlation may have changed.

The findings do, however, show that the achievement of PBL students on the AP English Language and Composition national exam (37%) was below the national average of passing scores (53%). This below average performance indicates that the PBL method may not be the most effective method to teach AP English Language and Composition, which is why this study paired the predictive and actual scores to determine whether students were able to achieve their predicted potential score in a PBL course. The moderate correlation found in the data shows that it is possible for some students to achieve their predicted potential score, but not all students' actual scores correlated with their predicted scores.

The purpose of the study was to determine whether PBL was an effective learning method for students mastering the AP English Language and Composition standards. The inconclusiveness of the findings shows a need for further research to determine whether students can benefit from taking a PBL course to prepare for the AP English Language and Composition national exam since the sample size was small. This study adds to the current body of research by showing that PBL could be an effective learning method to help students achieve their predictive score on the AP English Language and Composition national exam.

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Appendices

Appendix A

21st Century Skills (Boss & Kraus, 2007, pp. 47-51, 54-56) are focused on the behaviors required of accomplished people in the 21st century, including collaboration, technology, and higher order thinking skills.

Source:	Skill:	Details:
engage 21 st Century Skills	Digital age literacy	Scientific, economic, and technological literacies; visual and information literacies; and multicultural literacy and global awareness
	Inventive Thinking	Managing complexity; self-direction; curiosity, creativity, and risk taking; and higher-order thinking
	Effective Communication	Teaming, collaboration, and interpersonal skills; personal, social, and civic responsibility; and interactive communication
	High Productivity	Prioritizing, planning, and managing results; effective use of real-world tools; and ability to produce relevant, high-quality products
The Partnership for 21 st -Century Skills (www.21stcenturyskills.org)	Incorporate Core Subjects	Language arts, math, science, and so forth
	Along with 21 st -Century Content	Global awareness, entrepreneurial and civic literacy, and health awareness
	Learning and Thinking Skills	Critical thinking, problem solving, communication, creativity, collaboration, and information and media literacy
	Information and Communications	Effective use of technology for teaching and learning

	Technology Literacy	
	Life Skills	Leadership, self-direction, accountability, and adaptability
United Nations Educational, Scientific, and Cultural Organization	Definition	“Literacy is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts. Literacy involves a continuum of learning to enable an individual to achieve his or her goals, to develop his or her knowledge and potential, and to participate fully in the wider society.” (UNESCO Literacy Assessment and Monitoring Programmed, 2004)
ISTE National Educational Technology Standards for Students (NETS-S)	Creativity and Innovation	Creative thinking, constructing knowledge, and developing innovative processes and products
	Communication and Collaboration	Using digital media and environments to support individual learning and the learning of others
	Research and Information Fluency	Applying digital tools to gather, evaluate, and use information
	Digital Citizenship	Understanding human issues relating to technology and practicing ethical behavior
	Technology Operations and Concepts	Understanding technology concepts, systems, and operations
Bloom’s Taxonomy	Analyze	examine, explain, investigate, characterize, classify, compare, deduce, differentiate, discriminate, illustrate, prioritize
	Evaluate	judge, select, decide, justify, verify, improve, defend, debate, convince, recommend, assess
	Create	adapt, anticipate, combine, compose, invent, design, imagine, propose, theorize, formulate

Appendix B

PBL Student Data

Student #	Predicted Score	Actual SCORE
1	4.1	5
2	2.8	2
3	4.3	3
4	3.1	2
5	3.7	2
6	2.7	2
7	2.9	1
8	3.4	2
9	2.7	2
10	3.8	3
11	3.8	2
12	3.8	2
13	2.9	1
14	3.3	3
15	3.4	1
16	4.4	3
17	3.3	1
18	3.3	2
19	3.4	1
20	2.8	2
21	3.4	3
22	5.0	5
23	2.2	2
24	3.8	2
25	4.6	4
26	2.1	2
27	2.8	3
28	2.9	3
29	4.6	3
30	4.1	1
31	5.0	4
32	2.6	2
33	3.2	1
34	3.6	2
35	3.8	3
36	4.6	5
37	3.1	2
38	2.2	1

39	3.7	2
40	3.3	2
41	3.9	2

Appendix C

Traditional Student Data

Student #	Predicted Score	Actual SCORE
1	5.0	4
2	5.0	5
3	4.8	5
4	4.2	3
5	2.3	3
6	5.0	4
7	3.9	4
8	5.0	4
9	3.4	1
10	4.4	3
11	2.9	3
12	2.6	2
13	3.8	4
14	4.4	3
15	4.4	3
16	4.2	4
17	3.4	4
18	3.6	2
19	4.4	5
20	3.4	3
21	3.1	3
22	2.4	2
23	3.0	3
24	4.1	4
25	3.6	2
26	2.8	1
27	4.8	3
28	2.3	2
29	1.9	1
30	3.6	3
31	4.8	4
32	3.9	3
33	3.3	2

34	3.7	2
35	3.4	2
36	2.6	2
37	4.8	4
38	3.7	4
39	3.1	4
40	5.0	5
41	2.1	1
42	4.6	2
43	3.1	3
44	2.8	2
45	4.2	4
46	4.2	4
47	2.8	2
48	3.4	2
49	2.6	2
50	3.9	3
51	5.0	4
52	3.7	2
53	3.2	2
54	3.2	2
55	2.8	2
56	4.9	3
57	3.1	2
58	4.2	3
59	3.7	2
60	5.0	4
61	4.2	3
62	2.3	1
63	4.2	3
64	4.8	4
65	5.0	4
66	3.1	3
67	4.7	3
68	3.3	3
69	5.0	5
70	3.3	2
71	3.1	2
72	3.3	2
73	3.4	3
74	2.4	2
75	4.5	3
76	5.0	3
77	2.7	2
78	2.5	1

79	5.0	4
80	3.7	3
81	2.8	2
82	4.3	4
83	2.3	1
84	2.8	2
85	2.4	1
86	3.8	3
87	5.0	4
88	3.1	3
89	5.0	4
90	4.0	3
91	4.1	4
92	3.4	3
93	4.8	3
94	4.1	3
95	4.3	4
96	3.3	3
97	2.5	2
98	3.9	5
99	4.5	4
100	3.9	2
101	2.9	1
102	2.8	5
103	4.5	5
104	2.8	2
105	2.3	1
106	4.3	3
107	3.9	3
108	4.1	3
109	5.0	5
110	4.4	3
111	3.3	2
112	4.2	3
113	3.0	4
114	2.5	2
115	2.7	3
116	3.2	3
117	2.8	2
118	3.8	2
119	3.1	2
120	2.6	1
121	1.8	1
122	2.6	2
123	2.2	2

124	3.3	3
125	5.0	3
126	3.3	2
127	3.4	3
128	4.2	4
129	2.7	2
130	3.9	3
131	3.3	2
132	3.6	3
133	1.6	2
134	4.1	4
135	5.0	5
136	2.7	2
137	2.5	2
138	4.3	3
139	3.3	3
140	3.3	2
141	3.6	3
142	2.9	3
143	3.6	2
144	2.7	2
145	2.2	2
146	3.6	2
147	3.8	3
148	4.1	3
149	3.6	3
150	4.7	3
151	5.0	5
152	2.3	2
153	3.2	2
154	4.8	5
155	2.4	1
156	2.5	3
157	5.0	4
158	2.8	2
159	3.0	1
160	3.2	2
161	4.4	5
162	3.7	3
163	2.9	2
164	4.7	3
165	5.0	4
166	3.8	3
167	3.3	3
168	3.6	3

169	3.1	3
170	3.8	5
171	4.6	4
172	2.9	2
173	3.0	2
174	3.9	3
175	3.4	3
176	3.7	3
177	5.0	5
178	4.4	4
179	2.9	2
180	3.6	3
181	3.5	2
182	2.3	2
183	3.4	3
184	3.8	3
185	2.5	2
186	3.3	3
187	5.0	5
188	4.7	3
189	4.6	5
190	3.7	3
191	4.7	4
192	2.7	3
193	4.4	5
194	2.6	3
195	4.8	3
196	3.8	3
197	3.1	3
198	5.0	5
199	5.0	5
200	5.0	5
201	4.9	4
202	3.6	3
203	3.6	3
204	3.6	3
205	3.5	2
206	4.4	1
207	2.6	1
208	3.4	2
209	3.5	2
210	5.0	4
211	3.7	3