

ABSTRACT OF CAPSTONE

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The Graduate School

Morehead State University

April 17, 2017

PROJECT-BASED LEARNING: A PATHWAY TO SUCCESS

Abstract of capstone

A capstone submitted in partial fulfillment of the
Requirements for the degree of Doctor of Education in the
College of Education
At Morehead State University

By

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Lexington, Kentucky

Committee Chair: Dr. Michael W. Kessinger, Assistant Professor

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April 17, 2017

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PROJECT-BASED LEARNING: A PATHWAY TO SUCCESS

The purpose of this case study was to assess teachers and administrators' perceived effectiveness of the implementation of school wide project-based learning at one Kentucky middle school as well as examine both academic and non-academic data. Non-academic data for attendance and retention from one year prior to implementing school wide project-based learning, the year of implementation, and four years following the implementation of project-based learning were obtained and analyzed. Due to changes in the state assessment and accountability system, behavior and assessment data were collected for four years following the implementation of project-based learning. The case study provides a detailed analysis for future implications of the implementation of project-based learning. Research in the areas of project-based learning, application of knowledge, and 21st century learners was reviewed to guide the focus of the case study.

Data were collected through teacher surveys, administrator questionnaires, and the school report card provided annually by the Kentucky Department of Education. The survey and questionnaire were both administered online and were completely optional and confidential. Aligning with both the survey and questionnaire, the results of the case study indicate positive relationships between application of knowledge and student attainment of 21st century skills when project-based learning was implemented and a disconnect between project-based learning and Kentucky's current accountability system.

The intentions of this study were to contribute to the conversation about the way decision makers view success in education and to help current educators understand the need to prepare their students for life after secondary school. This case study provides the field of education with an analysis of educators' perceptions of project-based learning as well as highlighting the effects of implementing school wide project-based learning in one Kentucky middle school on both academic and non-academic factors.

KEYWORDS: Project-based learning, Kentucky, K-12 education, PBL, Unbridled Accountability System, Assessment, Application of Knowledge, 21st Century Learners, Learning by doing, Middle School

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PROJECT-BASED LEARNING: A PATHWAY TO SUCCESS

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DEDICATION

I would like to dedicate this work to my husband: Taylor, my mother: Melinda, and best friend: Natalie. Each of you have pushed me through this process in your own way when I needed it the most. You always saw my potential and never stopped encouraging me every step of the way, even when I didn't deserve it. It is because of each of you that I have FINALLY finished what I started and I will forever be grateful.

To my daughter: Ella, and my nephews: Kaiden and Konner, this work is for you. My wish for you is that you value the power of education, understand the importance of finishing what you have started, and advocate for those that may not have a voice. Let others see God's light shine through you in a way that they also want to be a servant leader.

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I would like to thank my committee members Dr. Lewis Willian, Dr. Shane Shope, and especially my committee chair, Dr. Michael Kessinger, for putting up with me through this journey. You never gave up on me and you were always patient. I would also like to include a special thank you to Sammi White from BMS for always lending a helping hand. Finally, thanks to BMS Teachers and prior Administrators for their time and contribution.

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Chapter 1

Introduction

Educational conversations that are taking place around the United States today center around one simple question: Are students graduating public high schools with the necessary skills for everyday life? In Kentucky, there are high demands of growth and achievement placed on K-12 public schools each year through the Unbridled Learning Accountability Model (KDE, 2012). The same is true at the national level with Every Student Succeeds Act (ESSA), which “maintains an expectation that there will be accountability and required action in the nation’s lowest-performing schools, where groups of students are not making progress, and where graduation rates are low over extended periods of time” (NCLS, n.d.). As the pressure continuously rises, many schools are working hard to meet state and federal demands but may fail to reach more students than realized in the process.

In 2009 the Kentucky Commissioner of Education, the Kentucky Board of Education, and various stakeholders began discussing the creation of the Unbridled Learning Accountability Model. After two years of planning and preparation, the Unbridled Learning Accountability Model was implemented in the 2011-2012 school year as required by Senate Bill 1 (KDE, 2012). The accountability model was created to align with the Kentucky Board of Education’s strategic priorities that focused on Next-Generation Learners, Professionals, Support Systems, and School Districts (KDE, 2012). While changes to the accountability system are already in the works, the current system remains in place through the 2016-2017 school year.

In the Unbridled Learning Accountability Model, the category of Next-Generation Learners was responsible for 70% of each school's accountability score. Annual program reviews and Kentucky's new teacher evaluation system, Professional Growth and Evaluation System (PGES), were used to measure the remaining 30% of the accountability score (KDE, 2012). The Next-Generation Learners category was the primary focus when discussing accountability for this capstone. This component consisted of achievement, gap, growth, college/career readiness, and graduation rate (KDE, 2012). At the middle school level, achievement and gap were measured annually based on data from the K-PREP assessment, growth was measured using the change in data over time, and college/career readiness was determined by results from the EXPLORE assessment administered annually to eighth grade students. Graduation rate was not applicable at the middle school level. The weighting for the five areas of Next-Generation Learners at the middle school level varies by category, as presented in Table 1.

Table 1

Weighting for Next Generation Learner Categories – Middle

Achievement	Gap	Growth	College/Career Readiness	Graduation Rate	Total
28%	28%	28%	16%	N/A	100%

Source: KDE, 2012

A school's accountability score became such a focal point that teachers found themselves 'teaching to the test' and students may not had been provided with different instructional approaches such as standards-based learning, blended learning,

flipped classrooms, and project-based learning. There was a false assumption that more traditional methods of teaching, such as lectures and seatwork, adequately prepared students for standardized assessments, college, and careers after high school (David, 2008). Therefore, many schools were comfortable with traditional approaches resulting in a lack of innovative instructional methods. Extensive research across different disciplines (Chen, 2010; Dopplet, 2003; Karaman & Celik, 2008) has indicated that project-based learning (PBL) could potentially impact student success in both academic and non-academic areas.

Because the Next-Generation Learners component accounts for the bulk of the Unbridled Learning Accountability score, schools became increasingly focused merely on numbers from standardized assessments and strategies to appear as if they were closing the achievement gap. Across Kentucky, schools had adopted various intervention programs, both during and after school, in attempts to narrow the achievement gap and increase student scores on standardized assessments. Students were targeted for intervention programs by their assessment scores, mastery checks, grades, and past academic performance. Intervention programs included, but were not limited to, classes built into the daily schedule, electronic programs for interventions or enrichments, one-on-one instruction, and after school study sessions.

As a result of the focus that was placed on increasing accountability scores, K-12 institutions may have been graduating students that were assessment driven yet unprepared for the world of work or higher education. The 2013-2014 Kentucky State Report card revealed that 55% of 43,722 Kentucky graduates were college

ready and only 17% were considered career ready (KDE, 2014). Because of the low number of students that were deemed by the state to be career ready, it was evident that students were graduating from Kentucky's high schools without the ability to apply previously learned knowledge in novel situations. The abilities that graduates were lacking could be gained through learning and practicing important 21st century skills and employability skills.

The research for the capstone centered on the areas of project-based learning, application of knowledge, and 21st century learners. Current research in those three areas suggests a need for students to learn and practice important life skills. This capstone was a case study which focused on Bate Middle School in Danville, Kentucky. The case study was conducted to reveal the potential impact that the implementation of school wide PBL had on student success in both academic and non-academic areas. In addition, the case study examined teachers and administrators' perceptions of PBL in relation to the conceptual framework and research questions.

Statement of the Problem

“Doing, making, reflecting, revising are how people really learn. The world of work is project-based. Schools are not. That needs to change” (Robin, 2014, p. 1). Research from the Buck Institute for Education (BIE) indicates that project-based instruction is more effective than traditional instruction as measured on state standardized assessments and assists in closing the achievement gap (Buck Institute for Education, n.d.-a). Furthermore, students that participate in project-based

activities “retain the content longer and have a deeper understanding of the content” (Buck Institute for Education, 2017, p. 1). Regardless of these findings, a limited number of schools implement project-based learning school wide (Chen, 2010).

The purpose of this case study was to survey the perceived effectiveness of project-based learning from Bate Middle School teachers and administrators, and examine both academic and non-academic student data in relation to project-based learning. This work contributes to the field of education by analyzing perceived teacher and administrative effectiveness of project-based learning and offering a comparison report of both academic and non-academic factors in relation to project-based learning. Additionally, resulting from the case study an infographic was produced and made available to schools across Kentucky.

Significance of the Problem

For decades, educators have understood that people do not learn in the same ways. Gardner (1983) defines intelligence as “the ability to solve problems, or to create products, that are valued within one or more cultural settings” (p. x). Teacher preparation programs stress the importance of differentiation, learning styles, individualized instruction, and educating the whole child but do not always demonstrate ways for future teachers to implement those ideas into their classrooms. Traditional ‘sit and get’ education just does not work for all students. Countless statistics confirm that we are educating children that will have jobs that have not been created. A study conducted by the Conference Board, Inc., the Partnership for 21st Century Skills, Corporate Voices for Working Families, and the Society for Human

Resource Management (2006) found that employers indicated that students from high schools and colleges were graduating without the necessary 21st century skills to be successful in the workplace (p. 11).

It was anticipated that this study would not only impact students, educators, and decisions makers across the state, but our future society. The implications of this study could change the way that educators at all levels see success and play a small role in redefining what achievement looks like.

Background of the Problem

Public education institutions are evaluated based on student success and achievement. But are the measures of success for public education and life beyond secondary education really parallel? In Kentucky, a school could be considered high performing but a majority of graduating students do not feel that they have been prepared for college, careers, or life beyond high school. Though some proponents for standardized assessment may argue that it provides parents, students, and teachers with valuable data, there seems to be a breakdown between teaching the content and teaching application of the content when focus is placed on ‘teaching to the test’.

Traditional methods of teaching are being used across the nation in attempts to ensure that students’ score at or above average on standardized assessments compared to their peers. While there are many educators that realize the need for a shift in instructional methods, teachers resist change due to fear of the unknown and in some cases, they feel that the school environment will not accept or support change. In their study related to the effects of state standardized testing programs, Moon,

Brighton, Jarvis, and Hall (2007) specified that “teachers feel a tremendous amount of pressure and that this pressure leads to a shift from individual student focus to test scores” (p. 14).

Local Context

The capstone was designed to impact decision makers, teachers, and students across Kentucky. Though the case study was conducted on one middle school in Kentucky, project-based learning is so versatile that the findings could potentially be adapted and applied to any school across the nation.

The focus school for the capstone was located in the suburban community of Danville in Boyle County, Kentucky. The city of Danville can be described as the economic hub of Boyle County. The broad range of commerce includes agricultural, commercial, industrial, and educational enterprises. Boyle County has a rich history and encompasses Boyle County Public Schools, Danville Independent Schools, and Centre College. A part of the Danville Independent School System, Bate Middle School (BMS) was built in 1912 and one could sense the character of the building upon entering the parking lot. Though the building seems traditional, what takes place inside the building is anything but traditional instruction.

In 2009 Dr. Carmen Coleman became Superintendent of Danville Independent Schools. At that time, it was evident that Bate Middle School was in academic trouble and facing closure by the Kentucky Department of Education (Kamenetz, 2014). In the fall of the 2011 academic year, Dr. Coleman decided that it was time for a change. The transformation began with Dr. Coleman appointing a new principal

to serve Bate Middle School. Working together, the pair implemented project-based learning school wide, conducted site visits and researched more effective ways to reach all students. In October of 2012, one year after the implementation of project-based learning, the idea of performance assessment was presented to the staff and 98% of Bate Middle School teachers agreed that the changes would be beneficial for the students and the school (Kamenetz, 2014).

Since Bate Middle School implemented school wide project-based learning six years ago, the enrollment increased from 357 students in the 2010-11 school year to over 400 students in the following years. For the 2016-17 school year, Bate Middle School has 52 faculty and staff members. Table 2 presents the characteristics of Bate Middle School students for the academic year that BMS implemented school wide project-based learning and four consecutive years following the implementation of school wide PBL (2011-12 to the 2015-16 academic years).

Table 2

Demographics of Bate Middle students 2011-2016

Data Category	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Total students	372	447	425	406	403
Gender					
Male	190	225	217	198	202
Female	182	222	208	208	201
Disadvantaged	60.2%	55.3%	56.5%	72.7%	64.1%
Students with disabilities	13.7%	5.4%	10.6%	10.4%	14.1%
Ethnicity					
Hispanic	20	17	16	31	22
Asian	2	2	2	5	5
African-American	70	22	32	76	75
Caucasian	247	402	371	255	267
Other	33	4	4	39	34

From an academic standpoint, Bate Middle School had not made adequate yearly progress in the 2010-11 school year or in years prior. BMS was deemed eligible for state assistance by the Kentucky Department of Education beginning in the 2009-10 School year. Although some progress was made during the 2011-12 and 2012-13 academic years, BMS was still classified as a ‘needs improvement’ school (KDE, 2014).

The desired impacts of this work were to (1) showcase the outcomes of project-based learning to guide decision making, and (2) encourage teachers to offer students different ways to meet state standards through creating their own work that demonstrates mastery of all content areas. With the school wide implementation of project-based learning, students and teachers at Bate Middle School were expected to engage in and learn from the concepts and processes of project-based learning. The

mission of Bate Middle School is to “provide a nurturing and challenging environment for the purpose of educating the whole student to achieve his or her highest potential” (BMS, 2017). Project-based learning increases student’s exposure to independently finding answers and working with the community and beyond (Buck Institute for Education, n.d-b). Through the implementation of project-based learning, students have been exposed to 21st century skills that are highly marketable for future employment.

Research Questions

Previous research has shown that PBL leads to increased content knowledge, reaches students at all levels of academic achievement, and develops a wide range of skills (Boss, 2011; Hixson, Ravitz & Whisman, 2012; Karaman & Celik, 2008). However, most Kentucky schools continue to implement traditional methods of instruction anticipating similar results that other institutions acquire through the implementation of project-based instruction. The research questions for this capstone examined project-based learning and its impact when implemented school wide in one Kentucky middle school.

The three research questions pertain to teacher and administrator perceived effectiveness of project-based learning as well as the impact that project-based learning has both academic and non-academic factors:

1. How do teachers perceive the effectiveness of project-based learning?
2. How do administrators perceive the effectiveness of project-based learning?

3. What impact does the implementation of project-based learning have on student attendance, standardized assessment, behavior, and retention rates?

Research questions one and two were investigated using an attitudinal survey distributed via email to all certified staff at BMS and a questionnaire completed by the former Principal of Bate Middle School and the former Superintendent of Danville Independent Schools. Various data from the school report card was used to examine the third research question.

Definition of Terms.

The following terms and their definition are used in the context of this capstone.

Annual Measurable Objective (AMO): “AMO goals are set to measure whether a school/district has made adequate progress for accountability determinations” (KDE, 2017, para 1).

Attendance Rate: “The proportion of students in attendance during the school year and is calculated by the sum of present days for all students divided by total present plus absent student days” (KDE, 2017).

Kentucky Performance Rating for Educational Progress (K-PREP): “A blended norm-referenced and criterion-referenced measures that provide national percentiles and student performance levels of novice, apprentice, proficient and distinguished. Tests are given in grades 3-8 in reading, mathematics, science, social studies and writing” (KDE, 2016).

Project-based Learning: “A teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging and complex question, problem, or challenge” (Buck Institute for Education, 2017, para 1).

Retention Rate: “The percentage of students’ grades 04-12 who were not promoted to the next grade level and is calculated by dividing the number of students retained by average daily membership” (KDE, 2017).

Total Behavior Events: “Safe School behavior events as reported in the Kentucky Student Information System (KSIS)” (KDE, 2017).

Summary

High school graduates across the state of Kentucky may be exiting public education without the necessary skills to be competitive in the workforce. Due to the current organization of Kentucky’s accountability system, schools may find themselves more focused on standardized assessment scores than ensuring that all students are ready for ‘the real world’ after high school.

Educators must understand that there is not a cookie cutter way to teach students. As humans, we need to see how things work rather than just being told how they work. Teaching a particular content is only part of the process. To truly learn, students must be able to apply what they are able to regurgitate. Although educators and decision makers have known this for decades, there still has not been a considerable shift in public schools to provide methods of instruction other than traditional learning in the classroom.

The case study focused on one Kentucky middle school that had realized that traditional education was not quite cutting it and implemented school wide project-based learning under the direction of a very innovative Superintendent. The research questions focused on teacher and administrator perceived effectiveness of project-based learning as well as the effects that project-based learning had on both academic factors such as standardized assessment and state accountability and non-academic factors such as behavior, attendance, and student retention.

Chapter 2

Review of Literature

Introduction

This capstone was designed to investigate three research questions while meeting two desired goals: 1) to showcase the effects of project-based learning; and 2) to encourage teachers to feel confident in implementing project-based learning.

The research questions for this capstone were:

1. How do teachers perceive the effectiveness of project-based learning?
2. How do administrators perceive the effectiveness of project-based learning?
3. What impact does the implementation of project-based learning have on student attendance, standardized assessment, behavior, and retention rates?

Examining the research questions and providing a detailed analysis of the findings can assist educators in understanding the potential impacts of project-based learning in the classroom. In addition, the study provides insight pertaining to the impact of project-based learning on both academic and non-academic factors when compared to traditional classroom strategies. The data collected helped to determine how the implementation of project-based learning impacted student attendance, behavior, retention rates, standardized assessment, and state accountability scores.

To achieve the goals of this capstone, it was necessary to create a research-based model centralized on three areas: project-based learning, application of

knowledge, and 21st century learners (Figure 1). Examining the research in each of these areas provided a foundation of understanding for teachers and administrators wishing to implement a school wide approach to project-based learning.

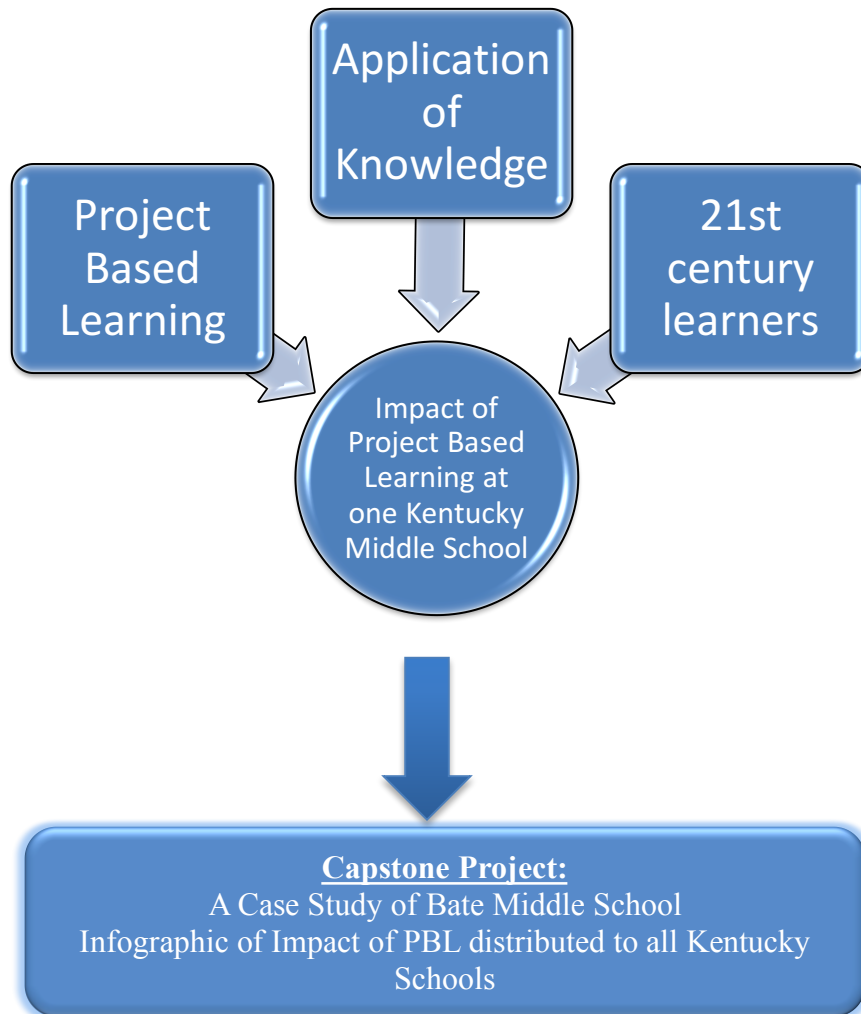


Figure 1. Conceptual framework for the capstone

Project-based learning

Project-based learning is a constructivist concept in which “students gain knowledge and skills by working to investigate and respond to a complex question,

problem, or challenge” (Buck Institute for Education, 2017, p. 1). Supporters of project-based learning believe in learning by doing and implementing hands on approaches to classroom activities. The approach is not a new concept to the field of education as PBL “originated more than a century ago with John Dewy and followers” (Zafirov, 2013 p. 299). The project-based learning approach involves problem solving, self-management of learners, researching, and inquiry. Considering these four areas, the purpose of project-based learning is to “engage students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks” (Buck Institute for Education, 2017). Following the process of project-based learning students should gain a variety of skills including, but not limited to, leadership, critical thinking, social skills, communication skills, and 21st century skills (Zafirov, 2013).

Project-based vs. Problem-based vs. Project-oriented learning. For project-based learning to have an impact on students and their success in the classroom, two things need to occur. First, it is important for educators to have the ability to differentiate between project-based learning, project-oriented learning, and problem-based learning. Second, it is important for students to have a guide and for teachers to create prototypes when implementing project-based learning. An essential component of this capstone is the understanding of what project-based learning is and what it is not. Therefore, it is necessary to understand the differences between project-based learning, project oriented learning, and problem-based learning. While

both project-based and problem-based instruction may share common assumptions about learning, the differences are clearly outlined in Figure 2.

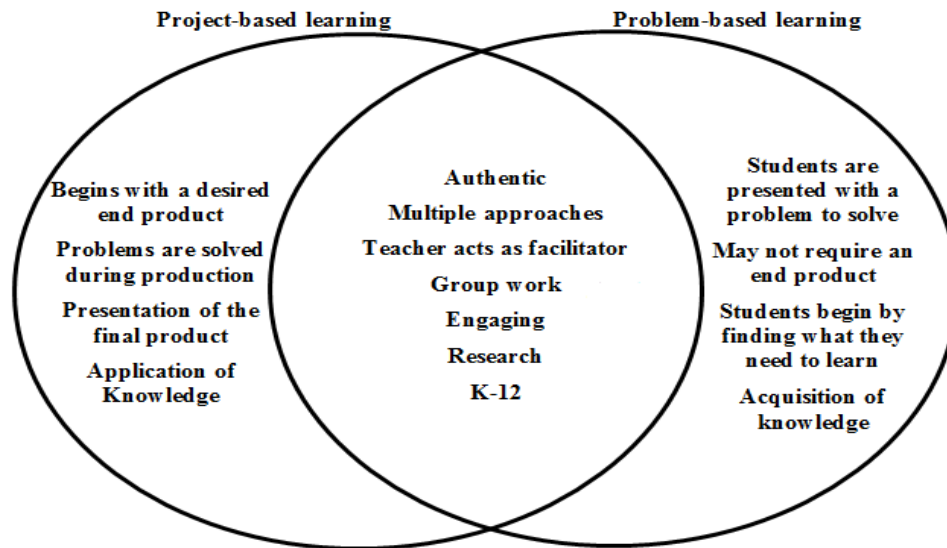


Figure 2. Project-based learning vs. problem-based learning.

A notable difference in project-based and problem-based learning is the desired outcome that drives the learning. Perrenet, Bouhuijs and Smits (2000) concluded that project-based learning is driven by the application of knowledge, whereas problem-based learning is driven by the acquisition of knowledge. Although the acquisition and application of knowledge are correlated, the differences in each definition validate the need for teachers to differentiate between the two.

A. J. Rhem and Associates (2001) explain that “explicit knowledge is acquired through printed material such as company policy manuals and regulations, reports, etc.” while “tacit knowledge resides in the minds of the people who have worked with and developed information” (p. 3). The application of knowledge occurs

when a student has previously acquired the knowledge and they began to apply it to authentic situations. While the acquisition of knowledge is the result of a single source, knowledge application combines previous knowledge that was acquired using various methods. When students are applying knowledge, they are recalling several past experiences as well as constructing new knowledge through research and experiential learning.

Though project-based and problem-based learning have several aspects in common, it is important to note that project-based learning is more focused on a final product and presentation as students learn before, during, and after the process. In contrast, problem-based learning is more focused on learning the necessary content before solving or applying the skill(s) to a specific problem.

It is evident that project-based learning and problem-based learning are similar and easily confused as they are both often referred to as PBL. To help differentiate between the two, Thomas (2000) identified the following five criteria that distinguish project-based learning from other methods:

1. Projects are central, not peripheral, to the curriculum
2. Project creation forces students to encounter and solve issue that are linked to important concepts and principals of the subject area
3. Projects require constructive investigation
4. Projects are student driven
5. Projects are real-world. (p. 3)

Teachers often incorporate projects during, or at the end of a unit and call it project-based learning. Contrary to this assumption, these types of activities in the classroom constitute project-oriented learning. In project-based learning, the desired outcome drives the instruction and students learn as they work toward completing their final product. In project-oriented learning the teacher gives his students all of the necessary information and asks them to complete a project based on the skills and knowledge they have already learned.

Implementing project-based learning. Project-based learning is a method of instruction that requires students to take responsibility for their own learning by using acquired knowledge to create and present various in-depth products (Zafirov, 2013). Implementing project-based instruction requires a shift from a teacher-centered to a student-centered classroom that thrives on creativity and independent construction of knowledge. As students work to construct new knowledge and create products for presentation the teacher's role becomes a facilitator and resource for the students to help them research, make inferences, and develop new knowledge and skills. When students are faced with issues while creating their project they may ask for help. The teacher's role is to question, prod, and provide resources to help the student find an appropriate solution. Teachers must allow their students to experience productive struggle.

Because the process of project-based learning will be new to teachers and students alike, it is imperative that teachers have support from administration while implementing project-based learning in the classroom. Administrators should be

trained and available to observe and advise teachers throughout the process. Teachers should realize their new roles in the classroom will shift from teacher to facilitator and administrative support is crucial during that transition. Teachers need to see an example of what project-based learning could look like in the classroom. It would be advantageous for teachers and administrators to attend trainings and conduct site visits together observing project-based learning in action and reflecting on their observations.

The process of project-based learning is one that requires planning and input from both students and teachers. Jeff Robin (2014), a successful artist and teacher at High Tech High School in San Diego, California, specializes in project-based learning. In teaching others about implementing project-based learning in the classroom he emphasizes that teachers must first build a prototype before asking his students to create a project. In creating a prototype, teachers are providing an example for their students that they can compare their work to as they move through the various processes (Robin, 2014). Creating a prototype also enables teachers to find solutions to possible issues before they occur in the classroom. In building prototypes teachers will often fail and have to try again forcing them to discover any issues or challenges that students might experience as they are completing their projects.

As presented to the University of Kentucky Next Generation Leadership Academy, Robin (2014) believes in learning through “making, not memorizing” and encourages students to fail early and often so they can learn experientially. Failing,

reflecting, and changing are important pieces of project-based learning for both teachers and students. In some cases, a prototype must be built multiple times until the product is successful. The desired outcome of the project must then be restructured for the project-based instruction to be effective. Teachers must carefully plan and scaffold projects to reach all students.

Coinciding with Robin's beliefs, Zafirov (2013) identified nine phases that shape the process of project-based learning (see Table 3). Each phase should be modified to meet group and individual needs for each task.

Table 3

Zafirov's Nine Phases of Project-based Learning

Phase	Actions
1 – Examples	The teacher, or facilitator, provides real examples of projects that are similar to those that students will be expected to complete. These examples will serve as models for students to use as a resource as they complete their own projects.
2- Responsibility	Students should understand their roles, responsibilities, and expected products.
3- Research	The teacher does not instruct the student while gathering information, but acts as a facilitator and a resource for the students. After the students have completed their research, the teacher and student co-create criteria that will be used to evaluate the student's final product.
4- Criteria Creation	The student and teacher create criteria together that will be used to evaluate the final product.

Table 3 (continued)

Zafirov's Nine Phases of Project-based Learning

Phase	Actions
5- Materials	The student's accumulates materials that are needed to complete the project.
6- Project Preparation	Students create their products while the teacher acts as a facilitator.
7- Presentation Preparation	Students prepare and practice their presentation for a designated audience.
8- Presentation	Students present to community members, school employees, peers, etc.
9- Reflection	Students reflect on the process and work together with the teacher to evaluate the final product.

Project-based learning is a process and cannot be done without proper planning and presentation. The classroom must be centered on the process of project-based learning and a final product. Bell (2010) emphasizes that project-based learning is not supplemental to instruction. Project-based learning *is* the instruction and activities need to be interesting, engaging, and encourage students to explore. The objective of project-based learning is for students to learn from both the process and the outcome. This is evident in Zafriov's (2013) nine phases as each step allows the students to learn experientially while creating their final products.

Perception of project-based learning. While no method or process is perfect, the positive perceptions of project-based learning are promising. In their

study of project-based learning in a technology classroom, Karaman and Celik (2008) found prospective teachers' perception to be generally positive as responses show that they learned from the experience, gained knowledge and skills that were not part of the course content, and gained skills to use in their classrooms. Additionally, a study conducted for the West Virginia Department of Education by Hixson, Ravitz and Whisman (2012) revealed that current teachers who implemented project-based learning in their classrooms found that students learned content that was needed for standardized tests, could transfer knowledge to new tasks, and were motivated to learn during class. Project-based learning should start small and grow within the school as it takes time and planning to implement project-based instruction.

Though the concept still has not captured the attention of schools across the nation, project-based learning has produced success dating back to early 20th century research. Denton (2012) notes that William Kilpatrick found in 1919 that projects promote purposeful action, social skills, and interest for the learner. As reported in the *Introduction to Project-based Learning* for the Buck Institute of Education, John Dewey, another well-known name in project-based learning, felt that education should reflect society and believed in “experiential, hands on, and student directed learning” (p. 3). Wrigley (1998) reports that Dewey encouraged teachers to observe the individual interests of learners and incorporate those interests into the classroom every day.

More recently, in the 21st century, Thomas (2000) analyzed results of schools that had implemented project-based learning from 1993 to 1999. He found that

project-based learning led to drastic improvements in standardized assessment scores (regardless of demographics), improved school climate, and improved staff morale. Thomas concluded that project-based instruction might “lead to increased student attendance, attention, and engagement” (p. 12).

Scott (2003) found that students positively perceived PBL in the areas of real-world application and development of technical and problem-solving skills. Resulting from the study, students found it necessary for teachers and students to both receive adequate training in the mechanics of project-based learning. Unfortunately, student approval of a teaching process is not enough for it to be implemented in public education. Before implementing project-based learning in the classroom, teachers will want to know that the process works and that it is worth their time and efforts.

Despite the research, Chen (2010) found that a large number of schools still fail to implement project-based learning in the classroom. Chen accredits this lack of innovative change to the “absence of political support, bureaucracy in our schools, preservation of the status quo, and high stakes assessment” (p. 3). The findings support a need for teachers and administrators to have more training and support so they can implement project-based learning in the classroom. The results of project-based learning have revealed through research that students are more engaged, students perform better on standardized tests, discipline issues decrease, and teachers learn with their students while they are facilitating. Through the implementation of project-based learning schools may have new opportunities to improve accountability

while facilitating learning that is guided by state standards and the common core.

Application of Knowledge

Knowledge is gained through experience or classroom activities and can be measured using a variety of techniques. Long gone are the days of rote memorization and paper and pencil tests. The final products and presentations that result from project-based learning can convey quite a bit about what students have learned and how knowledgeable they are of the topics at hand. An important concept of learning is practice; without practice students are just receiving information. When concepts are applied to real world situations and real problems arise students better understand the breadth and depth of that concept.

Project-based learning is centered on a constructivist model of education (Jonassen, 1999). In constructivism, it is thought that individuals create their own learning based on previous experiences and knowledge (Richardson, 2003). More specifically, Liu and Chen (2010) summarize trail constructivism as “the learner actively constructing knowledge rather than passively receiving it from the environment” (p. 63). Successful project-based learning in the classroom consists of the construction of new knowledge through research and exploration of resources coupled with the recollection of previously learned material that is relative to the project. The application of knowledge can be found in a project-based learning centered classroom as students use inquiry and research to complete their final products.

Corresponding with Zafirov’s (2013) nine phases of project-based learning,

Richardson (2003) found that constructivist learning activities that are central to project-based learning requires the facilitation of dialogue, reference to formal domain knowledge, opportunities for students to select challenge level, and practice of skills. Thomas (2000) suggests that if the project does not present a level of difficulty or the student can complete the project with information they already know, then the instruction is not considered project-based learning but merely a classroom exercise in knowledge recall. It is important to note the difference in a simple classroom project and project-based learning. A class project may be completed at home without any newly constructed knowledge or in-depth thinking while project-based learning requires a facilitator and the independent construction of new knowledge through various resources available for the learner.

Though some teachers and administrators may be concerned with the level of state standards that are being met through project-based learning, Patton (2012) found that “teachers who are frustrated by narrow standardized tests are finding that students can acquire the content they need through projects, without letting the test dictate the curriculum” (p. 13). Furthermore, Mitchell, Foulger, Wetzel, and Rathkey (2008) found that an understanding of the standards is a key part of planning project-based learning and students integrate standards across the curriculum into their projects. As students create and present their final products, their discussions may be tied to state standards from areas across the curriculum.

Guiding the applied knowledge. Miller (2014) suggests that teachers should collaborate with students to create an initial list of questions that will guide students

and yield more questions that students can answer on their own. These questions should necessitate in-depth thinking and problem-solving skills that are relevant to the real world. The list should not be long and these questions will contain a mixture of content specific questions and questions pertaining to the process of project-based learning. For example, the following questions could be used:

1. Who will my audience be?
2. How do the content standards (whatever they may be) fit in with what I want to create?
3. What will I do if my project doesn't work?
4. How will I present my findings?

As the process of project-based learning continues the student and teacher should return to these questions as they reflect on the process.

In completing a project, the students control how they spend their time planning and creating each product. They should be given flexibility to make their own decisions about meeting deadlines that have been collectively set by the student and teacher. It is critical to project-based learning that teachers enable students to apply decision-making and other relevant life skills in the process of creating their final product. Allowing students to become actively engaged and control their own learning builds skills that are necessary to become life-long learners and high demand employees (Buck Institute for Education, 2017).

Real world application. In his book, *The Global Achievement Gap*, Wagner (2012) interviewed several employers to find what companies are looking for in

employees. Wagner uncovered that students are graduating from high school and college unprepared to meet employer's needs. Students are not learning how to think in school – how to apply knowledge and skills to various situations – and it is affecting them in their career search. Responses from employers indicated that 21st century employees need to understand how to ask questions, how to problem solve, and have the ability to engage in discussions (Wagner, 2012). Furthermore, Martinez and Stager (2013) note that business leaders are looking for creative, independent problem solvers in every field. Traditional 'sit and get' education will no longer prepare students for the fast paced real world.

To combat this issue, Wagner (2012) produced his "Seven Survival Skills" that are necessary for employment in the 21st century. Each skill that Wagner discovered can be an outcome of project-based learning. Additionally, the acquisition of these skills is built into the process for students to learn from experience rather than from a teacher or employer teaching the specific skills. In understanding how to apply knowledge and by practicing basic and advanced skills students are preparing for the real world while expanding their abilities to think both concretely and abstractly.

21st Century Learners

One challenge for educators today is understanding how the 21st century students learn. Merriam (2004) reminds us that a learner must be seen "holistically". The teacher should not assume that there is any pre-understanding of the topic and not omit any important information. Teaching requires reaching all students by means of

their minds, emotions, and bodies. Learners desire to make sense of their lives through learning with others (Zepeda, 2012). Presenting content specific information in class is not enough. It is essential that teachers reach the whole learner and encourage growth through practice. Instruction should provide for different learning styles and teachers must understand that in project-based learning no two end products will look alike. Ken Kay serves as President of the Partnership for 21st Century Skills. Kay (2010) reminds us of the need to embed 21st century skills in the classroom because “the world is changing and schools are not adapting to the changing world” (p. 3). To reach 21st century learners, we must understand who they are and what they need to be successful beyond school.

Characteristics. The characteristics of 21st century learners align with the idea of teaching the whole student. These learners are often described as collaborative, engaged, inquisitive, and creative. Lombardi (2007) describes 21st century learners as students that would rather *do* than *listen*. K-12 educators must evolve as much as learners to prepare students to be productive citizens that can compete on a global scale. Project-based learning serves as a means of developing and encouraging skills that are characteristic of 21st century learners. According to the Partnership for 21st Century Skills (2011), students need to develop “life and career skills, core subject knowledge, 21st century themes, information, media, and technology skills, and learning and innovation skills” (p. 1). The skills are further sub-categorized by Herring (2011) to include global awareness, financial, economic, business and entrepreneurial literacy, civic literacy, health literacy, environmental

literacy, critical thinking, communication, leadership, responsibility and balanced assessment. Herring (2011) also suggests that 21st century learners need to “explore, remediate, and/or enhance standards-based learning in a variety of formats” (p. 788). Because we live in an information rich, constantly changing world, Kay (2009) advises that “mastery of core academic subjects is a necessary, but no longer sufficient, credential for postsecondary education, workplace, or citizenship readiness” (p. 41). Students must be able to constantly evolve and practice 21st century skills. Project-based learning serves as an instrument to instill and practice those skills necessary for working and living in the 21st century. Students are building their capacities in various areas and they may not even realize it until the presentation phase.

Project-based learning in the 21st century. Project-based learning consists of collaborative work, flexibility, and problem solving which are also recognized as 21st century skills. Lecturing and note taking may no longer be effective; to be effective, teachers must create instruction that is “seamless, customized, scalable, information rich” and tailored to the 21st century learner (St. Lifer, 2005, p. 11). Technology plays a vital role in both 21st century learning and project-based learning. In today’s society, technology is constantly at our fingertips and students use technology as a resource to find the answers to almost all questions. Blair (2012) emphasizes the fact that today’s learners “demand quick access to knowledge” (p. 8). Embedded in project-based learning are employability skills as students are required to think critically, problem solve, collaborate, locate and analyze information, and

communicate throughout the entire process. In 2012, Ravitz, Hixson, English, and Mergendoller found that classrooms that used PBL showed a distinguished increase in all areas of 21st century skills as compared to teachers that did not implement project-based learning in the classroom. This finding supports the notion that project-based learning centered classrooms are just as, if not more, appropriate for graduating students that can perform well on standardized assessments as well as contribute to the global economy.

Teacher preparation. Adults learn similar to students in a K-12 classroom but on a different scale. It is important to consider the three domains of learning. Aligning with one or more of the domains of learning (cognitive, affective, and behavioral), adults have different preferences in the way they receive information. While an adult learner may prefer visual, auditory, or kinesthetic learning, they are capable of receiving information in more than one way. It is crucial when training teachers that the process or method used to deliver the new concept is appealing; it would be advantageous to present in a way that meets all learning preferences and domains.

Like our students, adults want to know why they need to learn something new. Four key ingredients for successful adult learning includes the “use of concrete experiences, continuously available supervision and advising, encouragement of adults to take on new and complex roles, and the use of support and feedback when implementing new techniques” (Oja, 1980 as cited in Trotter, 2006, p. 12). The implementation of project-based learning in the classroom necessitates the integration

of concrete examples as well as time for teachers to practice the newly acquired skills that are essential to facilitate successful project-based learning in the classroom. Support from administration allows teachers to continue learning after the initial trainings.

Summary

Project-based learning is not a new concept to education. Beginning in the early 20th century Dewey and Kilpatrick establish that students learn better with a hands-on, constructivist approach to education. Dewey believed in understanding what students wanted to learn and teaching them through experience. As education has evolved more studies have revealed the positive results of project-based learning and the different dynamics of student/teacher interactions in the classroom.

It is important to note the differences between project-based learning, problem-based learning, and project-orientated learning. Project-based learning consists of students completing various phases of the process while teachers act as facilitators. Project-orientated learning takes place when students are front-loaded with content and then asked to independently complete a project at home or outside of class time. Problem-based learning is very similar to project-based learning and is designed for students to acquire knowledge while solving a particular problem whereas project-based learning is driven by the application of knowledge that students may acquire while completing their final products.

Successful project-based learning requires that teachers release some control of the instructional process and allow students to become responsible for their own

learning. Teachers will often assume the role of a facilitators while students work more independent of the teacher to meet deadlines and complete their final products. If project-based learning is a new concept to the school, both teachers and administrators should be trained so teachers can be provided with additional support throughout the process. There are opportunities for teachers to grow with their students during the implementation of project-based learning; with the realization that students and teachers will fail, reflect, and make changes during the process.

Research has shown that the implementation of project-based learning increases student motivation and standardized assessment scores while decreasing discipline issues. Despite the positive perceptions and results from project-based learning, many schools across Kentucky have not attempted to implement project-based learning. This may be due to the fact that teachers prefer more traditional methods such as lecturing as opposed to collaborating with students. However, if educators are going to reach 21st century learners it is necessary to approach the content in various ways.

The review of research in the areas of project-based learning, application of knowledge, and 21st century learners lead to a better understanding of how the implementation of PBL can potentially increase a school's accountability score while offering students enriching experiences beyond the classroom. The research reviewed indicates that several aspects of project-based learning may play a large role in increasing achievement for both the public school system and students alike.

Chapter 3

Methodology

Introduction

The purpose of the case study was to examine the possible impacts of implementing school wide project-based learning while obtaining teachers and administrators' perceived effectiveness of project-based learning. Additionally, data related to both academic and non-academic factors were examined from one middle school that had implemented school wide project-based learning in the 2011-2012 academic year.

Cowan (2007) describes case study research as using "a variety of data collection strategies to describe, explain, or evaluate phenomena" (p. 158). The case study methodology used in the study was driven by the research questions and the desire to conceptualize the effects of implementing school wide project-based learning at Bate Middle School. The research questions for this case study were:

1. How do teachers perceive the effectiveness of project-based learning?
2. How do administrators perceive the effectiveness of project-based learning?
3. What impact does the implementation of project-based learning have on student attendance, standardized assessment, behavior, and retention rates?

The methods used to collect data involved a teacher survey, an administrator questionnaire, and data from the school report card provided annually to the Kentucky Department of Education by Bates Middle School.

Research Design

A mixed methods approach was used for this case study. An attitudinal survey was used to measure teacher's perceptions of effectiveness of project-based learning in the classroom. Focus items on the survey pertained to instructional methods of each teacher and how much they felt that students were learning in the classroom. The survey was distributed via email to all certified teachers at Bates Middle School and it was explained that participation was entirely optional.

Two administrators (the former Superintendent and former BMS principal) were asked to complete a questionnaire containing eight questions. The questions pertained to the administrator's specific experiences in the implementation of project-based learning at Bates Middle School and their perceptions of the effectiveness of project-based learning in relation to both academic and non-academic factors.

Non-academic data from one year prior to implementation, the year of implementation, and four years following implementation were collected in the areas of attendance and retention rates. In addition, student assessment scores and behavior data were obtained and analyzed from the school report card obtained from the Kentucky Department of Education's website. Data for the year of implementation and four consecutive years following the implementation of project-based learning

were used to measure the impact of project-based learning on behavior and assessment and accountability scores.

Coinciding with the school wide implementation of project-based learning at Bate Middle School, the 2011-2012 academic year was the first year that KCCT was replaced by KPREP as part of Kentucky's Unbridled Learning Accountability System. Behavior, assessment, and accountability data could not be compared from the year prior to implementation due to changes at the state level. Dickinson, Levinson, & Thacker (2013) note that "direct comparisons (of KCCT) with K-PREP should not be made because scale scores are not comparable due to a change in the performance standards for K-PREP" (p. 2).

The data from the survey and questionnaire were analyzed to investigate teachers and administrators' perceptions of project-based learning at Bate Middle School. Findings from the survey were also offered to Bate Middle School's current administrator to assist in examining the future implementation of project-based instruction. An analysis of both academic and non-academic data was made available to the Bate Middle School decision makers to enable them to make informed instructional decisions about the future implementation of project-based learning.

Subjects and sampling. In this study, a combination sample method was used to investigate teachers and administrators' perceptions of project-based learning. Cohen and Crabtree (2006) define homogeneous sampling as "the process of selecting a small homogeneous group of subjects or units for examination and analysis" and convenience sampling as "a process of selecting subjects or units

for examination and analysis that is based on accessibility, ease, speed, and low cost” (p. 1). According to the characterizations provided in the Qualitative Research Guidelines Project (2006), the sample for this case study can be considered homogeneous in the sense that the population consisted of middle school teachers from the same school with similar backgrounds and experiences in the focus area of project-based learning. It can also be viewed as a convenience sample due to the location of the school, ease of access, and types of learning approaches used in relation to the focus of the study.

The teacher survey and administrator questionnaire were created using the survey host *kwiksurveys.com* and was sent to 29 certified teachers currently assigned to Bate Middle School and two former administrators via their school email address. It was previously explained that participation in the study was completely optional and the survey began with an informed consent. Of the 31 educators that were contacted, 13 teachers and two administrators responded creating a sample size of 15 participants.

Instrumentation. The two instruments used in the study, a teacher survey and administrator questionnaire, were adapted from *Project-based Learning as a Catalyst in Reforming High Schools*, a study conducted by Ravitz (2008) for the Buck Institute of Education. The survey instrument used in this study can be located in Appendix A and the administrator questionnaire that was used is in Appendix B.

The teacher survey began with an informed consent and consisted of 25 total items in the categories of teaching climate (items 2-7), general teaching practice

(items 8-12), use of PBL (items 13-18). Item number 19 asked if the participant had taught at BMS in the 2010-2011 academic school year (the year prior to the implementation of project-based learning). If the participant responded 'Yes', they were directed to six additional items that were specific to the implementation of project-based learning at BMS.

Some items had multiple parts. So if a respondent had taught at BMS in the 2010-2011 school year and answered all parts of all items, they would be providing 52 responses. Otherwise if the respondent had not taught at BMS in 2010-2011, the survey yields 46 responses. The administrator questionnaire consisted of eight questions that were pertinent to the implementation of project-based learning and specific to their experiences at Bate Middle School.

The instruments were field tested with educators that had various levels of experience with the implementation of project-based learning. Feedback was provided related to the appropriateness of the items in the survey and questionnaire in relationship to the research questions.

Procedures. Following approval from Morehead State University's IRB, data collection procedures came from three sources: teacher survey, administrator questionnaire, and data reported annually by the Kentucky Department of Education in the school report card.

The case study began with a site visit to Bate Middle School in the 2014-2015 academic year. The researcher and a colleague began the visit with a brief meeting with the principal and a point of contact for the site visit, followed by observing

classrooms from different content areas and speaking with teachers and students about the type of learning that was taking place throughout the school.

In the classrooms, mixed methods of instruction and different stages of project-based learning were taking place. In one sixth-grade social studies classroom, students were completing a globe project in which they were required to assemble a map, mark lines of latitude and longitude, plot the continents, and assemble a globe. While the teacher was facilitating and constantly moving around the room, students were experiencing productive struggle but persisted instead of immediately asking their teacher for help.

Down the hall in a seventh-grade science class, some students were conducting an experiment using an egg to observe how various materials enter or leave a cell while other students were working on building cell models out of their choice of materials. Regardless of the content, methods of instruction, or where they were in the process of PBL, students could explain what they were learning and what they would be able to do as the outcome of the learning. It was very evident that, for the most part, teachers and students understood the processes involved in project-based learning and there seemed to be a positive perception of PBL throughout the school.

Due to procedure, the surveys and questionnaires were not administered until the 2016-2017 school year following the collection and analysis of previous research on project-based learning, 21st century learners, and application of knowledge. In the

one school year between the site visit and survey administration, there was both teacher and administrative turnover.

With the help of one very gracious point of contact, surveys were administered to all certified teachers at Bate Middle School regardless of their time served in the building. The survey was hosted online at *www.kwiksurveys.com* and sent to 29 certified teachers at Bate Middle School via their school email address. The teacher survey began with an informed consent followed by items regarding teaching climate, teaching practice, and the use of project-based learning. Aside from basic demographic items like time spent in the field of education, etc., all survey responses were in the format of a percentage or an attitudinal measure.

The Superintendent from 2009-2014 academic years along with the principal from 2014-2016 was contacted to request their completion of the administrator questionnaire. To be respectful of their time, both were given the option of completing the questionnaire online or having the researcher meet with them in person. Both administrators chose to complete the questionnaire online but offered to have a follow up meeting if necessary.

School report cards are annually collected from all schools in the state and published by the Kentucky Department of Education. The school report card “includes test performance, teacher qualifications, student safety, awards, parent involvement and much more” (KDE, 2016). Data obtained from the school report card for the purpose of this study pertained to accountability scores, standardized assessment scores, attendance, behavior, retention, and demographics. Behavior and

assessment data were collected from the year of implementation and four years following the implementation of project-based learning (2011-2016). Non-academic data (attendance and retention) were collected from one year prior to the implementation of project-based learning (2010-2011), the year of implementation and four years following the implementation of project-based learning.

Data analysis. Since data were collected using three different methods, the data from each the survey, the questionnaire, and the school report card were analyzed individually and then triangulated to find common themes in the study. Castellanos (n.d) clarifies that in qualitative data analysis, “the statistical focus on the *p* value in quantitative research is replaced with pattern seeking and the extraction of meaning from rich, complex sources of linguistic or visual data” (p. 2).

Data analysis in this case study focused on qualities rather than quantities. To uncover themes, the survey data were analyzed and the mean and standard deviation for applicable items were calculated using the reporting tool available through the survey host *www.kwiksurveys.com*. Those calculations were paired with data from the school report card and responses to the administrator questionnaire to offer a in depth analysis of teacher and administrator perceptions of project-based learning as well as the effects on both academic and non-academic factors.

Chapter 4

Results and Findings

Introduction

This case study was designed to learn about teachers and administrators perceived effectiveness of project-based learning in one Kentucky middle school and to examine the effects the implementation of school wide project-based learning had on both academic and non-academic factors. The following research questions were examined in the study:

1. How do teachers perceive the effectiveness of project-based learning?
2. How do administrators perceive the effectiveness of project-based learning?
3. What impact does the implementation of project-based learning have on student attendance, standardized assessment, behavior, and retention rates?

An attitudinal survey was used to obtain perceptions from teachers and administrators on the processes and impacts that PBL has on teaching and learning in the classroom. In addition, data were obtained from the School Report Card for one year prior to the implementation, the year of implementation, and four years following the implementation of school wide project-based learning. The capstone was developed with the intentions of identifying the effects of project-based learning on both academic and non-academic factors in relation to 21st century skills, application of knowledge, and state accountability.

Demographic Information

The participant request was sent to 29 certified teachers and two administrators. Of the 31 educators that received an invitation to participate in the study, 13 teachers and two administrators responded. Since participation was entirely optional, it is unclear of the exact demographics of the 13 teacher participants. However, the demographics of the 31 educators that were invited to participate in the survey were found on Bate Middle School's website. Thirteen male educators and 18 female educators were contacted to participate in the study. Table 4 further categorizes potential participants by content area and gender.

Table 4

Requested Participants Content Area by Gender

Gender	Admin.	Elective	ELA	Math	Other	Science	Social Studies	SPED	Total
Male	0	4	0	1	3	1	1	3	13
Female	2	3	5	2	1	2	2	1	18
Total	2	7	5	3	4	3	3	4	31

Though the survey did not ask for any identifying information, item number two on the teacher survey asked for years of experience in education. Furthermore, information regarding years of experience for the two administrators that provided responses to the questionnaire were found online via their current employer's websites. Years of experience in education for the 13 teachers and two administrators that responded as a contribution to the case study are outlined in Table five.

Table 5

Number of Respondents by Years of Experience

Years of Experience	0-5	6-10	11-15	16-20	21+
Number of Participants	0	5	3	3	4

It is not uncommon for middle school teachers to be responsible for teaching more than one content area or grade level. To maintain anonymity, item three solicited teachers to identify any subject they had taught during their entire tenure at BMS. Though respondents may not currently be teaching all of the subjects that they identified in item three, Table 6 summarizes the backgrounds and experiences of the 13 teachers that had responded to the survey. Item three provided a response option of ‘other’ and asked the teacher to specify. Those specifications included Special Education, Visual Arts, Spanish, Drama/Theatre, Reading, and Writing.

Table 6

Respondents’ Subject Area and Grade Level Experience at BMS

Subject Area at BMS						
	Math	Science	English	Social Studies	Career or Elective	Other (Please Specify)
Number of Participants	3	3	5	2	4	8

Grade Levels Taught at BMS			
	Sixth Grade	Seventh Grade	Eighth Grade
Number of Participants	6	7	10

Item 4 requested that the teacher distinguish the grade level or levels they currently teach at Bate Middle School as presented in Table 9. Providing the current grade level(s) taught on the survey did not identify participants as their responses were not tied to any additional information that could potentially single out any one teacher and multiple teacher appears to teach more than one grade level in the current academic year.

Survey Analysis

All of the 13 teachers that responded indicated that they interact with anywhere from 61 to over 120 students per day. Twelve teachers indicated that they use direct instruction in the classroom, ten teachers revealed that they use a flexible approach to content and interdisciplinary projects, and eight teachers specified that they team teach with other teachers. A majority of teachers responded that they currently only used project-based learning in the classroom up to 25% of the time.

Teaching climate. Items 2 through 7 pertained to teaching climate at Bate Middle School. Teachers indicated that between 41% and 80% of current students in grades six through eight struggled with academic reading or writing, up to 20% of their students qualify for special education services, and only between 21% and 40% of students seem to be on track with their peers as shown in table 7.

Table 7

Teaching Climate (kwiksurveys, 2017).

	▼ 0-20	▼ 21-40	▼ 41-60	▼ 61-80	▼ 81-100	▼ Standard Deviation	▼ Responses	▼ Weighted Average
● Struggle with academic reading or writing	2 (15%)	1 (8%)	5 (38%)	5 (38%)	0 (0%)	2.06	13	3 / 5
● Seem on track with their peers	1 (8%)	5 (38%)	4 (31%)	2 (15%)	1 (8%)	1.62	13	2.77 / 5
● Qualify for SPED	7 (54%)	5 (38%)	0 (0%)	1 (8%)	0 (0%)	2.87	13	1.62 / 5

General teaching practice. Items 8 through 12 fell under the category of General Teaching Practice. Teachers responded that they predominantly use open-ended problems and multiple choice or short answer tests to measure student performance while sometimes using group or individual projects and hands on demonstrations or presentations. Furthermore, over 50% of teachers responded that most of the time their students evaluate and defend their ideas or views and orally present their work to peers, staff, parents or others. Table 8 illustrates that teachers commonly identified that students in their classrooms sometimes collect, organize, and analyze data, solve real world problems, and decide how to present what they have learned.

Table 8

General Teaching Practice (kwiksurveys, 2017).

↶ ↷	▼ Never	▼ Seldom	▼ Sometimes	▼ Most of the time	▼ Always	▼ Standard Deviation	▼ Responses	▼ Weighted Average
● Teach students what they need to know prior to beginning the project	0 (0%)	1 (8%)	6 (50%)	3 (25%)	2 (17%)	2.06	12	3.5 / 5
● Use a driving question or problem statement	0 (0%)	1 (8%)	4 (33%)	5 (42%)	2 (17%)	1.85	12	3.67 / 5
● Specify content standards that projects are designed to meet	0 (0%)	1 (8%)	0 (0%)	5 (42%)	6 (50%)	2.58	12	4.33 / 5
● Assess students for accuracy, thoroughness, or depth of understanding	0 (0%)	0 (0%)	0 (0%)	5 (42%)	7 (58%)	3.01	12	4.58 / 5
● Have students reflect on the quality of their work and learning	0 (0%)	0 (0%)	4 (33%)	5 (42%)	3 (25%)	2.06	12	3.92 / 5
● Use a rubric to guide or assess student work	0 (0%)	0 (0%)	1 (8%)	4 (33%)	7 (58%)	2.73	12	4.5 / 5

↶ ↷	▼ Never	▼ Seldom	▼ Sometimes	▼ Most of the time	▼ Always	▼ Standard Deviation	▼ Responses	▼ Weighted Average
● Collect, organize and analyze information and data	0 (0%)	1 (8%)	6 (50%)	5 (42%)	0 (0%)	2.58	12	3.33 / 5
● Solve real world problems	0 (0%)	0 (0%)	7 (58%)	5 (42%)	0 (0%)	3.01	12	3.42 / 5
● Decide how to present what they have learned	0 (0%)	0 (0%)	8 (67%)	3 (25%)	1 (8%)	3.01	12	3.42 / 5
● Evaluate and defend their ideas or views	0 (0%)	2 (17%)	3 (25%)	7 (58%)	0 (0%)	2.58	12	3.42 / 5
● Orally present their work to peers, staff, parents or others	0 (0%)	1 (8%)	5 (42%)	6 (50%)	0 (0%)	2.58	12	3.42 / 5

Also presented in Table 8 were the average responses from teachers indicated that teachers sometimes teach students what they need to know prior to beginning a project. Teachers responded that they use driving questions and have students reflect on their work and learning most of the time, and always specify the content standards that PBL is designed to meet, assess students for depth of understanding, and use rubrics to guide or assess student work. Item 12 asked for teachers' perspective of the importance of school wide practices concerning project-based learning. A majority of teachers indicated that they value scheduled time to meet during the day with other

teachers to focus on instructional practices and student learning. They also value critical feedback from supervisors and indicated that they are involved in decision-making within the school.

Use of project-based learning. Items 13 through 18 focused on the teachers' use of project-based learning. Item 13 asked teachers to select all of the reasons they use PBL. Of the 11 teachers that responded, 10 selected that they use PBL to make teaching and learning more varied, challenging, and fun. Nine teachers selected to teach academic content knowledge and skills more effectively and to teach skills beyond academic content. Two teachers did not provide responses to this particular item.

Items 14, 15, and 17 asked teachers to comment on the extent they agreed or disagreed with statements about students in relation to the impact of project-based learning on both academic and non-academic factors. In response to these three items, almost all teachers revealed that they either agree or strongly agree that PBL is effective for high, average, and low achieving students as well as students that lack motivation. Fifty-five percent of teachers agreed that the use of PBL in the classroom has a positive effect on student behavior and increases student engagement while a majority of teachers agreed that their students respond to PBL and can meet state or district standards.

Teachers also agreed that they believe they can assess each individual student's content learning and skills beyond academic content through project-based learning but feel that a lack of time to cover the entire curriculum and too many

testing or accountability requirements may limit their use of project-based learning. When asked to select all policies and procedures that are currently in place at BMS, only one teacher selected a school wide emphasis on project-based learning. However, 90% of respondents did select a school wide emphasis on skills beyond academics.

Before project-based learning. Teachers were asked to identify if they taught at Bate Middle School in the 2010-2011 school year (one year prior to the implementation of school wide PBL). The six teachers that responded ‘yes’ were directed to the following six free response items:

1. How would you describe the project-based learning approach as compared to “traditional teaching”?
2. How has using project-based learning affected your teaching of course concepts?
3. How has the knowledge that students gained or have not gained through PBL change your perception of project-based learning?
4. What are the strengths or pluses of PBL?
5. What are the concerns or challenges in the implementation of PBL in the classroom?
6. Is there anything you would like to add?

In response to the items teachers shared that in their experience at Bate Middle School project-based learning is student centered, engaging, and offers a deeper learning experience for students. Students are exposed to 21st century skills

such as problem solving, real-world application of content, accountability, and self-efficacy. Teachers implied throughout their responses that the focus has shifted from project-based learning to test prep at Bate Middle as one teacher responded that they are “back on the KPREP train” and another commented that “the immediate short term tests may not show improvement but the long term thirst for learning that students gain through PBL outweigh the short term benefits”. One teacher noted that PBL is “wonderful for lower/average students while more advanced students do not advance as much” while another simply stated “I could not teach without using PBL”.

Though the perception of project-based learning seemed to be collectively positive, when asked their concerns or the challenges of implementing PBL in the classroom, teachers responded that there may be a lack of administrative support at the school and/or district level as well as time and standardized testing requirements. One response included the notion that teachers must be trained and work together/project tune for project-based learning to be successful implying the need for a team atmosphere and support at all levels.

Questionnaire Analysis

Although both administrators asked to complete the questionnaire (the former superintendent and former principal) had moved on to different positions, they both contributed their time and efforts into the implementation and continuation of project-based learning at Bate Middle School. In examining the replies to the administrator questionnaire, there were several commonalities in the responses. Both administrators responded that in their experience, project-based learning had exposed

students to deeper learning as they gained problem solving and critical thinking skills among other 21st century skills.

Impact of project-based learning. When asked specifically about the difference that project-based learning made with students in the classroom at Bate Middle School, one administrator shared that “attendance improved and behavior referrals decreased” while both administrators commented on the growth they saw in the students’ ability to think and actively learn. Both respondents also touched on the positive relationship between project-based learning and student engagement stating that project-based learning “inspires curiosity” and “makes learning real”. It was also mentioned several times throughout the responses that project-based learning offered students with experiences and connections that they may not get through traditional instruction because students had to not only learn the content but also apply it in authentic situations.

In response to the final question regarding the challenges of implementing project-based learning, both administrators responded that there must be support from the top down. One respondent further provided that it could be challenging to “find a balance with PBL and traditional test prep that teachers have become accustomed to” but both respondents agreed that project-based learning gives students a deeper understanding of standards and perseverance both of which lend themselves to doing well on standardized assessments.

School Report Card Analysis

Data from the school report card that available annually from the Kentucky Department of Education was compiled from the year prior to implementing project-based learning (2010-2011) to the most recent academic year (2015-2016).

Attendance and retention data were available for all years as shown in Table 9.

Behavior data, however, could not be compared before the 2011-2012 school year due to a change in reporting regulations that were introduced with the new accountability system.

Table 9

Enrollment, Behavior, Attendance, and Retention Rates for BMS

Academic Year	Total Enrollment	Number of Total Behavior Events	Attendance Rate	Student Retention Rate
2010-2011	357	N/A	94.5%	.8%
2011-2012	372	57	95.2%	1.7%
2012-2013	447	129	95.3%	0
2013-2014	425	115	95.3%	0
2014-2015	406	134	95%	0
2015-2016	403	418	94.8%	0

Behavior. As presented in Table 9, the total number of behavior events has increased considerably over the 5 academic years that data could be compared. The sizeable difference in number of events could be a result of reporting procedures at the school and/or state level as data is reported through an academic reporting system, infinite campus, and validated by district employees. The lowest number of behavior

events was reported in the academic year that project-based learning was implemented (2011-2012) but fluctuates in the years after. It is insightful when looking at total behavior events to consider that total enrollment was 372 in the 2011-2012 academic year and increased annually until the 2013-2014 academic year.

Attendance. The attendance rate did rise from the year prior to implementation of project-based learning and remained at or over 95% until the 2015-2016 academic year. In the survey responses teachers shared that Bate Middle has recently lost focus on project-based learning which could potentially account for the drop in attendance rates. The retention rate increased the year that school wide project-based learning was implemented but then declined and remains at zero.

Accountability. Due to the Unbridled Learning Accountability System that was implemented in the 2011-2012 academic year, assessment and accountability data could not be compared from the 2010-2011 academic year but is presented for five consecutive years as shown in Tables 10 and 11. The annual measurable objective (AMO) column shows N/A for the 2010-2011 academic year as there was not previous data available to accurately set the goal.

A school's classification was determined by KPREP cut scores. Schools that were deemed 'needs improvement' were "those scoring below the Proficient cut scores of 65.8 for middle schools" (KDE, 2017). Please note that for the purpose of this study, the NAPD percentages in Table 11 are a reflection of total number of students tested at a Bate Middle School that were enrolled for at least 100 days during the academic year. The data on the assessment tab and accountability tab of the

school report card do not match as “schools must test all students, but are only accountable for students enrolled a full academic year (100 days)” (KDE, 2016).

Table 10

State Accountability for Bate Middle School

Academic Year	Overall Accountability Score	Classification	Met AMO Goal
2011-2012	50.7	Needs Improvement	N/A
2012-2013	62.7	Needs Improvement	No
2013-2014	62.6	Needs Improvement	No
2014-2015	60.3	Needs Improvement	No
2015-2016	63.0	Needs Improvement/Progressing	Yes

Though the classification has remained at ‘needs improvement’, the 2015-2016 academic year does show BMS as progressing meaning that it “met AMO goal and student participation rate for the all students group and each subgroup” (KDE, 2017). As indicated in Table 10, the accountability score was the lowest in the first year of the new assessment and accountability system that coincides with the year that Bate Middle implemented school wide project-based learning but does increase and remains moderately consistent through the 2015-2016 academic year. How the overall accountability score was calculated for the middle school is presented in Table 1. The NAPD percentages reported contribute to the bulk of the calculation for the Next Generation Learner Category in the areas of achievement, gap, and growth.

Table 11

NAPD by Content Area for Bate Middle School

Reading										
	2011-2012		2012-2013		2013-2014		2014-2015		2015-2016	
	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students
N	32%	119	29.3%	130	23.8%	101	26.3%	106	25.1%	100
A	19.1%	71	23.7%	105	27.3%	116	27.6%	112	21.6%	87
P	30.4%	113	30.8%	137	35%	148	32.4%	131	36.9%	148
D	18.5%	68	16.2%	72	14%	59	13.8%	56	16.3%	65
Math										
	2011-2012		2012-2013		2013-2014		2014-2015		2015-2016	
	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students
N	26.6%	98	22.2%	99	23.3%	99	20.9%	84	21.1%	85
A	40.9%	152	43.4%	193	44.8%	190	47.4%	192	35.9%	144
P	25%	93	26.3%	117	25.3%	107	23%	93	31.9%	128
D	7.5%	27	8.1	36	6.8%	28	8.7%	35	11.1%	44
Social Studies										
	2011-2012		2012-2013		2013-2014		2014-2015		2015-2016	
	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students
N	10%	37	9.1%	40	9.9%	4	10.1%	41	12.5%	50
A	29.1%	108	30.6%	136	24.1%	10	40.3%	163	29.2%	117
P	35.5%	132	44.6%	199	49.6%	210	36.4%	147	47.5%	191
D	25.5%	94	15.7%	70	16.3%	69	13.2%	53	10.8%	43
Science										
	2011-2012		2012-2013		2013-2014		2014-2015		2015-2016	
	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students	% of Total Students	≈ No. of Students	Science Assessment Data were not reported on the school report card in the 2014-2015 or 2015-2016 academic years.			
N	10.1%	37	9.2%	41	16.2%	68				
A	31.1%	115	31.9%	142	26.9%	12				
P	32.8%	122	33.3%	148	36.9%	16				
D	26.1%	97	25.5%	113	20%	9				

Academic performance. The data presented in Table 11 reflects the percentage of total students enrolled at BMS for at least 100 days that scored Novice, Proficient, Apprentice, and Distinguished in each subject area over five consecutive years. Again, when looking at percentages of total students it is important to consider total enrollment. In reading, for example, approximately 68 students (18.5%) scored distinguished in the 2011-2012 academic year and approximately 65 students (16.3%) scored distinguished in the 2015-2016 academic year. When evaluating the effects of PBL, it is advantageous to consider the impacts on individual students as well as the school as a whole. Additionally, when examining NAPD data it is desirable to see a shift across the continuum from novice to distinguished over time. The goal is to move students from novice to apprentice and so on through monitoring results of formative assessment and implementing instructional shifts to meet student needs.

In reading, the percentage of total students that scored novice declined over the five-year period from 32% to 25.1% but increased between the 2013-2014 and 2014-2015 academic years. Adversely, the percentage of students that scored distinguished steadily declined from 18.5% in the 2011-2012 academic year to 13.8% in the 2014-2015 academic year and then increased to 16.3% in the 2015-2016 academic year. The percentage of apprentice scores increased from 2011-2012 to 2014-2015 from 19.1% to 27.6% and then declined by 6% the following year. The percentage of students scoring proficient in reading increased until the 2014-2015 academic year where there was a drop of 2.6% and then an increase the following year from 32.4% to 36.9%.

The percentage of students that scored novice in math decreased from 26.6% to 21.1% over the five-year period but slightly increased between the 2012-2013 and 2013-2014 academic years by 1.1%. Percentages of apprentice scores continuously rose from 40.9% in 2011-2012 to 47.4% in 2015-2016 and then dropped the following year by 11.5%. Percentages of students scoring proficient in math fluctuate over the five-year period but did increase over all from 25% to 31.9%. The percentage of students scoring distinguished in math increased over all from 7.5% to 11.1% but dipped from 2012-2013 to 2013-2014 and then continued to rise.

Social Studies scores revealed a decline in the percentage of novice for the 2011-2012 and 2012-2013 academic years but continuously increased beginning in the 2013-2014 academic year. It is notable that social studies appear to be the only content area at Bate Middle School that ended the 2015-2016 school year with a higher percentage of novice scores (12.5%) than it began with in the 2011-2012 academic year (10%). The percentage of students scoring apprentice in social studies uninterruptedly increased and decreased year after year with an over all increase of .1% while the percentage of proficient scores increased over all by 12% with a substantial decline of 13.2% between the 2013-2014 and 2014-2015 academic years. The percentage of distinguished scores in Social Studies declined considerably over the five-year period from 25.5% in 2011-2012 to 10.8% in 2015-2016.

Science data were not available on the school report card for the 2014-2015 or 2015-2016 academic years. Table 11 offers science assessment data for three consecutive years. Over the three years, the percentage of novice students declined

from the 2011-2012 academic year and then increased considerably from 9.2% to 16.2% in the 2013-2014 academic year. Apprentice scores revealed a slight increase of .8% in the 2012-2013 academic year but declined to 26.9% the following year. Proficient percentages increased each year from 32.8% to 36.9% while the percentage of students scoring distinguished in science continuously decreased over all three years from 26.1% to 20%.

Themes. When identifying themes in data, Ryan and Bernard (2003) emphasize that “word-based techniques are an efficient way to start looking for themes” (p. 97). While analyzing the data from the survey and questionnaire the following word repetitions were noted: engaging/engagement, deeper learning, real world, life skills, and support. As a result of triangulating the data from the survey, questionnaire, and school report card three overarching themes were discovered: Benefits, Challenges, and Student Success.

Theme 1: Benefits. Teachers and administrators both noted that project-based learning provides students with rich, real-world learning experiences in which they gain important 21st Century skills. Additionally, both teachers and administrators suggested that in their experiences with PBL students were more engaged, retained content for longer periods of time, and behavior issues decreased. Teachers indicated through the survey that project-based learning makes learning more varied, challenging, and fun while students learn skills beyond the academic content. One administrator commented that teachers seemed more passionate about PBL than they did traditional education. In the year that Bate Middle School implemented project-

based learning, the attendance rate did increase and did not drop below 95% for four consecutive years. The percentage of students scoring novice in all content areas decreased and the percentage of students scoring apprentice and proficient in all content areas increased.

Theme 2: Challenges. Both teachers and administrators mentioned state accountability and assessment requirements as challenges to project-based learning. Likewise, they also referred to a lack of support from administration at school and district level as being a challenge. Teachers reported a lack of time in the curriculum as a barrier to project-based learning while one administrator reported a challenge of getting teachers to understand that it is ok to teach deeper instead of broader with the content standards. Data from the school report card shows that student retention rates increased the year of implementation but then declined in the years following. The percentage of students scoring distinguished on standardized assessment decreased in all content areas.

Theme 3: Student Success. Teachers and administrators both indicated that when using project-based learning, students are proud of their work and have increased self-efficacy. Teachers indicated that project-based learning was effective in reaching students at all levels (high, average, low, and students who lack motivation). Teachers agreed that PBL has a positive impact on student behavior but remained neutral when asked if PBL increased student attendance and decreased retention rates, while one administrator noted that attendance increased and behavior issues decreased. Novice scores in reading, math, science, and social studies all

decreased while apprentice and proficient scores all increased the year following the implementation of project-based learning. Distinguished scores, however, fluctuated in all content areas which may support one teachers perception that advanced students may not grow as much as low and average students when using project-based learning.

Results

This case study was conducted to address three research questions:

1. How do teachers perceive the effectiveness of project-based learning?
2. How do administrators perceive the effectiveness of project-based learning?
3. What impact does the implementation of project-based learning have on student attendance, standardized assessment, behavior, and retention rates?

To explore research questions one and two, 31 educators affiliated with Bate Middle School were invited to participate in the case study. Thirteen of 29 teachers responded to the survey (though not all 13 teachers responded to every part of every item) and both administrators that were invited to participate responded to all questions on the questionnaire. Data for behavior, attendance, retention and assessment was obtained from the school report card published annually by the Kentucky Department of Education to investigate research Question 3.

Research question 1: In response to Question 1, How do teachers perceive the effectiveness of project-based learning?, the data analysis revealed that, over all,

teachers at Bate Middle School had a positive perception of the effectiveness of project-based learning. Data from the survey indicated a positive relationship between teachers' perception of project-based learning and how students learn and respond in the classroom. Teachers reported that project-based learning makes learning more varied, challenging, and fun while students experience deeper learning and are exposed to situations in which they can develop and grow skills beyond the academic content.

Research question 2: In investigating Question 2, How do administrators perceive the effectiveness of project-based learning?, the data analysis revealed that administrators not only positively perceive the effectiveness of project-based learning, but understand the importance of supporting teachers in the implementation of project-based learning. Administrator responses to the questionnaire were indicative of positive perceptions in both academic and non-academic areas as it was reported that students showed increased engagement and an increase in self-confidence in their learning while teachers seemed to be more passionate when implementing project-based learning. Moreover, responses indicated an increase in student attendance rates and a decrease in student behavior issues.

Research question 3: Analyzing the data in relation to Question 3, What impact does the implementation of project-based learning have on student attendance, standardized assessment, behavior, and retention rates?, resulted in various evaluations. The impact of the implementation of project-based learning were neither entirely positive nor entirely negative for all four categories of attendance,

assessment, behavior, and retention. To examine this research question, data were explored for each factor as outlined below.

Impact on attendance. The attendance rate increased from 94.5% the year prior to the implementation of project-based learning to 95.2% the year that Bate Middle School implemented project-based learning. The attendance rate remained at or above 95% until the 2015-2016 school year.

While teachers indicated neither agreement nor disagreement that project-based learning had a positive impact on student attendance, one administrator noted an increase in attendance supported by the data found in the school report card. Teachers reported that Bate Middle School shifted its focus from project-based learning “a couple of years ago” which would align with the academic year that attendance began to drop. Although various factors may have contributed to the increase in student attendance after the implementation of PBL, an inference can be made that project-based learning had positive impacts on student attendance.

Impact on assessment. NAPD percentages fluctuated over the six-year period in every content area. Data reported for the year immediately following the implementation of project-based learning, however, indicates a decrease in novice scores in reading, math, science and social studies. Apprentice and proficient scores all increased in each content area as well. Distinguished scores showed fluctuation in all content areas but primarily decreased overall.

Survey results indicated that teachers felt that project-based learning was suitable for all levels of students but the data may contradict that claim for upper level

students in relevance to standardized assessment scores. The assessment data makes it apparent that project-based learning had a positive impact in decreasing novice scores and increasing apprentice and proficient scores but a negative impact on distinguished assessment scores.

Impact on behavior. There are drastic differences in the behavior data reported from 2011-2012 to 2015-2016. Over those five years, total behavior events ranged from 57 events in the 2011-2012 academic year to 418 events in the 2015-2016 academic year. Behavior data was reported and validated by each district so there may be inconsistencies in reporting procedures throughout the 5 years referred to in Table 9.

While there was not a specific trend in behavior data over time, the total number of behavior events increases in the 2014-2015 school year and reaches the five-year high in the 2015-2016 academic year. The data that was reported through the Kentucky Department of Education fluctuates so much that it was difficult to evidence through the data a positive impact on student behavior. However, teachers and administrators both noted that project-based learning did have a positive impact on student behavior.

Impact on retention. The student retention rate more than doubled in the 2011-2012 academic year. This could be due to the implementation of project-based learning as there was a learning curve for students and teachers alike. This was also the first year of Kentucky's new assessment and accountability system. In the year

following the implementation of project-based learning the student retention rate dropped and has remained consistently at zero.

Furthermore, a majority of teachers remained neutral when asked if PBL decreased student retention rate. Neither teachers nor administrators commented on student retention in their written responses. The evidence was inconclusive as to whether or not project-based learning had any impact on student retention rates.

Conclusions

The purpose of this case study was to examine teacher and administrator perceived effectiveness of project-based learning in one Kentucky middle school and the impacts of project-based learning on student attendance, retention, behavior, and standardized assessment. The data revealed that teachers and administrators positively perceive the effectiveness of project-based learning. There were positive associations in regards to student attendance and behavior. There was not substantial evidence that project-based learning had any impact, neither positive nor negative, on student retention rates. The implementation of project-based learning resulted in positive movements in the percentages of students scoring novice, apprentice, and proficient on standardized assessment but displayed negative connection with distinguished assessment scores.

Chapter 5

Conclusions, Actions, and Implications

Introduction

This case study was designed to examine teacher and administrator perceptions and the effects of project-based learning on both academic and non-academic factors at one Kentucky middle school that implemented school wide project-based learning. The conceptual framework of the study was constructed around research and theories in the areas of project-based learning, application of knowledge, and 21st century learners. Data were collected by means of a confidential teacher survey and an administrator questionnaire as well as annual reports from the Kentucky Department of Education. The findings presented below result from quantitative and qualitative data analysis related to the following research questions that were examined in this study:

1. How do teachers perceive the effectiveness of project-based learning?
2. How do administrators perceive the effectiveness of project-based learning?
3. What impact does the implementation of project-based learning have on student attendance, standardized assessment, behavior, and retention rates?

Summary of Results and Findings

Results of the data were analyzed to identify three overarching themes as (1) benefits, (2) challenges and (3) student success.

Benefits of the implementation of project-based learning at Bate Middle School included an increase in student engagement, an increase in the sense of pride that students had in their work, an increase in student self-efficacy, an increase in student attainment and practice of 21st century skills, an increase in student attendance rates, a decrease in behavior issues, and teachers seemed more passionate about project-based learning than traditional instruction.

The challenges of the implementation of project-based learning at Bate Middle School included a decrease in the percentage of students scoring distinguished on standardized assessment, the support structure that must be in place at the school and district level, teachers fear that they may not be covering enough of the curriculum, and state assessment and accountability requirements.

Student success included what teachers and administrators observed and what the data presents from the implementation of project-based learning specific to students. The percentage of students scoring novice on standardized assessment decreased while apprentice and proficient scores increased. Students seemed more engaged in the classroom and active in their learning. Students gained content knowledge and 21st century skills while being exposed to various experiences and real-world problems.

Data reported from the survey exposed that teachers have an overall positive perception of the effectiveness of project-based learning. The questionnaire analysis revealed that administrators also have a positive perception of the effectiveness of project-based learning. School report card data displayed positive trends relative to

project-based learning and the non-academic components of student attendance and behavior. There was not substantial evidence to support a claim about the impact that project-based learning had on student retention rates. Assessment data from the School Report Card indicated a positive impact associated with novice, apprentice, and proficient scores in reading, math, science, and social studies while signifying a negative impact on distinguished scores across all tested content areas.

Interpretations

This case study was designed to examine the perceived effectiveness of project-based learning from teachers and administrators at one Kentucky middle school while examining both academic and non-academic student data in relation to project-based learning. Results and findings were presented and three overarching themes were identified.

Results from the survey and questionnaire suggest that teachers and administrators find value in project-based learning in relation to both academic and non-academic factors. In analyzing the responses, it was clear that project-based learning increases the attainment of 21st century skills and provides students and teachers with opportunities to learn ‘outside the box’. Teachers at Bate Middle School did not seem particularly pleased for the focus to shift from project-based learning to test prep. One can only assume that this shift was made in attempts to improve state accountability scores.

The positive responses from teachers and administrators paired with fluctuation of standardized assessment results and low accountability scores shown on

the school report card implies a disconnect between what front line educators value and what state decision makers value for students. It was made clear through the study that state decision makers need to seek and integrate educator feedback across the state. Through project-based learning students attain more skills and abilities than simply learning how to score well on standardized assessment. School decision makers must decide if it is more important to appear to the state that students are learning or to ensure that students are actually learning not only content but life skills.

Implications for Improvement/Change

The intentions of this case study were to contribute to the conversation about the way that decision makers view success in education and to help current educators understand the need to prepare their students for life beyond secondary school. This case study provides the field of education with an analysis of educators' perceptions of the effectiveness of project-based learning as well as highlighting the effects of implementing school wide project-based learning on both academic and non-academic factors.

The participants provided the study with valuable feedback about the implementation of project-based learning and its effects in the classroom. The study not only revealed that teachers and administrators have a positive perception of project-based learning but also that project-based learning has positive impacts on student attendance, student engagement, student attainment of 21st century skills, and student behavior. In addition, standardized assessment data reveals that the percentage of students scoring novice, apprentice, and proficient all moved in a

positive direction. These positive results of the implementation of project-based learning imply a need for a shift from traditional methods of instruction to more hands on active learning models.

The teachers and administrators that implemented and sustained project-based learning at Bate Middle school are an example Kentucky educators that understood the negative consequences that students may face as a result of our current public education system. It is inevitable that educational accountability systems will change over time. As changes occur, it is imperative that educators and decision makers do not become wrapped up in numbers and accountability scores while students take the back seat and miss out on deeper, more experiential learning.

Limitations, Delimitations, and Assumptions

Limitations. There were a number of limitations in this case study including teacher and administrator turnover, convenience sampling, and state data reporting procedures. Because the researcher knew there was a high number of teacher and administrator turnover, two former BMS administrators were contacted that were present during the implementation of project-based learning. The researcher included additional items on the survey if teachers responded that they worked at BMS during the year of implementation. Because the researcher used convenience sampling, it is understood that results from the study may not be applicable to all educational institutions. State data reporting is submitted and verified by district personnel. Additionally, because it is at the discretion of each district, events that are reported and how they are coded in the reporting system may be subjective. Though data

retrieved for this study was reported by the Kentucky Department of Education, it is understood that data may be skewed or lack consistency over time due to reporting procedures.

Delimitations. Delimitations include location and subject choice for the case study. The case study was chosen as a result of conversations with a colleague about the innovative approaches that Danville Independent had taken to ensure deeper learning. Prior to conducting the case study, the researcher was interested in learning more about the potential benefits of project-based learning. The location of the study is one small, rural Kentucky middle school. While it is understood that the results may not be applicable to all school settings, the findings of the study do relate to secondary educators, educators in rural areas, and schools or districts that feel like traditional instruction isn't enough.

Assumptions. Underlying assumptions of the case study include that project-based learning was implemented with fidelity at Bate Middle School. It was also assumed that teachers and administrators would provide truthful answers in the survey and questionnaire. To maintain teacher confidentiality, it was ensured in advance that the survey would not ask any identifying information about teachers specifically. Another assumption is that the sample of teachers that completed the survey is representative of the population of teachers from Bate Middle School.

Recommendations

Results from the findings of this case study in relation to possible changes that are pending in the accountability system imply that all educators across Kentucky

could benefit from learning about the positive effects of project-based learning. An info-graphic outlining the results of this study and possible effects of project-based learning was disseminated to all Kentucky educators.

Both academic and non-academic data exposed positive trends for all stakeholders. It would be advantageous for school and district level administrators to relinquish some of the control associated with obtaining high accountability scores and incorporate project-based learning or other experiential methods of instruction in classrooms. Building principals are encouraged to place more emphasis on empowering teachers to decide how they want to teach content and skills and less emphasis on accountability scores.

Future Actions

Because of the positive associations presented in the case study it is suggested to further research in the area of the effectiveness of project-based learning with respect to standardized assessment and state accountability. It would be very insightful for a study to compare two public schools that use different instructional approaches but have similar populations. It was reported in this study that administration felt that teachers were more passionate about project-based learning. It would be interesting to research teacher attendance in relation to project-based learning in comparison to more traditional instructional methods. Furthermore, because the focus of the case study was one Kentucky middle school, there is a need to replicate this work with a larger sample size. If research continues to show positive impacts for students in both academic and non-academic areas then it may

call for a review of how we are assessing what our students know and are able to accomplish.

Reflections

As the researcher and a practitioner, it was difficult to present the case study without a biased opinion. There is not a 'one-size fits all' approach to educating students. Just as the experiences associated with project-based learning are invaluable, it is understood that traditional 'sit and get' methods of instruction work for some students and they can retain content.

We, as educators, cannot truly assess what our students know and are able to do from a standardized assessment score. Constant lectures and multiple-choice assessments do not get students ready for the real world or for work environments. Prior to this study, I was passionate about being an advocate for students and a change agent in public education. Upon completing this study and the doctoral program at Morehead State University my passion has only grown and I have gained the confidence to voice my ideas and beliefs.

Conclusions

Employers indicate that students are not graduating public high schools or some colleges with the 21st century skills that are required to be successful in the workforce. State assessment and accountability requirements are becoming an increasing focus in public education, which may result in the lack of student centered learning. The findings presented in this case study reveal positive teacher and administrator perceptions of the effectiveness of project-based learning when

implemented in one Kentucky middle school. There are also positive indications related to both academic and non-academic factors in student data related to project-based learning.

Although it admittedly may not be the best method of instruction for high-level students, when compared to traditional instruction, project-based learning provides deeper learning experiences and opportunities for application of content beyond the classroom. A review of research in the areas of project-based learning, application of knowledge, and 21st century learners indicates that several aspects of project-based learning may play a large role in increasing achievement for both the public school system and students alike.

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Appendices

Appendix A: Teacher Survey Instrument

Informed Consent

[Create your own
FREE ONLINE SURVEY](#)

- 1 * The purpose of this survey is to gain your perceptions and opinions related to Project Based Learning as implemented in your school. The responses you provide will be summarized and reported in a capstone report as part of the Doctor of Education program at Morehead State University. By responding Yes, you are indicating that you give consent for your answers to be used. If you do not wish to participate in this study, please indicated No, and then exit the survey site.

☐ Yes☐ NO – I do not wish to participate in this survey

Teaching Climate

2 How many years have you worked in education?

0-5	6-10	11-15	16-20	21+
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3 What subject areas have you taught at BMS? (select all that apply)

<input type="checkbox"/> Math	<input type="checkbox"/> Science	<input type="checkbox"/> English
<input type="checkbox"/> Social Studies	<input type="checkbox"/> Career or Elective	

Other (Please Specify)

4 What grade level do you teach? (select all that apply)

<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8
----------------------------	----------------------------	----------------------------

5 Approximately how many students do you interact in an instructional capacity in a given day?

0-30	31-60	61-90	91-120	120+
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6 Estimate the percentage of students you teach who:

	0-20	21-40	41-60	61-80	81-100
Struggle with academic reading or writing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seem on track with their peers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Qualify for SPED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7 For a typical student in your class, about what percentage of their time is spent on PBL?

<input type="checkbox"/> 0-25%	<input type="checkbox"/> 26%-50%	<input type="checkbox"/> 51%-75%
<input type="checkbox"/> 76%-100%		

General Teaching Practice

8 I use the following methods of instruction in the classroom: (select all that apply)

- ☐ Direct Instruction
 ☐ A flexible approach to content
 ☐ Team teaching with other teachers
☐ Interdisciplinary projects
 ☐ internships, or service learning

Other (Please Specify)

9 How often do you use the following methods to measure student performance?

	Never	Seldom	Sometimes	Most of the time	Always
Multiple Choice/Short Answer Tests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open ended problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Portfolios of student work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Group Projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Individual Projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hands on demonstrations, exhibitions, or oral presentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10 How often do your students:

	Never	Seldom	Sometimes	Most of the time	Always
Collect, organize and analyze information and data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Solve real world problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decide how to present what they have learned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Evaluate and defend their ideas or views	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Orally present their work to peers, staff, parents or others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11 When conducting projects, how often do you:

	Never	Seldom	Sometimes	Most of the time	Always
Teach students what they need to know prior to beginning the project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a driving question or problem statement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Specify content standards that projects are designed to meet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assess students for accuracy, thoroughness, or depth of understanding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have students reflect on the quality of their work and learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a rubric to guide or assess student work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12 When implementing PBL it is important that:

	True	False
Teachers at the school have regularly scheduled meetings that focused on instructional practices and student learning	<input type="checkbox"/>	<input type="checkbox"/>
Teachers have instructional coaches or administration provide critical feedback	<input type="checkbox"/>	<input type="checkbox"/>
Teachers are involved in making important decisions for the school	<input type="checkbox"/>	<input type="checkbox"/>

Use of PBL

13 Select the reasons you use PBL (select all that apply)

- ☐ To make teaching and learning more varied, challenging, and fun
 ☐ To teach academic content knowledge and skills more effectively
 ☐ To teach skills beyond academic content

14 To what extent do you agree or disagree that PBL is an effective teaching strategy for the following kinds of students?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
High Achieving Students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Average	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Students who lack motivation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15 To what extent do you agree or disagree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Students in my class respond to PBL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My students can meet state or district standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can assess individual student's content learning using PBL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I teach and assess skills beyond academic content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16 Select the following challenges that have limited your use of PBL (select all that apply)

- ☐ Too large class sizes
 ☐ Class periods are too short
 ☐ My students lack experience or skills for PBL
- ☐ Students have poor attendance and/or behavior issues
 ☐ Too many testing/accountability requirements
 ☐ Lack of funds/materials/resources
- ☐ Lack of time in the curriculum to carry out projects
 ☐ Lack of PD or coaching in PBL
 ☐ Administration expected me to use direct instruction

17 To what extent do you agree or disagree with the following statements?

The use of PBL in the classroom:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Has a positive impact on student attendance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has a positive impact on student behavior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreases student retention rates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increases student engagement in the classroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreases classroom disruptions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Use of PBL

13 Select the reasons you use PBL (select all that apply)

- ☐ To make teaching and learning more varied, challenging, and fun
 ☐ To teach academic content knowledge and skills more effectively
 ☐ To teach skills beyond academic content

14 To what extent do you agree or disagree that PBL is an effective teaching strategy for the following kinds of students?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
High Achieving Students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Average	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Students who lack motivation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15 To what extent do you agree or disagree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Students in my class respond to PBL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My students can meet state or district standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can assess individual student's content learning using PBL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I teach and assess skills beyond academic content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16 Select the following challenges that have limited your use of PBL (select all that apply)

- ☐ Too large class sizes
 ☐ Class periods are too short
 ☐ My students lack experience or skills for PBL
- ☐ Students have poor attendance and/or behavior issues
 ☐ Too many testing/accountability requirements
 ☐ Lack of funds/materials/resources
- ☐ Lack of time in the curriculum to carry out projects
 ☐ Lack of PD or coaching in PBL
 ☐ Administration expected me to use direct instruction

17 To what extent do you agree or disagree with the following statements?

The use of PBL in the classroom:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Has a positive impact on student attendance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has a positive impact on student behavior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreases student retention rates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increases student engagement in the classroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreases classroom disruptions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18 The following policies and procedures are in place at BMS: (select all that apply)

☐ Flexible Scheduling

☐ A school wide emphasis on PBL

☐ A grading system that includes projects or portfolios

☐ A school wide emphasis on skills beyond academics

19 Did you teach at Bate Middle School during the 2010-2011 school year?

☐ Yes

☐ No

Open Ended Questions

20 How would you describe the project-based learning approach as compared to "traditional" teaching?

21 How has using project-based learning affected your teaching of course concepts?

22 How has the knowledge that students gained or have not gained through PBL change your perception of project-based learning?

23 What are the strengths or pluses of PBL?

24 What are the concerns or challenges in the implementation of PBL in the classroom?

25 Is there anything you would like to add?

Appendix B: Administrator Questionnaire

BMS Admin Questionnaire

**Create your own
FREE ONLINE SURVEY**

1 What has your experience been in supervising teachers who implement project-based learning in the classroom?

2 How often did you observe PBL being taught in the classroom at Bate Middle School?

3 How do you think project-based learning contributes to student learning?

4 Based on your observations at BMS, how has project-based learning made a difference with students in the classroom?

.....

5 Based on the skills and knowledge gained through PBL, what contribution do you think PBL has on students' performance on state standardized assessments?

6 What is your overall perception of PBL as compared to "traditional" teaching in the classroom? 108

7 What are some strengths or pluses of using PBL in the classroom?

8 What are some challenges teachers have in implementing PBL in the classroom?

Appendix C: Infographic distributed to Kentucky schools


Project-Based Learning

A Pathway to Success


Project-Based Learning Defined:

"A teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging and complex question, problem, or challenge" (Buck Institute for Education, 2017, pp.1).


PBL is...




Investigative




Central to the curriculum



Linked to important concepts



Student driven



Real-world

(Thomas, 2000)

A Case Study of one Kentucky Middle School

The purpose of the case study was to emphasize the possible effects of implementing school wide project-based learning while obtaining teachers and administrators' perceived effectiveness of project-based learning.

What do Educators Say?

90% use PBL to make teaching and learning more varied, challenging, and fun.

86% agreed that their students respond to PBL and can meet state or district standards.

55% agreed that PBL has a positive effect on student behavior & increases student engagement

"I could not teach without using PBL"

"The immediate short term tests may not show improvement but the long term thirst for learning that students gain through PBL outweigh the short term benefits"

"Attendance improved and behavior referrals decreased"

"PBL inspires curiosity and makes learning real"

Findings


Project-based learning provides students with rich, real-world learning experiences in which they gain important 21st Century skills. Students were more engaged, retained content for longer periods of time, and behavior issues in the classroom decreased.

Teachers reported a lack of time in the curriculum as a barrier to project-based learning while one administrator reported a challenge of getting teachers to understand that it is ok to teach deeper instead of broader with the content standards.

Students were proud of their work and had increased self-efficacy. Novice scores in reading, math, science, and social studies all decreased while apprentice and proficient scores all increased the year following the implementation of project-based learning.

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PROFESSIONAL EXPERIENCES

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2010-2010	School Administrative Manager Fayette County Public Schools Lexington, Kentucky