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Project Based Learning to Promote 21st Century Skills: An Action Research Study

A Dissertation Study

Presented to the

The Staff of the School of Education

The College of William and Mary in Virginia

In Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

By

Jason M. Allison

May 2018

Project Based Learning to Promote 21st Century Skills: An Action Research Study

By

Jason M. Allison

Approved April 7, 2018 by

Dr. Megan Tschannen-Moran, Ph.D

Chairperson of Doctoral Committee

Dr. James Stronge, Ph.D

Committee Member

Dr. Margaret Constantino, Ph.D

Committee Member

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Abstract

This action research study explored how instructional staff members at a rural high school in Central Virginia can improve their PBL instructional practices to promote students to acquire the 21st century skills of communication, collaboration, creativity, and critical thinking. Based on the results of this action research study, the top three strengths of PBL were students learning from mistakes, students taking responsibility for their learning, and that projects come in all shapes and sizes. The study revealed that there is not a tight fit or alignment between PBL and the Four Cs of communication, creativity, and critical thinking, and collaboration; however instructional staff members still perceived PBL as promoting the Four Cs in various ways. The study revealed that instructional staff members envision their school as students learning from their mistakes in a non-punitive way, being responsible for their learning, and creating their own educational paths to success. The study revealed that instructional staff members would like professional development on grading PBL lessons, as well as infusing PBL into the curriculum.

PROJECT BASED LEARNING TO PROMOTE 21ST CENTURY SKILLS: AN
ACTION RESEARCH STUDY

CHAPTER 1

INTRODUCTION

K-12 students in the 21st century are constantly being challenged to be adequately prepared for colleges and careers beyond high school. In order to be successful in the 21st century workforce, students must be competent communicators, collaborators, creators, and critical thinkers; therefore schools must implement instructional strategies and approaches that meet the need for these skills. One of the challenges that schools face is that educational policies and practices are typically top-down, forward mapped initiatives that can limit how schools promote these skills. In order for schools to address the need for students to be college and career ready in the 21st century, instructional staff members must implement backward mapped, project-based instructional approaches that promote the skills of communication, collaboration, creativity, and critical thinking and be empowered to create a vision for the future of their school when Project Based Learning (PBL) is at its best.

Background

Public K-12 education in the 21st century is centered on preparing students with the knowledge and skills needed to be college and career ready after high school. The Every Student Succeeds Act (ESSA) requires states to develop accountability systems that annually measure student performance based on state assessments (ASCD, 2015). In order to receive federal funding for education, states must create accountability systems and implement policies that determine the accreditation status for local school districts.

These forward mapped, top-down accountability policies and measures can heavily influence state and local educational policies and instructional practices. Elmore (1979) indicated “the most serious problem with forward mapping is its implicit and unquestioned assumption that policymakers control the organizational, political, and technological processes that affect implementation” (p. 603). The problem with this type of approach is that policymakers can be uninformed and detached from the educational process and lack the understanding of how an educational organization functions and operates at the state and local levels.

In order to receive federal funds by implementing a state accountability system, students in public K-12 schools in Virginia are required to achieve a passing score on an end of course, multiple choice standardized assessment in core content areas to satisfy specific graduation requirements. These assessments are known as the Standards of Learning (SOL) tests. In order to prepare students to be successful on these standardized assessments, teachers must plan lessons that focus on standardized curriculum objectives such as essential knowledge, skills, and understandings of specific information and concepts. The implementation of standardized curricular objectives and assessments can influence teachers to plan traditional, or teacher-centered lessons that can limit student’s opportunities to acquire 21st century skills. Typically, these standardized assessments are based primarily on lower levels of Bloom’s Taxonomy (Krathwohl, 2002) rather than an emphasis on interpersonal and problem solving skills that are needed in the 21st century workforce. School districts need to have the autonomy and flexibility to implement bottom-up, or backward mapped policies and practices that enhance student learning outcomes in order to prepare students to be successful in the 21st century workforce.

Elmore (1979) indicated that backward mapping begins “at the last possible stage, the point at which administrative actions intersect private choices” (p. 604). By incorporating backward mapped approaches, teachers within a school will be able to create a values-based, shared vision of the knowledge and skills that they believe their students will need in order to be successful in the 21st century.

Traditional, teacher-centered instructional approaches too often limit offering students the opportunity to work together and acquire the 21st century skills of communication, collaboration, creativity, and critical thinking. The unacceptable costs of not offering students the opportunity to acquire these success skills along with challenging them with higher levels of Bloom’s Taxonomy, can result in a less skillfully trained workforce. The American Management Association interviewed over 2,000 managers and executives from many of the world’s leading corporations and identified the four skills of critical thinking, creativity, collaboration, and communication as being priorities for employee development, strategic planning, and talent management (American Management Association, n.d.). “Today’s workforce needs creativity, collaboration skills, communication skills, and the ability to think critically. *These* are the sought-after skills today’s business demands—*these* are the skills that define success” (American Management Association, n.d., para. 2). The P21 Partnership for 21st Century Learning organization described learning and innovation skills as the 4 Cs: critical thinking, communication, collaboration, and creativity (Framework for 21st Century Learning, n.d.) The National Education Association (n.d.) indicated that if students want to compete in a global society, they must be proficient communicators, collaborators, creators, and critical thinkers. K-12 school districts need to implement instructional

strategies and approaches that can promote these 21st century workforce and success skills.

In order to address this need for students to be successful in the workforce and compete in a global society, public K-12 school districts need to provide teachers and students with instructional approaches and strategies that incorporate these 21st century skills. K-12 schools are organizations that are composed of individuals with diverse values and various beliefs. In order for students to receive high quality instruction that will prepare them to be successful, teachers in K-12 schools need to work toward consensus on the knowledge and skills that they believe their students should possess in order to be successful in the 21st century workforce. In order for teachers in a K-12 school to successfully work together to make decisions in the best interest of its students, backward mapped approaches along with the tool of action research would be appropriate for creating a shared vision of what the organization should look like if it honored the values of its individuals. “Action research takes place in settings that reflect a society characterized by conflicting values and an unequal distribution of resources and power” (Herr & Anderson, 2015, p. 4). Utilizing action research, this study will investigate how a small, rural high school in Central Virginia has improved their instructional practices through the creation of an actionable and shared PBL plan, using the Appreciative Inquiry (AI) method to promote students to acquire the 21st century skills of communication, collaboration, creativity, and critical thinking.

Project Based Learning

The Buck Institute for Education (BIE) claims that PBL “builds success skills for college, career, and life” (Why Project Based Learning (PBL)?, n.d., para. 4). There are

various interpretations of what constitutes PBL. PBL can be described as an inquiry-based instructional approach that creates the opportunity for students to work together to solve a problem by creating an artifact or tangible end product. The BIE described PBL as “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” (What is Project Based Learning (PBL)?, n.d., para. 1). Galvan and Coronado (2014) described PBL as “an instructional strategy in which students work cooperatively over time to create a concrete, substantial product” (p. 40). Tseng, Chang, Lou, and Chen (2013) described PBL as an approach “that focuses on organizing self-learning in an empirical project” (p. 88). “PBL can be defined as an extended learning process that uses inquiry and challenge to stimulate the growth and mastery of skills” (Markham, 2012, p. x). Much of the subsequent literature and descriptions of PBL are based on Markham’s work and will be used periodically throughout this dissertation study. I selected the interpretations of PBL from this text because it was administered to all instructional and administrative staff members in the district during the summer of 2014, served as a guide for describing the instructional approach, and incorporated the information needed to create and implement a PBL lesson.

The literature on PBL asserts that it promotes a student’s problem solving and interpersonal skills that can contribute to the acquisition of 21st century skills through the creation of an artifact or tangible end product. This student-centered approach can create the opportunity for students to take ownership and control over their learning while simultaneously creating an enjoyable learning experience. Markham (2012) indicated in

relation to the impact of PBL that “students often have reported a qualitatively different experience of education, a shift from being rote recipient to active partner” (p. 3).

Students are able to take responsibility and be accountable for their learning by actively participating in a PBL lesson. As teachers implement PBL, they experience a shift from being in control to that of facilitator by turning the learning over to their students. This approach requires the teacher to guide and coach students through the problem solving processes. As students engage in a PBL lesson, they are experiencing the responsibility and accountability expectations that are required for them to be successful in colleges and careers after high school.

Context of the Study

The context of this AI action research study occurred at Blue View High School in Central Virginia that was implementing a PBL instructional initiative. PBL was a district-wide instructional initiative that was being implemented in all four schools. According to the 2010 Census, the population in the county is 13,308. Approximately 87% of the population is White and approximately 10% is Black or African American. The Hispanic or Latino population is approximately 2%, the Asian population is approximately 1%, and the Native Hawaiian/Pacific Islander population is less than 1%. The Board of Supervisors governs the county. The school district was the largest employer in the county. The top three industries in the county were Retail Trade being number one, Government Total (combination of Federal, State, and Local) being number two, and Manufacturing being number three.

The Schools

The Blue View school district consisted of four schools which served approximately 1,800 students. The district was approximately 79% White, 9% African American, 1% Hispanic, less than 1% Asian, less than 1% American Indian/Alaska Native, and 0% Native Hawaiian/Pacific Islander. The high school was approximately 85% White, 11% African American, 2% Hispanic, 1% Asian, less than 1% American Indian/Alaska Native, and 0% Native Hawaiian/Other Pacific Islander.

The PBL Initiative

The Blue View school district began implementing the PBL instructional initiative at the beginning of the 2014-2015 school year. A PBL consultant facilitated formal PBL professional development sessions for instructional staff members and school leaders during the summer of 2014 through the fall of 2015. District-wide instructional and administrative staff attended and participated in these trainings throughout this timeframe.

The high school PBL initiative. Blue View High School was on a four by four block schedule over two semesters. The expectation for instructional staff members at the high school was to implement one project per semester; two projects per school year. In order to comply with the PBL implementation expectation by the end of the school year, instructional staff members had to submit their PBL topics to the high school instructional coach. The instructional coach maintained a spreadsheet that described each instructional staff member's PBL topic throughout the school year. The instructional coach shared the spreadsheet with the administrative staff to be discussed during an instructional staff member's summative evaluation at the end of the school year.

During the 2016-2017 school year, all high school instructional staff members were provided an opportunity to participate in the creation of a shared possibility statement for the high school. The possibility statement for the high school was “Preparing collaborative, critical thinking, and enlightened citizens.” In addition, the high school implemented a school wide tiered support system with the motto of “Be Respectful,” “Be Responsible,” and “Be Resilient.” The characteristics of the possibility statement aligned with the components of PBL, specifically the collaborative and critical thinking components. Given that high school instructional staff members were already implementing PBL to a certain extent and have created a shared possibility statement at the high school that incorporates the components of PBL, this study came at a perfect time for instructional staff members to develop a shared vision of what they felt the high school should look like when PBL is being implemented at its best. By empowering instructional staff members to create a shared vision of what the high school should look like when PBL is being implemented at its best, they may have been more encouraged to explore the strengths of the instructional initiative so that students have an opportunity to acquire the 21st century skills of collaboration, creativity, critical thinking, and communication. In keeping consistent with the bottom-up approach used to create the high school’s possibility statement, this strengths-based, action research study created the opportunity for teachers to reflect on their PBL instructional practices with the overarching goal of improving the PBL instructional initiative.

PBL professional development. Although the school district’s PBL program was a district-wide instructional initiative, the subsequent information will only be related to the professional development (PD) provided to the high school. In a review of district

documentation for the PBL instructional initiative, a PBL consultant provided formal professional development sessions to all instructional staff from the summer of 2014 to the fall of 2015. During the summer of 2014, a PBL consultant provided five days of formal professional development to all instructional and administrative staff for each school in the district. Of the five days scheduled for the PBL PD, the high school instructional and administrative staff received two full days; resulting in approximately 10 hours of PBL PD.

In addition to the PBL PD during the summer of 2014, a PBL coaching guide/textbook was provided to instructional staff and school leaders as a resource for planning and implementation of the PBL initiative. Following the summer 2014 PBL PD, the consultant returned three times for follow up sessions with instructional staff members. As a follow up to the 2014 summer professional development sessions, the PBL consultant returned for one day during the fall of 2014 and met with instructional staff members and school leaders to discuss their progress with the PBL initiative. The follow up fall 2014 PD consisted of high school instructional staff members meeting with the PBL consultant, either individually or in small groups, during their planning blocks. Instructional staff members were expected to bring their final PBL plans, rubrics used, and any questions they may have for the consultant.

During the spring of 2015, the PBL consultant returned to meet with instructional staff members to focus on rubrics, plan for next year; as well as to reflect on the current year's implementation of PBL. Instructional staff members were expected to bring the description of the projects they completed along with a copy of the rubric that they used for grading. During the fall of 2015, in keeping consistent with the previous formats from

the fall of 2014 and spring of 2015, the PBL consultant returned to follow up with instructional staff members and school leaders. During this follow up session, instructional staff members were instructed to bring their completed PBL projects from 2014-2015 along with their rubrics that were used. Two days after the meeting with high school instructional staff members, the PBL consultant met with school leaders to debrief on the status and future needs of PBL for the school district. The expectation for school leaders was to create a timeline for monitoring the progress of the PBL initiative for the remainder of the school year. School leaders would create a plan for continued support from the PBL consultant and instructional staff members would check-in with principals throughout the year based on the agreed upon timeline and outcomes of the principal/PBL consultant planning meetings.

PBL professional learning community. At the beginning of the 2016-2017 school year, each instructional staff member was expected to participate on a professional learning committee at the high school. A PBL professional learning community (PLC) was created by building level leadership. During the 2016-2017 school year, the PBL PLC consisted of eight instructional staff members; seven teachers and one instructional coach. The PBL PLC consisted of the instructional coach, who is also the Career and Technical Education (CTE) department chair, two Math teachers, two English teachers, two Science teachers, and one STEM/Physics teacher. Each building administrator selected a PLC they wanted to assist by providing additional supports and resources. I selected to assist the PBL PLC. During our first meeting, we discussed how the PBL PLC would provide additional supports for instructional staff members. During this meeting, I indicated my interest in doing my dissertation on PBL, therefore having a personal and

vested interest in the PLC. The committee decided that they would not formally meet each month, but would provide support to instructional staff members on an as needed basis. Throughout the 2016-2017 school year, I did not receive any documentation of any meetings that occurred or of any support that was provided to instructional staff members.

Overview of the Appreciative Inquiry Study

Action Research Model

The Appreciative Inquiry (AI), action research model used for this study was the Four-I Cycle. Watkins, Mohr, and Kelly (2011) described the components of the Four-I Cycle as Initiate, Inquire, Imagine, and Innovate. These components served as the conceptual framework for this action research study and would be followed accordingly as the study progressed. Activities were scheduled for instructional staff members based on each of the phases of the Four-I Cycle.

The Four-I Cycle Action Research Model

The action research model that was used for this inquiry was the Four-I Cycle of the AI approach. The AI process begins with the selection of an affirmative, or positive topic. Whitney and Trosten-Bloom (2010) indicated that “affirmative topics are subjects of strategic importance to the organization” (p. 9). PBL was a positive and affirmative instructional approach for teachers at the high school. Figure 1 describes the Four-I AI Cycle.

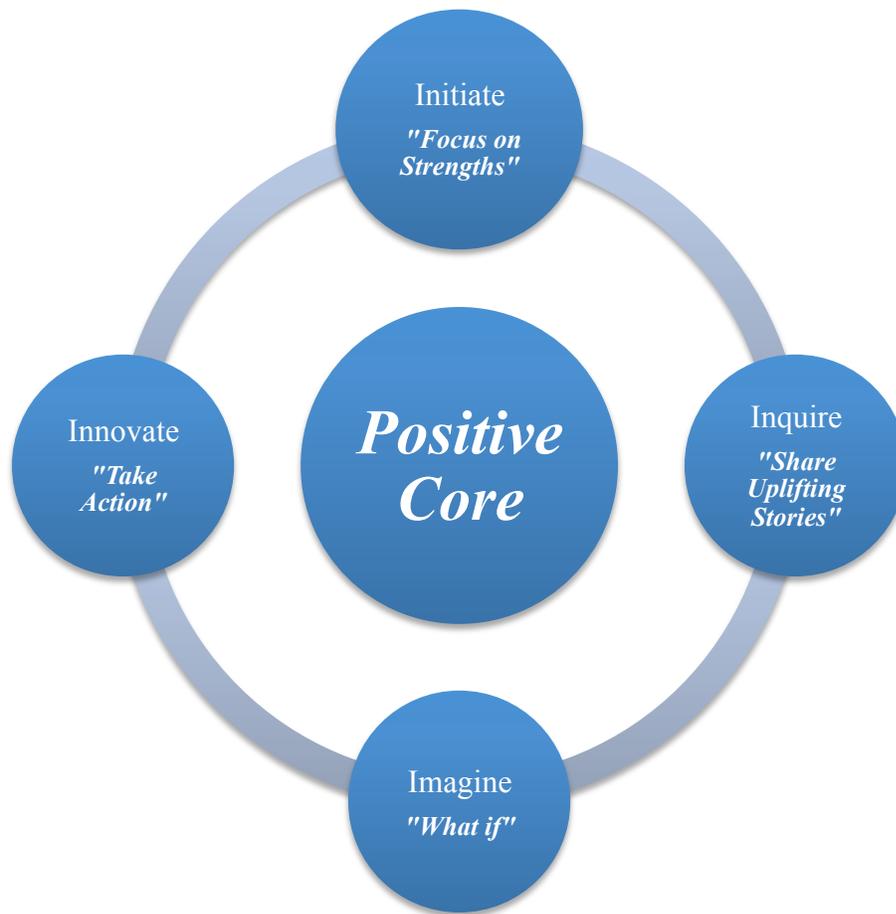


Figure 1. The Four-I Components of Appreciative Inquiry. Adapted from “What to Do When Your School’s in A Bad Mood,” by M. Tschannen-Moran and B. Tschannen-Moran, 2014, *Educational Leadership*, 71(5), p. 40-41.

The Four-I Cycle provided a procedural and conceptual framework for the strengths-based change agenda and created a map for what the organization should look like when AI is used and the organization is operating at its best. My goal was to empower and engage the high school instructional staff by working collaboratively as a team throughout the Initiate, Inquire, Imagine, and Innovate phases of the Four-I Cycle.

Purpose of the Study

The overall purpose of this AI, qualitative action research study was to create the opportunity for instructional staff members to explore their PBL practices and create a

shared, actionable and sustainable plan that could promote student's acquisition of the 21st century skills of communication, collaboration, creativity and critical thinking. Through AI, instructional staff members identified what components of PBL influenced students to acquire 21st century skills and created an opportunity for high school instructional staff members to create a shared vision and plan of what a small, rural high school should look like when PBL is being implemented at its best.

As instructional staff members collaboratively progressed through the AI process, they were able to discover the positive core of PBL. Whitney and Trosten-Bloom (2010) concluded that "if you want to transform a situation, relationship, organization, or community, focusing on the strengths is much more effective than focusing on problems" (p. 25). By taking a positive and strengths-based approach to change, instructional staff members may have been more willing to participate in the continual improvement and transformational process of their PBL instructional practices. "The research base on AI in schools is slim and primarily involves qualitative case studies" (Tschannen-Moran & Tschannen-Moran, 2011, p. 431). The results of this study were intended to improve PBL instructional practices at the small, rural high school by building on the strengths of the PBL initiative and can also contribute to the literature on AI.

Definition of Terms

Project Based Learning-a student centered and collaborative instructional approach that promotes students to solve a problem by creating an end product.

"At its best"-instructional staff member perceptions of what the high school would look like when PBL is being implemented at its best.

21st Century Skills-The Four Cs of communication, collaboration, critical thinking, and creativity.

Action Research Questions

The overarching research question for this study was, by focusing on the strengths of the current PBL initiative, how do instructional staff members envision the future of the PBL initiative at the high school so that students can acquire the 21st century skills of communication, collaboration, creativity, and critical thinking? The specific action research questions were based on the phases of the Four-I Cycle of AI and were as follows:

1. What do teachers perceive to be the strengths of the current PBL initiative in terms of the components that influence students to acquire the 21st century skills of communication, collaboration, critical thinking, and creativity?
(Inquire Phase)
2. How do teachers envision the future of the PBL initiative at the high school when PBL is being implemented at its best? (Imagine Phase)
3. How do teachers plan to achieve the future of the PBL initiative when PBL is being implemented at its best in terms of actions that are needed to create an actionable and sustainable plan for the future of the PBL initiative? (Innovate Phase)
4. Once the plan to achieve their future of the PBL initiative is created, how do teachers plan to enact and sustain this plan in terms of what actions, resources, or supports are needed to sustain this initiative? (Innovate Phase)

CHAPTER 2

REVIEW OF RELATED LITERATURE

Project Based Learning

When exploring the influences of Project Based Learning (PBL) on student achievement and the acquisition of the 21st century skills of communication, collaboration, creativity, and critical thinking, we must have an understanding of what constitutes PBL and how the approach promotes active learning and student achievement. This literature review will provide an overview of the effectiveness of the PBL instructional components, comparisons of project-based, problem-based, and traditional approaches, as well as an impediment to implementing PBL. The literature review will conclude with a summary of the aforementioned components.

What are the Components of Project Based Learning (PBL)?

There are many instructional and student engagement components that are incorporated into and throughout the PBL process. The Buck Institute for Education (n.d.) described the eight components of PBL as key knowledge, understanding, and success skills, a challenging problem or question, sustained inquiry, authenticity, student voice and choice, reflection, critique and revision, and public product. These eight characteristics can serve as the fundamental and essential engagement components of the PBL process. As students progress through the PBL process, they are engaged in active learning and use higher level thinking skills. “Project Based Learning (PBL) engages the students allowing them to learn in all six levels of ‘Blooms Taxonomy’ (1956), which are

(a) knowledge, (b) comprehension, (c) application, (d) analysis, (e) synthesis, and (f) evaluation” (Moylan, 2008, p. 288). These higher order thinking skills are incorporated throughout the PBL process and can positively influence student achievement. There are many interpretations of what defines and constitutes the components of PBL. Table 1 provides descriptions of various models and components of PBL.

Table 1
Models of PBL

Model	Author	Components
“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” (What is Project Based Learning (PBL)?, n.d., para. 1).	Buck Institute, (n.d.), What is Project Based Learning (PBL)?, para. 1	Inquiry-based learning, cooperative learning, authentic learning, creating an end product, solving a problem
“PBL can be defined as an extended learning process that uses inquiry and challenge to stimulate the growth and mastery of skills” (p.x.).	Markham (2012)	Inquiry based learning, promote mastery of skills
“An instructional strategy in which students work cooperatively over time to create a concrete, substantial product” (p. 40).	Galvan & Coronado (2014)	Cooperative learning, creation of a product
An approach “that focuses on organizing self-learning in an empirical project” (p. 88).	Tseng et al. (2013)	Self learning, project completion

PBL design and coaching guide. Markham (2012) provided a detailed, step-by-step process for designing a project based learning lesson and rubric. Although the text does not provide empirical evidence on the effects of PBL on student achievement, it does act as a guide for planning, implementing, and evaluating a PBL lesson, as well as providing resources and templates to assist practitioners. There are various steps in designing a quality project. “The Project Design Cycle begins with four steps: (1)

translate an idea into a challenge; (2) turn the challenge into an assessable Driving Question; (3) define outcomes and plan backwards; and (4) build a solid assessment plan” (Markham, 2012, p. 59). Once these prerequisite activities have been established, “the project unfolds in three stages: (1) enroll and engage; (2) facilitate the teams and collaboration; and (3) keep the end in mind by focusing on quality products” (Markham, 2012, p. 59). Preparation for each of the components of a PBL lesson are incorporated throughout this literature review. Many of the subsequent descriptions of PBL will be taken from this text. This text was administered to all instructional and administrative staff during the summer of 2014 to be used as a guide and resource for planning and implementing a PBL lesson.

PBL Instructional Components

Essentially, PBL can be described as a synthesis of various instructional components and approaches. When analyzing the effectiveness of PBL, it is important to identify these various instructional components that comprise the instructional approach. Key instructional components of PBL include, but are not limited to, creation of rubrics, 21st Century Skills, inquiry-based learning, problem-based learning, cooperative learning, and authentic learning.

Rubrics. Student achievement and demonstration of knowledge can be assessed by rubrics that incorporate specific criteria and 21st century skills. “Rubrics act as playbooks, showing students exactly what they must do to perform” (Markham, 2012, p. 40). Prior to beginning a PBL activity, the expectations should be clearly stated and communicated to all students in the class. In turn, the teacher needs to be transparent as to the expectations of the knowledge and skills that will be assessed once the project is

complete. The teacher should be the facilitator or coach, and be prepared to turn the learning over to the students once the expectations are clearly discussed. Markham (2012) indicated that:

Coaching is a proven means for increasing performance in sports, on the job, and in life by using established methods that help individuals define goals, adjust behavior, and improve skills. High performance PBL mandates a similar role for teachers: the teacher as coach. (p. 23)

The teacher needs to know when and how to gradually release responsibility to the students as they engage in the PBL process.

21st Century Skills. There are various interpretations of what constitutes 21st Century Skills. Some researchers consider skills other than the 4 Cs of communication, collaboration, creativity, and critical thinking as being 21st Century Skills. Recent literature on PBL has indicated positive influences on 21st Century Skills (Markham, 2012; Sahin & Top, 2015; Wan Husin et al., 2016). DiBenedetto and Meyers (2016) described a conceptual framework for the knowledge, skills, and dispositions required of high school students to be career ready in the 21st century. The nine constructs were identified as learning skills, life skills, career skills, social skills, knowledge competencies, incidental learning skills, dispositions, experiences, and interdisciplinary topics. Markham (2012) indicated that PBL “encourages the skills of the future-inquiry, collaboration, communication, and creativity-and is designed to expand curriculum to encompass authentic issues and topics relevant to the needs of young people in a global world” (p. 47).

The effects of PBL promote various 21st Century Skills. Sahin and Top (2015) conducted a qualitative study with 11 students using PBL and STEM education and found that the projects positively influenced the 21st Century Skills of self confidence, technology, life and career skills, communication, and collaboration. The study also indicated that projects promote students to develop ownership and take responsibility for their learning. As students take ownership and responsibility over their learning, they are able to take control over their learning. Of the 65 studies and two meta-analyses conducted, Hattie (2009) indicated that student control over learning has a .04, or low effect size on student achievement. This low effect size can conflict with the results of the previous study that indicates students should take ownership and take control over their learning. Other than communication and collaboration, 21st Century Skills can be considered the skill sets that students utilize in their daily lives. Wan Husin et al. (2016) conducted a study with 125 secondary school students and STEM education with a project-oriented, problem-based learning (POPBL) approach and concluded that:

Based on the research findings, it can be concluded that the application of the POPBL approach in the teaching and learning process as implemented in the *BITARA* STEM Program may increase students' level for the five elements of the 21st century skills, namely Digital Age Literacy, Inventive Thinking, Effective Communication, High Productivity and Spiritual Value. (Conclusion section, para. 1)

Although limited to these five specific skills, the study reinforced the notion that there are various interpretations of what constitutes 21st Century Skills; therefore it is evident that

additional research is necessary to identify the specific skills that are needed for students to be successful in specific careers in the 21st century workforce.

Descriptions of Project-Based, Problem-Based and Traditional Instructional Approaches

The literature on project-based learning reveals that there are various interpretations and descriptions of the instructional approach. Additionally, when project-based approaches are compared to problem-based and traditional instructional approaches, similarities exist among project-based and problem-based instructional approaches; however when project-based and problem-based approaches are compared to traditional instructional approaches, there are fewer similarities. Table 2 describes the claims in the literature of the descriptions of project-based, problem-based, and traditional instructional approaches.

Table 2

Descriptions of Project-Based, Problem-Based, and Traditional Instructional Approaches

Component	Project-Based	Problem-Based	Traditional
Cooperative Learning	BIE (n.d.), What is Project Based Learning (PBL), para. 2 Galvan & Coronado (2014) Markham (2012)	Larrier et al. (2016)	
Authentic Learning	BIE (n.d.), What is Project Based Learning (PBL), para. 5 Galvan & Coronado (2014) Markham (2012)	Galvan & Coronado (2014)	
Problem Solving	BIE (n.d.), What is Project Based Learning (PBL), para. 2 Markham (2012)	Galvan & Coronado (2014) Larrier et al. (2016)	
Inquiry-Based	BIE (n.d.), What is Project Based Learning (PBL), para. 4) Markham (2012)	Larrier et al. (2016)	
Student Centered	BIE (n.d.), What is Project Based Learning (PBL), para. 2 Galvan & Coronado (2014) Markham (2012)	Galvan & Coronado (2014) Larrier et al. (2016)	
Creation of a product	BIE (n.d.), What is Project Based Learning (PBL), para. 6 Galvan & Coronado (2014) Markham (2012)		
Teacher Centered			Aktamis, Higde, & Özden (2016)

Based on the descriptions of these approaches, it is evident that the project-based and problem-based approaches are similar in that each uses a student-centered, or student-directed approach to curriculum objectives, whereas the traditional approach uses a teacher-centered, or teacher-directed approach.

Inquiry-based learning (IBL). Throughout the inquiry process of PBL, students are engaged in active learning and are challenged with finding solutions to their challenging questions or problems through the creation of a tangible product or artifact. “A learner centered, inquiry-based process results in better retention, more in-depth knowledge, and expanded curiosity” (Markham, 2012, p. 15). The inquiry component of the PBL process, often referred to as inquiry-based learning (IBL), challenges students to utilize critical thinking and problem solving skills. Maxwell, Lambeth, and Cox (2015) indicated “IBL is seen as a system of learning that supports the development of student’s problem solving and critical thinking skills, which is important for them in everyday activities” (p. 3). Aktamis et al. (2016) conducted a meta analysis on inquiry-based learning and found that based on the 16 studies reviewed on students’ academic achievement, there was a 1.029, or large effect size. Conversely, of the 420 studies and four meta-analyses conducted, Hattie (2009) indicated that inquiry-based teaching had a .31 effect size; essentially resulting in less than a moderate influence on student achievement. Based on the conflicting results of these meta-analyses, it is evident that additional research is needed to further understand the influences of inquiry-based learning on student achievement.

Problem-based learning. The problem solving process is a core foundational component of PBL. When describing problem-based learning, Larrier et al. (2016) indicated that

As these students work together to identify questions, concerns, issues, and problems that need to be resolved through the process of inquiry, reflection, and discussion, they gain knowledge in and out of their academic content areas along with practice using affective and life skills such as negotiation and problem solving. (p. 13)

PBL and problem-based learning are similar approaches that both use an inquiry-based method consisting of *problems*, *questions*, and *solutions* as the basis for each approach. Lou, Liu, Shih, and Tseng (2011) conducted a project-based learning study in Taiwan with 84 high school and vocational students that combined STEM and PBL to design an online platform for students to use in order to complete an experiment in problem-solving. A STEM PBL behavioral model was constructed and the study found that “students’ attitudes, cognition, behavioral intentions, and behavioral effects were enhanced and became a basis for in-depth learning in the future” (Lou et al., 2011, p. 181). Problem-based and project based learning approaches are both student-centered, can engage students in collaborative groups to solve a problem, and can promote critical thinking skills. The main difference between project based and problem-based learning is that project based learning is designed to create an end product or tangible artifact as the solution whereas that is not always the case with problem-based learning.

Dochy, Segers, Van den Bossche, and Gijbels (2003) conducted a meta analysis on problem-based learning and indicated that 14 studies had a negative effect size and

seven studies had a positive effect size on the knowledge base of students. The negative effect size was due to two outlier studies. When these two studies were left aside, the effect size approached zero (Dochy et al., 2003). Sad, Kis, and Demir (2017) conducted a meta analysis on contemporary learning approaches. Of the nine studies reviewed, problem-based learning yielded a .94, or large effect size. Conversely, of the 286 studies and 8 meta-analyses conducted, Hattie (2009) indicated that problem-based learning had a low effect size of .15. The conflicting results of these meta analyses suggest that further research is needed to determine if problem-based learning will consistently lead to increases in student achievement.

Cooperative learning. One of the main emphases of PBL is the focus on cooperative learning and collaboration. PBL is intended to incorporate collaboration and teamwork throughout the inquiry process. “Research in learning confirms that collaboration leads to deeper understanding, higher-order thinking, and better performance on complex tasks” (Markham, 2012, p. 97). By creating the opportunity for students to work together in collaborative groups, they are able to share ideas and teach one another essential information needed to solve the problem and create the end product. “For PBL, the importance of teaching collaboration skills cannot be understated. High performance teams lead to powerful, successful projects” (Markham, 2012, p. 31). Of the 10 meta-analyses and 306 studies conducted, Hattie (2009) indicated that cooperative learning yielded a .41, or moderate effect size, on student achievement. Of the 16 studies reviewed, Sad et al. (2017) indicated that cooperative learning yielded a .72, or moderately large effect size. These conflicting studies suggest that additional research is needed to explain the effect of cooperative learning on student achievement.

Cooperative learning activities can create the opportunity for students to teach one another by sharing ideas and strategies during a PBL lesson. Altun (2015) conducted a cooperative learning study with 20 students in a sixth grade science and technology class and the results indicated “that cooperative learning had a favorable effect on learning of students” (p. 463). Conversely, Altun also found that group pressure can cause anxiety for unsuccessful students and that successful students may have anxiety if they have unsuccessful group members in their group. A significant challenge of cooperative learning can be students’ lack of interpersonal skills. “Generally, a PBL teacher will encounter two kinds of ‘outliers’: those who won’t work in teams and those who can’t” (Markham, 2012, p. 35). Lee, Huh, and Reigeluth (2015) found that task conflict was influenced by differences in perspectives and interest; process conflict was influenced by social loafing; and relationship conflict was influenced by differences in personalities and lack of social skills. Prior to implementing a PBL lesson, the teacher should conduct a lesson on the importance of cooperative learning and teach students how to appropriately and effectively work together in teams or groups. There are benefits to implementing cooperative learning activities; however teachers should be mindful that not all students may be equipped with the skills needed to successfully work together and accomplish a task.

Authentic learning. Authentic learning can be described as learning in real world, real life contexts. The authenticity that students experience when engaged in a PBL lesson can contribute to their understanding of the topic. “An authentic project confronts issues, attacks, problems, seeks solutions, and impacts the community” (Markham, 2012, p. 60). Huang (2011) described authentic learning as situated learning

that is different from the classroom or laboratory that is significant in the workplace. Susiyawati, Ibrahim, Atweh, and Rahayu (2015) conducted a study with 25 bachelor degree students in an authentic task and found that “the authentic task increases students’ motivation toward learning” (p. 24). However, the study indicated that authentic learning did not help students master the topic. Yoon and Hyun-Hwa Lee (2012) found that authentic learning provided “a positive experience in which students learned practical competencies, gained professional experience, and honed their ability to solve complex problems with various perspectives” (p. 287). The authentic and contextual factors of a specific problem may contribute to the level of a student’s engagement and interest in the activity that can influence the outcome or the solution(s).

PBL learning environment. PBL can create a positive and engaging learning environment through the establishment of positive relationships. “The PBL teacher must *design the environment* in which peak performance flourishes” (Markham, 2012, p. 6). As teachers implement PBL in their classrooms, they need to create a collaborative environment where students have the opportunity to acquire 21st Century Skills. By establishing positive and trusting relationships between teachers and students, the classroom can transform into a PBL-friendly environment where students can take risks and minimize the fear of failure as they explore their problem(s) and solution(s). Hugerat (2016) conducted a study with 458 ninth grade students; half of which learned using a project-based approach and the other half used a traditional approach. The results of the study found “that teaching science by the project-based learning method significantly improved student-teacher relationships, and enhanced students’ enjoyment” (p. 394). Of the 229 studies and one meta-analysis conducted, Hattie (2009) indicated that teacher-

student relationships indicated a .72, or relatively high effect size. A positive and engaging learning environment can promote active learning, which can create the opportunity for higher student achievement. As students are engaged in a PBL lesson, the active learning and engagement factors can encourage students to remain focused on their specific task(s). Additionally, when students have the creative and academic freedom to complete a task in their own way that is based on their interests, they can be more encouraged to have a positive attitude and participate to accomplish that task.

Traditional, or teacher-centered instructional approaches often utilize direct instruction as a key instructional strategy. In a PBL learning environment, traditional instructional approaches are less emphasized; however traditional instructional approaches positively influence student achievement. Of the four meta-analyses and 304 studies reviewed, Hattie (2009) indicated that direct instruction has a .59, or moderate effect size on student achievement. Various instructional components that comprise PBL contribute to the effectiveness of the instructional approach. Based on the results of the previous meta-analyses, it is evident that many of the PBL components have conflicting effect sizes on student achievement; resulting in the need for further research into their effectiveness. Table 3 provides a summary of the meta-analyses for various instructional components of PBL, as well as direct instruction used in traditional approaches.

Table 3
Summary of Meta-Analyses for Instructional Components

Component	Number of Studies	Effect Size (ES)	Source
Cooperative Learning	306, 10 meta analyses	.41	Hattie (2009)
	16	.72	Sad et al. (2017)
Student control over learning	65, two meta-analyses	.04	Hattie (2009)
Problem-based	14	-ES	Dochy et al. (2003)
	7	+ES	Dochy et al. (2003)
	9	.94	Sad et al. (2017)
	286, eight meta analyses	.15	Hattie (2009)
Inquiry-based	16, one meta analysis	1.029	Aktamis et al. (2016)
	420, four meta analyses	.31	Hattie (2009)
Direct instruction	304, four meta analyses	.59	Hattie (2009)

Project-Based Approach vs. Traditional Approach

Various studies have indicated that when a PBL approach was compared to a traditional approach, students using the PBL approach achieved higher than the students using the traditional approach (Karaçalli & Korur, 2014; Karpudewan, Ponniah, & Md. Zain, 2016; Summers & Dickinson, 2012). When traditional educational approaches are combined with a PBL approach, the addition of the PBL approach can enhance student achievement. Stozhko, Bortnik, Mironova, Tchernysheva, and Podshivalova (2015) found that when combining a traditional educational approach with an interdisciplinary project-based (IPBL) educational approach and comparing that solely to a traditional educational approach “that the use of IPBL has a positive impact on student cognition; namely, the cognitive level in the experimental group of IT students has exceeded the

cognitive level in the control group by 2.3 times” (p. 11). In a longitudinal study of two high schools, one using a PBL approach and the other using a traditional approach, Summers and Dickinson (2012) examined four years of social studies achievement toward college and career readiness (CCR) embedded within the context of eight years. The study found that the PBL approach increased students’ academic achievement and progress toward college and career readiness. Students using the PBL approach scored higher than students using the traditional method on the state-mandated exam; however both instructional approaches led to high levels of social studies achievement.

Karaçalli and Korur (2014) conducted a study with 143 fourth grade students comparing the project-based approach to a traditional approach and the results showed “that there were statistically significant effects of the project-based learning method on academic achievement and retention of knowledge” (p. 232). Reinforcing this notion, when students are exposed to a PBL curriculum, Karpudewan et al. (2016) found “that students exposed to a PBL curriculum outperformed the students who were taught using a more conventional curriculum in terms of knowledge, behaviors, attitudes, and beliefs towards energy conservation” (p. 235). These comparative studies suggest that when a traditional approach is compared to a PBL approach, the PBL approach is a more effective approach for positively influencing student achievement.

Impediment to Implementing PBL

There are various impediments to implementing PBL in the current 21st century standardized testing and accountability movement. Two of these challenges and perceived barriers to implementing PBL is the perception that teachers must “teach to the test” and that students are not equipped with the necessary skills to successfully work

together to solve a problem. By taking the time to teach 21st century and collaborative skills to students, teachers may have the perception that this detracts from teaching standardized curriculum objectives. If teachers do not emphasize teaching standardized curriculum objectives, this can influence the chance for students to not achieve a passing score on their end of course tests to satisfy specific graduation requirements.

Standardized Testing and Accountability

The PBL process can be lengthy at times due to the time needed to properly and thoroughly investigate a topic or problem and come to a solution through the creation of an end product or artifact. Teachers must follow a pacing guide and incorporate many standardized curriculum objectives into their daily instruction; resulting in a short time frame to implement PBL appropriately and effectively. Vega and Brown (2013) conducted a study with five middle school campus administrators, one university liaison, and nine teacher leaders implementing PBL. The results indicated struggles with implementing PBL authentically while meeting the curricular and assessment demands of the curriculum, an added stress and confusion to meet the benchmarking of the district, and an indication that students were not ready for PBL. Standardized testing and closed curriculums can hinder collaboration and restrict creativity and problem solving. “The transmission model of education emphasizes topics and facts rather than in-depth learning. This approach invites direct instruction, rote learning, and teaching to the test- and makes PBL difficult or impossible” (Markham, 2012, p. 13). Schools do students a disservice by the narrow focus and emphasis that is placed on standardized tests. PBL can unlock creativity and innovation in schools and better prepare students for the demands of the 21st century workforce.

Summary

Incorporating Project Based Learning (PBL) instructional approaches should be a fundamental tool for K-12 schools. As students engage in a PBL lesson, they are challenged to work collaboratively with one another to solve a problem through the creation of an end product or artifact. PBL lessons can incorporate the 21st Century Skills that are needed to be successful in today's colleges, careers, and workforce. K-12 schools should invest in providing appropriate and meaningful PBL professional development to instructional staff members with the intent for them to implement PBL in their schools that can contribute to student achievement and the acquisition of 21st Century Skills.

CHAPTER 3

METHODOLOGY

This action research project explored the strengths of the Project Based Learning (PBL) initiative at Blue View High School in Central Virginia. Instructional staff members at the high school were asked to explore how to improve their PBL instructional practices so that students can acquire the 21st Century Skills of communication, collaboration, creativity, and critical thinking and had the opportunity to develop an actionable and sustainable plan that was based on the strengths of PBL using the Appreciative Inquiry (AI) method. AI has been described as “both a philosophy and an approach for motivating change that focuses on exploring and amplifying organizational strengths” (Tschannen-Moran & Tschannen-Moran, 2011, p. 422). I utilized a qualitative action research design for this study, using strengths-based interview questions and procedures. The purpose for selecting action research was to empower and engage the entire instructional staff at the high school to strive for organizational change. Tschannen-Moran and Tschannen-Moran (2011) asserted that “the more people attend to the positive dimensions of the present moment, the more positive will their intentions be for future moments” (p. 424).

Appreciative Inquiry

The origins of AI emerged as a collaboration between David Cooperrider and Suresh Srivasta at Weatherhead School of Management at Case Western University (Whitney & Trosten-Bloom, 2010). Cooperrider and Srivasta began experimenting with

traditional action research techniques and focused on the strengths, positives, and factors that contributed to the organization's effectiveness. Using the constructionist principle, the interviews reinforced success stories of the organization and encouraged people to make positive new meaning of their past experience; resulting in quantifiable increases in people's attention to and valuing their behaviors they had set out to explore.

I opted to use the AI approach because the current PBL instructional initiative at the high school had been in place for several years and was initiated as a top-down instructional decision. Instructional staff members had not had an opportunity to create a bottom-up, shared actionable plan to implement the instructional initiative. Using the constructionist principle, I wanted to create the opportunity for all instructional staff members to establish positive relationships, collaborate with one another, and share their best experiences with PBL based on their values to create a shared actionable plan that could improve their instructional practices. Whitney and Trosten-Bloom (2010) indicated that "according to the constructionist principle, the power of language is not as an individual tool but rather as the vehicle by which communities of people create knowledge and meaning" (p. 74). The social constructivist principle was evident throughout each of the Four-I Cycles of this study.

Study Design

I approached this action research study using the AI Four-I Cycle: Initiate, Inquire, Imagine, and Innovate (Watkins et al., 2011). Instructional staff members engaged in various activities that were centered around each of these phases of the Four-I Cycle. This study identified the perceived strengths of PBL through qualitative methods. These strengths were then used to create a shared direction for the high school when PBL

is at its best. Constructivist interviews, conversations, and dialogue were used throughout the Four-I Cycle activities of this study. Mertens and Wilson (2012) described the Constructivist paradigm as focusing “primarily on identifying multiple values and perspectives through qualitative methods” (p. 41). Instructional staff members shared their best experiences with PBL and worked together to design the future of the high school. The AI approach brings all stakeholders together to collaborate and design the organization they most value and desire (Whitney & Trosten-Bloom, 2010). Instructional staff members were able to identify the strengths of the PBL initiative and work together to create a shared vision and actionable plan of what the instructional initiative should look like at the high school when being implemented at its best.

Action Research Questions

The overarching research question for this study was, by focusing on the strengths of the current PBL initiative, how do instructional staff members envision the future of the PBL initiative at the high school so that students can acquire the 21st Century Skills of communication, collaboration, creativity, and critical thinking? The specific action research questions were based on the phases of the Four-I Cycle and were as follows:

1. What do teachers perceive to be the strengths of the current PBL initiative in terms of the components that influence students to acquire the 21st Century Skills of communication, collaboration, critical thinking, and creativity?
(Inquire Phase)
2. How do teachers envision the future of the PBL initiative at the high school when PBL is being implemented at its best? (Imagine Phase)

3. How do teachers plan to achieve the future of the PBL initiative when PBL is being implemented at its best in terms of actions that are needed to create an actionable and sustainable plan for the future of the PBL initiative? (Innovate Phase)
4. Once the plan to achieve their future of the PBL initiative is created, how do teachers plan to enact and sustain this plan in terms of what actions, resources, or supports are needed to sustain this initiative? (Innovate Phase)

Procedures

For this strengths-based and collaborative action research study, the Action Research Team (ART) facilitated the Four-I Cycle activities, as well as facilitated the actions and strategies needed to implement and sustain the plans developed during the Innovate phase. I took the role of researcher as participant. Given my position as a building administrator where the action research study occurred, certain biases may have occurred. It may have biased the results if the instructional staff members felt obligated to participate in the Four-I Cycle activities during the designated professional development and instructional staff meeting days when the expectation was that staff members were to attend these meetings. Further, they may have felt that, due to my role of authority, that they needed to say what they thought I wanted to hear. That is, if they perceived that I was a proponent of PBL, they may have withheld comment critical of this process. I attempted to guard against this source of bias by repeatedly reminding the participants that their participation was voluntary.

I met with a subset of the ART prior to the first instructional staff meeting to explain the study, and provided an in-depth introduction to AI. This small group and I

reviewed the interview questions, completed a practice run of the paired interview questions and common themes analysis, and engaged in discussion to refine the process as needed. There were two meetings scheduled; one in the morning and one in the afternoon. The morning group consisted of six teachers who had participated in the PBL PLC the previous academic year. This group was trained on AI and served in a consultative capacity during the Initiate Phase. The afternoon group consisted of seven teachers who had indicated interest in being a part of the ART. This group piloted the paired interview questions and provided feedback to enhance the study. The members of each group had the opportunity to be a part of the ART.

With the assistance of this small group of the ART, I facilitated the Inquire phase at the first instructional staff meeting prior to the beginning of the school year. At this meeting, I introduced the study to all instructional staff members, explained the upcoming Four-I Cycle activities, provided an overview of the timeline of the study, and extended an invitation to all instructional staff members to join the ART for the upcoming Four-I Cycle activities. The ART met prior to each activity of the Four-I Cycle to ensure that each member understood the instructions and objectives of each phase prior to each staff professional development day during the months of August, September, and October. As a team, we debriefed the previous Four-I Cycle activities and planned for the upcoming Four-I Cycle activities with the entire instructional staff. During the September and October ART meetings, various ART members had an opportunity to briefly research each phase of the Four-I Cycle and present the upcoming concept and approach to the ART to ensure that each member understood the concept. A Google Drive spreadsheet

was created and shared with the ART to organize the data that emerged throughout each phase of the action research study.

Participants

The Action Research Team (ART). All instructional staff members were afforded an opportunity to be a part of the ART. A total of six instructional staff members and myself comprised the ART for the study. Of these, three were from the morning group who had participated in the PBL PLC the previous academic year, two from the afternoon group who had expressed interest in joining the PBL PLC, and one instructional staff member who expressed interest after participating in the Inquire Phase instructional staff activity. The ART members consisted of one STEM/Physics teacher, one Business/Marketing teacher, three English teachers, one Math teacher, and myself. Two of the seven ART members were male and five were female. Each signed the consent form indicating their willingness to participate in the study (see Appendix A).

The instructional staff. There were approximately 44 instructional staff members at the high school. Each instructional staff member that participated in the study received professional development points for their participation in each stage of the Four-I Cycle. The participating instructional staff members in the study were diverse in terms of years of teaching experience, variety of content areas/disciplines, and of the amount and quality of PBL professional development they had previously received. Of the 44 instructional staff members who signed in during the Inquire Phase activity, 29 returned their PBL Interview Handout that indicated their attendance during the PBL professional development sessions from the fall of 2014 until the fall of 2015. Fourteen instructional staff members attended the summer 2014 PBL professional development session, the fall

2014 session, and the spring 2015 session. A total of 18 had attended the fall 2015 session. Seven instructional staff members indicated that they did not attend any professional development sessions and two did not complete the section.

Data Sources

There were four data sources for this study; the common themes that emerged from the paired, appreciative interviews from the Inquire phase, the common themes from the possibility statements from the Imagine Phase, the common themes from the action plans and strategies developed through the Innovate phase of the Four-I Cycle, and the common themes from the open ended survey at the end of the first semester to assess teacher perceptions of the PBL initiative. Field notes and artifacts, along with written and spoken instructional staff member statements were used in the four data sources.

Appreciative interviews. The appreciative interview questions were developed using the AI conceptual framework. Once the interview questions were developed, the ART conducted a pilot study with these questions and provided feedback. The final version of the teacher interview questions were as follows:

1A. Tell me a story about your best experience of a PBL project or lesson, whether you were the teacher or a student. What were the most positive and engaging aspects of this project?

1B. In what ways, if any, did the PBL lesson promote creativity, collaboration, critical thinking, or communication?

2. When you think about the things that matter most to you in your teaching, what aspects of PBL best align with those values?

3. What have been the resources or conditions that have been the most helpful to you as you have engaged in PBL with your students (here at the high school or elsewhere)?

4. Imagine that it is the year 2022, and our school has received an Excellence in Innovation award from the Virginia Department of Education due to the success of our students in postsecondary settings because of their communication and collaboration skills, as well as their creativity and critical thinking. Looking back, what were the most important factors and strategies in bringing about this success?

Possibility Statements/Visible Representations. During the Imagine phase of the Four-I Cycle, instructional staff members organized into small groups based on their choice. Each group created a visible representation of their vision for PBL at the high school, as well as, a possibility statement that described what the high school would look like if it honored the themes from the Inquire phase. Once instructional staff members presented their possibility statements/visible representations to the full instructional staff, the ART collected all the information. This information was then uploaded to the spreadsheet that was used by the ART throughout the study and would be used during the upcoming Innovate Phase.

Instructional staff action plans. During the Innovate phase of the Four-I Cycle, instructional staff members re-organized back into their groups from the Imagine Phase and created action plans with strategies that would work to achieve the common themes from the Imagine phase. Once each group discussed and completed their action plans, the ART member assigned to facilitate each group collected all of the information. The

information was then transferred to the spreadsheet that was used throughout the study and shared with the ART.

Instructional staff survey. An open-ended survey was distributed to instructional staff members during the monthly instructional staff meeting in January 2018. The survey invited instructional staff members to share their best experiences with PBL during the first semester, as well as any wishes they might have to support their learning and growth in offering instruction that supports the development of their student's communication, collaboration, critical thinking, and creativity skills. The questions were modeled after the Inquire Phase of the Four-I Cycle. Prior to administration, the ART piloted the survey questions and made recommendations to enhance the survey. Once the ART completed piloting the questions, their feedback was incorporated into the final version of the questions. The responses to the questions served as the starting point for beginning the second phase of the action research cycle during the spring semester. A final version of the instructional staff survey questions were as follows:

1. What was your best experience(s) of implementing PBL during the first semester?
2. What are three realistic and attainable wishes (more or less) that you have for the future of the PBL initiative?

Data Collection

Two small groups, or subsets of the ART assisted in facilitating the first phase of the Four-I Cycle of Appreciative Inquiry: *Initiate* in early August 2017. All instructional staff members had an opportunity to participate in the next three phases of *Inquire*, *Imagine*, and *Innovate* from August 2017 until January 2018.

Initiate phase. During the first, or *Initiate* Phase of this process, Tschannen-Moran and Tschannen-Moran (2014) indicated that “Appreciative inquiry always starts with that first, fateful decision to focus on the strengths” (p. 40). I selected to use the Appreciative Inquiry approach as a way to empower the instructional staff at the high school to focus on the strengths of PBL so that they could improve their instructional practices. I presented this study to two small groups, or subsets of the ART at a meeting in early August and enlisted their support in facilitating the Inquire phase of the AI process at the first instructional staff meeting during the instructional staff work week in August. Instructional staff members participated in each phase of the Four-I Cycle during the designated staff professional development days from August through October.

Inquire phase. The Inquire phase, consisting of paired interviews and meeting in the small groups to examine the themes that emerged from the interviews, took place during the first instructional staff meeting during the teacher work week prior to the opening of the 2017-2018 school year. On August 9, 2017, 44 instructional staff members signed in for the Inquire phase of the study. As instructional staff members entered the media center, I had music playing and a PowerPoint that informed instructional staff members that they would receive professional development points for the day’s activity, to not sit with their department or someone that they interact with on a regular basis, and that they would need to something to write with today. Once all instructional staff members were at their tables in the media center, I introduced the day’s activity and overview of the study for this action research project.

After explaining the study, I introduced and briefly discussed the video, *Celebrating What’s Right with the World* by Dewitt Jones. Instructional staff members

viewed the video and engaged in a brief discussion at the end. After viewing the video, one instructional staff member related the video to PBL and how it can influence student's experiences and one instructional staff member indicated their hesitations with PBL, but after viewing the video, saw the value in taking this perspective on PBL. I then explained the paired interviews to the instructional staff members present and they began interviewing their partner. Each instructional staff member received a PBL interview handout called "What's Working with PBL" (see Appendix B) to guide their discussion and explain the upcoming group activity. The paired interview activity took approximately 25 minutes. Once I received consensus that each partnered group completed the paired interview activity, I informed them to turn over their PBL interview handout, break up into groups of four to six, and follow the instructions to complete the small group activity.

I informed all instructional staff members to select a spokesperson for their group to share the themes that emerged from the sharing of the paired interviews. Once all groups had created three to five themes, each shared their themes. Next, I informed them to spread out their themes on their tables, stand up and move around the room, and place one of the green sticky dots that they had received on the themes that best aligned with their values. This activity took approximately 5 minutes.

Once all instructional staff members were back at their seats, I identified and read the top three themes out loud to all instructional staff members. These were discussed in the whole group. I then informed all instructional staff members about the next phase and activity in September. I asked the ART members to stay to debrief the activity and approximately half of the ART members stayed. Afterwards, I transferred the themes to

an excel spreadsheet to be shared with the ART. The Inquire phase section of the spreadsheet contained two columns: the themes from the sentence strips and the number of dots that each theme received from the gallery walk.

Imagine phase. The Imagine Phase consisted of creating visual representations and possibility statements in small groups. On Friday, September 29, 28 of approximately 44 instructional staff members signed in at the media center to participate in the Imagine Phase. As instructional staff members entered the media center, I had music playing and a PowerPoint screen that informed instructional staff members to sign in and organize into groups of six. The instructional staff members organized into five groups. I then welcomed everyone, explained the activity and its overall purpose for the study, and showed the top three themes from the August Inquire Phase activity. Once I explained the activity, instructional staff members began to work through the assignment. All five groups selected to create a poster as their visual representation of their vision for the future of the high school with the provided materials. I facilitated and provided any needed support.

As each group finished up their visual representation, I individually went to each group and explained the creation of the possibility statement and its purpose. Once all groups were completed with their visual representations, they posted their visuals on the windows. A member of each group explained their group's visual representation and shared their possibility statement. After each group explained their visual representation and possibility statement, I provided a recap of the rationale for the day's activity and the next steps for October's staff activity. I explained the next steps of creating strategies to achieve the Imagine Phase possibility statements, the implementation of the strategies in

November and December, and the follow up survey in January. I updated the Google Drive spreadsheet to reflect the five possibility statements to be used at the October ART meeting, then sent the document to the ART members.

Innovate phase. On October 27, 26 instructional staff members signed in at the media center to participate in the Innovate Phase instructional staff activity. The activity consisted of instructional staff members organizing back into their small groups from the September Imagine Phase activity and creating action plans for achieving each group's possibility statement. At this meeting, I presented the objectives and goals for the day along with an overview of the upcoming activities for the remainder of the study. Working in their groups, they created action plans with strategies to achieve their possibility statement using the Appreciative Inquiry planning chart (see Appendix C). The Appreciative Inquiry planning chart consisted of instructional staff members outlining specific strategies, commitments, requests, timelines, and resources to achieve their possibility statement. Each small group had the autonomy and freedom to create their action plans and strategies they deemed appropriate to achieve their specific possibility statement.

The ART member assigned to each group facilitated the activity and was responsible for providing guidance and support to accomplish the day's objectives. Once each group completed their AI planning charts, each ART member collected the charts so that they could be used in the creation of a master action plan with strategies. Once all planning charts were collected from each group, I updated the spreadsheet that the ART had used throughout the study to reflect each group's action plans and strategies. Once the master action plan (see Appendix D) was completed, it was sent to all instructional

staff members in an email. All instructional staff members received a paper copy of their individual and/or group planning charts to be used for implementation during November and December.

On January 24, 38 instructional staff members participated in the monthly instructional staff meeting. As instructional staff members entered the media center, they were given an open ended, follow up survey (see Appendix E) to provide feedback about their best experiences with implementing PBL and three wishes they had for the future of the initiative. Instructional staff members had the opportunity to complete the survey before, during, or after the instructional staff meeting. Additionally, instructional staff members had the opportunity to complete the survey on their own time and turn it in to me by the end of the following instructional day. Following the instructional staff meeting, I sent an email to all instructional staff members indicating that if they were absent for the instructional staff meeting and were interested in completing the survey, to stop by my office and I would provide them with a survey. The following day, two instructional staff members stopped by my office and were given a survey to complete, putting the total at 40 administered surveys. Only nine completed surveys were returned for a 23% response rate. Of the nine participants that completed the survey, four or 44% were ART members. Two ART members did not return the survey in the allotted time. After I received the completed follow up survey from instructional staff members, I transcribed and coded the survey results and identified the common themes. Once completed, I shared the results with the ART.

Data Analysis

As the study progressed through each phase of the Four-I Cycle, the ART met at scheduled dates and times and provided input, through social construction, into each of the research questions. Creswell (2014) described the qualitative data analysis process as transcribing the data, coding the data into themes or categories, then interpreting the data into findings or results. My role was that of participant-observer in which I participated and guided the ART through each phase of the Four-I Cycles during the data analysis process. The ART used the social constructivism approach when analyzing the data to identify the common themes. Table 4 outlines the research questions, data sources, and data analysis methodologies. The answers for each of the survey questions were coded and incorporated into the final data analysis process to identify the common themes.

Table 4
Data Sources and Data Analysis

Research Question	Data Sources	Data Analysis
1. What do teachers perceive to be the strengths of the current PBL initiative in terms of the components that influence students to acquire the 21st Century Skills of communication, collaboration, critical thinking, and creativity? (Inquire)	-Appreciative Interviews from Inquire Phase	-ART interpretation of common themes from Appreciative Interviews
2. How do teachers envision the future of the PBL initiative at the high school when PBL is being implemented at its best? (Imagine)	-Possibility Statements/ Visual representations from Imagine Phase	-ART interpretation of common themes from Visual representations/ Possibility statements/Staff performances
3. How do teachers plan to achieve the future of the PBL initiative when PBL is being implemented at its best in terms of actions that are needed to create an actionable and sustainable plan for the future of the PBL initiative? (Innovate)	-Possibility Statements -Staff plans, strategies, staff meeting feedback from Innovate Phase	-ART interpretation of common themes from Possibility Statements/ staff plans and strategies, and ongoing staff meeting feedback
4. Once the plan to achieve their future of the PBL initiative is created, how do teachers plan to sustain this plan in terms of what actions, resources, or supports are needed to sustain this initiative? (Innovate)	-Staff action plans and teacher follow up, open ended survey results from Innovate Phase	-ART interpretation of common themes from instructional staff action plan follow up -Researcher interpretation of the common themes from instructional staff follow up, open ended survey from January 2018

The data analysis process occurred during the monthly ART meetings as the study progressed. At these meetings, ART members debriefed and analyzed the results of each of the instructional staff activities and planned for the upcoming phase of the each of the

Four-I Cycles. Table 5 outlines each monthly meeting and provides the agenda for each of the meetings.

Table 5
Action Research Team (ART) Monthly Meetings and Agenda

Monthly ART Meeting	Agenda
August	-Discuss study and purpose -Train ART in Appreciative Inquiry -Pilot interview questions -Finalize interview questions -Prepare for August Inquire Phase instructional staff activity
September	-Debrief on August instructional staff activity -Plan for October instructional staff activity -Provide input into first research question
October	-Debrief on September instructional staff activity -Plan for November instructional staff activity -Provide input into second research question
November	-Debrief on October instructional staff activity -Debrief on instructional staff implementation of PBL plan -Provide input into third research question -Pilot follow up, open ended staff survey questions
December	-Debrief on instructional staff implementation of PBL plan -Debrief on instructional staff feedback from November instructional staff meeting -Plan for administration of instructional staff survey at January instructional staff meeting -Finalize the agenda for the January ART meeting
January	-Debrief on instructional staff implementation of PBL plan -Debrief on instructional staff survey results -Debrief on Appreciative Inquiry process -Provide input into the fourth research question -Plan for second semester (2nd phase of action research cycle)

CHAPTER 4

FINDINGS

The major findings from this action research study emerged throughout each of the Four-I Cycle instructional staff activities and monthly ART meetings. Each of the Four-I Cycle instructional staff activities provided themes that were used for the ART to answer the research questions and plan for the upcoming instructional staff activities. Additionally, specific information provided from instructional staff and ART members are identified that support each of the themes from each of the Four-I Cycle phases. Once the emergent themes were identified, each of the research questions were answered based on the information provided by instructional staff and ART members in narrative and table format.

Research Questions

ARQ1-What do teachers perceive to be the strengths of the current PBL initiative in terms of the components that influence students to acquire the 21st Century Skills of communication, collaboration, critical thinking, and creativity?

At the September action research team meeting, ART members constructed a matrix on paper and indicated how PBL promoted each of the Four Cs of communication, collaboration, critical thinking, and creativity. Throughout this discussion, ART members described various PBL lessons that focused on student-driven, teacher-facilitated projects and activities. These student-driven projects and activities were based on students working together to solve problems, creating products, and engaging in real life

experiences that were relevant and applicable to their everyday lives. When students are engaged in a PBL lesson, ART members viewed themselves as facilitators and were responsible for guiding and supporting students as they implemented PBL lessons. ART members discussed how PBL turns the learning over to the students by placing the emphasis on them to work together to accomplish their task, while at the same time, taking ownership and being responsible for their learning.

As ART members discussed the strengths of PBL, it was evident that there was not a tight alignment or fit between PBL and the Four Cs. Table 6 indicated that, in relation to the top three strengths of PBL, communication, collaboration, creativity were all fairly equal with each other in terms of the amount of energy behind them, but were not as highly valued as learning from mistakes, promoting students to be responsible, and that projects come in all shapes and sizes. The results of the study did not specifically indicate that critical thinking was a strength of PBL; however it was evident that ART members perceive the strengths of PBL as promoting critical thinking skills.

Given that there was not a tight fit or alignment between the strengths of PBL and the Four Cs, it was evident that ART members still perceived PBL as promoting the Four Cs of communication, collaboration, critical thinking, and creativity. As the discussion organically progressed, one ART member volunteered to be the scribe and wrote down each ART member's perception of how PBL promoted the Four Cs. Throughout the discussion, ART members provided examples of how their student-driven projects and activities promoted each of the Four C's in their respective classes and content areas.

Communication. ART members indicated how PBL promotes communication by “listening skills,” “following directions,” “identifying parameters” and “feedback

between the student and teacher.” As students engage in a PBL lesson, the teacher is the facilitator and guides and supports students through the PBL activity. As the teacher is guiding and supporting the students, the students need to utilize “listening skills” and constantly be “following directions” throughout the process. Prior to beginning the PBL lesson, the teacher and student must “identify parameters” in the rubric and these expectations must be communicated to students during the beginning stages of the project. Throughout the PBL process, communication is promoted by regular and constant “feedback between the student and teacher” as well as feedback between students in their respective groups.

Collaboration. ART members indicated how PBL promotes collaboration by “solving/brainstorming together,” “collecting information,” and that collaboration is “required in order to plan the final product.” Throughout the PBL process, students must work together to solve their problem or create their final product. As they progress through the data collection process, they must be able to work together and share the collected information in order to achieve the end result. The concept of collaboration also aligned with the high school possibility statement created by instructional staff members during the previous school year. By implementing the collaborative aspect of PBL, instructional staff members are working toward the “collaborative” portion of their desired future for the high school.

Creativity. ART members indicated how PBL promotes creativity by trying “something new,” thinking “outside the box,” and by encouraging students to “take ownership” over their learning. In addition, students exercise creativity in determining what “shape/size” their end result is going to look like and discovering “how to learn

from mistakes.” As students engage in the PBL process, they are challenged to be creative when trying something new and thinking outside the box. Similarly, as they progress through the PBL process, they may need to be creative to achieve their desired result. They are engaging in real life experiences and can learn from their mistakes. The notion of learning from mistakes, students having choices, and being responsible for their learning are the perceived strengths of PBL as indicated by instructional staff members. As instructional staff members implement these strengths of PBL, they are moving in the desired direction of the high school.

Critical thinking. ART members indicated how PBL promotes critical thinking when students make “choices” when they see “mistakes and problem solve to fix” them, and through promoting “metacognitive awareness.” Similarly to creativity, critical thinking was seen as students engaged in learning from mistakes and problem solving to fix those mistakes. Similarly to learning from mistakes, metacognitive awareness can be seen as critiquing and revising the project to make any needed adjustments to achieve the desired results. Aligning with creativity again, comes the notion that projects can come in all shapes and sizes and that students will have choices as to how they view their end result and what that could look like when being presented. The concept of critical thinking also aligned with the critical thinking component of the high school possibility statement. When instructional staff members implement PBL and are challenging their students to think critically, they are working toward their desired future of the high school.

ARQ2 –How do teachers envision the future of the PBL initiative at the high school when PBL is being implemented at its best?

As instructional staff members engaged in their paired interviews during the Inquire Phase activity, they had the opportunity to take notes on their PBL interview handout. The conversations that occurred during the paired interviews set the stage for the creation of the possibility statements of what the high school could look like when PBL is at its best. The possibility statements that were created by instructional staff members during the Imagine Phase activity were based on the perceived strengths of PBL from the Inquire Phase activity.

Approximately 44 instructional staff members participated in the Inquire Phase activity. During this activity, each instructional staff member was provided with three green dots, then placed one or more dots on each of the themes that best aligned with their values. Once completed, all of the themes were spread out on each table and instructional staff members engaged in a gallery walk, or moved between tables, and had the option to place between one and three of their green dots on the themes that best aligned with their values.

Table 6 lists the strengths of PBL from the Inquire Phase gallery walk as well as the amount of energy behind each theme. The top three themes that emerged from the Inquire Phase instructional staff activity were “Mistakes=Learning Experiences”, Take responsibility for own learning”, and “Projects come in all shapes and sizes”. Aside from these top three themes, many of the characteristics from the remaining themes reinforced the top three themes and also assisted in the creation of the possibility statements.

Table 6
Inquire Phase Themes with the Number of Dots from the Gallery Walk

Theme	Number of Dots
“Mistakes=Learning Experiences”	24
“Take responsibility for own learning”	14
“Projects come in all shapes and sizes”	14
“PBL supports growth mindset and grit”	10
“Self-advocacy and discovery”	10
“Teamwork makes the dream work”	6
“Creative problem solving”	5
“Student Driven”	4
“Real world/life skills”	4
“Realistic”	3
“Networking with community and business”	3
“Opportunities to choose individual roles that showcase creativity”	3
“Student ownership”	3
“Available Time/Resources”	3
“Communication” (written/verbal/nonverbal)	2
“Relationships and Collaboration”	2
“PBL increases incorporation of creativity in lessons”	2
“Provides opportunities for flexible learning”	2
“PBL provides structure for instructional ideas”	2
“Teaching becomes facilitating”	2
“Integration of SOL into PBL”	2
“Creative freedom leads to investment”	2
“Ownership of learning”	2
“Student confidence”	2
“Collaboration”	2
“Teacher tested-student approved”	2
“Open to new ideas”	1
“Community”	1
“Hands on Experiences”	1
“Engagement of Students”	1
“Experiences that promote communication”	1
“Communication”	1
“Deeper understanding”	1
“21st Century Skills”	1
“Real life applications”	0
“Meaningful life experiences	0
“Simulated Workplace”	0
“Working together for the common goal”	0
“Student oriented”	0
“Peer collaboration”	0
“School Philosophy”	0

Once instructional staff members identified the perceived strengths of PBL, their next step was to organize into small groups and create possibility, or vision statements for their school based on these perceived strengths. One ART member was assigned to each

group and was provided with the list of the strengths of PBL. The ART member was responsible for facilitating the creation of these statements for their respective group. The subsequent strengths-based, possibility statements are evidence that instructional staff members value students learning from mistakes, students being responsible for their learning, and student voice and choice.

Possibility Statement #1-“School is preparation for your life, which is full of ups, downs, and mistakes. We will learn from all of it together”

The first possibility statement that emerged from the instructional staff Imagine Phase activity was based on being resilient, learning from mistakes, and working together. This possibility statement was best described by an ART member as “education is validation for the learning curve we call life and it’s a shared experience.” Various instructional staff members indicated that their best experience(s) with implementing PBL was when students experienced “trial and error” and learned from their mistakes. One ART member indicated that “making mistakes using projects for learning allows students to see that learning is not perfect and that it has many twists and turns and like the real world, you have to adapt.”

The concept of learning from mistakes had been a common theme during the Inquire Phase and was evident during the creation of the possibility statements. One ART member indicated that “PBL encourages mistakes and learning from those mistakes.” The notion of learning from mistakes was best described by instructional staff members as “PBL supports growth mindset and grit.” The concept of “grit” or perseverance when faced with a challenge, is what instructional staff members want for their students. As they experience a challenge in their lives, instructional staff members wanted their

students to grow by learning from their mistakes and also to acquire “confidence.” Instructional staff members viewed themselves as facilitators and acknowledged their roles as guiding and supporting students as they progress through the PBL process. One ART member indicated that “the instructor needs to focus on guiding the students because that is where the learning really happens.”

As students engage in their PBL lesson, they are able to see what works and what does not work when attempting to accomplish their task. Reinforcing this notion, one ART member indicated that PBL “allows them to see there is more than one way to solve a problem”. This claim indicates that there is not a linear, or a one size fits all approach to solving a problem or creating the end product with PBL. By understanding there is not a one-size fits all approach to PBL, students are challenged to utilize creativity and critical thinking skills to accomplish their task. Instructional staff members wanted to create an environment where failure is seen as a learning opportunity. When students make a mistake, they need to acknowledge those mistakes, analyze the reasons why the mistake was made, and try a different approach to the situation.

The high school implemented a school wide, tiered support system to provide various supports for students which was created by instructional staff members. The “full of ups, downs, and mistakes” component of this possibility statement aligned with the tiered support system motto of “Be Resilient.” The PBL initiative and tiered support systems were both led by instructional staff members. The themes from each provided evidence that there is a positive relationship between these two initiatives. Instructional staff members valued “working together for the common goal.” This claim reinforced the “we will learn from it together,” portion of the possibility statement. Instructional staff

members wanted their students to establish “relationships and collaboration” among their peers. This “peer collaboration” created the opportunity for students to experience interpersonal skills. The ultimate, end result for instructional staff members is that they wanted to create an environment of learning opportunities and wanted their students to understand that “teamwork makes the dream work.” The components of this possibility statement reinforced the high school’s vision statement as well as collaboration from the Four Cs.

Possibility Statement #2-“When students take responsibility for their learning and grow from their mistakes, the possibilities are endless”

The second possibility statement, similar to the first possibility statement, that emerged from the Imagine Phase activity was based on students being responsible and learning from their mistakes. This possibility statement was best described by an ART member’s statement of “endless possibilities for students rest in the degree of responsibility they are willing to take.” One ART member indicated that “when people don’t take responsibility for their own existence, they go nowhere. PBL allows teachers to train students in the importance of personal responsibility and the process of achieving it.” PBL places the responsibility and ownership on the student to create the end product or solve the problem. Various instructional staff members indicated that their best experience(s) with implementing PBL was when students were “taking ownership of the project,” making it their own, as well as “taking ownership and direction of something.” This possibility statement reinforced the values from the first possibility statement, the components of learning from mistakes and being responsible from the top two strengths

of PBL from the Inquire Phase, and also two components of the tiered support system motto of “Be Responsible” and “Be Resilient.”

Taking responsibility for a student’s learning is evidenced by instructional staff members as “ownership of learning” and “student ownership.” Instructional staff members want their students to be responsible for their learning and they interpreted this as students taking ownership over their learning. One ART member indicated that responsibility is a skill “not really emphasized in traditional pedagogy.” By incorporating student-centered lessons, students are able to take responsibility for creating their own evidence of learning. One ART member indicated that “students get bogged down with the same old class assignments that are teacher-directed; whereas Project Based Learning allows students to create their own puzzle piece that contributes to the big picture of education.” Similar to the previous possibility statement, instructional staff members will continue to work together, learn from their mistakes, and implement the strengths of PBL to achieve the high school’s desired vision.

As students engage in a PBL lesson, they have the opportunity to demonstrate knowledge in various ways. One ART member indicated that PBL promotes students to have “ownership and being prepared for something that they can turn in, rather than just a worksheet.” As students engage in the PBL process, they can understand the importance of the process and not just the product. One ART member indicated that “when done well, PBL turns passive learners into active learners. Students become more responsible, more intuitive, more driven, less focused on a grade, more focused on the outcome. It truly becomes more about the journey, not the destination.” When students are able to

create their own methods or approach to learning, they are able to take responsible for their learning and acquire real life skills.

Possibility Statement #3-“Room to chart your own course”

The third possibility statement that emerged from the Imagine Phase activity was best described by an ART member as “students identify the finish line and the best path to get there.” Instructional staff members wanted to provide “opportunities for flexible learning” and “meaningful life experiences” for their students. These meaningful life experiences can be a “simulated workplace” where students can learn on the job training and skills that are needed in post high school careers. The simulated workplace was a PBL based, instructional initiative that had been implemented by the CTE department. As students engage in the PBL process and these meaningful life experiences, they are provided with an opportunity to select how they want to approach a problem or task and select the best method or approach to solve that problem or accomplish that task. There is not a one-size-fits-all approach to PBL and projects can vary based on the decisions that students make during the process. An instructional staff member indicated that their best experience with implementing PBL was when students had the “freedom to make decisions” or have student voice and choice in their learning. One ART member indicated that “each student is going to come with their own project and every aspect is going to be unique and valuable to that student.”

As students engage in the PBL process, they will need to create the best path to meet their desired end result. Instructional staff members wanted to implement student-centered projects, based on their voice and choice, so that students had the opportunity to pursue their own interests and plan for their future. Instructional staff members indicated

that “creative freedom leads to investment” and this investment will promote students to take ownership and responsibility over their learning. This possibility statement reinforced various components of the strengths of PBL in that projects come in all shapes and sizes, promoted student choice and voice, and also supported creativity as one of the Four Cs.

Possibility Statement #4-“Take your chance, own it, and then be you”

The fourth possibility statement was best described by an ART member as “everyday is a new opportunity to break the mold.” As students engage in the PBL lesson, it is essential to understand that everyone is different and these differences influence the process and outcome of a project. When engaged in a PBL lesson, instructional staff members want their students to be “open to new ideas” and “experiences that promote communication.” When students communicate and share ideas, they are creating a “community” among their peers, which can be helpful when working toward the common goal. Instructional staff members wanted to continue to implement student-centered PBL lessons, based on student interests, so that they can learn new ideas. PBL values individual interests and skills, which can, if done correctly, promote students to be open to new ideas and acquire new knowledge. This possibility statement also reinforced the strength of PBL that “projects come in all shapes and sizes” and is similar to the third possibility statement in the way that it is based on student voice and choice.

Possibility Statement #5-“Learning looks different for everyone”

The fifth possibility statement is essentially a combination of the third and fourth possibility statements. This statement is best described by an ART member as

“perspective affects how students experience the world and how they learn from those experiences.” The possibility statements of “room to chart your own course” and “take your chance, own it, and then be you” are referenced, as well as “projects come in all shapes and sizes” from the third strength of PBL. This statement indicated that everyone learns differently, and their own experiences and who they are, can influence how they learn. Instructional staff members indicated that PBL provides “opportunities to choose individual roles that showcase creativity.” When students engage in a PBL activity, the cooperative learning component creates the opportunity for individual students to showcase their creativity, along with their various skill sets, that can contribute to the end result of the project. These individual and various skill sets can influence how they work collaboratively with other students and how the group or team demonstrates their knowledge. All students bring a different set of skills and background knowledge to the classroom and their previous experiences and perspective can influence how they conduct themselves in the educational setting.

The five possibility statements created during the Imagine Phase activity are infused with the strengths of PBL from Table 6, aligned with components of the high school vision statement, as well as the components of the school wide tiered support system. It is evident that the various strengths of PBL were incorporated into the creation of these possibility statements and that these statements describe the desired direction of the high school. The next step for instructional staff members was to create an actionable and sustainable plan to achieve each of their possibility statements.

ARQ3-How do teachers plan to achieve the future of the PBL initiative when PBL is being implemented at its best in terms of actions that are needed to create an actionable and sustainable plan for the future of the PBL initiative?

Instructional staff members had the opportunity to create actionable and sustainable plans to achieve their desired future for the high school over approximately a two-month period. During this time, ART members checked in and followed up with their group members from the Imagine and Innovate Phases and provided the necessary supports. During the Innovate Phase instructional staff meeting, 26 instructional staff members organized back into their groups from the Imagine Phase and created action plans and strategies to achieve their possibility statements. There were approximately 12 less instructional staff members that attended this meeting compared to the Imagine Phase activity. Additionally, there were various instructional staff members that attended the last meeting that were not present at this meeting, as well as various instructional staff members that attended this meeting, but not the previous meeting. The subsequent action plans and strategies reflect information provided by instructional staff members that attended the Innovate Phase instructional staff activity in October. Appendix D outlined the instructional staff possibility statements along with their respective action plans and strategies for each statement during the Innovate Phase. These action plans focused on allocating resources and implementing activities to create a teacher-facilitated, student-driven, PBL conducive environment based on real life applications.

The actionable and sustainable plan for the first possibility statement of “school is preparation for your life, which is full of ups, downs, and mistakes. We will learn from all of it together” was best described by an ART member as “focusing on real life

applications and implementation.” Instructional staff members also planned PBL lessons that were based on various real life scenarios and would challenge their students to utilize outside resources to solve the problem. These real life applications consisted of specific projects that incorporated high levels of Bloom’s Taxonomy. These projects were based on student choice and voice, collaboration, and promoted individual accountability. Instructional staff members indicated that they implemented “high repetition, high failure rate projects,” as well as “teaching failure” with games that are designed to fail. These projects promoted students to think critically, as well as challenged them to create a solution, which ultimately would allow them to learn from their mistakes throughout the process. One instructional staff member committed to “promoting resiliency,” which aligned with the tiered support system component of “Be Resilient” and also aligned with the notion of learning from mistakes from the top strength of PBL. One instructional staff member committed to “teaching how to check with self evaluation” to their students. In order to keep this initiative moving forward, one instructional staff member committed to inserting PBL throughout the curriculum.

In order to achieve the second possibility statement of “when students take responsibility for their learning and grow from their mistakes, the possibilities are endless,” instructional staff members wanted to create an “environment where respect is given and received” and “where expectations are clear, concise, and challenging.” This was best described by an ART member as “cultivating an environment that is conducive for this type of learning.” The concept of respect was evident and aligned with the tiered support system motto of “Be Respectful.” One instructional staff member committed to “teach clear expectations,” while another committed to “model respectful behavior.” One

of the main, end goals was for instructional staff members to create an “environment that fosters a growth mindset” where “failure is OK.”

Creating an environment where failure is okay reinforced the rationale for implementing projects where students are able to learn from their mistakes. When instructional staff members created this environment where failure is accepted, they also indicated that “feedback is informational, not punitive.” In an attempt to get away from punitive grading practices, one instructional staff member committed to “use positive grading practices.” This would allow students to learn from their mistakes and not be penalized for a wrong answer. Aligning with student voice and choice, one instructional staff member indicated that they would “increase student choice with assignments” and affirm “positive thinking.” These commitments emphasized the creation of an environment of positivity similar to the positive tone that they were experiencing using the appreciative inquiry process.

In order to achieve the third possibility statement of “room to chart your own course,” instructional staff members valued creating a physical environment based on creative, student-led projects, as well as an opportunity in which multiple projects were occurring at the same time. This was best described by an ART member as “the teacher finds a way to take a more hands-off approach to support a more student-driven learning environment; the focus of grading shifts to a focus on process as well as product.” Instructional staff members indicated that they would “create more student-led projects in order to promote independence, confidence, and self-determination.” In this way, they would be preparing students with the skills needed to be successful in life.

Working toward this possibility statement, while similar to the previous possibility statement, one instructional staff member committed to not “grading first attempts” and providing “real-time feedback” so that students will be able to make adjustments to their project as they progress through the PBL process. Thus, students will not be penalized for mistakes on their first attempt. The teacher can then “provide support” and coach students as they work together to learn from their mistakes to accomplish their task as they progress throughout the project. The emergent theme from this possibility statement is similar to that of the previous statement of being positive and supporting students.

In order to achieve the fourth possibility statement of “take your chance, own it, and then be you,” instructional staff members valued the components and process of PBL. This was best described by an ART member as “facilitating a process that is visionary and concrete and comes back to the driving question.” These components consisted of collaboration, research, driving question(s), and the sharing of the PBL product. When explaining a PBL lesson to students, instructional staff members indicated they would “introduce PBL by sharing an example of a finished product” so that they had an idea as to what a PBL lesson looks like in practice. Once the PBL lesson was explained to the students, instructional staff members indicated that they would have students “create a driving question,” “work together,” and “plan and distribute responsibilities to members” of the group. Once the planning phase of the PBL process was completed, students were then able to engage in the PBL lesson. Once students were engaged in the PBL lesson, one instructional staff member committed to “plan the time needed for students to support student choice based on PBL.” In order for students to be

successful during the PBL process, various instructional staff members committed to teaching “individual effort,” “group effort,” and teamwork to “commit to teammates to have their information ready for submission.” They also acknowledged the need to explicitly teach “communication” skills. These components aligned with the collaboration and communication components of the Four Cs and students taking responsibility for their learning from the strengths of PBL. In reflecting on the action research process in December, one ART member indicated that “students are getting more involved in the design phase of the project” reinforcing the PBL process.

In order to achieve the fifth possibility statement of “learning looks different for everyone,” instructional staff members wanted students to move at their own pace and have a choice in what they learned. Instructional staff members indicated that they had “students create their own evidence” of learning and provide “choice in how they demonstrate achievement.” One instructional staff member committed to being “flexible and open to a variety of products/results, but still hold students accountable” and helping them “create an action plan” to achieve their end result. The notion of being flexible and providing choice and options are evident in the creativity aspect of the Four Cs, the third possibility statement of projects coming in all shapes and sizes, and the student voice and choice concept that was embedded in the various possibility statements.

At the November and December instructional staff meetings, instructional staff members were given an opportunity to share their success stories and inquire about needed resources as they implemented their PBL action plans. Instructional staff members shared success stories of student engagement and student driven activities. One ART member described success stories of creating a physical environment to reflect a

business environment, student's presenting in groups, and involving community members into the class. Another instructional staff member shared that students were engaged in choice activities and took on roles during the lesson.

During the follow up discussions with their colleagues, one ART member reported the positive experiences as "PBL gave her the opportunity to utilize former experience and wisdom in delivering and facilitating the product to the students." This claim reinforced the notion that instructional staff members saw themselves as facilitators and their role was to guide and support their students. Another ART member indicated that their follow up discussion with their group member consisted of students being "invested and it went well" and that students were "taking more responsibility." These student investment and responsibility components aligned with students taking responsibility and ownership over their learning from the top strengths of the PBL, as well as the first two possibility statements. One ART member indicated in their discussions with their colleague that there was "more student led, hands on activities" and one instructional staff member was "offering student choice based on student interest as an alternative to instructor dictated projects" which essentially aligned with all five possibility statements. These claims indicated that instructional staff members observed positive results with PBL during the first semester.

At the January 2018 instructional staff meeting, instructional staff members were given an open ended, follow up survey to provide feedback about their experiences with implementing PBL during the months of November and December. The participation rate for the survey was 23%. A potential reason for the low response rate was described by an ART member as "people had the option to fill it out and turn it in later, and later became

never.” For survey question number one, “What was your best experience(s) of implementing PBL during the first semester?”, two categories emerged: teacher experiences and student experiences. There were four teacher experiences. These four experiences were coded and categorized into three themes: Collaboration between teachers (2 out of 4), communication between teachers (1 out of 4), and teachers plan real life lessons (1 out of 4). The teacher experiences aligned with the strengths of PBL as previously indicated in Table 6, the high school vision statement, the various aspects of the PBL possibility statements, and the Four Cs. A distinction was made between collaboration and communication because communication does not necessary lead to, or mean the same as collaboration; however some form of communication, whether written or spoken, is needed in order to effectively collaborate. Based on the three themes, teachers hope to plan more real life lessons so that students can acquire the needed skills to be successful in post high school careers.

There were a total of 13 student experiences as indicated by instructional staff members. These 13 student experiences were coded and categorized into seven themes as outlined in Table 7. They are as follows: Student-driven project criteria (4 out of 13), student engagement (2 out of 13), student ownership and responsibility (2 out of 13), student real life experiences (2 out of 13), student problem solving (1 out of 13), student discovery of information (1 out of 13), and observing changing mindsets of students (1 out of 13). The student experience(s) from the survey revealed diverse responses and suggested weak consensus among instructional staff members. Student-driven project criteria is clearly the best experience that instructional staff members had during their

implementation PBL. They expressed the desire to keep moving in that direction and keep building on that momentum during the spring semester.

Instructional staff members indicated that student-driven project criteria and real-life experiences, along with students taking ownership and taking responsibility for their learning were the best experiences as they implemented PBL. Additionally, these components aligned with school-wide tiered support system motto, strengths of PBL, PBL possibility statements, as well as the Four Cs. The student-driven-project criteria were a common theme in the master action plan created by instructional staff members. Instructional staff members will focus on creating lessons and strategies that incorporate student ownership and responsibility, engagement, and real life experiences into their PBL lesson planning as they work to achieve their desired vision(s) for the high school. Finally, they will work together to create lessons that emphasize problem solving and student discovery of information by creating an environment that is conducive for this type of learning in order to observe the changing mindset of students. Essentially, all of these components are interrelated and instructional staff members will need to collaborate with their colleagues in the second phase of the action research cycle in order to achieve their desired vision of the high school.

Table 7
Innovate Phase Survey Question #1 and Common Theme(s)

Survey Question	Researcher Interpretation of Common Theme(s)
“What was your best experience(s) of implementing PBL during the first semester?”	<u>Teacher Experiences</u> -Collaboration between teachers (2 out of 4) -Communication between teachers (1 out of 4) -Teachers plan real life lessons (1 out of 4) <u>Student Experiences</u> -Student driven project criteria (4 out of 13) -Student engagement (2 out of 13) -Student ownership and responsibility (2 out of 13) -Student real life experiences (2 out of 13) -Student problem solving (1 out of 13) -Student discovery of information (1 out of 13) -Observing changing mindsets of students (1 out of 13)

ARQ4-Once the plan to achieve their future of the PBL initiative is created, how do teachers plan to enact and sustain this plan in terms of what actions, resources, or supports are needed to sustain this initiative?

When ART members met with their respective group members, they inquired about the needed for additional resources to achieve their possibility statements and action plans. ART members reported that instructional staff members did not provide any feedback into the needed or additional tangible resources to keep the initiative moving forward. This is evidenced by one ART member as “everyone is doing it with what they have.” Based on the report from ART members, it was evident that PBL can be incorporated into the instructional program using a variety of tangible resources with little to no additional cost.

Although there was a 23% participation rate in the instructional staff survey, the information that was provided was helpful for planning next steps of the action research initiative. For survey question number two, “What are three realistic and attainable wishes (more or less) that you have for the future of the PBL initiative?”, a total of 19 wishes emerged. The 19 wishes were coded, then categorized into eight themes and were as follows: Grading PBL (5 out of 19), Curriculum Alignment (5 out of 19), PBL Environment (2 out of 19), Time (2 out of 19), Student Skills (2 out of 19), Professional Development (1 out of 19), Core Classes (1 out of 19), and School Culture (1 out of 19). The results of these categorical themes are presented in chart format in Table 8.

Table 8
Innovate Phase Survey Question #2 and Common Theme(s)

Survey Question	Researcher Interpretation of Common Theme(s)
“What are three realistic and attainable wishes (more or less) that you have for the future of the PBL initiative?”	-Grading PBL (5 out of 19) -Curriculum alignment (5 out of 19) -PBL Environment (2 out of 19) -Time (2 out of 19) -Student Skills (2 out of 19) -Core Classes (1 out of 19) -Professional Development (1 out of 19) -School Culture (1 out of 19)

Grading PBL. Various instructional staff members indicated that understanding various PBL grading practices is one of the main challenges going forward during the PBL initiative. Various challenges were indicated when describing how to grade a PBL lesson. These challenges are related to the traditional setup of schools and the grading criteria established by the district. The traditional setup of schools and their respective grading practices can be a challenge by the “number of grades and constraints” in addition to the “way we assign grades” as indicated by instructional staff members. It is

evident that there are various ways to assess a PBL lesson and “perhaps recognition that projects often fall into a gray area between formative and summative assessments in the gradebook” can be something that can be further investigated.

Instructional staff members indicated that “tests could be projects that relate to what students will see outside of school.” One instructional staff member indicated that “students can learn to think logically instead of in terms of multiple choice.” PBL could provide an alternate to standardized testing which could create the opportunity for students “to come up with their own projects to present why and/or how they know they have mastered a topic” and possibly prompt the discussion of students being rewarded “in some other ways than grades.” Clearly, instructional staff members need additional training and action research to learn about the various ways that PBL can be assessed. Once they receive the training and engage in the action research process, they can collectively make decisions about grading practices so that they are consistent throughout the high school.

Curriculum alignment. Similarly to the PBL grading practices, instructional staff members indicated that curriculum alignment is another area in need of focus. One ART member indicated that PBL is “not integrated into the curriculum” as a potential reason why this perception exists. One instructional staff member indicated that all classes should “incorporate projects that they can learn skills and ideas they can use outside of a school setting” and this can be accomplished by it being “more integrated into the curriculum rather than viewed as an add-on” to alleviate the perception of “it doesn’t feel like something extra.” A potential solution can be that “projects are more cross curricular” as indicated by an ART member. These wishes are evidence that various

instructional staff members see the value in PBL and believe it should be embedded into curricular and instructional practices.

PBL environment. Various instructional staff members associated the PBL environment with the actual, physical space of the classroom. One instructional staff member indicated that they needed a “larger space” whereas another staff member indicated the “possibility of collaboration furniture and materials for the room.” These components are interesting because a perception that may exist for implementing PBL is that the traditional school architecture or layout may not be conducive for PBL lessons. Students and teachers may need to get creative in order to overcome this perceived barrier.

Time. Various instructional staff members reported that time constraints made it difficult to implement a PBL lesson. This is evidenced by “recognition that discovery and empowerment via PBL can take time, often not time readily available in a core course” and “you don’t have time to do a student discovery PBL model” because “there is so much content to cover.” During the traditional school calendar year, an instructional staff member indicated that “the 4X4 schedule is a constraint,” limiting the amount of time that can be used to meet the PBL expectations. Again, these comments can prompt further discussion into how traditional schools are set up and provide insight into how schools should be created in the 21st century.

Student skills. One instructional staff member indicated that there is a need for “stronger student skills with regard to critical thinking and problem solving” when implementing PBL. A possible solution could be to integrate PBL as a more cross-

curricular approach. This would prompt incorporating collaboration, creativity, and communication among instructional staff members and students.

Core classes. One instructional staff member indicated that “increased student engagement in core classes” would assist in continuing to move the PBL initiative forward. If students are engaged in all of their classes and not just in their core classes, this will assist in continuing to move the PBL initiative forward as well. Additionally, this would reinforce the need for students to be stronger in 21st century skills.

Professional development. Continual professional development for instructional staff members is essential to the success of a school. Given that PBL is a shift in thinking from a teacher-centered to a student-centered approach, instructional staff members may need additional supports and training on how to implement the approach in their respective content areas. This is evidenced by one instructional staff member as “the math department needs curriculum development time to develop and integrate projects” and another staff member indicated that we need “some further PD to brainstorm ideas.” These comments suggest that instructional staff members may need additional supports and professional development as they implement PBL in their respective classrooms.

School culture. Reinforcing the need for professional development and the shift from teacher-centered to student-centered pedagogical practices, comes the need to create a school culture of trying something new. This is best described by an instructional staff member as “open mindedness.” This open mindedness can begin the conversation to deconstruct traditional schooling and how to reinvent or be innovative to meet the needs of the 21st century workforce.

Auxiliary Findings

In addition to answering the research questions, ART members were asked about their experiences with the Appreciative Inquiry process. One ART member, who was absent during the initial morning session in the summer, shared that the AI process “started off confusing” and that they “didn’t learn the tool when we started.” Another ART member who was absent during the morning session indicated that they would have liked a “better introduction and explanation of the process.” All ART members did not attend all ART meetings when each phase of the AI process was explained; therefore did not initially learn each phase of the Four-I Cycle. One ART member who was present during the initial afternoon session, as well as during the monthly ART meetings described the benefits and positives of the AI process as it “uncovered some issues that we might not have previously identified” and indicated that it was “good to really figure out where we are” as a staff on PBL. These comments suggest that AI brings to light the possibilities of the organization and provides an understanding of how instructional staff members perceive PBL in their school. One ART member who came on board after the Inquire Phase activity indicated that the AI process “should be an ever expanding spiral” and ongoing.

ART members, as well as the entire instructional staff in this study were able to document their participation in the Four-I Cycles of AI, were able to create their own shared vision of the high school when PBL is at its best, and overall improve their PBL instructional practices. This is a change from the previous year(s) in which the PBL PLC did not document any type of supports that they provided and did not facilitate a school

wide effort to enhance the PBL initiative. This study did not impact district level instructional decision making in regards to PBL.

Summary of Findings

Based on the findings of this study, it was evident that there was not a tight fit between PBL and the Four Cs; however ART members indicated that PBL promotes the Four Cs of communication, collaboration, creativity, and critical thinking in various ways. More importantly, it is evident that instructional staff members perceive that there are many strengths of PBL and that these strengths can set the stage for the future of the high school. These values can drive the lesson planning of instructional staff members and can be evident in their daily practices. It is evident that instructional staff members had a positive experience with collaborating with one another and experiencing student success when implementing student-centered projects. Actionable areas for the second semester include investigating PBL grading practices along with incorporating PBL into the curriculum to meet curricular and assessment demands. Additionally, based on the feedback shared during the monthly instructional staff meetings, the ART will need to encourage participation with PBL and create strategies to support their colleagues as they implement PBL during the second semester.

CHAPTER 5

RECOMMENDATIONS

Instructional staff members that participated in this action research study created a shared vision for what the high school would look like when PBL is at its best. This vision consisted of, but was not limited to, creating an environment of learning from mistakes, students being responsible for their learning, and that projects come in all shapes and sizes. Additionally, instructional staff members created possibility statements, along with action plans for the high school that were based on the strengths of PBL. Specifically, these strengths were learning from mistakes, student voice and choice, and opportunities for students to create their own individual paths for their educational careers.

Discussion

ARQ1. What do teachers perceive to be the strengths of the current PBL initiative in terms of the components that influence students to acquire the 21st Century Skills of communication, collaboration, critical thinking, and creativity?

The strengths of PBL, as indicated by instructional staff members, revealed that PBL promotes skills other than communication, creativity, and collaboration. Although critical thinking was not specifically indicated as a strength of PBL, it can be perceived that critical thinking is integrated into the strengths of PBL from Table 6. Due to the fact that PBL is so complex and intricate beyond the Four Cs, it is evident that further

research is needed to fully understand if and how PBL promotes the Four Cs, as well as operationalizing the Four Cs.

Although there was not a tight fit between the Four Cs and PBL, it was evident that ART members perceived PBL promoted communication skills through the development of listening skills and following directions. These two communication characteristics can be related to DiBenedetto and Meyer's (2016) 21st Century Skills construct of learning and social skills. When students are engaged in a PBL lesson, they have the opportunity to learn from others by communicating. When they are communicating and interacting with one another, they can also acquire interpersonal skills. Reinforcing the ART's interpretation that PBL promotes communication skills by the feedback between the student and teacher, the literature on PBL also indicates the instructional approach promotes communication skills (Markham, 2012; Sahin & Top, 2015; Wan Husin et al., 2016).

ART members indicated that collaboration is promoted by problem solving and brainstorming together as indicated by the BIE's description of PBL (BIE, n.d., Why Project Based Learning (PBL)?, para. 4). When students problem solve, they are inquiring into a problem and engaging in inquiry-based learning. ART members described the collaboration component as being required in order to plan the final product. Collaboration is cultivated using PBL when students problem solve and brainstorm together to solve their problem or create their product. Creation of a product is indicated in the literature of PBL (BIE, n.d., What is Project Based Learning (PBL)?, para. 6; Galvan & Coronado, 2014; Markham, 2012).

ART members indicated that PBL promotes creativity as trying something new and thinking outside the box. Trying something new and thinking outside the box can be related to the findings of Wan Husin et al. (2016) that indicated that project-based, problem-based learning may increase inventive thinking. Similarly to creativity, ART members indicated that PBL promotes critical thinking in the form of choices and learning from mistakes. Critical thinking was seen as a form of metacognitive awareness and this can be related to the BIE's PBL description of critique and revision (BIE, n.d., What is Project Based Learning (PBL)?, para. 8). An ART member's description of critical thinking as choices are evidenced in the claims of the BIE (n.d.) that indicated that PBL promotes student voice and choice (BIE, n.d., What is Project Based Learning (PBL)?, para. 6).

ARQ2. How do teachers envision the future of the PBL initiative at the high school when PBL is being implemented at its best? Instructional staff members created five possibility statements describing what the high school would look like if it honored the strengths of PBL. The first and second possibility statements of preparing students for the ups and downs of life by learning from their mistakes is central to the tiered support system motto of the high school as being resilient. These experiences aligned with the components of PBL of reflection, critique, and revision (BIE, n.d., What is Project Based Learning (PBL)?, para. 7-8) and were a key value of instructional staff members. Instructional staff members will need to investigate how not grading first attempts of student work might support student risk taking. They also discussed their efforts to teach students how to be responsible. They will need to take more of a facilitator approach and focus on valuing the process and not just the end product. In order to accomplish this,

instructional staff members will need to be open minded and be creative when grading a PBL lesson.

The third, fourth, and fifth possibility statements value student choice and voice. These possibility statements reinforce the PBL components of student voice and choice (BIE, n.d., What is Project Based Learning (PBL)?, para. 6). Instructional staff members need to understand that each student is going to make it to the finish line, but that finish line may look different for each student. Instructional staff members need to work toward planning PBL lessons where students have the option to choose their goal or end result and map the best route to get there. These end results may be based on authentic experiences that are relevant to each student and their lives. By providing students with authentic experiences, they will be able to explore their interests in a specific context, which in turn can assist them in achieving their desired goal. The positive effects of authentic, real life experiences are evidenced by the results of Yoon and Hyun-Hwa Lee's (2012) study that indicated authentic learning provided a "positive experience in which students learned practical competencies, gained professional experience, and honed their ability to solve complex problems with various perspectives" (p. 287). Additionally, these real life lessons and authentic learning have been found to increase motivation toward learning (Susiyawati et al., 2015). If students are able to have a voice and choice in how they chart their own course, they will have a better chance to reach their own finish line. In order to accomplish this, instructional staff members will need to plan PBL lessons and create an environment that promotes students to create actionable and realistic plans to achieve their end result in an authentic way.

ARQ3. How do teachers plan to achieve the future of the PBL initiative when PBL is being implemented at its best in terms of actions that are needed to create an actionable and sustainable plan for the future of the PBL initiative? Instructional staff members created action plans and committed to implementing various strategies to move the high school in the direction of the PBL possibility statements. Instructional staff members will need to work together and continue to create strategies and implement their commitments from their AI planning charts to keep the high school moving forward in the direction of the possibility statements. ART and instructional staff members will need to continue to communicate and collaborate with each other, as well as with building and district level leadership throughout the second semester to create a successful PBL environment at the high school. As Markham (2012) claimed “the PBL teacher must design the environment in which peak performance flourishes” (p. 6).

The information from the instructional staff action plans did not specifically reveal the need for building and district level support or leadership; however building and district level leaders will need to embrace the PBL approach in order for the PBL initiative to be successful. Building and district level leadership have an opportunity to provide professional development on action research methodologies and approaches to facilitate further inquiry into the challenges that instructional staff members face when implementing PBL. When building and district level stakeholders share the same vision for their school(s) and work together to provide the necessary resources to achieve the desired results, students will have more opportunities to be successful and prepared for careers beyond high school.

A potential barrier that instructional staff members may need to overcome as they implement their PBL action plans is the emphasis of standardized testing and accountability as evidenced in the findings of Vega and Brown (2013). The fear of students not learning standardized curricular objectives can influence teachers to plan lessons that emphasize teacher-centered or traditional instructional approaches that promote memorization of facts and lower levels of Bloom's Taxonomy (Kathwohl, 2002) rather than applying knowledge to a new situation and creating a product or to solve a problem. These traditional pedagogical practices can undermine or deter the PBL initiative and keep instructional staff members from implementing PBL with fidelity. In order to meet the required standardized curricular expectations, the challenge for instructional staff members becomes how to incorporate these standardized curricular objectives into a PBL lesson so that they can acquire the knowledge needed to achieve a passing score on these exams, as well as acquiring the essential 21st Century Skills that are needed for students to be successful in today's workforce as indicated by the American Management Association (n.d.).

ARQ4. Once the plan to achieve their future of the PBL initiative is created, how do teachers plan to enact and sustain this plan in terms of what actions, resources, or supports are needed to sustain this initiative?

The feedback from the instructional staff survey indicated that instructional staff members enjoyed working together and planning real life lessons for their students. Instructional staff members will need to continue to encourage their colleagues to work together and plan PBL lessons that promote communication and collaboration as indicated in the Four Cs. As instructional staff members shared their best student

experiences, they indicated that student-driven project criteria, specifically the rubric, was important as indicated in the literature on PBL (Markham, 2012). Aligning with student-driven projects, instructional staff members indicated that their best experiences were also students taking ownership and being responsible which reinforced the components of the PBL possibility statements, the school wide tiered support system motto, and strengths of PBL.

When asked about their wishes moving forward, instructional staff members indicated that they wanted greater clarity on the grading of projects and integrating PBL into the curriculum. It was evident that there are a variety of ways to assess and grade a PBL lesson. Instructional staff members may need to review their rubric criteria and approach (Markham, 2012). Instructional staff members indicated that there is a gray area when grading PBL and that students could be rewarded in other ways than grades. This is an interesting point and could prompt further discussion into teaching, learning, and grading PBL practices. Various instructional staff members valued the PBL approach and indicated that all classes should incorporate projects and that they should not be seen as an add-on. These projects should be cross-curricular and integrated into the curriculum. The next step for ART members would be to collaborate with district and building level leadership to provide professional development opportunities for teachers to infuse PBL into the curriculum, as well as professional development for grading PBL. Once instructional staff members are able to enhance their PBL grading practices, they may be able to incorporate PBL into the curriculum more regularly and their instructional repertoire, because as Markham (2012) iterated, it is the classroom teacher who designs the environment for PBL.

Implications

Recommendations for Practice

The findings from this study indicate that Project Based Learning (PBL) promote students to learn from mistakes, take responsibility for their learning and that projects come in all shapes and sized. The findings also suggest that PBL promotes the 21st Century Skills of communication, collaboration, critical thinking, and creativity in various ways. These findings were evident during the design of the desired direction of the high school. Based on the feedback from the follow up instructional staff survey, instructional staff members will need professional development on grading PBL and strateiges to infuse PBL into the curriculum. By incorporating these student-centered projects across the curriculum, students will have the opportunity to acquire and demonstrate the 21st Century Skills that are needed to be successful in post high school careers. This shift in thinking will need to become school wide and building and district level leadership will need to support and share this same vision. Table 9 outlines the recommendations for each action research question.

Table 9
Related Recommendations

Questions	Related Recommendations
Action Research Question 1	Further research is needed to investigate if and how the strengths of PBL promote the Four Cs, as well as further inquiry into operationalizing the Four Cs.
Action Research Question 2	Instructional staff members need to continue building on the strengths of PBL and work toward creating an environment where students can learn from their mistakes, be responsible, and create their own individual path to success. Building and district level leadership will need to support these efforts and provide funding and resources to make this initiative come to fruition.

Action Research Question 3	Instructional staff members need to continue to implement their commitments from their AI planning charts and may need to revisit their strategies as they progress through the PBL initiative. Building and district level leadership will need to provide professional development opportunities to all instructional staff members to support these efforts.
Action Research Question 4	Instructional staff members will need to continue to build on their best experiences, as well as the best student experiences. Building and district level leadership will need to support these positive experiences and provide professional development opportunities for instructional staff members on grading PBL and incorporating PBL into the curriculum.

This action research study began to address the Four Cs at Blue View High School and empowered instructional staff members to create a shared vision as to what they believe education should look like in their school. This study also begins the process of creating a shift in how we think about curriculum and instruction at the local level. Based on the findings of this study, it is evident that there is a powerful group of instructional staff members at Blue View High School in Central Virginia who believe and value learning from mistakes, students taking responsibility for their learning, and understanding that everyone brings their own unique experiences and that those experiences can be developed through projects that come in all shapes and sizes. For this PBL initiative to be successful, instructional staff members will need to maintain this momentum during the spring of 2018.

The plan for the second semester was for instructional staff members to meet with their design teams after their monthly instructional staff meetings to debrief the progress of the initiative and continue to create strategies to accomplish their individual commitments. Building level leaders may need to create the master schedule in such a way that provides common planning time for instructional staff members to meet and

create PBL lessons. These teams can also work to address the wishes from the open ended instructional staff survey. The teams may also want to utilize the Appreciative Inquiry approach to begin the action research cycle over again. If so, ART members could lead this initiative and provide support to their colleagues who are interested in promoting this type of change. Once all instructional staff members buy in to implementing PBL regularly and observe the positive benefits, these experiences could prompt a discussion into how the high school classrooms are set up and keep the high school moving in the direction of the possibility statements.

Recommendation for Policymakers

Educational stakeholders and policymakers at the local, state, and national levels will need to support this student-driven, project-based, and innovative type of approach. With this student-driven, project-based shift in thinking, comes the notion that schools could create an environment where students are able to learn from their mistakes, be taught how to be responsible for their learning, value student voice and choice, and be allowed to demonstrate their knowledge in alternate ways rather than a standardized, or traditional test. Policymakers need to rethink how they view teaching and learning and understand that not all students learn the same way or should be held to the same standard.

Fortunately, in the state of Virginia, the new *Profile of a Virginia Graduate* incorporates a lesser focus on standardized testing, but more of a focus on the 5 Cs of creativity, communication, collaboration, critical thinking, and citizenship. These standards will become effective for first time 9th graders during the fall of the 2018-2019 school year (Virginia Department of Education, 2018). By emphasizing these skills, this

can contribute to the notion that students may have the opportunity to break from traditional curricular and assessment practices and learn different ways to demonstrate knowledge. This is a step in the right direction for students in K-12 schools and aligns with the skills that are needed for today's workforce.

In keeping consistent with this initiative to create a teacher-facilitated, student-centered, project-driven approach, Blue View High School was awarded a VDOE High School Innovation Planning Grant in 2016 to implement innovative approaches in public education. In 2017, the high school was awarded a VDOE High School Innovation Implementation Grant to implement the innovative approach. This grant was centered on transforming Career and Technical Education (CTE) into simulated workplace (SWP) companies and/or businesses and partnering with a local community college for students to engage in work based learning opportunities. The conceptual framework for this program included a PBL instructional approach along with the components of various business models and applications. One of the goals for this program is for students to create Google-based portfolios to showcase and demonstrate their knowledge and skills. The results of this study align with the purpose and goals of this innovative approach and address the need for the Four Cs of creativity, communication, collaboration, and critical thinking as indicated by the American Management Association (n.d.).

Using the SWP approach, the CTE department has worked toward creating an environment where PBL can flourish and can begin to become a consistent instructional approach where 21st Century Skills are taught and modeled. Two of the ART members in this study were a part of the CTE department and are implementing student-driven, companies and/or businesses that address the need for the Four Cs of collaboration,

communication, critical thinking, and creativity that align with needs of businesses in the 21st century, in addition to the new *Profile of a Virginia Graduate*. Both instructional staff members have participated in various PBL professional development sessions and have been working diligently to enhance the SWP initiative. These ART members have the opportunity to keep the SWP and the second phase of the action research cycle going at the high school to create opportunities for students to acquire the necessary skills to be successful in today's workforce.

Recommendations for Future Action Research

This study began the process for organizational change at Blue View High School. Instructional staff members were given the opportunity to create a shared vision of what the high school would look like when PBL is at its best. The results of this study indicated a snapshot of the work that instructional staff members had accomplished from August 2017 until January 2018. The next phase of the action research initiative would be to conduct an implementation study. The plan for the second phase of this study will be to continue the move toward organizational change as the spring of 2018 progresses. Due to PBL being so complex and intricate, the next step for ART members could be to operationalize the Four Cs and provide more clarity as to how PBL promotes communication, collaboration, creativity, and critical thinking and indicate what this looks like in practice. Instructional staff members will have the opportunity to continue to build on the strengths of PBL, as well as working toward accomplishing their commitments based on their AI planning charts. Additionally, professional development on grading PBL and infusing PBL into the curriculum will need to be provided by district and building level leadership to instructional staff members as they implement PBL.

Based on the results of the instructional staff survey, it is evident that their best experiences of implementing PBL were working together among their colleagues and creating real life, student-centered lessons. These positive experiences could continue to be used to make instructional decisions during the spring of 2018. Further recommendations based on the results from the staff survey could be to encourage more instructional staff members to participate in the PBL initiative, to commit to collaborate with their colleagues to implement their action plan commitments, be innovative, and work to create an environment where collaboration is an essential part of the success of the school.

The feedback on the AI process is a vital tool that can be used during the second phase of the action research process to research the implementation of PBL as well. Instructional staff members can be provided with additional resources and guidance about AI and be encouraged to take on a leadership role to lead their colleagues during the school transformation process. The findings from this study have set the stage for the future of the PBL initiative at Blue View High School and can be used to determine next steps to move the initiative forward. Further questions for consideration are “How do we get more instructional staff members involved in the PBL initiative at the high school?” “If there were less an emphasis on standardized testing at the high school, would people be more willing to implement PBL?” “To what extent are building-level and district-level leadership willing to support a change or shift in education?” If so, what kinds of support do the instructional staff members want from leaders?”

Summary

Overall, based on the results of this study, it is evident that the move to rethink education and deconstruct traditional schooling needs to be a consideration if we are going to adequately prepare students to be successful in post high school careers in the 21st century. The findings from this study suggest that further research is needed to determine the relationship between PBL and the Four Cs, as well as what the Four Cs look like in practice. The findings also reveal that there are many strengths of PBL and these strengths can be used to move the high school in the desired direction of its instructional staff members. Instructional staff members will need to continue to build on their best experiences of implementing PBL, while at the same time be provided with professional development on grading PBL and infusing the approach into the curriculum.

Assumptions, Delimitations, Limitations

The study focused on the first phase of an action research cycle at Blue View High School in Central Virginia. The information presented focused on the participants and their perceptions of Project Based Learning.

Assumptions. I assumed that each staff member wanted to participate rather than felt obligated to participate in the study; however given my role as an assistant principal in the building, it is possible that they felt compelled to participate. Throughout the study, instructional staff members were invited to participate in the various Four-I Cycle phases and were continually informed that participation was optional. As each member of the ART interviewed and interacted with their colleagues during each phase of the study, it is assumed that they interpreted, collected, and recorded all data accurately and correctly and did not leave out anything specific that could influence the results.

Delimitations. The study occurred at Blue View High School in Central Virginia. The current expectation was for instructional staff members to implement one project per semester; two projects per school year. The results of the study influenced PBL instructional practices with the current staff at the high school, but could provide insight to school leaders about how to incorporate positive, strengths-based organizational change. I limited the study to one instructional initiative, PBL, and how it influenced the 21st Century Skills of communication, collaboration, creativity, and critical thinking. The first phase of the action research study was limited to the identification of the strengths and the creation of an actionable and sustainable plan with strategies that can begin the process for organizational change. From a district-level perspective, the study was limited to the high school context only.

I selected this context to research because I am a building level leader and wanted to know how to increase student achievement by improving teacher PBL instructional practices at my high school. I selected to use action research, Appreciative Inquiry, and the Four-I Cycle for this study. As I have encountered instructional staff members at various points throughout the summer of 2017, I informed them about the study and asked if they were interested in participating in the study. It was expected that all instructional staff members attend monthly instructional staff meetings and participate in professional development activities scheduled by the district/school. I provided professional development points for instructional staff members who participated in the study. I limited the study to the fall 2017 semester and into January 2018. I do not make any claims for generalizability of these findings beyond the specific school in which the study was conducted.

Limitations. A limitation of this action research study is that I was a participant researcher, which may have created a bias in the study. I am in a supervisory role at the high school and my communications and decisions may have influenced the behaviors of the instructional staff members. The Four-I Cycle activities were scheduled during instructional staff professional development days and instructional staff meetings of each month during the school year. All instructional staff members were expected to participate in staff professional development sessions unless they decided to use a flex day or take leave. The number of ART members participating in each of the monthly ART meetings varied, as all ART members did not attend each meeting. The number of instructional staff members participating in each of the Four-I cycles varied each month. The study was limited to the number of instructional staff members that agreed to participate at the high school. Participants may not have had a common understanding and definition of PBL and 21st Century Skills and each could have varied by participant. Not every participant had received the formal PBL professional development offered by the district from the summer of 2014 to the fall of 2015. The low response rate of the survey sample size was a limitation for the results that depended upon those data.

Ethical Considerations

Prior to conducting this study, W&M IRB Human Subjects approval was requested to conduct this study. The approval ensured that the identities and information of all participants would be kept confidential. I also received approval from district-level leadership to conduct this study. I submitted documentation of the study to district level leadership to be kept on file.

APPENDIX A

Letter of Consent to Participate in the Study

Purpose and Procedures: You are being asked to participate in an action research study about your perceptions of Project Based Learning and its influence on students to acquire the 21st century skills of communication, collaboration, creativity, and critical thinking. If you agree to participate in this research study, you will be asked to participate in staff meeting discussions, small group activities, and the creation of an actionable and sustainable plan for the ideal future of the high school PBL initiative. You will be asked to meet periodically at agreed upon times with members of the action research team to discuss the study and follow the Appreciative Inquiry process. Each meeting should take no longer than one hour. The timeline of this study will be from September 2017 until January 2018. All meeting dates will occur from September 2017 to January 2018.

Voluntary Study: Your participation in this study is completely voluntary. You may refuse and/or discontinue participation in this study at any time. If there are any questions that you do not wish to answer or any activities that you wish to not participate in, you may do so without penalty. Your participation in this study will not influence your contractual responsibilities with the school district and you will not be penalized in any evaluation for refusal to participate in this study.

Risks and Benefits: There are no risks involved in participating in this study. The benefits of this study will be to create a plan that can improve PBL instructional practices at the high school so that students can acquire the 21st century skills of communication, collaboration, creativity, and critical thinking. Students and instructional staff at the high school can benefit from your participation in this study.

Compensation: There is no compensation for your participation in this study. You will receive a certificate of professional development during each phase of the Four-I Cycles.

Confidentiality: Identifiable and personal information will not be connected to your discussions and information. However, the information that you share during the staff meetings and small group activities is not considered private information; therefore the information will not be held confidential. The information that you share will be used to improve PBL instructional practices at the high school and be included in the creation of the PBL action plan. In the event of publication of this research, no personally identifiable information will be published and disclosed. For confidentiality purposes, please do not provide any personally identifiable information on this signed consent form.

Who to Contact with Questions: If you have any questions about this action research study, please contact the assistant principal at the high school and primary researcher, Jason Allison. I can be reached by phone at 540-948-3785 or by email at jallison@madisonschools.k12.va.us. or you may contact Dr. Thomas Ward of the W&M EDIRC at tjward@wm.edu. You will receive a copy of this consent form.

I certify that I have read this form and volunteer to participate in this research study.

(Print) Name _____

Signature _____ Date _____

APPENDIX B

PBL Interview Handout-Inquire Phase

What's Working with PBL?

Part 1: Paired Interviews

- Choose a partner and take turns interviewing one another asking the following questions.
- Take brief notes in order to share your partner's responses later.
- Please indicate if, and which PBL PD sessions, your colleague attended from the summer of 2014 to the fall of 2015.
Summer 2014 ___ Fall 2014 ___ Spring 2015 ___ Fall 2015 ___ None ___

1A. Tell me a story about your best experience of a PBL project or lesson, whether you were the teacher or a student. What were the most positive and engaging aspects of this project?

1B. In what ways, if any, did the PBL lesson promote creativity, collaboration, critical thinking, or communication? Please be specific.

2. When you think about the things that matter most to you in your teaching, what aspects of PBL best align with those values?

3. What resources or conditions have been the most helpful to you as you have engaged in PBL with your students (here at the high school or elsewhere)?

4. Imagine that it is the year 2022, and our school has received an Excellence in Innovation award from the Virginia Department of Education due to the success of our students in postsecondary settings because of their communication and collaboration skills, as well as their creativity and critical thinking. Looking back, what were the most important factors and strategies in bringing about this success?

Part 2: Small Groups

- When you and your partner have finished, find two or three other pairs to form a small group.
- With your group, briefly share your partner's responses.
- As a small group, listen for and capture 3-5 themes that emerge from the interviews.
- Appoint a spokesperson to share your themes with the large group.

APPENDIX C

Appreciative Inquiry Planning Form-Imagine Phase

Appreciative Inquiry Planning Form

Possibility Statement:				
Group Members:				
Action Strategies	Resources Needed	Timeline	Commitments	Requests
Evidence of Attainment:				

APPENDIX D

Master Action Plan-Innovate Phase

Possibility Statement	Action Strategies
<p>"School is preparation for your life, which is full of ups, downs, and mistakes. We will learn from all of it together"</p>	<ul style="list-style-type: none"> -Interdisciplinary Projects (Long Term) (English/History) (History/Science) (Science/Math) -Better guided practice learning to check own work becomes independent practice -Better hook/anticipatory -High Repetition, high failure rate projects (Short Term, 1-2 days) -Sandbox Shorelines-choose a shoreline feature, set up a sandbox "ocean" to explain how the feature forms -EPF-design PBL that involves a particular job and set income -Have students find a place to rent, set up utilities, purchase/lease vehicle, etc. -Pay bills month to month -If not enough resources-what will they do to correct/respond. Find solution -World History (teach/work with foundation of a unit, have students work in groups to predict outcome or group work to develop strategy they would recommend to solve problem/approach situation) -Present strategy/student groups adjust their strategy as opposed to work at others -Use science data collection equipment to gather data. Get a regression model to the data and interpret the model with a focus on physical components of the practical problem. -AFDA students create probability games and present in fair setting (December) -EDP Stage 7-w/o peer review or instructor correction. Student choice @ design -Lab practicum instead of traditional -Individual student check/accountability -Teaching failure-game that is designed to fail -Madeline Hunter format

<p>"When students take responsibility for their learning & grow from their mistakes, the possibilities are endless"</p>	<ul style="list-style-type: none"> -Create an environment where respect is given and received -Create an environment that fosters growth mindset (Failure is Ok) -Create an environment that encourages intrinsic motivation -Create an environment where feedback is informational, not punitive -Create an environment where expectations are clear, concise, challenging
<p>"Room to chart your own course"</p>	<ul style="list-style-type: none"> -Create a supply shelf for the students with materials for them to do their PBL's -Using the library as a classroom to facilitate the creation and completion of PBL project -Moving/rearranging work stations to encourage creativity -Team "boxes" for finding ingredients and creating grocery lists -Multiple projects going on at the same time -Students will create a final project using course content. Students will select their own groups and decide the format of their project they will present to the class -Support individual independence -Don't grade 1st attempts -Create a space (room) that is conducive to student creativity, achievement, and simulated workplace (SWP) -Create an environment that encourages students to try new things and learn from mistakes -Create more student led projects in order to promote independence, confidence, and self-determination (Student's given three topics and they choose the topic their group wants to do and are given the freedom to present info in a manner of their choice)
<p>"Take your chance, own it, and then be you"</p>	<ul style="list-style-type: none"> -Establish the design components, location from library of the future -Be open to students accommodations as long as they justify -Develop PowerPoint -Draft a possibility statement (length to 600-700 words) -Research with your team

- Develop the driving question
- Students work together
- Show students examples of older works and modern translations
- Have students choose one book from the Odyssey and choose their method and create a modern version of their choice
- Have students create their leading question
- Student surveys
- PowerPoint Presentations
- PSA video
- Research
- The teacher will introduce PBL by sharing example of finished product
- Students will create a driving question
- The collaborative groups will plan and distribute responsibilities to members
- Each member will do research to add to the nonfiction article
- Commission work w/other teacher to work for or with
- Empty bowl drive (helping community, pricing their artwork)

"Learning looks different for everyone"

- Read aloud option for text/novels
 - Options for content assessment
 - Advanced class-allow more independence + self-driven work-students get benchmarks/requirements they have to meet and move @ own pace, have choice in how they demonstrate achievement-create their own evidence of learning
 - Every student writes/fulfill a unit of study
 - Show/demonstrate the necessary skills and allow students the manners/choice to fulfill
 - Students create their own evidence
 - Choices of instruction (novels)
-

APPENDIX E

Instructional Staff Survey-Innovate Phase

2017-2018

Purpose and Procedures: The purpose of this open-ended survey is to provide the action research team with information and feedback regarding the implementation of the PBL initiative from November and December. The information that you provide will be used to determine the next steps needed to move the PBL initiative forward and plan for implementation during the second semester.

Voluntary Participation: Participation in this survey is completely voluntary. By answering the survey questions, you are agreeing to participate in this study.

Risks and Benefits: There are no risks to completing this survey. The benefits of your participation in this survey will provide feedback to enhance the PBL initiative.

Compensation: There is no compensation for completing this survey.

Confidentiality: Your responses to this survey will be kept and remain confidential.

Survey Questions: There are two open-ended survey questions for this study. They are as follows:

1. What was your best experience(s) of implementing PBL during the first semester?

2. What are three realistic and attainable wishes (more or less) that you have for the future of the PBL initiative?

Who to Contact with Questions: If you have any questions about this survey, please contact Dr. Thomas Ward at the College of William & Mary, tjward@wm.edu, 757-221-2358. You will receive a copy of this consent form. I certify that I have read this form and volunteer to participate in this research study.

(Print) Name _____

Signature _____ Date _____

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VITA

Jason Michael Allison

Doctor of Education, Major: Educational Policy, Planning, and Leadership-The College of William and Mary; Williamsburg, VA (2018)

Master of Education, Major: K-12 Principal-California University of PA; California, PA (2008)

Certification, Major: 7-12 Social Studies-Edinboro University of PA; Edinboro PA (2006)

Bachelor of Arts, Major: History-Pennsylvania State University, The Behrend College; Erie, PA (2003)

Certificate, Major: German language-Goethe Institute; Munich, Germany (2003)

Diploma, Major: Academic-Oil City Senior High School; Oil City, PA (1999)