Secondary Charter School Educators' Perceptions of the Impact of Project-Based Learning on Student Achievement, Engagement, and Equity

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Abstract

The purpose of this qualitative study was to explore secondary charter school educators' perceptions of the impact of Project-Based Learning (PBL) on student achievement, engagement, and equity. The framework for this research study was based on Kilpatrick's project method, Dewey's constructivism theory, and Vygotsky's theory of project-based and social learning. The four purposes of this study were to better understand educators' perceptions of the ways that PBL promotes student engagement, improves 21st century skills, encourages student equity, and fosters student achievement. A focus group of five participants ($N = 5$) generated the source of data. A thematic analysis and coding system were performed to analyze and report patterns generated from the data. Eight key themes emerged: encourages student participation, fosters student success, generates higher order thinking skills, develops transferrable skills, promotes academic attainment for all students, prepares students for career and college readiness, aligns with academic standards for effectiveness, supports vital professional development opportunities. The results reinforce the positive impact that PBL has on student achievement, engagement, and equity.

Dedication

First, I give all glory and honor to God for the many blessings bestowed upon me throughout this journey. I dedicate my phenomenal accomplishments to my late parents, Joseph F. Redden and Faith Spears Redden. Their heavenly presence has been my inspiration and motivation to complete my doctoral degree. My father, an educator and administrator, and my mother, who protected her younger siblings through adversities, left a legacy of hard-work and self-determination. I endeavor to continue in their convictions of gaining knowledge and skills to achieve my college and career goals. To the love of my life, thank you so much for your respect, support, and understanding. My accomplishments are the result of the many family members and friends who have supported my efforts to be the best I can be!

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Chapter 1

Introduction

Project-based learning (PBL) is not a new concept; however, PBL has regained new vigor and energy as educators seek instructional methods to provide deeper learning opportunities for students. PBL is a teaching methodology that incorporates student-centered projects into traditional learning environments by improving collaboration skills and by engaging students in the learning process (Berends, Boersma & Weggeman, 2003). Learning by doing has been a decades-long practice in many educational environments. Through the utilization of PBL-related strategies, students drive their own learning through inquiry, as well as work collaboratively to research and create projects that reflect their knowledge and skills (Bell, 2010). PBL in classroom applications replicates the type of learning and decision making which occurs daily in the world of work. PBL is an instructional model that focuses on the involvement of students in the design, problem-solving and other investigative activities (Bell, 2010). Students who participate in PBL-related activities work in teams over extended periods of time to create products and presentations of research (Bell, 2010).

School leaders seek methodologies such as PBL to boost student achievement and engagement. PBL encourages students to demonstrate content mastery by working collaboratively with peers to solve problems through inquiry and research (Bell, 2010). The teacher takes on the role of facilitator and guides students to utilize individual skills within a standard curriculum framework. PBL is not an extra-curricular activity, but is an instructional framework used to deliver curriculum (Bell, 2010). Advocates of PBL

promote its benefits of improved student engagement while providing the 21st Century Skills to ensure success in the world of business.

According to Bell (2010), PBL demonstrates the potential as a method to generate motivation and engagement among students. Bell (2010) noted that PBL should be a component of a comprehensive instructional program. Project selection should be based on a question central to the curriculum topic. Learning objectives and standards should be clearly identified and taught through the implementation of the project. Project planning must include the logistics of the project, materials and technology needed, and any potential roadblocks and options to overcome them. The role of the teacher transitions from the dispenser of information to the facilitator, mentor, and observer of the project. The teacher must anticipate a certain level of chaos and varied levels of participation (Bell, 2010).

Background

The Partnership for 21st Century Skills (P21, 2003) is an educational advocacy organization that developed learning and innovation skills that include critical thinking, problem-solving, communication, collaboration, and creativity, as core skills students need to be successful in today's global work environment. P21 is the leading organization that advocates for college and career readiness for every student (P21, 2003). The P21 organization partners with business, civic, and community groups to promote rigorous academic coursework using innovative approaches. One such approach with the potential to foster creativity in critical-thinking and problem-solving is the application of PBL methodologies and practices. PBL can allow students to collaborate

on authentic projects that have personal meaning and stimulate relevance and engagement.

Efforts have been made to understand how to increase academic student achievement in educational settings; one type of educational alternative institution is the charter school movement. The charter school movement evolved out of the need to serve as an incubator for innovative educational pedagogy, such as PBL, that can be implemented within the public school system (Lattimer & Riordan, 2011). The core values of the charter school system are to promote equity, foster personalization, and conduct inquiry to create authentic work opportunities (Lattimer & Riordan, 2011). PBL can be the vessel through which hands-on and practical skills can be cultivated in students. At many charter schools, students are expected to engage in critical thinking and be active participants in discussions and projects. A PBL charter school focuses on using the best thinking and teaching methodologies to empower students to do their best. Charter schools that incorporate PBL into the curriculum enable students to build collaboration leadership skills (Lattimer & Riordan, 2011).

There are numerous reasons to incorporate PBL into traditional classroom environments. According to Grant (2002), teacher instruction should not occur in isolation; students learn within the context of their surroundings. Learning is primarily a social process which takes place within the context of culture, community, and past experiences. Students use background knowledge to construct new knowledge and to create solutions to problems. In addition, PBL places the focus of students and educators on the learning process rather than the repetition of facts. The results are increased student engagement and higher levels of learning. Grant (2002) cited barriers to

implementing PBL effectively, including the transformational and instructional abilities of the educator, the challenge of students working in groups, and the authentic assessment of students.

Another reason for the support of PBL is the changing environment of the work world. According to Bell (2010), the Industrial Age required the ability to perform repetitive tasks in isolation from other workers. The educational framework at that time reflected the industrial model by the focus of knowledge in separate content areas. Now, education must change to meet the challenges of the 21st century. Advocates of educational reform efforts tout PBL as a model to prepare students for life beyond high school. With PBL, students learn to work collaboratively with peers through inquiry to create projects that are presented to an authentic audience (Bell, 2010). Today's students must acquire both the knowledge and skills to compete in a global workforce. PBL engages the learner in content while providing the necessary tools to thrive in an emerging economy (Dole, Bloom, & Kowalske, 2016).

The benefits of PBL are significant when integrated into the school curriculum. Student engagement is increased as the result of pursuing interests within the context of the project. There are opportunities for students to frame questions, use technology to solve problems, make decisions based on information, and be involved in the evaluation of the project (Bell, 2010). Students can integrate academic skills with career and technical competencies needed to complete a project (Klem & Connell, 2004). The understanding and application of skills is emphasized instead of covering a broad range of subject matter with no focus. Project formulation is based on real-world problems which are relevant and interesting to students. Students develop knowledge and skills in

the context of the work world at a level required by many business organizations. Comprehension skills are enhanced because students are empowered to direct their own learning. PBL develops the collaborative skills necessary for lifelong learning (Klem & Connell, 2004).

PBL is a methodology that incorporates the following components (Thomas, 2000):

- The incorporation of projects that focus on content that is related to the curriculum. These projects become the primary vehicle for content learning and assessment.
- Driving questions are derived from the project and must be related to the content, and foster student engagement through the pursuit of solutions.
- Projects ignite students in ways that require them to solve problems and create products such as presentations, reports, and models.
- Projects are student-centered to the greatest extent possible. Educators serve as facilitators and guides, but it is the students who define, select, and design their projects.
- Projects are developed from real-world problems rather than on academic exercises and pursuits. The projects represent authentic efforts in solving or investigating real-world dilemmas. (pp. 23-25)

Additionally, researchers have focused on identifying the specific instructional skills, expectations, and other attributes that contribute to the success of project-based instruction (Duncan & Tseng, 2010). Essential elements include above average classroom management skills, content knowledge, setting clear learning objectives, the

ability to anticipate difficulties, support students as needed on an individual basis, and establish a high-performing culture to support positive interactions are vitally important. Much of the success of PBL is due in part to the implementation of research-based practices that good educators already possess and can transition with fidelity (Duncan & Tseng, 2010).

According to Pierrakos, Zilberberg, and Anderson (2010), PBL, through a progressive lens, can address historical and systemic barriers affecting underserved students. With a focus on deeper learning and application, PBL can provide for student voice and choice in student learning and an authentic purpose and audience for student work. Pierrakos (2010) stated that the PBL method allows students to have real-life practice when faced with solving projects with little or no structure. Educators who embrace the PBL method can examine the connections between equity and design in their instructional practices and determine the skills needed to support colleagues in shaping a school that is both innovative and equitable. PBL prepares students for the future and changes happening in the business world (Pierrakos et al., 2010).

The project-based methodology offers highly desirable benefits, yet implementation is difficult due to the traditional standards of many American classrooms (Grant, 2002). PBL provides a realistic approach that encourages educators to incorporate successful and proven elements of PBL into classroom practice. The refinement of PBL methodologies to develop the practical and perceived challenges of this teaching method continues with further research studies. PBL requires instructional shifts in educational pedagogy and classroom practices. Professional development

opportunities can assist in the transition from teacher-centered to student-centered learning environments.

Districts are beginning to encourage student-centered models of instruction such as PBL. There are barriers which district and building administrators along with educators can overcome. Research studies have revealed that educators have reservations about implementing PBL due to the changes of instructional strategies, materials and resources needed, and lack of time for preparation for planned instruction (Hertzog, 2007).

Grant and Hill (2006) identified five factors that impact teacher implementation of PBL strategies:

1. Recognition and acceptance of new roles and responsibilities.
2. Comfort level in the learning environment.
3. Tolerance for ambiguity and flexibility in management of the new learning style.
4. Tolerance for ambiguity and flexibility in management of the new learning environment.
5. Confidence in integrating technology. (pp. 3-4)

The conceptual beginnings of the charter school movement in Missouri launched in the 1970s (Wells, 2002). The charter school movement has grown from a localized alternative to public school education into a viable educational reform strategy. Through the years, charter schools have expanded to over 40 states (Quaid, 2009). The K-12 charter school included in this study is located in a large, urban, metropolitan city. The school, of approximately 500 students, is rich in its diversity and delivers instruction and

services to students of different ethnicities and backgrounds (Missouri Department of Elementary and Secondary Education Dashboard, 2020).

Throughout the charter school's 20-year history, the state assessment test scores for reading and math have been above average (see Table 1 below).

Table 1

End of Course Top 2 Assessment Levels 2018-2019

Subject	Semester	Advanced or Proficient	Total	%
English 2	Fall	26	44	59.10
	Spring	1	11	9.10
	Total	27	55	49.10
Algebra 1	Fall	8	24	33.30
	Spring	1	26	3.80
	Total	9	50	18.00

Adapted from *End-of-Course Assessment Results*, 2019, https://dese.mo.gov/school-data

However, test scores stagnated due to a focus on direct instruction and on specific math and reading competencies. Direct instruction often restricts creativity and limits critical-thinking and problem-solving opportunities. In addition, direct instruction limits the engagement and equity opportunities that can enable students to be successful in acquiring academic content (Saavedra & Opfer 2012). As a business educator in an urban public high school transitioning to an urban public charter high school, the researcher realized the prospects to develop high-quality PBL opportunities were ever-present.

Statement of the Problem

The integration of PBL into a traditional classroom instructional framework can be a daunting and difficult task. Due to standardized testing, educators are more focused on district and state curriculum standards than on methods that encourage creative thinking and collaboration (Grant & Hill, 2006). Such a lasered focus on standardized testing has created the conditions that Fullan and Langworthy (2013) noted when students in school will become increasingly bored and the adults increasingly frustrated. Conventional precepts dictate that the mission of an educated citizenry is to prepare students for the adult world by responding to the needs of every student; this mission can be best achieved through the implementation of PBL concepts and strategies (Hawley, Hall, & Pate, 2017). In addition, academic skills and content knowledge show favorable increases through the implementation of the PBL model (Hawley et al., 2017). When educators utilize PBL, students can retain more knowledge of the subject being taught while gaining employability skills that are sought after by businesses and organizations (Hawley et al., 2017).

Implementing PBL can be a complex and difficult task that requires a prominent change in the school's climate and culture (Grant, 2002). Educators have developed effective, student-centered classroom structures that integrate PBL techniques; however, more research is needed to discover effective PBL strategies for implementation across the entire charter school system. This study can provide the student engagement processes to increase the stagnant math and reading standardized test scores.

Because educators have recognized PBL as a promising method for increasing student achievement, engagement, and equity, it is important to identify the benefits and

challenges associated with PBL (Olson, 2008). The focus of this study was to identify educator perceptions to formulate PBL strategies that educators can utilize in their classrooms to promote authentic teacher instruction and student academic success. As an international society, schools must prepare students for the 21st century workplace and equip students to become productive citizens (Kuhlthau et al., 2007).

The emphasis on traditional teaching and learning can often limit a student's natural inclination toward active participation which can stagnate mind development. PBL is an optimal platform for nurturing students' higher level cognitive skills as well as engaging meaningful learning (Kizkapan & Bektas, 2017). Teacher-centered learning hinders the students' mind development which eventually affects their academic performance (Nooriza & Effandi, 2015). On the other hand, PBL can support student-centered learning in terms of cognitive, meta-cognitive, and affective aspects (Wilkin, 2017).

Project-based learning can be described as student-centered instruction that occurs over an extended period of time, during which students develop, plan, investigate, and produce a product, presentation, or performance that answers a real-world question or offers solutions to an authentic problem. Minter (2011) proposed that the learner-centered approach requires the teacher to assume the role of facilitator and the teacher-centered approach requires a traditional instructional style (see Table 2 below).

Table 2

Characteristics of Learner-Centered and Teacher-Centered Instruction

Learner-centered instruction	Teacher-centered instruction
Focus is on both students and teacher	Focus is on teacher
Teacher models: students interact with each other	Teacher talks: students listen
Students determine driving questions	Teacher determines driving questions
Students evaluate own learning along with teacher	Teacher only evaluates student learning
Classroom is noisy and busy	Classroom is basically quiet and controlled

Adapted from "The Learning Theory Jungle", by R. L. Minter, 2011, *Journal of College Teaching and Learning.* https://www.clutejournals.com/index.php/TLC/article/view/4278

Purpose of the Study

The purpose of this qualitative study was to determine teacher perceptions of the impact of PBL on student academic achievement, engagement, and equity within an urban charter school environment. Scarbrough and Swan (2006) stated that one of the chief reasons for organizing and completing projects in a collaborative effort is the need for learning and innovation. This study identified educators' perceptions of the strengths and weaknesses of PBL as a model of student-centered learning. This qualitative study revealed the importance of skills to locate and evaluate information for innovative outcomes (Kuhlthau, Caspari, & Maniotes, 2007).

Significance of the Study

This research study is intended to answer significant questions related to student achievement, engagement, and equity. A unique factor of this research is its approach to the study of how PBL can benefit teacher instruction and student learning. Another aspect of this research determined the design elements of PBL that are influential in

promoting student achievement, engagement, and equity. With a renewed emphasis being placed on getting back to the basics and increasing pressure to streamline instruction and teach to specific standards, there is the idea that most effective instruction for these goals can also include instruction that fosters depth of learning and engages students. Several researchers have indicated that PBL is beneficial, with positive outcomes including increases in the level of student engagement, increased interest in content, and a deeper depth of learning the transfer of skills to new situations (Hmelo-Silver, Duncan, & Chinn, 2007; Thomas, 2000).

As discussed in chapter 2, there is a body of research (Thomas, 2010) that suggests PBL can positively affect student cognitive development through the hands-on application of reading, writing, and mathematical skills. However, little research has been completed on the relationship of PBL to promote engagement and equity in teacher instruction and student learning. This study and others with similar research design are important to the fundamental understanding of how PBL can impact academic achievement, engagement, and equity for all students. This research study was an advocacy type of study that investigated PBL as a means to impact student achievement, engagement, and equity.

In addition, this research study will contribute to the understanding of how to create effective PBL experiences for educators and students. The charter school has been using PBL to some degree for the last 5 years; however, there was a need to improve the efficacy of this program and to increase the implementation of PBL among the teaching staff. By identifying the factors that impact student achievement, engagement, and equity, practitioners can design more impactful experiences for students.

This study is significant to the administration and board members of the charter school who visualize the school-wide implementation of PBL strategies. However, there are numerous student-centered models from which effective implementation can be achieved. Therefore, this study can be the impetus for determining if PBL is the instructional model that will best meet the needs of the student population by offering administrators and board members insight into teacher perceptions of its usefulness in promoting academic achievement, student engagements, and equity.

Delimitations

The timeline for this qualitative research study spanned the period of one month. The participants from the charter high school were selected based on their consent to provide feedback for the research study and the district administrators who were seeking to implement student-centered professional development opportunities. The interview questions focused solely on PBL and its impact on student achievement, engagement, and equity rather than on all pedagogical learning. However, this delimitation enabled participants to discuss experiences relevant to the research questions that led to significant data for analysis.

Assumptions

During the completion of this research study, the following assumptions were made:

1. During the focus group discussion, assumptions of participants answering truthfully were made.
2. During the focus group discussion, the assumptions of the participants were made that when answering questions there would be no fear of retribution.

Research Questions

A qualitative study design was appropriate to address the problem presented and to allow a detailed collection process using open-ended interview questions (Hagan, 2000). A qualitative study is an effective means to describe the features, contextual evidence, and processes of a phenomenon, such as PBL (Yin, 2009). In this research study, the interview questions were derived from the following research questions:

RQ1. What are the perceptions of charter school secondary educators about the effect of PBL on student engagement?

RQ2. What are the perceptions of secondary charter school educators about the effect of PBL on the acquisition of 21st Century Skills?

RQ3. What are the perceptions of secondary charter school educators about the effect of PBL on student equity?

RQ4. What are the perceptions of secondary charter school educators about the effect of PBL on academic achievement?

Definition of Terms

The following list of terms are essential to understanding this research study. The terms are defined by the researcher(s) or as noted in the citations.

Authentic audience. Students who are engaged in project-based learning present their products to groups and the community other than their classmates and teacher (Larmer & Mergendoller, 2010).

Constructivist learning. Rooted in the works of Piaget, Dewey, and Vygotsky is this theory of learning (Dole et al., 2016). Students engage in inquiry-based learning to solve problems to construct meaning in learning.

Equity. At the Buck Institute for Education (BIE, 2016), the vision is that all students--no matter where they live or what their background--will have access to high quality PBL so they deepen their learning and achieve success in college, career, and life.

Facilitator. The teacher acts as a guide to promote student collaboration and learning (Grant & Hill, 2006).

Learner-centered instruction. This is the instructional method that requires the student to be active in the teaching and learning process (Felder & Brent, 2017).

Project-based Learning (PBL). This instructional methodology is guided by protocols when students learn content by engaging in real-world problems and presenting results of student work (Larmer, Mergendoller, & Ross, 2009).

Student achievement. For the purposes of this study, Trowler's (2010) research described the definition of student achievement as scores on classroom assessments as well as state-mandated tests.

Student engagement. For the purposes of this study, Trowler's (2010) research describes the definition of student engagement as the attentiveness and participation given to complete rigorous cognitive tasks.

Teacher-centered instruction. This methodology requires the teacher to be the focus of the learning process (Minter, 2011).

Organization of the Study

Chapter 1 provided an introduction to the qualitative research study, including background information, the statement of the problem, definitions of key terms, and the purpose of the study. Chapter 2 provides a comprehensive review of relevant research and perspectives related to project-based learning. Chapter 3 provides details regarding

the research methodology guiding the research study. Chapter 4 delineates the results of the study and a discussion of the findings related to the existing research. The interview findings from the qualitative items are addressed. Chapter 5 contains a discussion of the implications of the research for policy, practice, and future research.

Chapter 2

Review of the Literature

This chapter provides a comprehensive review of literature that is relevant to this research study based on the impact and importance of a student-centered instructional methodology for secondary charter school students. The initial section provides an overview of historical influences that define the framework for PBL. Research that focuses on the impact of PBL on student achievement, engagement, and equity is explored.

History of PBL

Historically, PBL can be documented in Greek literature. Based on the writings of Aristotle and Socrates related to critical thinking, project-based learning focuses on the concept that education is life itself (Korkmaz & Kalayci, 2019). Socrates imparted knowledge by not only lecture but also through active personal inquiry. The Greek philosopher, Aristotle, advocated for a hands-on approach. When the project-based learning method was initiated in 1912 by the J. J. Rousseau Institute in Geneva, the method was based on the progressivism teaching philosophy (Korkmaz & Kalayci, 2019). Progressivists believe that students can best learn through learning experiences that take individual differences into account (Wrigley, 1998). The PBL methodology integrates an educational approach, whereby students develop practical solutions to solve real-world problems.

PBL is utilized to establish links between education and the job market and is considered to be an effective way to develop professional competencies (Thomas, 2000).

PBL gained its popularity in engineering, science, and technology careers and momentum has developed within elementary and secondary classrooms (Knoll, 1997).

Based on historical research, PBL originated in Europe and travelled to the United States (Knoll, 1997). While the project-based method was refined in the United States, the method transitioned again to Europe (see Table 3 below). When John Dewey was invited to Turkey in 1924, he witnessed project-based learning in action (Knoll, 1997). The Village Institutes of Turkey helped to establish Dewey's educational philosophy of expanding learning from theoretical courses to practices solving real-life problems. By 1965, project-based learning entered an international expansion process (Knoll, 1997).

Table 3

Chronological Development of PBL

	Phase				
	1st	2nd	3rd	4th	5th
Years	1590-1765	1765-1880	1880-1915	1915-1965	1965-Present
Development	Start of project studies in architecture schools in Europe.	PBL as a teaching strategy in the United States.	General public education and vocational education integrate PBL.	Redefinition of PBL method and its transition from US to Europe.	Rediscovery of PBL and international expansion.

Note. Adapted from *The project method: Its vocational education origin and international development*, by M. Knoll, 1997.

The Project Method, William Heard Kilpatrick, 1918

While mostly associated with adult education, PBL for school-age students is nothing new. PBL can be described as student-centered instruction that occurs over an extended time period. According to an historical survey of project learning of an early 20th century description offered by William H. Kilpatrick (1918) referred to the Project Method as a hearty, purposeful act, generally a project or pursuit undertaken by the student has four distinct phases: purposing, planning, executing, and judging. Early career experiences inspired Kilpatrick's perspective on the potential of student-centered projects in the classroom. For Kilpatrick, projects connected student learning to interactions with social and physical environment that encouraged student engagement (Beyer, 1997). By integrating activities of school and community with a goal of developing socially competent citizens, students are equipped to become contributing members of a democratic society (Pecore, 2009). These ideas, often combined with the model for scientific inquiry, have contributed to a variety of student-centered methods such as problem-based, case-based, and experiential learning (Knoll, 1997; Prince & Felder, 2007; Thomas, 2000).

The Project Method links purpose with democracy. Kilpatrick sought to clarify and defend the use of projects in education (Kilpatrick, 1918). Kilpatrick's Project Method was influenced by John Dewey's writings. Kilpatrick advocated for student-initiated projects that utilize the laws of learning to intrinsically motivate the student to emerge with a high degree of skills and knowledge, view the school activity with confidence, and appreciate the value of school (Kilpatrick, 1918). The Project Method's greatest strength was the potential for building moral character, with students acting in

pursuit of a rich variety of purposes, under the supervision of a skilled teacher to help guide students to make critical decisions (Kilpatrick, 1918).

Critics of Kilpatrick's Project Method pointed out that his definition of the project was ambiguous and not a method (Knoll, 2010). Kilpatrick broke from tradition by redefining the project as an independent constructive activity to a whole-hearted purposeful activity (Knoll, 2010). Kilpatrick's friend and colleague, John Dewey remarked that allowing the student to decide the learning process was impossible (Knoll, 2010). For Dewey, the notion was conflicting due to failing to realize that thinking was achieved through the leadership of the teacher to promote the student's ability to think and not through providing the student with the freedom to self-direct (Knoll, 2010). Dewey, unlike Kilpatrick, did not view the teacher-led project as a means of suppression, (Knoll, 2010).

In the past few years, attention has focused on the advantages and disadvantages of the PBL instructional methodology. Students have the opportunity to become active participants in the learning process by immersing themselves into complex and multi-faceted real-life problems. In addition, students become problem solvers, decision makers, and investigators (Wurdinger & Rudolph, 2009).

There are disadvantages associated with the implementation of PBL as identified by Ellis and Hafner (2008). They reported that the planning, development, and execution of PBL instruction as difficult, time consuming, and challenging to evaluate the outcomes. However, for every instructional strategy, there are advantages and disadvantages. The challenges must be weighed against the benefits as a potential for success.

PBL has a strong foundation in constructivism which is the way learners gain new knowledge. In the constructivist's mindset, the actively engaged learning is more successful (Neo & Neo, 2010). The PBL methods of teaching and learning are based on the cognitive reasonings of theorists such as Dewey, Piaget, Papert, and Vygotsky (Jenson, 2008; Kearsley, 2010). These theorists acknowledged that students construct their own understanding of practices and situations based on their unique experiences (Turner, 2009). Instructional objectives should be written in experiential terms, which include identifying the types of learner problems addressed, the range of control learners would exercise in the educational setting, and how selected activities would shape the learners into well-rounded leaders (Andrade, 2009).

The American educator and philosopher, John Dewey (1938), promoted the constructivist approach to learning. The history of the emergence of the PBL approach connects to the works of Dewey who was curious about the influence of the experiences on the process of gaining knowledge (Pecore, 2015). Dewey theorized that students learn through being involved in real-world situations that allow them to gain experiences that are useful for the implementation in future circumstances (Roberts, 2003). Dewey (1938) concluded that the culture of a classroom is determined by the teacher creating democratic experiences upon which the student draws a higher quality experience. The theory of constructivism states that knowledge is actively constructed by the cognitive subject, and construction is realized through the interaction of new and old experiences. The teacher role should be that of a facilitator of student growth and be the lead in project development. Constructivism suggests that learning is an active and constructive process within a social framework (Crotty, 1998). Constructivism is the philosophical view that

knowledge is individually constructed, transmitted by interaction with the environment, and socially developed (Crotty, 1998).

Dewey and Experiential Learning

Dewey (1938) supported experiential learning and was a proponent of project-type learning (Peterson, 2008). Dewey emphasized that students should have authentic learning experiences. He believed that learners should emerge from active learning with new knowledge and skills that were more important and meaningful. In addition, he stated that learning experience should occur in social classroom settings where students would be involved in handling and manipulating materials. The potential result of this type of learning environment would be the accomplishment of common outcomes (Miller, 2010).

Individually constructing knowledge involves cognitive conflict as a stimulus or learning target. Learners bring personal experiences with them into the classroom, which have a tremendous impact on their world view. Therefore, constructivists reason that learning begins with the prior knowledge, feelings, and skills students bring with them into the academic environment (Schulte, 1998). The learner is a knowledge constructor instead of a passive information receiver. The constructivism learning theory implies some key learning components for PBL.

Constructivist principles require learners in PBL contexts to function as self-motivated and self-directed individuals in their own learning experiences (Tam, 2000). Educators assist learners by assessing how students are constructing knowledge and by providing guidance through cognitive experiences (Schulte, 1998). When the teacher

serves as the facilitator of learning, challenges arise that the student can transform into meaningful methods of learning to foster desired results (Grant, 2005).

The Project Method was reflective of Dewey's position of blending the student with society. While the project concept emerged with Dewey, PBL was addressed as a viable teaching method by Kilpatrick (1918). However, Kilpatrick arguably succeeded where Dewey fell short of his aspiration. Rather than using abstract terminology, Kilpatrick used concrete and exact terms such as "worthy-living, "purposeful acts, and "laws of learning" to identify the methodology (Schulte, 1998, 25-27).

Piaget and Constructivism

Piaget (1952) based his concept of constructivism on the psychological development of the child. Piaget believed that the teacher should provide a learning setting where students could experience spontaneous research where authentic opportunities challenged the students (Atherton, 2009; Gardner, 2008). Piaget noted that there should be a degree of freedom so that the students are able to develop, understand, and construct meaning through personal experiences in the classroom. He also noted that learning should take place within the boundaries of a collaborative group with peer interaction (Resta & Laferrière, 2007).

During the 1970s, project management emerged in various teaching programs. In the early years, the broad definition and implementation of PBL presented some issues (Thomas, 2000). In the United States, project management became accepted as one of the best teaching methods connected to career and technical education (Knoll, 1997). Through the application of the PBL methodology, students can become independent, motivated learners, who are able to apply their skills to real-world problems (Knoll,

1997). Based on a summary of PBL research, there are findings of positive student learning outcomes in the areas of content knowledge, engagement and motivation, and critical-thinking and problem-solving skills (Thomas, 1998). The student benefits of PBL include improved attendance, advanced self-reliance, enhanced attitudes toward learning, and opportunities for engaging culturally diverse learners (Thomas, 1998).

Papert and Constructionism

Papert (1991) established a theory of learning and education known as constructionism. He acknowledged that constructionism was based on two different mindsets of construction. First, the traditional constructivist related to people that learn by actively constructing new knowledge and skills instead of by rote memorization. Secondly, constructionism pertained to student learning that was more effective if they were engaged in active learning which brings forth an outcome or artifact (Hmelo-Silver et. al., 2007).

Vygotsky and the Social Context of Learning

Vygotsky, a prominent theorist, shared many of the same beliefs with Piaget; however, he placed more emphasis on the social context of learning. Since PBL is a type of experiential learning method, students construct meaning from personal beliefs, values, and experiences (Hertzog, 2007; Prince & Felder, 2007). According to Vygotsky's (1978) theories, important roles were played by both the teacher and the student. The teacher/facilitator role was defined as one that assisted students in the recognition of isolating or separating systematic concepts. Coffey (2008) contended that through organized instruction, the student would experience development processes that would be developed and mastered.

With Vygotsky's (1978) constructivist theory, also known as social constructivism, the teacher is a more active participant in the instructional process. Social constructivism places an emphasis on the importance of culture and the social framework for the student to develop cognitive skills (Freshwater, 2009; Prince & Felder, 2007). Vygotsky theorized that students should not be forced outside of their proximal development, but to be encouraged to become independent learners (Freshwater, 2009; Prince & Felder, 2007).

Implementation of the PBL Approach

PBL is a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks (Markham, Larmer, & Ravitz, 2003). Students devise strategies to collect and analyze data, integrate content knowledge, and create products and models of their own understanding (Papanikolaou & Boubouka, 2010). Although the PBL method is student-centered, the teacher should take the responsibility of facilitating and supervising the process (Pecore & Bohan, 2013).

Implementation of PBL can be challenging for educators who make a dramatic change from traditional instructional strategies (Pecore & Bohan, 2013). Effective facilitation of and prior teaching experiences with PBL are important factors as authoritative classroom management, establishment of an inquiry classroom culture, and philosophical beliefs about teaching and learning that may contribute to the effectiveness of PBL (Pecore & Bohan, 2013). Variations in the PBL process can be attributed to applications in different content areas, facilitation and guidance of students, and the understanding of the project-based learning approach. Well-established practices and

entrenched beliefs can lead to struggles for educators, causing challenges when negotiating the tensions between students exploring their interest and covering state standards, respecting student responses, and providing accepted answers, and empowering student self-directed learning (Ladewski, Krajcik, & Harvey, 1994, pp. 498-515).

The major components that drive the implementation of PBL instruction include:

1. A real-world, interdisciplinary, embedded driving question.
2. Student-driven inquiry and extensive investigation.
3. Cooperative learning and meaningful collaboration between the teacher and students.
4. Use of resources and technology to aid in the illustration of student ideas.
5. Creation of a product, solution, or artifact that represents the students' learned knowledge (Robinson, 2006).

Utilization of the PBL framework allows for mastery concepts using student application and scaffolding of knowledge while being provided with meaningful feedback from both the teacher and peers (Robinson, 2006). During the learning process, evaluation is continuous, and students reflect on the decisions being made toward the end of a final product or artifact. PBL allows students to become active learners who possess ownership of their learning (Robinson, 2006).

Based on his research about project-based learning, Thomas (2000) identified distinctive features of the methodology:

- The use of projects that focus on content that is central to the curriculum. These projects become the primary vehicle for content learning, and often, assessment.

- Projects are based on questions of importance or driving questions (Blumenfeld et al., 1991). Driving questions must be related to the content and designed to foster student engagement and an active intellectual pursuit of solutions.
- Projects are student-centered to the greatest extent possible. Educators serve as facilitators; students define and carry out their projects.
- The projects represent authentic efforts in solving or investigating real-world dilemmas. (Thomas, 2000, p. 27)

Table 4

Project-based learning implementation stages

Stages	Process	Design standards	Teaching methodology
1: Starting with question or topic	The process is initiated with a question or problem that prompts student interest or is related to real-life.	Challenging problem or question, authentic learning	Design and plan, align to standards, scaffold student learning, engage and coach
2: Plan and program	Work plan and schedule are made for the project. Standards that should be checked are addressed.	Student voice and choice	Build the culture, manage activities, engage and coach
3: Research	Students conduct research about problem or topic. Through discussion, students can restructure the project as necessary.	Sustained inquiry, critique, and revision	Build the culture, manage activities, engage and coach
4: Creating the assessment criteria	Assessment criteria are determined by the teacher and the students.	Student voice and choice	Design and plan, align to standards, scaffold, engage and coach, assess student learning
5: Outcome	Problems and opportunities emerging from this stage serve as suggestions during the evaluation stage.	Sustained inquiry, critique, and revision	Manage activities, engage and coach
6: Preparing for presentation	Students prepare reports for the project to be presented to a group or the community.	Student voice and choice, public product	Design and plan, align to standards, manage activities, engage and coach
7: Evaluation and feedback	Process is evaluated based on criteria determined by the teacher and students.	Reflection, critique, and revision	Assess student learning, engage and coach

Adapted from Project-Based Learning by the *Buck Institute for Education*, 2015.

https://devonshire.ccsd59.org/wp-content/uploads/sites/7/2016/03/8_Essential-Elements-of-PBL.pdf

Setting the Stage for PBL

As with many instructional methodologies, PBL has a number of distinguishing characteristics. ChanLin (2008) stated the importance of practical experience in learning as the major indicator in the PBL learning environment. When setting the stage for PBL in the classroom, students have an opportunity to bring real-world practices and issues to life in the contextual framework of student learning. David (2008) suggested that PBL was an ideal learning opportunity where the primary goal was to introduce real-world problems that would capture students' interests and generate higher-order thinking as they searched for and applied new knowledge in a problem-solving context. Kraft (2005) acknowledged that an effective PBL environment should allow for practical learning activities conducted in a risk-free environment that would encourage higher-order thinking skills. This hands-on approach to learning would provide for a more in-depth understanding of the concepts while utilizing various modes of communication and giving students ownership of the resulted learning (Evertson, 2006; Kraft, 2005).

The success of a PBL classroom can be achieved when students are participating in an atmosphere where there is a feeling of mutual respect and safety in taking risks (Keith, Pritchard, & Roesch, 2006). When PBL is incorporated into the learning setting, students are transported into real-world scenarios; they have a connection to the real-world. The use of real-world situations provides validity to student projects. Studies have found that students score higher on standardized tests when they have been given the opportunity to apply their knowledge to authentic problems (Madaus, Russell, & Higgins, 2009). Researchers have noted the significance of looking beyond standardized testing as the sole measure of student learning and balancing traditional tests with

assessments that would measure a range of students' skills (Dede, 2009; D'Orio, 2009; McGrath, 2005)

Effectiveness of PBL

A large volume of research on PBL spans from early childhood to graduate and adult education. PBL offers students an interactive learning environment that focused on learning activities that are mid to long-term, interdisciplinary, student-centered, and integrated with real-world issues (Hossain, 2007). Numerous studies investigated the effectiveness of PBL and the benefits which can be gained with the help of this approach; however, not many studies revealed the actual difficulties that many students and educators experienced with the implementation of PBL (Tally, 2015). The difficulties in implementing PBL were related to distinguishing project-based learning from problem-based learning, thus leading to the use of these approaches interchangeably and incorrectly (Tally, 2015). Most research studies focused on the effectiveness of project-based learning compared to traditional teaching methods. In addition, several research studies have reported the effects of PBL on academic achievements and attitude changes (Mapes, 2009). Planning and designing the project under key essential features may facilitate the achievement of the target goals in learning and developing 21st Century Skills along with various abilities including critical thinking skills (Smakova, 2020). According to research conducted by Ayaz and Söylemez (2014), the project-based learning method was more effective at the high school level and had the least effect at the university level based on academic achievement. As related to various science disciplines, project-based learning was more effective in biology than in chemistry courses. In the social sciences, project-based learning was proven more effective in

mathematics and foreign languages courses. When analyzing project-based learning on the level of student engagement, the method has a positive effect on academic success and student attitude (Chen & Yang, 2019).

The expectations of today's educational systems are to create a citizenry that possesses creativity, critical-thinking, and problem-solving skills. PBL builds communication, cooperation, literacy, and technology skills, also known as 21st Century Skills (Partnership for 21st Century Learning, 2003). Students develop skills for generating new ideas, cooperative social skills, and an increase in their self-awareness. The project-based learning approach can improve interpersonal skills, project management, and teamwork skills. Analysis of project-based learning by Bell (2010) explained the importance of learning self-confidence, organizational and planning skills, and connecting to real-life through the utilization of project-based learning. PBL professional learning experiences can provide the opportunities to gain these skills for both educators and students.

Concerns Associated with PBL

However, there are negative issues associated with the effectiveness of this instructional methodology as identified by Ellis and Hafner (2008). Ellis and Hafner (2008) reported that the planning, development, and execution of this type of instruction as difficult and time consuming. The researchers also noted other negative issues associated with PBL included class misalignment, personality conflicts, and unpredictable process and results (Ellis & Hafner, 2008).

Mayer (2004) challenged the practicality of student-centered teaching. His research concluded that such teaching methods are in direct conflict with cognition

research that demonstrates not only that learners in the beginning stages of knowledge acquisition do not attend to critical problem features or employ effective problem-solving strategies, and they should not necessarily be encouraged to do so. Kirschner and Clark (2006) asserted that according to the ideals of constructivist, PBL may miss the mark by leaving too much discretion to novice learners. Leaving students to self-direct can result in sustained misconceptions and multiple "restarts" that often result in frustration for students and educators. In addition, adherence to a highly student-centered approach that does not promote strategic teacher intervention and guidance may prove inefficient and/or ineffective (Bransford, 2000; Kirschner & Clark, 2006). Blumenfeld et al. (1991) described numerous classrooms where PBL activities were being conducted, but where project results did not live up to expectations because the students lost focus or channeled their inquiry efforts in unproductive directions. The conclusion was that teacher involvement and guidance is needed for optimal learning.

However, PBL is often confused with other hands-on methods such as problem-based learning. Since a problem is a primary component of PBL, it is important to distinguish between the two concepts (Larmer, 2014). Mettas and Constantiou (2008) compared project-learning to problem-learning and concluded that both strategies allowed students to learn through authentic and real-world scenarios. Larmer (2014) stated that PBL and problem-based learning have few conceptual differences and problem-based learning can be considered a subset of project-based learning.

The beginning of the 21st century has produced much research in support of PBL (Beineke, 1998). Proponents of PBL emphasize student gains such as improved thinking skills, enhanced cognitive abilities, and increased interest and engagement with the

content. Also, students can become more independent learners and acquire life-long learning skills (Smith, 1995). Researchers attribute the increased success of students participating in PBL to a constructivist framework of effectively activating prior knowledge, promoting meta-cognition through increased information processing, greater understanding and recall, and situating learning in a real-world context (Sonmez & Lee, 2003).

The degree to which educators implement the essential features of PBL with fidelity often determines its success. Strategies for tackling the challenges of PBL can include positive student-teacher relationships, facilitation through carefully monitoring, skillfully guiding student progress, collaboration by providing structure and accountability, and reflection through discussions that foster thinking about knowledge and skill acquisition (Pecore & Bohan, 2013). The PBL approach can result in student development in terms of citizenship, critical-thinking, intelligent actions, and adaptability to new social conditions (Beineke, 1998).

Academic Achievement of PBL Students

Research studies have shown that students learning through PBL had core content assessment scores that were higher than students who were instructed by traditional methods (Barshay, 2018). When incorporating PBL into the curriculum, it is important to consider the significant role that students play in each PBL phase of planning, implementation, and assessment (Andrade, 2009). In each phase, the teacher should maximize the students' participation and involvement in order to develop their motivation and curiosity for learning. When PBL is effectively utilized, research has shown that student engagement increases (Butler & Lumpe, 2008). With PBL, students

work together collaboratively to investigate real-world problems and issues and create solutions based on the current available resources. However, when students are forced to choose projects in which they have little or no interest, their engagement is lessened. Using PBL strategies in the classroom, students have the opportunities to:

- Work together in small teams,
- Work with and discover various learning styles and differences,
- Have opportunities for interdisciplinary learning,
- Obtain deeper knowledge of subject matter,
- Gain critical-thinking and problem-solving skills, and
- Manage and solve real-world issues and problems (Hossain, 2007)

Student Engagement

The results of a survey conducted by California Exit Exam noted that the greatest limitation on teacher effectiveness was the lack of student engagement (Human Resources Research Organization, 2004). Student engagement is a driving force that enables students to take action and pursue goals (Sasson, Yehuda, & Malkinson, 2018). Students who are engaged in their schoolwork display actions that provide a sense of inner satisfaction. PBL is active and engaged learning that can produce motivated students (Zastavker, Ong, & Page, 2006). As students participate in PBL activities, they gain a deeper understanding of the subjects they are learning. Researchers have indicated that when students are engaged in learning, they retain knowledge more readily than through traditional classroom instruction (Lombardi, 2007; Lujan & DiCarlo, 2006; Prince, 2004). Therefore, educators should institute techniques and teaching strategies that engage students and encourage them to take ownership in their learning goals.

As an outcome of PBL, students acquire self-confidence and self-direction as they participate in collaborative activities. The PBL approach provides a framework from which student engagement can exist. Students identify a problem or question to analyze and generate a hypothesis. Then, students work toward solutions through inquiry and research. As a result of the PBL process, students discuss the problem or question and summarize their findings (ChanLin, 2008). Barron and Darling-Hammond (2008) concluded that the practice of PBL instructional methods showed a greater impact on student performance.

Student Equity and PBL

The concept of equity is ensuring that every student gets what they need in order to succeed in school (McKay, 2018). A foundational belief of PBL is that all students, no matter the background, should have access to high-quality PBL to experience deeper learning and achieve success in career, college, and life (Lenz, 2016). Well-designed PBL projects that draw upon local community challenges to be solved allow students to see themselves as agents of change (Lenz, 2016). The PBL approach can be used as a tool to address educational inequities for students furthest from opportunities (Lenz, 2016).

The use of scaffolding strategies in PBL can assist students who may struggle with building skills based on prior knowledge. Scaffolding strategies enable the teacher to breakdown a project-based activity into smaller parts so that students can gain a better understanding of the concept (Clark & Graves, 2005). Scaffolding strategies are valuable for the PBL student to accomplish successful project completion.

PBL in the Era of Distance Learning

In recent years, and especially during the unprecedented Covid-19 pandemic, distance learning has become vital to providing education to most student populations. The nationwide shutdown resulted in many educators transitioning from traditional teaching and learning to PBL to encourage student creativity and engagement (Modan, 2020). Distance learning has many different characteristics that distinguish it from other types of learning. Research conducted by Keegan (1986) indicated the six leading traits of distance learning:

1. The physical separation of teacher and student. For example, remote learning versus face-to-face instruction.
2. The direction of an educational leadership team in the planning, preparation, and implementation of curriculum and instruction including the distribution of technology.
3. The use of instructional technology through different modes of electronic media.
4. Delivery modes of two-way communication through prearranged web conferences.
5. Students working independently with the assistance of prerecorded sessions, receiving assignments via email, and viewing lectures through cable or satellite.
6. Educators involved in the delivery of course content with pre-defined objectives and outcomes. (p. 132)

Distance learning requires a certain amount of self-efficacy and self-motivation on behalf of the student in order to achieve academic success. Academic self-efficacy refers to a student's ability to perform a specific task at a designated level to attain a

certain goal (Bandura, 1997). For instance, a high academic self-efficacy can provide students with additional opportunities for career choices while academic preparation offers different career opportunities because of a student's future endeavors (Bandura, 1997). Students who are self-regulated learners are confident in their abilities and are more internally motivated (Zimmerman, Bandura, & Martinez-Pons, 1992).

As a result of the Covid-19 pandemic, instructors are transitioning to distance learning environments. Motivating students while online can be difficult given content technology and internet challenges, isolation, and poor communication with instructors (Neto, 2015). Therefore, interesting, and multi-faceted projects should be developed to give personal meaning and relevance to students.

According to Watson (2008), as digital opportunities grow, so will the educational challenges facing schools in our country and around the world. Personalized learning options, which include PBL, are in significant demand as well as the demand for improved student learning and data-driven decision making. By using digital learning as a delivery method for communication, collaboration, and content development, schools are less dependent on printed materials and traditional school schedules. In addition, schools are more reliant on emerging technologies that will refine teaching and learning (Watson, 2008). As many students return to school for face-to-face instruction, many educators express their interest to continue the implementation of PBL projects (Modan, 2020).

Summary

PBL is a methodology that is designed to align to specific standards with the goal to develop and strengthen cognitive, affective, and social skills. PBL is a student-

centered instructional strategy; however, PBL requires strong teacher presence and facilitation. PBL provides the opportunity for students to learn skills and knowledge that can be applied and utilized in real-world settings and gain 21st century skills for the future.

Although Kilpatrick's Project Method and its contemporary, PBL, often operate under broad interpretations, key features aligned to a constructivist framework are necessary components of a PBL pedagogy (Knoll, 2012). A broader interpretation had led to the creation of similar learning approaches (i.e., Inquiry-Based Learning, Problem-Based Learning), which adhere to the features of the constructivist PBL model but provide more specific learning features. One of the issues of a broad interpretation is the challenge to which PBL is implemented with fidelity. Currently, PBL continues to operate in mostly teacher-led, student-driven learning environments when fidelity can be inconsistent to the intended outcomes.

Thomas (2000) reported that a project should possess five criteria to be deemed project-based learning: Authenticity, Driving Question, Constructive Investigations, Autonomy, and Realism. PBL requires sound planning to be implemented with fidelity. PBL provides effective learning practices such as collaboration among students where they are given the opportunity to accept a challenge, solve a problem, pose a solution, and demonstrate the knowledge standards.

Chapter 3

Methodology

In this chapter, research and focus group questions, and data analysis are described for this qualitative research study. Also, the details about the data collection techniques, and sampling procedures are discussed in this chapter. The methods used to answer the research questions stated in Chapter 1 are described including the nuances associated with a qualitative study approach that targets the relationship between PBL and the teacher perceptions of student achievement, engagement, and equity.

This dissertation study is broadly defined as a qualitative study that investigated perceptions on the impact of implementing PBL in classroom instruction at a charter high school located in an urban area of a midwestern city. This chapter presents the structure and organization of the research that was undertaken to investigate these perceptions. The methods and procedures by which the information was obtained, analyzed, and summarized are also presented in this chapter. Hagan (2000) noted that qualitative research conceptions are stimulating ideas that augment understanding where information from the research is gathered, analyzed, and interpreted to present the findings in a manner based upon the researcher's experiences within the study. The goal when conducting a qualitative study is to amplify and generalize theories, not to count frequencies (Yin, 2003). Qualitative research is most productive when epistemological assumptions are gained from the information and gathered within the construct of the participants' natural setting (Thomas, 2003). Extrapolating the participants' perceptions, the researcher collected information relative to the impact of PBL on student achievement, engagement, and equity in the classroom.

Research Design

Qualitative methodology was used for this research study. A qualitative methodology is a research approach which researchers utilize to plan their studies and investigate their facts. A qualitative approach determines to understand a social situation, event, or interaction (Maxwell, 2004). Since this research study was designed to understand the phenomenon of how secondary charter school educators perceive the impact of PBL on student achievement, engagement, and equity, the qualitative method was deemed as appropriate.

Utilizing a qualitative methodology for this research study was the best approach for answering the research questions and addressing the problem statement. Qualitative research assists researchers in accessing the views and feelings of participants, fostering an understanding of meaning that people attribute to their experiences (Merriam & Tisdell, 2016). Qualitative research required consideration by the researcher throughout the process to provide background information and knowledge for readers of the study. According to Hartwell (2011), qualitative research is used for exploring experiences and perspectives of participants.

In contrast to quantitative research, which dissects a phenomenon to examine its parts, qualitative research can reveal how all parts work together to form a whole. Issacs (2014) stated that the findings of quantitative studies focus on numerical data while qualitative studies emphasize narrative results. Therefore, a quantitative study was not appropriate for this research.

Setting

In the context of the larger philosophical issues regarding teacher instruction and student learning, the charter school setting provides an incubator for innovative opportunities to promote student achievement, engagement, and equity (Quaid, 2009). The charter school movement has a strong foundational structure, culture, and a pedagogy that emphasizes high expectations, parent involvement, and student abilities that reflect student interests (Quaid, 2009). During the 2018-19 school year, the school leadership team developed a renewed interest in PBL to differentiate instruction for students at all levels of learning and to increase academic success of all students enrolled in the school.

Sampling Procedures

The purpose of the study was to analyze and evaluate focus group questions to gather data on participants' perceptions about PBL. As stated by Bell (2010), the interview questions were written using the essential principles of PBL found in the review of literature. The research questions were developed using the review of research related to PBL.

The source of data was in the form of a focus group. The focus group provided participants the opportunity to allow multiple perspectives and maintain consistency when responding to interview questions. The results of the focus group interviews improved the understanding of the experiences of educators in a secondary charter school.

Instrument

A focus group was conducted to gain an in-depth understanding of the impact of PBL on student achievement, engagement, equity. The research questions were addressed through data collection appropriate for a qualitative study. The researcher used open-ended questions to allow participants to provide detailed responses thoroughly in a descriptive manner. The participants' answers provided explicit details and established trustworthiness of the study. The researcher sought to answer the following research and focus group questions through a focus group discussion via Zoom:

RQ1. What are the perceptions of secondary charter school educators about the effect of PBL on student engagement?

Focus Group Question 1: Describe your students' level of engagement before PBL was implemented. Describe your students' level of engagement after PBL was implemented. What is the evidence of the level of engagement?

RQ2. What are the perceptions of secondary charter school educators about the effect of PBL on the acquisition of 21st Century Skills?

Focus Group Question 2: Describe the impact that PBL can have on students' acquisition of 21st Century Skills (i.e., critical-thinking, problem-solving and collaboration). What is the evidence of the acquisition of 21st Century Skills?

RQ3. What are the perceptions of secondary charter school educators about the effect of PBL on student equity?

Focus Group Question 3: Describe the effect of a PBL learning environment on the equitable treatment of students. What is the evidence of the equitable treatment of students?

RQ4. What are the perceptions of secondary charter school educators about the effect of PBL on academic achievement?

Focus Group Question 4: Describe your observations of any differences in student academic achievement on tests while implementing PBL? What is the evidence of student academic achievement?

The intent of this research study was to select a sample of five to seven educators from a charter high school who were under no commitment to share information and volunteered to participate in the study. According to Yin (2014), this small sample size was sufficient for the study based upon the purposeful sampling concept. This approach provided opportunities for faculty and staff from a variety of educational assignments to participate and ensure a broad view of the impact of PBL.

In this qualitative study, the research questions guided the study leading to the collection of data, analysis, interpretation, and concluding the research with the findings. The focus group questions invited participants to describe the perceived impact of PBL on teacher instruction and student learning. A focus group script was developed to gain participant perceptions of the effectiveness and the application of the PBL model and the perceived outcomes of its utilization as it relates to promoting student engagement, equity, and academic skill acquisition.

Data Collection Procedures

A letter of cooperation (see Appendix A) was signed and approved for the purpose of staff to participate in the study. An invitation to participate (see Appendix B) was provided to the school to invite the school to be part of the study. At the beginning of the study, participants were given an overview of the focus group discussion and a

consent form (see Appendix C). The consent form, the purpose of the research, the data collection process, and the fact that participation can benefit the body of research pertaining to PBL were shared with participants. As a result of the approval from the Baker University IRB Committee and the Charter School Advisory Board, the focus group research instrument was used to collect data. As of March 2022, secondary educators were invited to participate in the research study. Consent to participate in the research study was confirmed by an electronic agreement with each participant.

Data Analysis and Synthesis

Qualitative analytic practices were used to interpret data collected through the focus group questions. In order to analyze and synthesize the data collected for this study, the following phases of organization and analysis were performed: preparing the focus group data, coding the data, identifying patterns and themes, drawing analytic conclusions, and verifying findings. The focus group discussion was stored in a computer-aided transcription software, Trint, that transcribed all the inputted information. Transcripts were distributed to focus group members to verify the accuracy of the data. The focus group transcript was analyzed and coded in the Dedoose software program.

To examine the research questions, data relating to this hypothesis were carefully read, categorized, and analyzed based on participants' responses. The participants' responses were then divided into smaller segments, including paragraphs, sentences, and words related to the research questions. Categories were refined a number of times to ensure the validity of the data. Major findings were described from the research data.

The data collected from the focus group was documented from the original participant responses. The participant responses were read thoroughly, and short notes

were composed that recorded initial impressions of focus group responses. Content analysis techniques were used to code the data and to display the results. Demographic and descriptive codes were utilized to denote the type of respondent and conceptual codes that organized the content into identifiable categories (Miles & Huberman, 1994). The coding allowed for the identification of issues, patterns, and themes within the research data. These findings were described in a narrative form and results were graphically displayed for presentation purposes. The approach to drawing analytic conclusions from the data was to compare perceptions across demographic data. These comparisons allowed for distinct contrasts between theory and practice; these conclusions were expressed as propositions for future research. The research findings were verified by presenting drafts for comments to key administrative and faculty members. The research findings and implications were presented to the faculty and staff during a professional development workshop.

For this study, the focus group discussion consisted of open-ended questions. The data analysis required full consideration of the participants' experiences and reflections. The results of the focus group discussion improved the understanding of secondary educators' perceptions of PBL on student achievement, engagement, equity. The focus group transcript was stored in a qualitative data analysis software program that organized all of the inputted information.

Since participants responded to interview questions in their own idioms and language, Dedoose was used to assist in the translation of various jargon. A goal of using qualitative software is to establish the relationship between the source and the target texts

so that the responses reveal the same message within the number of constraints. These constraints can include context, idioms, and writing conventions.

Reliability and Trustworthiness

Guidelines and protocols were implemented to ensure ethical protection of the participants. The procedures involved in conducting the research were clearly defined before requesting participation in the research study. Participants were assured that identifying information would not be made available and that confidentiality would be enforced throughout the study. The researcher was sensitive to the protection of the information from unauthorized observation and the notification of any unforeseen findings. Creswell (2013) suggested that validation strategies and use of multiple and different methods will provide corroborating evidence.

The focus group responses from consenting participants were submitted to the researcher through online focus group responses. When the focus group discussion was completed, data were collected and saved in a secured computer file. Once the analysis of the data was concluded, all data were saved on a secured drive and will remain secured for period of five years. At the end of five years, all research data will be deleted and permanently removed from the secured drive.

Researcher's Role

The researcher's educational career began in 1989 as a business educator in an urban public high school. Thirty-two years later, the passion for business education has never waned. The researcher's past educational endeavors include serving as a teacher leader, professional development coordinator, and curriculum specialist. Throughout the researcher's educational career, the goal has been to enable students to achieve their very

best. The researcher's professional and research interests are focused on student engagement and achievement as a result of student-centered learning. As a contrast to quantitative research where the researcher is an objective observer, this qualitative study has allowed the researcher to be immersed in the study.

While conducting this study, the researcher served as a research instrument who collected and analyzed the data. Rubin and Rubin (2005) argued that qualitative research is not simply learning about a topic, but also learning what is important to those being studied. The objective of qualitative research was to capture and present the participants' perceptions related to PBL and offer the findings upon finalization of the study.

Limitations

Any biases that may exist during this research study have been limited by the protocols implemented during the interview process to ensure anonymity of results. The interpretation of data was not hindered by cultural biases or differences. Any internal threats to validity may have occurred if participants altered their views about PBL. The researcher's experiences and career aspirations have created a specified set of assumptions as they relate to project-based learning implementation.

Summary

This chapter explained the research methods utilized for a qualitative case study including a description of the research design, sample, data collection and analysis processes. Implementing the phenomenological approach through the utilization of a focus group allowed for extensive responses from open-ended questions. In addition, the data collection provided for detailed descriptions and a deeper understanding of the perceptions related to the impact of PBL on student achievement, engagement, and equity

in an urban charter high school. A coding process was defined as patterns were identified to aid in the organization and analysis of the data collection. In Chapter 4, the research findings of the qualitative study are presented for future implications.

Chapter 4

Results

Chapter 4 gives insights into educators' perceptions of Project-based Learning (PBL) as related to the impact and value of this instructional methodology. The purpose of this study was to analyze the impact of PBL on student achievement, engagement, and equity. This study was conducted using a qualitative approach to research. A focus group was conducted to detail educators' perceptions of the value of PBL as well as the impact on student achievement, engagement, and equity. With the unexpected onset of the Covid-19 global pandemic, educators were navigating a shifting landscape with teaching and learning through in-person, virtual, and hybrid environments. Conducting research through a focus group approach provided the most effective method to gather data for the study.

A focus group approach was taken to qualitatively evaluate educator responses in the form of interview questions was used. Dedoose software was utilized to categorize the responses into themes and subthemes. Focus group data were obtained from five educators who consented to participate in the research study. The focus group was conducted on April 13, 2022, and lasted 53.45 minutes.

To determine the effects of PBL on student achievement, engagement, and equity, the perceptions of those involved in the educational process were examined. The educator participants were certified administrators or general education teachers. Also included in the demographic section of the interview questions was the collection of information to document the highest level of education completed. The levels of education completed among the participants consisted of doctorate, specialist, master,

and bachelor degrees. The gender identified by the participants in the study consisted of two males and three females. The following sections address the qualitative results from the interview responses generated from the Research Questions 1 through 4.

The research study was guided by the following research questions:

RQ1. What are the perceptions of secondary charter school educators about the effect of PBL on student engagement?

RQ2. What are the perceptions of secondary charter school educators about the effect of PBL on the acquisition 21st Century Skills?

RQ3. What are the perceptions of secondary charter school educators about the effect of PBL on student equity?

RQ4. What are the perceptions of secondary charter school educators about the effect of PBL on academic achievement?

A limitation involved in this research study was determining the best method to gather research data during the Covid-19 pandemic. During the time of the recruitment for in-person meetings, Covid-19 restrictions limited in-person contact to reduce the transmission of the virus. Another limitation involved in this research study is sample size; a purposeful sampling was used to conduct the focus group. The focus group was conducted via Zoom with five participants. However, the focus group sampling size represented a faculty of 12 educators.

Results of Qualitative Data Analysis

For this study, the analysis involved the use of thematic analysis process. Braun and Clarke (2013) explained the six steps of the thematic analysis process: familiarization with the data, generating codes, identifying themes, reviewing themes, defining themes,

and producing the results. The researcher became familiar with the data by reading and re-reading the data from the transcript several times. One open-ended focus group question was asked for each research question. Five educators composed the focus group to obtain data for the qualitative elements of this study. Each educator who participated in the focus group was given an anonymous identifier.

Participant Profiles. Data in this study were gathered from five participants who were current and former charter school educators. To protect the confidentiality of the participants, the actual names of the participants were not disclosed. The researcher added participant profiles to include descriptions and perceptions of the participants. Notes were recorded during the focus group discussion and while listening to the audio recordings regarding the general impression. These observations are as follows:

1. Participant 1 had positive experience in teaching PBL to their students. The participant builds strong relationships and empowers students with voice and choice when completing projects.
2. Participant 2 did not elaborate on the answers to the questions. The participant focused on the overall influence that PBL has on building knowledge and understanding of essential concepts.
3. Participant 3 provided a unique perspective on how to educate students through PBL which encourages the construction of knowledge and strengthens their social development.
4. Participant 4 was honest and passionate in their responses. The participant focused on wanting to ensure that every student has the opportunity to be

involved in PBL. The participant said they are dedicated to ensuring that each project was meaningful, collaborative, and meets state standards.

5. Participant 5 was transparent and provided a unique perspective on PBL and leadership. The participant emphasized the importance of having student-centered activities and hands-on activities. The participant stated that a challenge of PBL is the planning of the project, the evaluation of the project, and student participation.

Data Analysis Steps. Once the focus group discussion was completed, the entire audio was uploading into the Trint software. The Zoom recording was transcribed and uploaded to the Dedoose software. The researcher read and re-read the transcript several times to become familiar with the data. The re-reading of the transcript gave the opportunity for reflection, understanding the participants' experiences, and the early identification of codes.

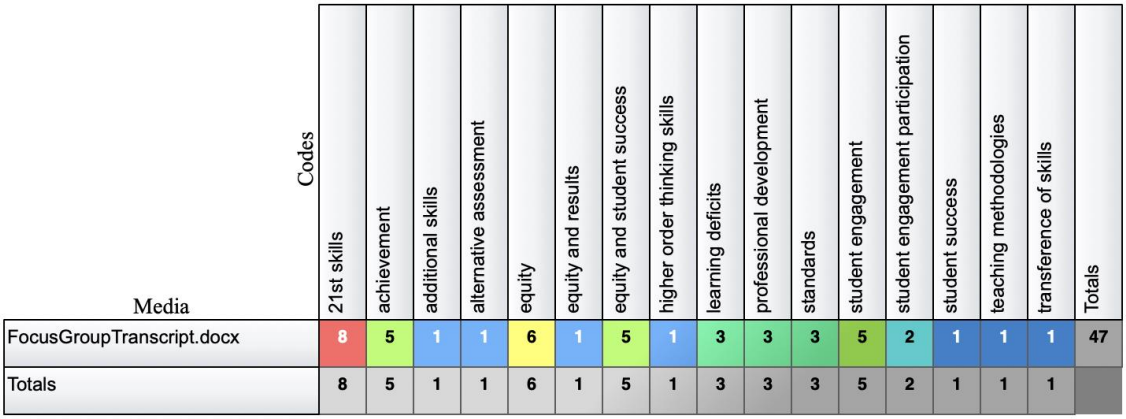
The researcher began generating initial codes by forming categories using the research questions: student engagement, 21st Century Skills, student equity, and student achievement. The codes were listed according to the number of times the participants mentioned each item which was indicated by the number in each code. Coding deals with converting raw data into workable data by identifying similarities and differences in the data (Sutton & Austin, 2015).

The researcher searched for themes by combining the codes of each research question into a Word document and organized the codes inside clusters based on similarities and topic. This task was completed to ensure the researcher could revise this process when necessary (see Figure 1 below). The results are influential to produce an

understanding of the experience that educators describe when implementing PBL. The result is often a deeper appreciation of social and emotional skills.

Figure 1

Dedoose Code and Theme Analysis



Media \ Codes	21st skills	achievement	additional skills	alternative assessment	equity	equity and results	equity and student success	higher order thinking skills	learning deficits	professional development	standards	student engagement	student engagement participation	student success	teaching methodologies	transference of skills	Totals
FocusGroupTranscript.docx	8	5	1	1	6	1	5	1	3	3	3	5	2	1	1	1	47
Totals	8	5	1	1	6	1	5	1	3	3	3	5	2	1	1	1	

Theme 1: PBL encourages student participation. Participants shared that after the implementation of PBL strategies, there was an observable increase in student engagement. With traditional teacher-led instructional strategies, students are more observers rather than active participants. Many students can thrive and excel with PBL. Participant 1 stated,

> Project-based learning, I would say it's much closer to 95 or 100 percent. The students enjoy that and seem excited about it. You gain a lot more discussion between students, I've found, and that's part of the evidence that I have is there are more people participating in our conversations.

Participant 2 stated,

> The project and the task that they have to complete versus maybe just conversations about completing a task in a non-PBL class. And then probably the evidence would be the completed projects that they were working on versus just some problems or a worksheet or a paragraph, something like that.

Participant 3 stated,

> But project-based learning extends across multiple disciplines. And so, it's not necessarily just going to be mad facts. And so, we can kind of implement science as well as social studies. I mean, so we can kind of extend across various subjects to make sure that our students are learning. And so that evidence that I will probably say would just being able to give students the platform to articulate what they were taught.

Theme 2: PBL fosters student success. With PBL, students show more support for the work and the teacher transitions more ownership of the learning to the student. Students are more interested in the work and seemed to perform more than the teacher expectations in many instances. Participants stated that the retention of content was higher because the students were able to make connections.

Participant 4 stated,

> That is the fact that many students are not reading and performing on grade level. And so, for those students who are having difficulties with comprehension and understanding, the project-based instruction gave them the opportunity to be more fully engaged because of their shortcomings. Those kids that we're losing. What do we do to get them more actively engaged in the learning process? And what systems do we have in place? Project-based learning has proven to be one of

> them. The research shows that those kids that had problems with comprehension and understanding tend to do better if they worked in a group and it motivated them.

Participant 5 stated,

> And when we do project-based learning activities, it kind of changes everything and they become almost the teachers. And I'm only just the facilitator. High levels of thinking to the things that I'm asking them to do, they have to learn other tasks that are not even as intentional, such as time management and how to prioritize different things because there's usually multiple steps that are involved inside of whatever it is that I'm asking them to do. And so those are those are extra skills.

Theme 3: PBL generates higher order thinking skills. When students feel like they have a stake in the outcome, they will naturally work with one another and seek answers with intuitive critical thinking. Undoubtedly, this type of project-based methodology helps students develop all those skills, use their knowledge, and those who acquire through research to reach conclusions and through issuing their opinions. Critical thinking and problem solving are the two biggest impacts of PBL. Students are better prepared for the post-secondary endeavors.

Participant 1 stated,

> You'll also see the critical thinking skills when you give them a project and put students to work on solving a problem or researching a topic that they are completely unfamiliar with. You know, they're doing the work and they're

> sharing with one another that work as they do it. So, it's something where it's a combined effort.

Participant 2 stated,

> Create a product out of project-based learning, and that is definitely part of the 21st Century Skills that you're making something. It's not just, you know, you're writing answers on the test or you're answering questions on a worksheet. It's something that they connect to.

Participant 2 also stated,

> Twenty-first Century Skills are learned or sharpened through project-based learning through the collaboration that's needed just to think through a project. The ability to solve problems, understand that you're working towards a shared goal and being able to compromise at times. I think all of those are our key skills that are needed.

Participant 3 stated,

> And I would just say the evidence from it is, is everyone playing their part in then some accountability in terms of what was able to be produced, was able to be presented to the class. And so, it pretty much gives us the opportunity to know that unless they're going to work in an office or a cubicle, and this is kind of what the real world looks like in the sense of relying on a teammate or relying on their peer to produce work to produce that goal.

Theme 4: PBL develops transferrable skills. There is belief that the best way to learn something is to teach it. Not only do students learn the material they also focus on having others understand the material. Students collaborate with partners and then

brainstorm and problem solve any obstacles they envision while teaching each other. PBL is immersive and gives participation points for students throughout multiple sectors of their lives. Students use the skill sets gained through their coursework or experiences to transfer knowledge to other areas.

Participant 4 stated,

> Student success itself, when you look at the number of students who are not successful with the traditional delivery of instruction, when you change the pattern for many of those students who are deficit in skills, they can become successful even though they may not be able to verbalize it or put it on paper. But they can do it because they're good with their hands. And if there's a project involved, everybody has responsibility. So, you're looking at critical thinking, collaboration, teamwork, all of those things are going to come in to place with project-based instruction.

Participant 5 stated,

> The evidence, I would say, being that you're able to give another project an additional task and they're able to complete it without a lot from you because they've learned all these skills, they've learned all these different 21st Century Skills. So, they're able to do all these things now on their own versus just the beginning. There is a lot of questioning and asking for clarification. But once they continue to do this, they start to kind of pick up on the patterns and understand how to work best with other people or how to find answers to things themselves, which is similar to what they would be asked to do in the workplace.

Theme 5: PBL promotes academic attainment for all students. With PBL, students can be better prepared for their post-secondary endeavors. When teachers ask students to create or collaborate, they must pull several types of skill sets together to produce one piece of work. The teacher is able to see the development of learning outcomes become easier for students as the year progresses because PBL becomes a natural way of operating.

Participant 1 stated,

> Equity goes with project-based learning as it plays to an individual's skill set. A good group will find people to do certain roles and those roles now align with what a kid's good at. When the other participant talked about deficits, you know, not everybody is a great public speaker or not. Everyone is very artistic and good at the creation of posters or, you know, presentations and things like that

Participant 2 stated,

> Because it does allow for the participants or the members in that group to play to their strengths. And even if it's an area that they may not be strong enough, they will learn from the exposure of what the others are doing.

Participant 3 commented,

> They join a group, or they're assigned a group and they still don't participate, you know, they still rely on others to do all the work they or some of them. It's just some kids just have dominant personalities, and they take charge, and they don't necessarily rely on the group to complete the project.

Participant 3 continued,

> And so, where project-based learning kind of mitigates relying on the standardized assessment, and it allows kids to really demonstrate other means of knowledge. And so, I believe like that the equity will come in from giving kids an opportunity to demonstrate be more.

Participant 4 stated,

> Project-based learning does involve more than one student and those students are going to be grouped according to various achievement levels so that those students who have the most difficulty in class can be successful. Everybody just can't do the pen and paper and rote remembering. We've depended on that for so long, and it's not to the benefit of many students. The educational system has some shortcomings in regard to who is successful and who is not.

Theme 6: PBL prepares students for career and college readiness. This leads to a more egalitarian classroom where views are shared more openly, and thoughtful discussion of issues more readily takes place. From the strongest academic student to the weakest academic student, they all came away from the project successful with teaching the younger students. If everything is a multiple-choice test or an essay, those students who do well will always shine and others will not fare as well.

Participant 4 commented,

> To be a part of a group once they get out into the workforce, they can take those skills with them in regard to critical thinking of working in teams, taking care of responsibility, individually being a self-starter…but all about making sure that our students are becoming more successful, and the traditional methods are not working for so many of our students that we have to try something new.

Participant 4 added,

> Project-based learning is one of those initiatives where you can actually see the results of what you're doing. The kids can feel good about themselves and see some level of success, which may help them in the long run. Well, we're dealing with 21st century and the demands of the jobs are asking for more. And so, in order to prepare our kids for the workforce, we have to do more education. Right? And we just can't hold on to what worked for us 50 and 60 years ago. It doesn't work in the 21st century, so we have to step up to the times, even though it may take some more initiative and incentive on our part. But, if we're going to be successful educators, if we're not a part of the solution, then we are part of the problem.

Participant 5 stated,

> I'm sure there are groups of students and families out there that feel like it's not equitable because, you know, it's worth, I think, for some students. And so, it depends on the teacher, depends on the assignment. It depends on the task within that project. The projects do require them to work with other people, and so that may not feel as equitable as the projects that they do that are on their own.

Theme 7: PBL aligns with academic standards for effectiveness. The participants shared that they did see improvement on specific content if related to the project. I have seen students with IEP's excel and do well on tests because of the opportunity for them to work through the material and understand it in real-world terms because of PBL. Achievement scores are much higher when teachers are regularly implementing PBL.

Participant 1 stated,

> There is a whole lot of difference in testing a lot of times when I use PBL. You know what they're creating in their project. And so, what I do see is, you know, you will still include questions on maybe a quarter final or something like that that would come from the unit that I would do a piece on. And the students by and large showed success there. It was something where they were still scoring higher on those questions, even though we didn't do a reading or a study guide where they would have gotten those questions initially. I think incidentally, you know, again, the evidence that I see with acquisition is that, you know, the students are talking more about it, they're asking more questions.

Participant 3 stated,

> PBL plays a part in the instruction because of achievement as a whole, primarily because teachers are now able to not necessarily assign a worksheet and say, hey, you need to do this. There is no dialog. Teachers aren't equipped with the skills or equipped with the feedback to know where they need to pivot into teaching. So, project-based learning kind of gives the educators an opportunity to see specifically where those gaps are.

Participant 4 stated,

> PBL provides an alternative assessment where we normally depend on regurgitation of information and facts. This leads to, I think, a broader understanding of whatever it is that's trying to be portrayed or taught.

Participant 4 added,

> How can you give a student a test that is written on a 10th grade level and they're writing and understanding on a seventh and eighth grade level? They don't match. And so those students are set up for failure from the beginning, especially if we just teach one way and we assess one way. We had to come up with something different for those students who are struggling the most. You have to balance that use of class time. And when you have assessments that are tied to the things that you teach, that becomes even more crucial because suddenly you've got all these things you're supposed to teach in a given period of time. And I think that scares people away from PBL. I think that, yeah, it's something where I've got to get this in. And if I spend two weeks on this one, I could have spent three days on this. It doesn't seem like a fair exchange to a lot of people. I think again, that comes back to your professional development, you know, being intentional with it and, you know, teaching people how to maximize those gains with that time. You know, how can you broaden the project? So, it's covering maybe multiple things so that they're getting all the information they need in order to attack those tests while also, you know, doing it a PBL way that's going to make it more interesting and engaging for students.

Participant 5 stated,

> A lot of that boils down to the training that's provided before it's even implemented to make sure that those projects are tied directly to standards and that the intentionality is there. And so, with that, you would have the transference of skills from the project to more of a standards-based type of assessment. It would be more clear. But everybody has to be on the same page and doing the

> same thing and speaking the same common language. So, all that boils back down to that professional development that's given on all levels to everybody that's involved to make sure it's successful.

Theme 8: PBL supports vital professional development opportunities.

Participants stated that they observed teachers who have reported they see students stop and plan what they are going to do instead of just jumping into the task after the implementation of PBL. Learning to create a plan to attack problems stems from the utilization of PBL. Teachers can benefit from professional development opportunities to learn effective PBL instructional strategies.

Participant 5 stated,

> We just did a really great art project, but there were no standards that we really touched on. There were none. So, I think that the thing that we could do that's best to be intentional about what we're teaching to figure out what our end is before we start. What are the objectives of this project before we start it versus just doing something? So yeah, that's what I think we needed to change. I think we just need more professional development over it. More and more experts to teach teachers how to do it, what it should look like. The grading of some of that can be obscure and people steer clear from it because it just seems like it's too much. So, I just think of those things, the intentionality, more touch points as far as how to do it and then how to properly assess would be phenomenal.

Participant 1 stated,

> You have to balance that use of class time. And when you have assessments that are tied to the things that you teach, that becomes even more crucial because

> suddenly you've got all these things you're supposed to teach in a given period of time. And I think that scares people away from PBL. I think that, yeah, it's something where I've got to get this in. And if I spend two weeks on this one, I could have spent three days on this. It doesn't seem like a fair exchange to a lot of people. I think again, that comes back to your professional development, you know, being intentional with it and, you know, teaching people how to maximize those gains with that time. You know, how can you broaden the project? So, it's covering maybe multiple things so that they're getting all the information they need in order to attack those tests while also, you know, doing it a PBL way that's going to make it more interesting and engaging for students.

Summary

The results-related information presented in this chapter provided data supporting the qualitative methodology for addressing the research questions for this study. Chapter 4 reported on the findings of this research based on the review and analysis of data collected by way of a focus discussion group. The purpose of this qualitative study was to explore how charter school educators describe the impact of PBL on student achievement, engagement, and equity.

The focus group transcript was analyzed and coded to determine patterns and themes using Braun and Clarke (2013) steps of thematic data analysis. Thematic data analysis for this study yielded major themes for each research question.

Chapter 4 outlined the thematic findings of the research study through the data analysis. The data analysis revealed eight themes: Theme 1: PBL encourages student participation, Theme 2: PBL fosters student success, Theme 3: PBL generates higher

order thinking skills, Theme 4: PBL develops transferrable skills, Theme 5: PBL promotes academic attainment for all students, Theme 6: PBL prepares students for career and college readiness, Theme 7: PBL aligns with academic standards for effectiveness, and Theme 8: PBL supports vital professional development opportunities.

Chapter 5 concludes with the restatement of the research topic, problem statement, and research questions. Also, chapter 5 explains how the data results correlate to the information in the literature review and the framework for the study. In addition, chapter 5 suggests recommendations for future research and implications from the evolution of this research study.

Chapter 5

Interpretation and Recommendations

The purpose of this qualitative study was to explore how secondary charter school educators describe the impact of PBL on student achievement, engagement, and equity. This chapter includes a discussion of major findings as related to the literature study and implications for action. In addition, this study offers recommendations for future research and concluding remarks.

This qualitative study revealed the importance of skills to locate and evaluate information for innovative outcomes (Kuhlthau, Caspari, & Maniotes, 2007).

RQ1. What are the perceptions of secondary charter school educators about the effect of PBL on student engagement?

RQ2. What are the perceptions of secondary charter school educators about the effect of PBL on the acquisition of 21st Century skills?

RQ3. What are the perceptions of secondary charter school educators about the effect of PBL on student equity?

RQ4. What are the perceptions of secondary charter school educators about the effect of PBL on academic achievement?

Study Summary

The purpose of this qualitative study was to explore how secondary charter school educators describe the impact of PBL on student achievement, engagement, and equity. This chapter includes a discussion of major findings, as related to the literature review study that revealed within recent years, minimal research has been conducted within the education field related to theory and practice of PBL among secondary charter school

educators. Henshon (2017) asserted that teaching methods of instruction must focus on providing students with a project-based, personalized education by enlightening their learning experiences so that they can be prepared for college and careers.

Overview of the problem. Implementing PBL can be a complex and difficult task that requires a prominent change in the school's climate and culture (Grant, 2002). Educators have developed effective, student-centered classroom structures that integrate PBL techniques; however, more research is needed to discover effective PBL strategies for implementation across the entire charter school system.

Purpose statement and research questions. The purpose of this qualitative study was to determine teacher perceptions of the impact of PBL on student academic achievement, engagement, and equity within an urban charter school environment. Scarbrough and Swan (2006) stated that one of the chief reasons for organizing and completing projects in a collaborative effort is the need for learning and innovation. This study identified educators' perceptions of the strengths and weaknesses of PBL as a model of student-centered learning.

Review of the methodology. The framework of PBL may be unconventional as viewed by traditional teaching advocates. However, the gap in the knowledge and implementation of PBL highlights the need for further research with different methodologies to explore educator perceptions of PBL on student-centered learning. This qualitative study involved five participants in a focus group via Zoom. The participants shared their perceptions of PBL and its impact on student achievement, engagement, and equity.

The utilization of a qualitative methodology was the best approach for exploring answers to the research questions and answering the problem statement. With qualitative research, the researcher provides the necessary questions to glean the appropriate responses to generate data. Through qualitative methodology, the researcher was able to study the perspectives of the participants and provide an understanding that was deeper in meaning than quantitative data could provide.

A focus group was created to glean a deeper understanding of the impact of educators' perceptions on the impact of PBL on student achievement, engagement, and equity. The research questions served as the impetus to develop interview and follow-up questions for the focus group participants to discuss. The open-ended questions provided the participants an opportunity to share details of specific experiences. The sample size of the focus group was five participants who effectively represented the school faculty of twelve staff members. Purposeful sampling was utilized to determine the participants with the understanding that the number of participants would serve as a limited representation of the school faculty.

An email invitation to participate in the focus group was sent out to the entire school faculty. A focus group protocol script was developed with guidelines and questions to be posed to the participants. Before the start of the focus group, an electronic consent form was presented for voluntary agreement from each focus group participant.

Once the focus group was completed, the researcher utilized Trint, a computer-aided transcription software to create a focus group transcript. Next, the transcript was shared with each focus group participant to determine if they were any discrepancies.

Then, the researcher used Dedoose software to analyze and create codes generated from the transcript. The codes were utilized to formulate themes based on the research questions.

Major findings. The study's findings aided in recommending an analytical approach to extend comprehensive research in the field of PBL and student-learning methodologies. Also, the findings highlighted the benefits and strengths of using PBL in the traditional classroom. Finally, the results of these findings revealed an overall positive impact of PBL on student achievement, engagement, and equity.

Research question 1. The objective of research question one was to explore how educators describe the effect of PBL on student engagement. The results from the focus group data generated two themes: PBL encourages student participation and fosters student success. Participants shared how PBL generates student engagement and taking ownership in their own learning and mastering concepts. The participants stated that students are more interested in the work and often produce more product than what was asked of them. In addition, participants shared that as a result of increased student engagement, the retention of content was higher because students were able to make connections.

Research question 2. The objective of research question two was to explore how educators describe the effect of PBL on the acquisition of 21st Century Skills. The results from the focus group data generated two themes: PBL generates higher-order thinking skills and PBL develops transferrable skills. Participants expressed how PBL increased student confidence by building their communication and presentation skills. Students not only learn the material, but they also gain a deeper understanding by demonstrating to

others. Students were able to collaborate with partners and brainstorm any obstacles that may arise during the project. Students were proud of their work and showed responsibility when working with others. PBL builds higher-order thinking skills by acquiring knowledge through application and research to reach conclusions and issuing opinions. PBL shapes critical thinking and problem-solving skills that enable students to be better prepared for college and career endeavors. When students feel like they have a stake in the outcome, students will work with one another and seek answers with intuitive critical thinking.

Research question 3. The objective of research question three was to explore how educators describe the effect of PBL on student equity. The results from the focus group data generated two themes: PBL promotes academic attainment for all students and prepares students for career and college readiness. Participants agreed that everyone has strengths and weaknesses. However, PBL allows for student strengths and weaknesses to be balanced to give choices and opportunities for diverse learners to demonstrate their talents as related to the content. PBL gives all students a chance to show what they have learned and to be successful. PBL leads to a more egalitarian classroom where views are shared more openly and thoughtfully through discussion of issues. PBL offers the opportunity for equity because students can still succeed by showing a working knowledge of the content.

Research question 4. The objective of research question four was to explore how educators describe the effect of PBL on student achievement. The results from the focus group data generated two themes: PBL aligns with academic standards for excellence and supports vital professional development opportunities. Participants shared how PBL can

provide a marked improvement in the acquisition of knowledge and skills of content if related to a specified project. Students gained knowledge and confidence in specific material and presenting their findings to others. As a result of implementing PBL, students have improved writing skills and standardized test scores. With PBL, students demonstrate intentionality planning for projects by creating a plan and tasks to solve problems.

However, professional development is needed for teachers to learn how to effectively use PBL in the classroom and how to align learning standards to project development. Professional development can support the educator to design and facilitate a student-centered learning environment where students can pursue meaningful questions and create products that demonstrate outcomes. In addition, professional development opportunities can provide educators with the resources to create authentic experiences for students.

Findings Related to the Literature

The review of literature about PBL revealed gaps in the need to discover strategies to explore the connection between PBL as a generator of student achievement and as a conductor of student learning and development. The review of literature explored the following the themes: project method theory, experiential learning, constructivism theory, and social learning theory. Kilpatrick's Project Method theory (1918) focused on the four distinct stages of PBL: purposing, planning, executing, and judging. These stages of PBL implementation encouraged student engagement and motivation.

Dewey's constructivism theory (1938) promoted active learning and the teacher serving as the facilitator of student academic and social growth. In addition, Dewey (1938) supported experiential learning whereby students can gain authentic learning experiences. The focus group participants shared similar views about the benefits of experiential learning. Experiential learning can enable students to gain higher-order thinking skills.

Piaget's concept of constructivism (1952) was based on the psychological development of the child and construct meaning through personal experiences in the classroom. The focus group participants discussed the importance of students being able to make connections between theory and application. Students can develop a deeper understanding of content through the utilization of constructivism strategies.

Vygotsky's social learning theory (1978) stated that people learn through thought and social interaction that promotes deeper understanding. The focus group participants agreed social learning theory placed an emphasis on the importance of culture and the development of cognitive skills. Although the existing research provided a sound foundation to explore the advantages and disadvantages of PBL; the gap in these studies revealed the need for further research using various methodologies to gain a deeper understanding of educator perceptions related to PBL.

Lenz (2016) stated that a foundational belief of PBL is that all students, no matter the background, should have access to high-quality PBL to experience deeper learning and achieve success in career, college, and life. The focus group participants shared that the concept of equity as it relates to PBL is necessary to facilitate active learning

opportunities for all students. However, educators must be equipped with instructional strategies to effectively incorporate PBL into their classrooms.

The qualitative design for this study provided analytical data from five educators by conducting a focus group via Zoom. As a result of this qualitative study, eight themes emerged from the data to address the four research questions. These eight themes expressed the interpretations of the participants' explanations and understandings of PBL and its impact on student achievement, engagement, and equity. The major findings were: PBL encourages student participation, PBL fosters student success, PBL generates higher order thinking skills, PBL develops transferrable skills, PBL promotes academic attainment for all students, PBL prepares students for career and college readiness, PBL aligns with academic standards for effectiveness, and PBL supports vital professional development opportunities. The results were influential to produce a deeper comprehension of secondary charter school educators' perceptions of PBL and its impact on student achievement, engagement, and equity.

Conclusions

Secondary charter school educators acknowledge the benefits of implementing PBL to have an impact on student achievement, engagement, and equity. The research questions responded to the problem statement which stated more information and implementation strategies are needed for PBL to be a viable teaching methodology for educators. For research question one, secondary charter school educators indicated that PBL provided opportunities to build student engagement through the incorporation of real-world topics and problem-solving of significant issues. For research question two, secondary charter school educators expressed that PBL helps students develop

collaboration and critical-thinking skills that are important for post-secondary endeavors. For research question three, secondary charter school educators shared that PBL offers achievement opportunities for all students. Also, PBL can provide the framework to build cooperation, respect, and trust among students. For research question four, secondary charter school educators stated that increased student achievement is possible with continued implementation of PBL strategies and professional development opportunities for educators.

Implications for action. The purpose of this qualitative study was to research secondary charter school educators' perceptions of the impact of PBL on student achievement, engagement, and equity. The results of this aligned with Vygotsky's (1968) social learning and development theory through the utilization of a focus group discussion via Zoom. The secondary charter school educators described through examples, feelings, and thoughts the different ways in which PBL strategies are integrated into 21st Century Skills and other academic and social skills introduced within school environments. The results of this study confirmed that PBL serves as a viable platform for students to connect to who they are academically and socially within an educational context. Also, the results of this study of secondary charter school educators expressed how PBL can foster interdisciplinary connections and real-world applications along with self-examining reflection. The results of this study indicated that professional development related to PBL concepts and strategies is needed to further enhance the instructional effectiveness of educators and the learning achievements of students. All participants' responses were collected and used to provide additional insight into the phenomenon to understand secondary charter school educators' perceptions of the impact

of PBL on student achievement, engagement, and equity. The results are meaningful to produce a highly skilled field of educators who have a deeper understanding of PBL and student-centered learning when teaching in secondary charter schools.

As a result of this study, the researcher determined the following recommendations to secondary charter schools:

1. Secondary charter schools without an emphasis on PBL should consider the investigation into the process of providing professional development opportunities for its educators to implement a comprehensive PBL program.

2. Secondary charter schools without an emphasis on student-centered learning need to begin the process of providing professional development opportunities for its educators to implement a comprehensive student-centered learning environment.

While charter schools have historically served as incubators of innovative teaching and learning methodologies, this research study supports the continued implementation of PBL strategies to promote student achievement, engagement, and equity.

Recommendations for future research. This research added to the body of knowledge by providing the perspectives of secondary charter school educators. Current research related to PBL methodologies are limited to the fundamental concepts of PBL; however, did not include the impact of PBL on student achievement, engagement, and equity. The results of this study demonstrated that an opportunity exists for researchers to further examine the major findings revealed in this research and evaluate their relevance for continued research.

Future research is needed to include more states other than the state of Missouri. In addition, a wider scope of schools (private, public, and parodical) and grade levels (primary, elementary, and middle) may yield different results. Secondary charter school educators acknowledge the benefits of teaching PBL while incorporating 21st Century Skills. As a benefit, secondary administrators and educators could apply the findings of this study in future practice. The data collected through this study indicated the positive and supportive impact of PBL on student achievement, engagement, and equity. The result of this qualitative study encourages charter schools who do not incorporate PBL strategies to begin the process of providing PBL-related educational and professional development opportunities. Educators need the resources, supports, and tools to provide PBL experiences for all students. There are few measures of PBL's impact on student engagement and equity; however, research has established the positive impact of PBL on student achievement. Future research studies related to the impact of PBL on gender and socio-economic factors would be significant to the enhancement of PBL.

Concluding remarks. In conclusion, the significance of this research is that it added to the body of knowledge about PBL and its impact on student achievement, engagement, and equity based on the perceptions of secondary charter school educators. The results of this study provided a specialized lens that only secondary charter school educators could provide. This study reinforces the importance of creating a student-centered learning environment that promotes achievement, engagement, and equity. This study provided examples of what is currently being done with PBL and student-centered learning to promote student achievement, engagement, and equity.

References

Andrade, D. (2009). *How to get started with project-based learning.* Retrieved from http://www.techlearning.com/PrintableArticle.aspx?id=20442

Atherton, J. S. (2009). *Learning and teaching: Piaget's developmental theory.* Retrieved from http://www.learningandteaching.info/learning/piaget.htm

Ayaz, M. F., & Söylemez, M. (2014). The effect of the project-based learning approach on the academic achievements of the students in science classes in Turkey: A meta-analysis study. *Education & Science/Egitim Ve Bilim, 40*(178), 272-273. Retrieved from https://www.researchgate.net/profile/Mehmet-Ayaz/publication/275959212_The_Effect_of_the_Project-Based_Learning_Approach_on_the_Academic_Achievements_of_the_Students_in_Science_Classes_in_Turkey_A_Meta-Analysis_Study/links/554b7af40cf29f836c96bffb/The-Effect-of-the-Project-Based-Learning-Approach-on-the-Academic-Achievements-of-the-Students-in-Science-Classes-in-Turkey-A-Meta-Analysis-Study.pdf

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York, NY: W. H. Freeman.

Barron, B., & Darling-Hammond, L. (2008). *Powerful learning: Studies show deep understanding derives from collaborative methods.* Retrieved from http://www.edutopia.org/inquiry-project-learning-research

Barshay, J. (August 27, 2018). A study finds promise in project-based learning for young low-income children. Social studies and reading scores were higher in a test of a popular education trend. *The Hechinger Report*. Retrieved from

https://hechingerreport.org/a-study-finds-promise-in-project-based-learning-for-young-low-income-children/

Beineke, J. A. (1998). *And there were giants in the land: The life of William Heard Kilpatrick.* New York, NY: Peter Lang.

Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 83*(2), 39-43. Retrieved from https://journals.sagepub.com/doi/abs/10.1177/0018726703569001

Berends, H., Boersma, K. & Weggeman, M. (2003). The structuration of organizational learning. *Human Relations, 56*(9), 1035-1056.

Beyer, L. E. (1997). William Heard Kilpatrick. *Prospects: The Quarterly Review of Comparative Education, 27*(3), 470–485. Retrieved from http://www.ibe.unesco.org/sites/default/files/kilpatricke.PDF

Blumenfeld, P. C., Soloway, E., Marx, R.W., Krajcik, J. S., Gudzial, M., & Palinscar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist, 26*(3&4), 269-398. Retrieved from https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139

Bransford, J. (Ed.). (2000). *How people learn: Brain, mind experience and school.* Washington, D.C.: National Academy of Sciences.

Braun, V., & Clarke, V. (2013). Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. *The Psychologist, 26*(2). Retrieved from http://eprints.uwe.acf.uk/21155/

Buck Institute for Education. (2008). *Project-based learning*. Retrieved from http://www.bie.org/index.php/site/PBL/pbl_handbook_introduction/#history

Buck Institute for Education and Boise State University, Department of Educational Technology. (2005). *Project based learning: The online resource for PBL.* Retrieved from http://www.pblonline.org/

Butler, K., & Lumpe, A. (2008). Student use of scaffolding software: Relationships with motivation and conceptual understanding. *Journal of Science Education and Technology, 17,* 427-436. doi:10.1007/s10956-008-9111-9

ChanLin, L. J. (2008). Technology integration applied to project-based learning in science. *Innovations in Education and Teaching International*, *45*(1), 55-65. Retrieved from https://www.tandfonline.com/doi/abs/10.1080/14703290701757450

Chen, H. C. & Yang, C. Y. (2019). Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators. *Educational Research Review, 26,* 71-81.

Clark, K. F., & Graves, M. F. (2005). Scaffolding students' comprehension of text. *The Reading Teacher, 58*(6), 570-580.

Coffey, H. (2008). *Zone of proximal development*. Retrieved from http://www.learnnc.org/lp/pages/5075#noteref8

Constantiou, I. D. (2008). New games, new rules: Big data and the changing context of strategy. *Journal of Information Technology, 30*(1), 44-57.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Thousand Oaks, CA: SAGE Publications.

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process.* Thousand Oaks, CA: SAGE Publications.

David, J. (2008). Teaching students to think. *Educational Leadership, 65*(5), 80-82. Retrieved from http://www.ascd.org/publications/educational_leadership/feb08/vol65/num05/Project-Based_Learning.aspx

Dede, C. (2009). *Comparing frameworks for 21st century skills*. Retrieved from http://www.watertown.k12.ma.us/dept/ed_tech/research/pdf/ChrisDede.pdf

Dewey, J. (1938). *Experience and education.* New York, NY: Macmillan.

Dole, S., Bloom, L., & Kowalske, K. (2016). Transforming pedagogy: Changing perspectives from teacher-centered to learner-centered. *Interdisciplinary Journal of Problem-Based Learning, 10*(1). Retrieved from https://docs.lib.purdue.edu/ijpbl/vol10/iss1/1/

D'Orio, W. (2009). *The power of project learning: Why new schools are choosing an old model to bring students into the 21st century*. Retrieved from http://www2.scholastic.com/browse/article.jsp?id=3751748

Ellis, T., & Hafner, W. (2008). Building a framework to support project-based collaborative learning experiences in an asynchronous learning network. *Interdisciplinary Journal of E-Learning and Learning Objects*, *4*(1), 167-190. Retrieved from https://www.learntechlib.org/p/44854/

Evertson, C. M. (2006). *Handbook of classroom management: Research, practice, and contemporary issues.* Mahwah, NJ: Erlbaum.

Felder, R., & Brent, R. (2017). Learner-centered teaching: How and why. *Learning Abstracts, 20*(5), 1-5. Retrieved from https://www.engr.ncsu.edu/wp-

content/uploads/drive/13bveaviVsJ8n8vKtfBqkLLNeMbIrietw/2017-LCT%20Paper.pdf

Flores, I. (2015). Preservice educators as investigative science mentors: Advancing self-efficacy through school-based professional development. *Journal of Instructional Pedagogies, 17,* 1-27. Retrieved from https://eric.ed.gov/?id=EJ1102881

Fullan, M., & Langworthy, M. (2013). *Towards a new end: New pedagogies for deep learning.* Retrieved from http://www.newpedagogies

Gall, M. D., Borg, W. R., & Gall, J. P. (1996). *Educational research: An introduction*. Boston, MA: Longman Publishing.

Gardner, H. (2008). *Wrestling with Jean Piaget, my paragon*. Retrieved from https://www.edge.org/response-detail/11927

Grant, J. (2002). Learning needs assessment: assessing the need. BMJ. *324*(7330), 156-159. Retrieved from https://www.bmj.com/content/324/7330/156

Grant, M. (2005). Getting a grip on project-based learning: Theory, cases, and recommendations. *Meridian: A Middle School Computer Technologies Journal, 5*(1), 1-17.

Grant, M. M., & Hill, J. (2006). Weighing the rewards with the risks? Implementing student-centered pedagogy within high-stakes testing. *Understanding teacher stress in the age of accountability* (pp. 19-42) Greenwich, CT: Information Age Publishing.

Hagan, F. (2000). *Research methods in criminal justice and criminology.* Boston, MA: Allyn & Bacon.

Hawley, J. L., Hall, K., & Pate, M. (2017). Students' perceptions of implementing problem-based learning in an agribusiness sales course. *NACTA Journal, 61*(3), 197-201.

Henshon, S. E. (2017). Exploring global perspectives: An interview with Yong Zhao. *Roeper Review, 39*(1), 4-8.doi:1080/02783193.2017.1247309

Hertzog, B. (2007). Transporting pedagogy: Implementing the project approach in two first-grade classrooms. *Journal of Advanced Academics, 18*(4), 530-564.

Hmelo-Silver, C. E., Duncan, R. G., & Chinn, C. A. (2007). Scaffolding and achievement in problem-based and inquiry learning: A response to Kirschner, Sweller, and Clark (2006). *Response, 42*(2), 99-107. Retrieved from https://www.tandfonline.com/doi/abs/10.1080/00461520701263368

Kearsley, G. (2010). *Constructivist theory (J. Bruner): Overview.* Retrieved from http://tip.psychology.org/bruner.html

Keegan, D. (1986). *The foundations of distance education.* Dover, NH: Croom Helm.

Keith, J., Pritchar, T., & Roesch, B. (2006). *Teaching strategies and student motivation* (Master's thesis, SUNY). Retrieved from http://dspace.sunyconnect.suny.edu/bitstream /1951/43017/1/Teaching%20Strategies%20and%20Student%20Motivation.doc

Kilpatrick, W. H. (1918). The project method. *Teacher's College Record, 19,* 319-335.

Kirschner, P. A., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Learning, 41*(2), 75-86. Retrieved from

https://scholar.google.com/citations?view_op=view_citation&hl=en&user=6c3HTBIAAAAJ&citation_for_view=6c3HTBIAAAAJ:5UUbrqTvKfUC

Kizkapan, O. & Bektas, O. (2017). The effect of project-based learning on seventh grade students' academic achievement. *International Journal of Instruction*, *10*(1) 37-54. Retrieved from http://acikerisim.nevsehir.edu.tr/xmlui/bitstream/handle/20.500.11787/3626/iji_2017_1_3.pdf?sequence=1&isAllowed=y

Klem, A. M., & Connell, J. P. (2004). Relationships matter: Linking teacher support to student engagement and achievement. *Journal of School Health, 74*(7), 262–273. doi:10.1111/j.1746-1561.2004.tb08283.x

Knoll, M. (1997). The project method: Its vocational education origin and international development. *Journal of Industrial Teacher Education, 34*(3), 59-80. Retrieved from https://scholar.lib.vt.edu/ejournals/JITE/v34n3/Knoll.html?ref=psweboffice.com

Knoll, M. (2010). *"A marriage on the rocks": An unknown letter by William H. Kilpatrick about his project method.* Retrieved from ERIC database. (ED511129)

Knoll, M. (2012). "I had made a mistake": William H. Kilpatrick and the project method. *Educators College Record*, *114*(2), 1-45. Retrieved from https://journals.sagepub.com/doi/abs/10.1177/016146811211400202

Korkmaz, G., & Kalayci, N. (2019). Theoretical foundations of project-based curricula in higher education. *Cukurova University Faculty of Education Journal*, *48*(1), 236-274. Retrieved from https://dergipark.org.tr/en/pub/cuefd/issue/44511/479322

Kraft, N. (2005). *Criteria for authentic project-based learning*. Retrieved from http://www.rmcdenver.com/useguide/pbl.htm

Kuhlthau, C., Caspari, A., & Maniotes, L. (2007). *Guided inquiry: Learning in the 21st century.* Westport, CT: Libraries Unlimited.

Ladewski, B. G., Krajcik, J. S., & Harvey, C. L. (1994). A middle grade science teacher's emerging understanding of project-based instruction. *The Elementary School Journal, 94*(5), 498–515. Retrieved from https://www.journals.uchicago.edu/doi/abs/10.1086/461780

Larmer, J. (2014). Project-based learning vs. problem-based learning vs. X-BL. *Edutopia.* Retrieved from https://www.edutopia.org/blog/pbl-vs-pbl-vs-xbl-john-larmer

Larmer, J., & Mergendoller, J. (2010). *The main course, not dessert: How are students reaching 21st century goals? With 21st century project-based learning.* Novato, CA: Buck Institute for Education. Retrieved from http://files.ascd.org/pdfs/onlinelearning/webinars/webinar-handout-10-8-2012.pdf

Larmer, J., Mergendoller, J., & Ross, D. (2009). *Project based learning toolkit series: PBL starter kit.* Navota, CA: Buck Institute for Education

Lattimer, H. & Riordan, R. (2011). Project-based learning engages students in meaningful work, *Middle School Journal*, *43*(2), 18-23. Retrieved from https://www.tandfonline.com/doi/abs/10.1080/00940771.2011.11461797?journalCode=umsj20

Lenz, B. (2016). Project-based learning with an equity lens. *Education Week's Blog.* Retrieved from https://www.edweek.org/leadership/opinion-project-based-learning-with-an-equity-lens/2016/08

Lombardi, M. M. (2007). Authentic learning for the 21st century: An overview. *Educause Learning Initiative, 1*(2007), 1-12.

Lujan, H. L., & DiCarlo, S. E. (2006). Too much teaching, not enough learning: What is the solution? *Advances in Physiology Education, 30*(1), 17-22.

Mapes, R. M. (2009). *Effects and challenges of project-based learning: A review* (Master's thesis, NMU). Retrieved from https://www.nmu.edu/sites/DrupalEducation/files/UserFiles/Files/Pre-Drupal/SiteSections/Students/GradPapers/Projects/Junak-Mapes_Michele_MP.pdf

Markham, T., Larmer, J., & Ravitz, J. (2003). *Project based learning handbook: A guide to standards-focused project-based learning for middle and high school Educators.* Novato, CA: Buck Institute for Education.

Marr, B. (2008). *Impacting future value: How to manage your intellectual capital.* Retrieved from https://www.cimaglobal.com/Documents/ImportedDocuments/tech_mag_impacting_future_value_may08.pdf.pdf

Maxwell, J. A. (2004). Causal explanation, qualitative research, and scientific inquiry in education. *Educational Researcher, 33*(2), 3–11. doi:10.3102/0013189x033002003

Mayer, R. E. (2004). Should there be a three-strikes rule against pure discovery learning? The case for guided methods of instruction. *The American Psychologist, 59*(1), 14-19. doi:10.1037/0003-066X.59.1.14.

McGrath, D. (2005). Technology-supported PBL: Developing 21st century skills for all students. Retrieved from http://coe.ksu.edu/McGrath/Edunova_paper.htm

McKay, F. (2018). Ensuring that PBL is accessible to all. *Edutopia's Blog.* Retrieved from https://www.edutopia.org/article/ensuring-pbl-accessible-all

Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation*: Vol. Fourth edi.

Mettas, A. C., & Constantiou, C. C. (2008). The technology fair: A project-based learning approach for enhancing problem solving skills and interest in design and technology education. *International Journal of Technology and Design Education, 18*(1), 79-100. doi:10.1007/s10798-006-9011-3

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook.* Beverly Hills, CA: Sage Publications.

Miller, R. (2010). *Experiential education*. Retrieved from http://www.pathsoflearning.net/

Minter, R. L. (2011). The learning theory jungle. *Journal of College Teaching and Learning (TLC), 8*(6), 7-16.

Modan, N. (2020). *Fast forward: Is it time for project-based curriculum to replace traditional model?* Retrieved from https://www.k12dive.com/news/fast-forward-is-it-time-for-project-based-curriculum-to-replace-traditiona/582088/

Neo, M., & Neo, T. (2010). Students' perceptions in developing a multimedia project within a constructivist learning environment: A Malaysian experience. *The Turkish Online Journal of Educational Technology, 9,* 176-184. Retrieved from https://files.eric.ed.gov/fulltext/EJ875781.pdf

Neto, M. (2015). Educational motivation meets Maslow: Self-actualisation as contextual driver. *Journal of Student Engagement: Education Matters, 5*(1), 18-27.

Olson, J. (2008). *A literary review of engaged learning and strategies that can be used in planning and implementing instruction that engages students in the learning process*. Retrieved from https://www.uwstout.edu/lib/thesis/2008/2008olsonj.pdf

Papanikolaou, K., & Boubouka, M. (2010). Promoting collaboration in a project-based e-learning context. *Journal of Research on Technology in Education, 43*(2), 135-155.

Partnership for 21st Century Skills. (2003). *The road to 21st century learning: A policymakers' guide to 21st century skills.* Washington, DC: Author.

Pecore, J. L. (2009). *A case study of secondary educators facilitating a historical problem -based learning instructional unit* (Doctoral dissertation). Available from ProQuest Dissertations & Theses Global: The Humanities and Social Sciences Collection. (UMI No. 577403128)

Pecore, J. L. (2015). From Kilpatrick's project method to project-based learning. *International handbook of progressive education*, 155-171.

Pecore, J. L., & Bohan, C. H. (2013). Problem-based learning: Some Educators flourish and others flounder. *Curriculum and Teaching Dialogue, 14*(1), 123–126.

Peterson, C. (2008). *Project-based learning through the eyes of educators and students: Investigating opinions of PBL in adult ESL* (Master's thesis, University of Victoria). Retrieved from http://hdl.handle.net/1828/1114

Piaget, J. (1952). *The origins of intelligence in children.* New York, NY: International Universities Press.

Pierrakos, O., Zilberberg, A., & Anderson, R. (2010). Understanding undergraduate research experiences through the lens of problem-based learning: Implications for curriculum translation. *Interdisciplinary Journal of Problem-Based Learning, 4*(2), 35-62. Retrieved from https://scholarworks.iu.edu/journals/index.php/ijpbl/article/view/28238

Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education, 93*(3), 223-231. Retrieved from https://onlinelibrary.wiley.com/doi/10.1002/j.2168-9830.2004.tb00809.x

Prince, M., & Felder, R. (2007). The many faces of inductive teaching and learning. *Journal of College Science Teaching, 36*(5) 14-20.

Quaid, L. (2009, March 10). *Obama backs teacher merit pay, charter schools.* Retrieved from http://archive.boston.com/news/education/k_12/articles/2009/03/11/obama_backs_teacher_merit_pay_and_charter_schools/

Resta, P., & Laferrière, T. (2007). Technology in support of collaborative learning. *Educational Psychology Review, 19,* 65-83. doi:10.1007/s10648-007-9042-7

Roberts, T. (2003). *An interpretation of Dewey's experiential learning theory* (Opinion Paper). Retrieved from ERIC at https://files.eric.ed.gov/fulltext/ED481922.pdf

Robinson, D. (2006). *Project-based high school geometry* (Master's thesis, Louisiana State University). Retrieved from http://etd.lsu.edu/docs/available/etd-07092009-120927/unrestricted/robinsonthesis.pdf

Rubin, H. J., & Rubin, I. S. (2005). *Qualitative interviewing: The art of hearing data* (2nd ed.). Thousand Oaks, CA: SAGE Publications.

Saavedra, A. R., & Opfer, V. D. (2012). Teaching and learning 21st century skills: Lessons from the learning sciences. *A Global Cities Education Network Report. New York, Asia Society, 10*. Retrieved from https://www.opsba.org/wp-content/uploads/2021/02/RANDPaper.pdf

Sasson, I., Yehuda, I., & Malkinson, N. (2018). Fostering the skills of critical thinking and question-posing in a project-based learning environment. *Thinking Skills and Creativity, 29*, 203-212.

Scarbrough, H., & Swan, J. (2006, October 27-28). *Project work as a locus of learning: The journey through practice.* Paper presented at the Communities of Practice: A Driver for Innovation & Competitive Advantage conference, University of Durham, NC.

Schulte, P. L. (1998). A definition of constructivism. *Science Scope, 20*(3), 25–27.

Smakova, K. (2020). Promotion of self-regulated learning in project-based approach. *Bulletin of Kazakh National Women's Teacher Training University, 1*(81), 106-113. Retrieved from https://search.proquest.com/openview/f8e07f397fbf5c45ae06a68697209b18/1.pdf?pq-origsite=gscholar&cbl=18750&diss=y

Smith, M. (1995). Helping preservice Educators develop habits of inquiry: Can it be done? *Reading Research and Instruction, 45*(1), 39-68.

Sonmez, D., & Lee, H. (2003). *Problem-based learning in science.* Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.

Sutton, J., & Austin, Z. (2015). Qualitative research: Data collection, analysis, and management. *The Canadian journal of hospital pharmacy, 68*(3), 225-226.

Tally, T. (2015). *The challenges of implementing project-based learning in the 21st century classroom*. Retrieved from http://dspace.library.uvic.ca

Tam, M. (2000). Constructivism, instructional design, and technology: Implications for transforming distance learning. *Educational Technology and Society, 3*(2), 50-60.

Thomas, J. W. (1998). *Project-based learning: Overview.* Novato, CA: Buck Institute for Education.

Thomas, J. W. (2000). *A review of research on project-based learning.* Retrieved June 24, 2011, from http://www.bobpearlman.org/BestPractices/PBL_Research.pdf

Thomas, M. (2003). *Blending qualitative & quantitative research methods in theses and dissertations.* Thousand Oaks, CA: Corwin Press.

Turner, T. (2009). Piaget's structuralism. *American Anthropologist, 75,* 351-373. doi:10.1525/aa.1973.75.2.02a00010

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Wells, A. S. (2002). *When charter school policy fails. The problems of accountability and equity.* New York, NY: Educators College Press.

Wilkin, C. L. (2017). Enhancing critical thinking: Accounting students' perceptions. *Education Training, 59*(1), 15–30. https:doi.org/10.1108/ET-01-2015-0007

Wise, L. L., Harris, C. D., Koger, L. E., Bacci, E. D., Ford, J. P., Brown, D. G., ... & Coumbe, K. L. (2004). *Independent evaluation of the California high school exit examination (CAHSEE): Second biennial report.* Retrieved from https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.738.3826&rep=rep1&type=pdf

Wrigley, H. S. (1998). Knowledge in action: The promise of project-based learning. *Focus on Basics, 2*(D), 13-17.

Wurdinger, S., & Rudolph, J. (2009). A different type of success: Teaching important life skills through project-based learning. *Improving Schools*, *12*(2), 115-129.

Yin, R. K. (2003). Designing case studies. *Qualitative Research Methods*, 359-386.

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Thousand Oaks, CA: Sage.

Zastavker, Y. V., Ong, M., & Page, L. (2006, October). Women in engineering: Exploring the effects of project-based learning in a first-year undergraduate engineering program. In *Proceedings. Frontiers in Education. 36th Annual Conference* (pp. 1-6). IEEE.

Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal setting. *American Educational Research Journal*, *29*(3), 663-676.

Appendices

Appendix A: Letter to the Superintendent

December 7, 2020

LETTER TO THE SUPERINTENDENT

Superintendent
Cc: Assistant Superintendent Cc: Human Resources
Cc: Principal
[redacted] High School

RE: Permission to Conduct Research Study

I am currently a Doctoral Candidate in the Educational Leadership program at Baker University. After being approved by the [redacted] Administration to attend the High Tech High Fall Workshop in October 2019, I was inspired to conduct a study about the perceptions of Project-Based Learning as a viable instructional methodology. This research study will conduct interviews with secondary school educators regarding the impact of Project-Based Learning on student achievement, engagement, and equity.

The purpose of this letter is to request permission to a focus group of five to seven educators at the high school. With your permission, the focus group will be conducted electronically via Zoom along with an email invitation to the prospective participants. The participants will remain anonymous at all times. No individuals will be identified in the research findings.

This research study will be approved by the Institutional Review Board of Baker University. My dissertation advisers are Dr. Harold Frye (Harold.Frye@baker.edu) and Dr. Peg Waterman (Peg.Waterman@bakeru.edu). Upon approval of my request, please sign and return the consent form on the second page of this letter. The signed form can be returned to [redacted] or TerriLRedden@stu.bakeru.edu

Sincerely,

Terri L. Redden Business/CCE Coordinator [redacted] High School

DocuSign Envelope ID: 105EB0F8-F5C7-41BA-BF9A-E385165D9854

CONSENT FORM

By signing and returning this form, I give Terri L. Redden, a doctoral candidate at Baker University, permission to conduct a research study in the [redacted] High School.

I acknowledge that Terri L. Redden may conduct a focus group via Zoom with five to seven secondary educators.

Approved By (Printed Name and Title): [redacted] Superintendent 12/15/2020

Appendix B: Letter of Invitation

Hello,

This email is an invitation for you to participate in a research study to investigate the impact of Project-Based Learning (PBL) on student achievement, engagement, and equity. Your participation will be to participate in a focus group via Zoom to gain your perspectives about PBL as a viable and effective instructional strategy. I have received approval from the Leadership Team to conduct this research study.

Your participation in this research study is voluntary and your responses are anonymous. All personal information and interview responses will remain confidential. Only the researcher and research analysts will view the individual interview responses. Your input will help to inform research on teacher perceptions about the value of PBL and how schools can effectively implement this teaching methodology.

Attached you will find a link to the electronic consent agreement and the focus group discussion script that should take approximately 45 minutes to complete. You will have the opportunity to indicate your consent to participate before proceeding with the focus group interview.

Thank you for your time and consideration.

Terri L. Redden

Doctoral Candidate, Educational Leadership, Baker (KS) University

Business/CCE Coordinator

Appendix C: Electronic Consent Form

ELECTRONIC CONSENT:

Terri L. Redden, Doctoral Candidate, Educational Leadership (Baker (KS) University)

Hello, I am conducting a research study about the impact of Project-Based Learning (PBL) on student achievement, engagement, and equity. Before you agree to participate in this study, I would like to confirm that you have read and agree to this electronic consent form and that your participation in this focus group discussion is voluntary.

Confidentiality: All information taken from the study will be coded to protect each participant's name. No names or other identifying information will be used when discussing or reporting data. Once the data has been fully analyzed it will be destroyed. Your participation in this is entirely voluntary and you may refuse to complete this study at any point during the experiment or refuse to answer any questions with which you are uncomfortable. Your responses are completely anonymous. No personal identifying information or IP addresses will be collected. Once audio recordings are coded and transcribed, they will be destroyed.

Please select your choice below. You may print a copy of this electronic consent form for your records. Checking "Yes" indicates that: You have read the entirety of this consent form: You voluntarily agree to participate in this focus group discussion; You are 18 years of age or older; and You are employed as an educator for the 2021-22 school year. Please select one of the following indicating your choice to be in this research study.

- Yes, I have read and agree to the consent form to participate in this research study.

- No, I do not consent to participate in this research study.

Appendix D: IRB Letter of Approval

Baker University Institutional Review Board

April 11th, 2022

Dear Terri Redden and Harold Frye,

The Baker University IRB has reviewed your project application and approved this project under Expedited Status Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Please be aware of the following:

1. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
2. Notify the IRB about any new investigators not named in original application.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents of the research activity.
4. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.
5. If the results of the research are used to prepare papers for publication or oral presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.
6. If this project is not completed within a year, you must renew IRB approval.

If you have any questions, please contact me at npoell@bakeru.edu or 785.594.4582.

Sincerely,

Nathan Poell, MLS
Chair, Baker University IRB

Baker University IRB Committee

Sara Crump, PhD

Nick Harris, MS

Christa Hughes, PhD

Susan Rogers, PhD

Appendix E: Focus Group Protocol Script

Secondary Charter School Educators' Perceptions of the Impact of Project-Based Learning on Student Achievement, Engagement, and Equity

SCRIPT PROTOCOL FOR FOCUS GROUP SESSION

Introductions:

Introduction of moderator. Ask participants to introduce themselves and position and number of years in education. State the purpose of the focus group.

Moderator:

This focus group is conducted to collect information regarding the perceptions of the impact of project-based learning (PBL) on student achievement, engagement, and equity. The purpose of this focus group is to obtain data on the insights and observations of PBL as a teaching methodology.

Moderator:

Thank you for agreeing to take part in this focus group via Zoom. I appreciate your willingness to participate. Your input is needed and your honest feedback is appreciated to help gather actionable information to determine the impact of PBL on student learning.

Here are a few guidelines and rules to facilitate our discussion:

1. There are no right or wrong answers. Every person's experiences and opinions are important. The expectation is to hear a wide range of opinions. Don't disparage another participant's remarks; one speaker at a time.
2. The discussion will last approximately 45 minutes. Cell phones will need to be turned off. Each participant will be given an opportunity to respond to each interview question in sequence during the conversation.

3. The focus group session will be recorded to capture everything you have to say. No one will be identified by name in my research study; participants will be identified by number only. When you respond, be sure to not mention any names; you will remain anonymous. Audio recordings will be summarized and transcribed. Summary detail can be provided once the study is complete.

Are there any questions?

Interview Questions:

Interview Question 1: Describe your students' level of engagement before PBL was implemented. Describe your students' level of engagement after PBL was implemented. What is the evidence of the level of engagement?

Interview Question 2: Describe the impact that PBL can have on students' acquisition of 21st Century skills (i.e., critical-thinking, problem-solving and collaboration). What is the evidence of the acquisition of 21st Century Skills?

Interview Question 3: Describe the effect of a PBL learning environment on the equitable treatment of students. What is the evidence of the equitable treatment of students?

Interview Question 4: Describe your observations of any differences in student academic achievement on tests while implementing PBL? What is the evidence of student academic achievement?

Additional questions:

Interview Question 5: What resources are needed to support your efforts to implement PBL?

Interview Question 6: What obstacles exist to prevent effective PBL from occurring during class?

Interview Question 7: What suggestions do you have to improve the effectiveness of PBL?

Interview Question 8: Are there any other comments you would like to make at this time?

Helpful Probing Questions:

Can you talk about that more?

Help me understand what you mean?

Can you give an example?

Moderator: This concludes our focus group discussion. Thank you for your participation.

Appendix F: Focus Group Transcript

Speaker 1 [00:00:03] Good evening, everyone. My name is Miss Red in, and I'm conducting a focus group. The topic is secondary charter school educators' perceptions of the impact of project-based learning on student achievement, engagement, and equity. This focus group is conducted to collect information regarding the perceptions of the impact of project-based learning known as PBL on student achievement, engagement, and equity. The purpose of this focus group is to obtain data on the insights and observations of PBL as a teaching methodology. Thank you for taking. For agreeing to take part in this focus group via Zoom. I appreciate your willingness to participate. Your input is needed, and your honest feedback is appreciated to help gather actionable information to determine the impact of PBL on student learning. Here are a few guidelines or rules to facilitate our discussion. Number one, there are no right or wrong answers. Every person's experiences and opinions are important. The expectation is to hear a wide range of opinions. Don't despair. And though the participants remark one speaker at a time, the discussion will last approximately more or less forty-five minutes. Cell phones will need to be turned off unless you're on your phone via Zoom. Each participant will be given an opportunity to respond to each interview question in sequence during the conversation. The focus group session will be recorded to capture everything you have to say. No one will be identified by name in my research. Study participants will be identified by number only when you respond. Be sure not to mention any names. You will remain anonymous. Audio recordings will be summarized and transcribed. Summary Details can be provided once the study is complete. Are there any questions? No, thank you. Let me review the consent form for documentation purposes. Electronic consent. Hello, I am conducting a research study about the impact of project-

based learning PBL on student achievement, engagement and equity. Before you agree to participate in this study, I would like to confirm that you have read and agree to this electronic consent form and that your participation in this focus group discussion is voluntary confidentiality. All information taken from this study will be coded to protect each participant's name. No names or other identifying information will be used when discussing or reporting data. Once the data has been fully analyzed, it will be destroyed. Your participation is entirely voluntary, and you may refuse to complete the study at any point during the experiment or refuse to answer any questions with which you are uncomfortable. Your responses are completely anonymous. No personal identifying information or IP addresses will be collected. Once audio recordings are coded and transcribed, they will be destroyed. Please select your choice below. You may print a copy of this electronic consent form for your records. Checking or saying yes indicates that you have read the entirety of this consent form. You voluntarily agree to participate in this focus group, discussion your 18 years of age or older, and you are employed as a school educator for the 21-22 school year or otherwise invited as an educator. Please select one of the following indicating your choice to be in this research study participant number one. Do you agree?

Speaker 3 [00:04:35] Yes, I agree.

Speaker 1 [00:04:36] Thank you. Participant number two.

Speaker 4 [00:04:40] Do you agree

Speaker 2 [00:04:41] to? Yes, I agree.

Speaker 1 [00:04:43] Thank you. And participant number three, do you agree?

Speaker 5 [00:04:47] Yes, I agree as well.

Speaker 1 [00:04:49] Thank you. Each and every one. All right. Interview question number one. Participant number one, I want you to begin. Here's the question. Oh, hold on just a moment. Let's see who we have.

Speaker 2 [00:05:15] Hello.

Speaker 1 [00:05:23] Okay. Here is the question. Describe your students' level of engagement before project-based learning was implemented. And describe your students level of engagement after project based learning was implemented. What is the evidence of the level of engagement?

Speaker 3 [00:05:51] So our students are pretty good about being engaged for the most part, I'd say most of the time, I feel confident that we're hitting 80 percent or better engagement on most activities that we're doing. But where the project-based learning, I would say it's much closer to 95 or 100 percent. The students enjoy that and seem excited about it. You gain a lot more discussion between students, I've found, and that's part of the evidence that I have is there are more people participating in our conversations. I also see more people offering slides on like Google Slides if they're bringing a presentation that way or, you know, some of the other materials. And so that's my evidence for a higher level of engagement.

Speaker 4 [00:06:51] Thank you. Participant number two, I will read the question again. Describe your students' level of engagement before project-based learning was implemented. Describe your students' level of engagement after project-based learning was implemented. And what's the evidence? Just tell me about the level of engagement with students.

Speaker 2 [00:07:21] Probably without fear before a project-based learning, the level of engagement will probably be anywhere from maybe 30 to 40 percent to maybe 50. And sometimes it's hard to gauge because you can almost gauge maybe compliance for engagement at times, meaning that they seem to be paying attention and they're not having side conversations, et cetera, versus their engagement with one another and having those conversations about the standard, the project and the task that they have to complete versus maybe just conversations about completing a task in a non project-based learning class. And then probably the evidence would be the completed projects that they were working on versus just some problems or a worksheet or a paragraph, something like that. So ,the collaboration that it took to put the project-based learning together and then to cross curricular skills that were displayed would be the evidence.

Speaker 4 [00:08:31] Thank you so much. Okay. Participant number three. Here's the question again. Describe your students' level of engagement before project-based learning was implemented. Describe your students' level of engagement after project-based learning was implemented. What is the evidence of engagement?

Speaker 5 [00:08:53] Okay. I would say the question is kind of multi-layer for the most part. I think engagement comes in a couple of different forms, but a lot of our students prior to project based learning, it would be that DOK level one type of response. And so, it was a lot of kind of recall, it wasn't in depth. They weren't required to have an in-depth understanding of the material. And so, primarily the response is that we will see we're just kind of be maybe just regurgitating facts, so to speak. It just kind of just a lot of short answers, but project-based learning. It extends across multiple disciplines. And so,

it's not necessarily just going to be mad facts. And so, we can kind of implement science as well as social studies. I mean, so we can kind of extend across various subjects to make sure that our students are learning. And so that evidence that I will probably say would just being able to articulate give students the platform to articulate what they were taught and what they understand. And so again, deviating from a worksheet where a student just kind of answers to questions and submits it, project-based learning gives them an opportunity to kind of explain and tell and describe the steps that they took to kind of solve the problem or answer the question.

Speaker 4 [00:10:16] Thank you so much.

Speaker 1 [00:10:18] Participant number four.

Speaker 4 [00:10:20] I'm going to read the same question. Describe your students' level of engagement before project-based learning was implemented. Describe your students' level of engagement as their project-based learning was implemented. What is the evidence of the level of engagement?

Speaker 2 [00:10:42] A very major concern of mine, and that is the fact that many students are not reading and performing on grade level. And so, for those students who are having difficulties with comprehension and understanding, the project-based instruction gave them the opportunity to be more fully engaged because of their shortcomings. It also gave them more hands-on involvement in the processes that were taking place. And so, they were able to retain the information because they had actually been engaged in putting it together, whether it was individually or within a group setting where you had different students responsible for different parts of a project. And so, they tend to put a little pressure on each other to get their part done. Mm-Hmm. Very good.

Much better than that paper and pencil. True, false, multiple choice. It takes the guesswork out of the knowledge base that you want them to acquire.

Speaker 4 [00:11:57] Mm hmm. Thank you very much. Okay. Participant number five. Let me read the question again. Describe your students' level of engagement before project-based learning was implemented. Describe your students' level of engagement after project-based learning was implemented. And what is the evidence of the level of engagement?

Speaker 4 [00:12:25] That's right. I want you to go, I want you to go on based off that experience.

Speaker 2 [00:12:31] Okay, so if that's the case, then prior to have I've taught English language arts for years and so that it can become a kind of boring, dull given type of activity because it's read, read chapters, read text, answer questions, reach out to answer questions. And so, a lot of students find workarounds to that as far as using, you know, spark notes or anything else, and that connects to text and just get work done or they use their neighbors or their partners. And so, you're never able to truly evaluate what they know versus what they don't know, or if they just got answers from, you know, some web page or maybe even, for that matter. And when we do project-based learning activities, it kind of changes everything and they become almost the teachers. And I'm only just the facilitator. They're able to achieve high levels to the things that I'm asking them to do, they have to learn other tasks that are not even as intentional, such as time management and how to prioritize different things because there's usually multiple steps that are involved inside of whatever it is that I'm asking them to do. And so those are those are extra skills that they're learning on top of whatever comprehension or skill-based things

that I'm asking them to do. So, what I've seen in the classroom, it's just that they're kind of a little bit more. They have a little bit more pride for whatever it is that they turn in because they've had a little bit more buy in to it. But also the level of understanding that I'm able to get from them or able to see is much better. It's higher and they're able to do more complex tasks. And with the things that I'm asking them to do, and like I said again, they're kind of proud of it at the end because it's something that they've put a little bit more effort into showing outcomes.

Speaker 4 [00:14:50] Thank you very much. Okay, we're moving on to the next question. I'm going to start with participant number one. Here's the question. Describe the impact of project-based learning that project-based learning can have on students' acquisition of 21st Century Skills. And those are critical-thinking, problem-solving and collaboration. What is the evidence of the acquisition of the 21st Century Skills? Participant number one.

Speaker 3 [00:15:24] I think that project-based learning does a lot in a small package. What you'll see is acquisition of lots of different skills, teamwork, and collaboration. You'll also see the critical thinking skills when you give them a project and put students to work on solving a problem or researching a topic that they are completely unfamiliar with. You know, they're doing the work and they're sharing with one another that work as they do it. So, it's something where it's a combined effort. You know, you're gaining knowledge from your peers. And I feel that with students, maybe that's a little more comfortable. You know, it's not that you have the talking heads, it's just passing information over to you. And if you're not really interested, you might point that in whereas you know, when the onus is on the student and on the group, you know they're

more willing to listen when it comes from somebody who's you know, their age like, then it's not a teacher that's 20 to 30 more years older than them sharing that information. I think one of the big benefits is that, you know, they create a product out of project-based learning, and that is definitely part of the 21st Century Skills that you're making something. It's not just, you know, you're writing answers on the test or you're answering questions on a worksheet. It's something that they connect to. Much better evidence for that is, you know, for me, incidental teaching social studies this year. It's the conversations that I overhear because they're working on a project, you know, the things that they're asking each other. There's a direct link. It leads to a lot of discussion, which is, I think the heart of social studies is we're talking about tough issues and they're looking for solutions to problems, you know, not only in a historical context, but we can relate it to today. What is it that we're learning from this event that happened before that? Now we can apply today and we can see why things are happening the way they are now, and what can we do to change that narrative for the future?

Speaker 4 [00:17:48] Thank you. Very good. Participant number two, let me reread the question describe the impact that PBL has on students' acquisition of 21st Century Skills, critical-thinking, problem-solving and collaboration. What is the evidence of the acquisition of the 21st century skills? Participant number two.

Speaker 2 [00:18:15] I think a lot of the 21st century skills are learned or sharpened through project-based learning through the collaboration that's needed just to think through a project. The ability to problem solve, understand that you're working towards a shared goal and being able to compromise at times. I think all of those are our key skills that are needed. When you start talking about 21st Century Skills because things change

so fast, we have to be adaptable, and you have to be able to quickly come up with solutions to possible challenges. And those are skills that carry over. So, it becomes quite important to really develop those skills so that you are ready for those challenges later on.

Speaker 4 [00:19:16] Thank you very much. Participant number three. Here's the question again. Describe the impact the PBL can have on students' acquisition of 21st Century Skills, critical-thinking, problem-solving and collaboration. What is the evidence of the acquisition of the 21st Century Skills?

Speaker 5 [00:19:39] I believe participant one pretty much summed it up, but I'll just add a little bit that for the most part. Project-based learning teaches collaboration that teaches students to work as a team to rely on others for a common goal, and so typically instruction is kind individualized, and so probably project-based learning gives kids opportunity to connect and collaborate with their peers. And I would just say the evidence from it is everyone playing their part in then some accountability in terms of was able to be produced, was able to be presented to the class. And so, it pretty much gives us the opportunity to know that unless they're going to work in an office or a cubicle, and this is kind of what the real world looks like in the sense of relying on a team mate or relying on their peer to produce a project work to produce that goal.

Speaker 4 [00:20:39] Thank you so much. Participant number four, I'll reread the question, describe the impact that project-based learning can have on students' acquisition of 21st century skills, for example, critical-thinking, problem-solving, and collaboration. What is the evidence of the acquisition of the 21st century skills?

Speaker 1 [00:21:01] Number four.

Speaker 2 [00:21:04] I think the student success itself when you look at the number of students who are not successful with the traditional delivery of instruction, when you change the pattern for many of those students who are deficit in skills, they can become successful even though they may not be able to verbalize it or put it on paper. But they can do it because they're good with their hands. And if there's a project involved, everybody has responsibility. So, you're looking at critical thinking, collaboration, teamwork, all of those things are going to come into place with project-based instruction, which will be helpful for those young people once they get out into the real world and those skills will be necessary on the job.

Speaker 4 [00:22:04] Okay, participant number five. Same question. Describe the impact the project-based learning can have on the acquisition of 21st century skills, critical-thinking, problem-solving, and collaboration. What is the evidence of the acquisition of 21st century skills?

Speaker 2 [00:22:24] Yeah, the only thing that I would add is that as you continue to do this, it's a lot less you have to do in the classroom. The evidence, I would say, being that you're able to give another project an additional task and they're able to complete it without a lot from you because they've learned all these skills, they've learned all these different 21st century skills. So, they're able to they're able to do all these things now on their own versus just the beginning. There's a lot of questioning. There's a lot of asking for clarification, type, things going on. But once they continue to do this, they start to kind of pick up on the patterns and understand how to work best with other people or how to find answers to things themselves, which is similar to what they would be asked to do in the workplace. You know, you get a little bit of help when you first get on a new

job, but after a while, people expect you to figure out a lot of things on your own. So that's the evidence of what I'm able to see.

Speaker 1 [00:23:37] Very good. Thank you so much.

Speaker 4 [00:23:40] Okay, question number three. Describe the effect of project-based learning environment on the equitable treatment of students. What is the evidence of the equitable treatment of students? Participant number one.

Speaker 3 [00:24:01] I think that the big thing that I see as far as equity goes with project-based learning is it plays to an individual's skill set. A good group will find people to do certain roles and those roles know align with what a kid's good at. When the other participant talked about deficits, you know, not everybody is a great public speaker. Everyone is very artistic and good at the creation of posters or, you know, presentations and things like that. And by giving, you know, giving that project to a group of people know they're able to find that they're able to find something that they can contribute and make it better for the whole because they're able to do that. And when I see that, where I see that is higher levels of engagement, you have students that want to participate. They want and do seem to acquire that information. When you talk to students about it, it's not that we just did that one part. It's, you know, that was the part they did. That's what they learn. The whole thing, you know, is the whole group holding it together.

Speaker 4 [00:25:23] Mm-Hmm. Thank you very much.

Speaker 1 [00:25:26] Participant number two, I'll read the question.

Speaker 4 [00:25:28] Describe the effect a project-based learning environment on the equitable treatment of students. What is the evidence of the equitable treatment of students?

Speaker 2 [00:25:43] Okay, and maybe I just want to make sure I understand the question completely, could you explain equitable treatment? In what sense?

Speaker 4 [00:25:53] Focusing on providing student equity through the project-based learning experience where we may overlook it because of a student deficit. Does that project-based learning help provide equity?

Speaker 2 [00:26:20] Okay.

Speaker 4 [00:26:20] In the learning process.

Speaker 2 [00:26:22] Right? Okay. So, I would agree. I would say that yes, it does, because it does allow for the participants or the members in that group to play to their strengths. And even if it's an area that they may not be strong enough, they will learn from the exposure of what the others are doing. So, it also provides a great learning environment to help shore up some of those deficits that they may not feel strong in, just by working in the group and being exposed to someone else working on an area of their weekend. So, I do believe it does provide equitable treatment and also provides a lot more confidence to all the participants, regardless of what their role is, because they all had a hand in producing that final product and they all they will receive the whatever that prize is, whether it's a good grade, whether it was something they had to present, and then they received great reviews on it. So, they all benefit from it regardless of what their role.

Speaker 4 [00:27:30] That's very good. Thank you. And I'm glad you asked for a clarification. Thank you. Okay, participant number three. Same question. Describe the effect of project-based learning environment on the equitable treatment of students? What is the evidence of the equitable treatment of students?

Speaker 5 [00:27:52] I would say that it would kind of be mixed in terms of its benefits. I believe that there are instances where some students, you know, they join a group or they're assigned a group and they still don't participate, you know, they still rely on others to do all the work they or some of them. It's just some kids just have dominant personalities and they take charge and they don't necessarily rely on the group to complete the project. However, I do know that standardized tests have definitely been something that we kind of don't use that as one indicator to measure students' abilities. And so, we're project-based learning kind of mitigates relying on the standardized assessment, and it allows kids to really demonstrate other means of knowledge. And so, I believe like that the equity will come in from giving kids an opportunity to demonstrate be a more. They demonstrate their mastery of a skill outside of just one assessment. And so, I believe in with the right teacher in the right environment, it can definitely be beneficial to kids.

Speaker 4 [00:28:59] Very good. Thank you so much. OK, number four, here is the same question. Describe the effect of PBL learning environment on the equitable treatment of students. What is the evidence of the equitable treatment of students?

Speaker 2 [00:29:18] Because of the fact that project-based learning does involve more than one student and those students are going to be grouped according to various achievement levels so that those students who have the most difficulty in class can be

successful. Everybody just can't do the pen and paper and a rote remembering. We've depended on that for so long, and it's not to the benefit of many students of the educational system has some shortcomings in regards to who is successful and who is not. And so, when we do project-based learning, it gives those students who maybe wouldn't even normally participate the chance to participate and not be shy about it. To be a part of a group once they get out into the workforce, they can take those skills with them in regard to critical thinking of working in teams, taking care of responsibility, individually being a self-starter. So, it gives them a structure and a foundation for other things. And I apologize. I maybe said on Monday where that's all right. That's all about making sure that our students are becoming more successful, and the traditional methods are not working for so many of our students that we have to try something new. Project-based learning is one of those initiatives where you can actually see the results of what you're doing. The kids can feel good about themselves and see some level of success, which may help them in the long run. You know, a lot of people don't want to do projects because of the time it takes, but at the same time, those projects are assuring that somebody in that class passes. That may not have in normal circumstances.

Speaker 4 [00:31:35] Thank you very much. All right. Number five, I will read the question describe the extent of PBL learning environment. Equitable treatment of students. What is the evidence of the equitable treatment of students? Number five.

Speaker 2 [00:31:59] Oh, sorry about that. Oh, that's a struggle, I think. I struggle, I think, a little bit with the wording, maybe, but I do know what you mean. I think it depends; I'm sure there are group of students and families out there that feel like it's not equitable because, you know, it's worth, I think, for some student. And so it depends on

the teacher, depends on the assignment. It depends on the task within that project. The projects do require them to work with other people, and so that may not feel as equitable as the projects that they do that are on their own. So kind of struggle with that answer, to be honest. I do. I do see how. Just finding a different way to do something is much equity as far as weight due to the same and as far as understanding whatever skill that you're working on. And so, I do think that it provides another avenue to get there. But I do struggle with the equity part, and I don't know why. Maybe I don't know. Maybe I'm thinking too hard about it, but I think it's valuable as what I'll say, and I do see where there are certain students that do better on projects, whether they're independent or collaborative than others. But I think that it maybe it depends on the task or depends on the group of students. Perhaps. OK, I'm just going to stop talking.

Speaker 4 [00:33:47] No, that's valid. That's very good. Thank you. Okay. Let me go to the next question. Participant number one, what are your observations of any differences in student academic achievement on test while implementing project-based learning? What is the evidence of student academic achievement? Number one.

Speaker 3 [00:34:16] In the times that I've used PBL versus not use PBL, a whole lot of difference in testing a lot of times when I use PBL. You know what they're creating in their project. And so what I do see is, you know, you will still include questions on maybe a quarter final or something like that that would come from the unit that I would do a piece on. And the students by and large showed success there. It was something where they were still scoring higher on those questions, even though we didn't do a reading or a study guide where they would have gotten those questions initially. I think incidentally, you know, again, the evidence that I see with acquisition is that the students

are talking more about it, they're asking more questions. They're connecting. We'll get to something later that relates back to something that we studied as part of that PBL. And so the knowledge seems to stay with them. And so for me, that's evidentiary, you know, more so than test scores.

Speaker 4 [00:35:38] Okay, thank you. Participant number two the same question. What are your observations of any differences in student academic achievement on tests while implementing project-based learning? What is the evidence of student academic achievement? Number two.

Speaker 2 [00:36:01] So I think when you say test, it was kind of like what participant number one stated. The completion of that project would serve as their summative for that year, that area. So in that respect, I think more students were able to pass it because they understood and were able to apply and demonstrate that knowledge versus just having to be able to remember some definitions or regurgitate some lower level understandings. And so a lot of kids don't test well, so on the standardized type test that the scores would not be as high versus project-based learning where they would complete the project or the test and be able to demonstrate how they understood to apply it.

Speaker 4 [00:37:05] Yes. That was the nature of the question to be asked. Thank you very much. Number two, that was the purpose of that question. There are students who struggled on struggle on standardized tests and the project-based learning in and of itself. The final project is just another way to test the student's skills. So, thank you. Okay, number three, I will read the question. What are your observations of any differences in student academic achievement on tests while implementing project-based learning? What is the evidence of student academic achievement? Number three.

Speaker 5 [00:37:53] So I guess my response will be to part, the very first thing is the student engagement. You can visually see students be more, become more engaged doing project-based learning then than they were if they were just taking a simple assessment or just a simple worksheet. And so that's the first part. As I'm reflecting, I'm just thinking that project-based learning is beneficial. I mean, this is beneficial to the teacher as much as it is the students. And so, what I mean by that is teachers can actually assess and they can actually go around and determine where are the gaps? What's not being understood? What do I need to clarify to teach? And so for me, that plays a part in the instruction because of achievement as a whole, primarily because teachers are now able to not necessarily assign a worksheet and say you need to do this. There is no dialog. Teachers aren't equipped with the skills to provide the feedback to know where they need to pivot into teaching. So, project-based learning kind of gives the educators an opportunity to see specifically where those gaps are, and they can adjust and make those adjustments. They can alter their instruction as they need to or on the fly.

Speaker 4 [00:39:12] Thank you very much. Number four, same question. Let me read it again. What are your observations of any differences in student academic achievement on tests while implementing project-based learning? What is the evidence of student academic achievement?

Speaker 2 [00:39:35] It provides an alternative assessment where we normally depend on regurgitation of information and facts. This leads to, I think, a broader understanding of whatever it is that's trying to be portrayed. For many students, I've said before they would not be successful if it were not for project-based assessments where they can do something, but they can't write it out. They have an understanding of it, but they cannot

present their understanding in written form. Or they may be confused about the wording on tests. Especially for those students who are not on grade level. How can you give a student a test is written on a 10th grade level and they're writing and understanding on a seventh and eighth grade level? They don't match. And so those students are set up for failure from the beginning, especially if we just we teach one way and we assess one way. We had to come up with something different for those students who are struggling the most. Those who have everything in place will be successful no matter what. But on the other hand, that I want to say that 40 percent tend not to graduate. They get left behind because nothing has changed for them in the classroom, teachers are doing things the same way that they did 25 to 30 years ago using those same old lesson plans. Well, we're dealing with the 21st century and the demands of the jobs are asking for more. And so in order to prepare our kids for the workforce, we have to do more education. Right. And we just can't hold on to what worked for us 50 and 60 years ago. It doesn't work in the 21st century, so we have to step up to the times, even though it may take some more initiative and incentive on our part. But if we're going to be successful educators, if we're not a part of the solution, then we are part of the problem. We don't want to do things different. Our kids require different methods of teaching because they learn different. The issues that they are confronted with are much more compound than what we dealt with 50 and 60 years ago. I'm aging myself. I'm sorry.

Speaker 4 [00:42:30] No, that's all right.

Speaker 2 [00:42:32] But it is…it is different. And we're all about seeing success in our students, and so if we're about the business of actually pushing and pulling because some kids we have to pull, we don't push with them. And those are the most challenging

students, right? And so, I think as an educator, that was my major focus. Those kids that we're losing. What do we do to get them more actively engaged in the learning process? And what systems do we have in place? Project-based learning has proven to be one of them. The research shows that those kids that had problems with comprehension and understanding tend to do better if they worked in a group and it motivated them.

Speaker 4 [00:43:32] Thank you so much. Okay, number five, I'll read the question. What are your observations of any differences in student academic achievement on tests while implementing project-based learning? What is the evidence of academic achievement?

Speaker 2 [00:43:54] I agree with everything that's been said just as far as whether, depending on whether the test is is is in the safe. If the test, if it's a test, it's also project-based, or that the project-based learning assessment was the test. I see great, great results. If I give a test that is strictly, you know, old school, here are the 20 questions. Answer them, it can be a struggle. I don't always see the transference sometimes. And the one thing that frustrates me the most is I do have kids that will do great, and I know they've learned more. And they can do exactly what I'm asking them to do on the project side. But when they get the test, it's something that's similar to a state assessment or even a unit assessment that comes from the book, that transference isn't always there for some kids. It's great for some kids. And I think it goes back to everything. Everyone said here is that sometimes it's not. I t's on grade level versus what they've been doing in classes that has been geared more towards them or more towards some finite skills that I know that they need to work on to get to the place where they can work on some of the higher-level thinking skills or the higher skill sets that are asked in class. So, I would in a

wonderful world, we'd move to a project-based style, traditional type of testing and everything that we do, you know, even graduating from high school and, you know, different types of things. But it's when they still have to take the unit tests from the textbook. It's like if the switch turns off for some of them and they can turn in remarkable things, you know, but I don't always get the same interest, the same enthusiasm to take that regular pencil paper test and that that I that they have for their projects. And like I said, it doesn't matter if the projects independent or collaborative in nature, I can always get something better out of them. Know the evidence, if I had to put them side by side, I would almost unfortunately say that probably 30 percent of my students transfer adequately, the things that I've learned and project-based learning to the paper pencil style of test. So that's unfortunate, but it is the truth.

Speaker 4 [00:46:44] That's the truth and that's a dilemma. Yes, thank you. Hey, quickly, I want to do a quick follow up question with you all. Just really quick. And it's going to be out of order. So just get ready. Number five, I'm coming right back to you. What suggestions do you have to improve the effectiveness of project-based learning?

Speaker 2 [00:47:14] I think that we have based on what I just said, I think we have to find a way to enter to find the best of both worlds and to interweave traditional learning and standards and tests taking an assessment into project-based learning. I think some of it also is. I think we have to figure out how to raise the level of what they're doing. I'll make it quick, but I remember when I first started teaching, I thought we were doing this great project with pyramids when I was teaching elementary school, and then I take a step back and look back on that from 20 some years ago. We just did a really great art project, but there were no standards that we really touched on. So, I think that the thing

that we could do that's best is to be intentional about what we're teaching to figure out what our end is before we start. What are the objectives of this of this project before we start it versus just doing something? What are they going to learn and what are they supposed to be able to do, not just build a pyramid, but what are they supposed to come away with? That would be just as valuable as and reading the entire unit over this chapter. So, I think that's the part that people kind of me included can sometimes veer off into, and you end up spending two and three weeks on projects when you could have, you know, any take up a lot of class time. And then it's still we still don't have the value of that project is at its highest point. So, I think it's the intentionality I think is crucial and it's a lot of work to be intentional about. What we're asking is graduating. So yeah, that's what I think we needed to change. I think we just need more professional development over it. More experts to teach teachers how to do it, what it should look like. It's had a great it, all that stuff, because even the grading of some of that can be obscure and people steer clear from it because it just seems like it's too much. So, I just think of those things, the intentionality, more touch points as far as how to do it and then how to properly assess would be phenomenal.

Speaker 4 [00:49:48] That is so good. Participant number one. What obstacles exist to prevent effective project-based learning from occurring during class? Just walk away from what obstacles do you have?

Speaker 3 [00:50:10] I think the biggest obstacle that I see is time. You know, that's always big one, and I'm going to show off what participant have said. You have to balance that use of class time. And when you have assessments that are tied to the things

that you teach, that becomes even more crucial because suddenly you've got all these things you're supposed to teach in a given period of time. And I think that scares people away from PBL. I think that, yeah, it's something where I've got to get this in. And if I spend two weeks on this one, I could have spent three days on this. It doesn't seem like a fair exchange to a lot of people. I think again, that comes back to your professional development, you know, being intentional with it and, you know, teaching people how to maximize those gains with that time. You know, how can you broaden the project? So, it's covering maybe multiple things so that they're getting all the information they need in order to attack those tests while also, you know, doing it a PBL way that's going to make it more interesting and engaging for students.

Speaker 4 [00:51:22] Hmm. Thank you so much. Real quick. I just want to have participants two and four. If you would like to share any other comments at this time about project-based learning at all.

Speaker 2 [00:51:43] Well, I think that one of the key things that we had to keep in mind when we're doing those project-based assessments is that we're also looking at the standards that those students are going to be tested over once the standardized tests are giving in the spring of the year.

Speaker 2 [00:52:10] Very important. Crucially important, very important is that are going to be tested over are covered. Yes. You know, you cannot handle a standardized test if you haven't been taught the material that's on it. Mm hmm. So, to make sure that you're not just doing projects to assure that those students who have deficiencies will pass, but also that the standards that they would have to meet. On those standardized tests that will come up that that they are where they need to be.

Speaker 4 [00:52:44] Hmm. Thank you. And any additional closing comments.

Speaker 2 [00:52:50] Now I think I mean, everybody else has hit upon it, I think, and a lot of that boils down to the training that's provided before it's even implemented to make sure that those projects are tied directly to standards and that the intentionality is there. And so, with that, you would have the transference of skills from the project to more of a standards-based type of assessment. It would be more clear. But everybody has to be on the same page and doing the same thing and speaking the same common language. So, all that boils back down to that professional development that's given on all levels to everybody that's involved to make sure it's successful.

Speaker 1 [00:53:35] Thank you so much for all your input. I appreciate you all. I'm going to close out our focus group for this evening. Thank you. And I'll follow up with each one of you soon.