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Experiences and Perceptions of Local Diocesan Catholic School Teachers Regarding the Progress of Their Implementation of Project-Based Learning in the Classroom

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Abstract

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by

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MA, Cleveland State University, 2000

BS, College of Mt. St. Joseph, 1968

Project Study Submitted in Partial Fulfillment

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Abstract

After finding research confirming that the innovative approach of project-based learning (PBL) improves 21st century education for all students, the administrators of a large local diocesan Catholic school system (LDCSS) initiated PBL implementation in their schools. The problem was that after 6 years it was not known how the teachers were experiencing and perceiving their progress with this implementation in the classrooms. The purpose of this basic qualitative study was to discover and understand LDCSS teachers' experiences and perceptions of their progress of PBL implementation in the classroom. The conceptual framework for the study comprised John Dewey's educational philosophy of experiential learning and Lev Vygotsky's educational philosophy of a constructivist learning environment. Data were collected through person-to-person video interviews with 12 teacher participants in Grades 6–8 from four LDCSS schools. The main research question that guided the teacher interviews focused on understanding those experiences and perceptions of teachers regarding their progress in implementing PBL in the classroom. Data were analyzed through coding to identify themes. Findings indicated that LDCSS teachers' personal and professional knowledge, experiences, beliefs, and professional support affected their experiences and perceptions of their progress of PBL implementation. These findings were used to design a professional development program that may help administrators in Catholic schools know how to support teachers in effectively implementing PBL. Implications are that effective PBL implementation may impact students' learning and preparation for success in their 21st century education, careers, and life, contributing to positive social change.

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Dedication

I dedicate this doctoral study first to my God who is the source of my strength, passion, life, ability, and "never-give-up-ness" to complete this work.

I dedicate this work also to my family who have supported me in this long journey in very loving and patient ways. I love you all so much! Thank you, Mom, for always believing in me and being my model and hero. I know you really wanted this for me, and I hope you are looking down and see I did it! Thank you, Dad, for also being my model in faith, from early on inspiring me to see the deep goodness, worth, and sacredness of all human beings. I hope you are looking down on me with pride. Thank you, my beautiful and amazing daughters, Stacy, Cheryl, and Angela, and my beautiful and amazing granddaughters, Ashley and Madison. In hard times during my work, just being with, talking with you, or thinking of you brought a deep, uplifting joy and calm to my heart. Thank you, my precious little great-grandsons Hank and Jack, for your inspiring innocence that has truly given me reassuring hugs from and glimpses of the love of my God! And thank you my dearest husband, Frank, for your never dying love, your patience through these countless hours, and for the countless delicious meals you prepared to free up time for me and keep me well-nourished on this long journey! Thanks also to my six "little sibs" for your strengthening love and prayers. I look up to you, each one of you being so uniquely inspirational to me. Butch, thank you for the many times you checked in on me to listen and to know how my work was doing. That meant so much to me. And finally, I dedicate this doctoral work to all the children, and all the families, caretakers, and educators who guide them to develop their potential and be the best learners and people possible for themselves and for our world! This work is for you!

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First, my God and my family again I want to acknowledge and thank for standing with and walking with me, inspiring me on this challenging journey. I want to further add here my in-laws, nieces and nephews, and friends. My gratitude for the blessing of family and friends as I worked through this doctorate is boundless.

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Section 1: The Problem

The Local Problem

Project-based learning (PBL) is an innovative student-centered inquiry-based instructional approach that benefits students of all learning needs for education, careers, and life in the 21st century (Boss & Larmer, 2018; Darling-Hammond et al., 2008; Larmer et al., 2015; Lee & Galindo, 2021; Wurdinger, 2018). The administration of a local diocesan Catholic school system (LDCSS) initiated PBL over 6 years ago with the goal of improving the education of their students for the 21st century through development of learning skills such as problem solving, critical thinking, collaboration, communication, and creativity. The LDCSS comprises 108 schools with 2,796 pre-K students, 23,637 Grade K–8 elementary students, and 11,886 Grade 9–12 secondary students and enrolls students from a range of city and suburban schools in the area (Superintendent, personal communication, September 7, 2022). An assistant superintendent at the time of initiation explained that the LDCSS chose PBL to meet the diocese's need to "do something different and better to prepare its students for the future" (personal communication, September 12, 2018). Since the initiation of PBL, the diocese has made professional development available for teachers, has sponsored activities, has produced newsletters, and has helped principals establish teacher coordinators in schools. The current superintendent believes it is important to shift to the student-centered instructional paradigm in PBL to improve authentic student learning (personal communication, May 17, 2019). The superintendent has hoped that the professional development in workshops and activities offered to diocesan classroom teachers each

year would catch on and that those in workshops would take the learning back to their schools and spread it to their colleagues (personal communication, May 16, 2019). The superintendent explained that the problem was the lack of understanding of how the implementation of PBL was progressing with the diocesan teachers in their classrooms because there had been no measurement or evaluation since it had been initiated over 6 years ago in the diocesan schools. For example, it was not known whether teachers were transforming their instruction, how they were applying and implementing the design and components of PBL in practice, or how students were developing new skills and learning. To address this lack of knowledge and understanding of how teachers were progressing with PBL implementation in the diocesan schools, I investigated teachers' experiences and perceptions regarding the progress of their implementation of PBL in the classrooms.

Rationale

In the modern world economy, employers and careers call for innovation, entrepreneurship, designing, research, problem solving, goal setting, and collaboration skills (Avallone, 2019; Sawchuk, 2019; Sparks, 2019; Wurdinger, 2018). Students in the 21st century need instruction that prepares them with skills based on inquiry, applying knowledge, problem solving, and creating products for addressing authentic life situations and problems (Darling-Hammond et al., 2008; Morrison et al., 2021). PBL is used to develop 21st century career and citizenship skills such as critical thinking, problem solving, creativity, and collaboration that are key abilities needed by students (Carr, 2021; Wurdinger, 2018). Implementing PBL presents unique challenges that need to be addressed, however, such as teachers needing to change dispositions and transform

their beliefs and thinking about their roles and pedagogy (Boss & Larmer, 2018; Carr, 2017; MacMath et al., 2017). In the complex nature of the PBL approach, teachers must shift to being facilitators through experiential and constructive instruction, problem solving, collaboration, diverse assessments, creativity, and authentic projects (Boss & Larmer, 2018). Further, teachers may face contextual challenges such as limited time and resources, demonstrating that effective implementation is key for PBL success (Condliffe et al., 2017). What is little known in general educational research is what strategies teachers can use and what supports teachers need to ensure effective PBL implementation. At the site of the current study, how teachers experienced and perceived PBL challenges, and what was working and not working in PBL implementation in the Catholic school setting, had not been researched.

Gathering knowledge of teachers' experiences and perceptions is essential in ensuring effective implementation of any new instructional practice (Anagun, 2018; Seidman, 2019). Anagun (2018) maintained that not knowing or understanding teachers' experiences and perceptions can hinder getting teachers the support and development they may need or may impede the sharing of strategies and successes with colleagues in their school, district, or state. Seidman (2019) stated that studying the experiences of the individuals who implement the processes of an organization is the first approach a researcher should use to investigate that organization. Patton (2015) found that knowing whether teachers are progressing in implementing a program, intervention, or activity according to its design and purpose is critical to accomplishing expected outcomes.

Patton showed that obtaining information to evaluate the progress of implementation is often of greater value than obtaining information evaluating a program's outcomes.

Investigation of LDCSS teachers' experiences and perceptions of the implementation of PBL in their classrooms may lead to knowledge and understanding of how PBL implementation is progressing in its purpose and design. I used qualitative methodology, which is appropriate for researchers interested in how people interpret and see meaning in their experiences (Merriam & Grenier, 2019; Merriam & Tisdell, 2016). Interviews with a purposeful sample of participant teachers in four diocesan elementary schools, representative of diverse diocesan demographics of city and suburbs and low and high enrollments, were used to gain information, insights, and views of teachers' regarding the progress of PBL implementation in their classrooms. Findings may lead to a better understanding of how teachers are progressing in learning and mastering the instructional pedagogy of PBL, what support or assistance they need, and what successes they have had with implementing PBL. Knowledge, understanding, and insights of an implementation can provide findings of great value (Patton, 2015). For the LDCSS of the current study, findings may help ensure achievement of their goal of educational improvement through effective implementation of PBL that can prepare students to be successful in their 21st century higher education, careers, lives, and communities.

Definition of Terms

21st century skills: Learning and innovation skills often called for by employers, parents, and others that are needed for students to succeed in 21st century education, careers, and life, which include core skills sometimes abbreviated to the 4 Cs, including

critical thinking and problem solving, creativity and innovation, communication and presentation, and collaboration and teamwork, in addition to other skills such as goal setting, time management, and digital literacy (Boss & Larmer, 2018; Larmer et al., 2015; P21 Partnership for 21st Century Learning, n.d.).

Constructivism: An educational theory that learning is an ongoing process of meaning making and constructing knowledge that involves the student building on previous experiences through active learning and hands-on discovery, that there is a social dimension in learning in which the learner engages in experiences of building knowledge with others, and that learners internalize the interpretation of their experience (Dewey, 1938; Vygotsky, 1978).

Experiential continuum: A progression of experiences in learning that promotes and moves in the direction of growth in which every experience is a moving force that takes up something that has gone before and that modifies creatively in some way the quality of that which comes after (Dewey, 1938).

Experiential learning: A learning theory that maintains there is an intimate and necessary relation between the process of experience and the education of the student, that the place and meaning of subject matter and organization lies within student experience, that there is more freedom of the individual student, and that the authority of the teacher is more effective as guiding and arranging quality experiences for the student from the side rather than controlling from above (Dewey, 1938).

Local Catholic diocese: The territory or group of Catholic churches under the jurisdiction of a bishop appointed by the pope, that is a small part of the larger system of

dioceses of a state or country, that make up the global universal Catholic Church; each local diocese may comprise its own smaller system of territories or Catholic churches called parishes, with each given over to the care of a single priest appointed by the bishop as pastor. These parishes often have their own education system of Grades Pre-K–8 elementary schools and Grades 9–12 high schools (Catholic Online, n.d.).

Local diocesan Catholic school system (LDCSS): A group of Pre-K–12 schools that may reside within, be built within, and be operated within the parishes of a local Catholic diocese. Each school in each parish follows the educational guidance and leadership of diocesan superintendents yet remains independent in its structure, operation, and governance by the pastor. Catholic schools are credentialed as charter schools that follow public school academic standards and some public-school policies in their state, yet also follow a mission of inculcating Catholic Christian beliefs and values in students for spiritual and personal growth (Catholic Online, n.d.; National Catholic Education Association, n.d.)

Project-based learning (PBL): An innovative instructional student centered pedagogy in which students learn by being guided by the teacher through sustained need-to-know inquiry; students apply learning to gain academic knowledge and develop 21st century skills through investigation and using voice and choice in producing a product in response to an authentic real-world question, problem, or challenge. PBL extends over time as a tool used iteratively involving reflection, critique, and revision of projects to engage learning, not to have the projects be the end goal (Boss & Larmer, 2018; Larmer et al., 2015; PBL Works, n.d.).

Significance of the Study

PBL is an innovative pedagogical approach that provides significant benefits for students in preparing them for success in the 21st century, yet it presents challenges for teachers that can hinder effective implementation (Boss & Larmer, 2018; Carr, 2017; Edmunds et al., 2016; MacMath et al., 2017). Research is needed to discover strategies for addressing the challenges and overcoming barriers to enable effective PBL implementation (Condliffe et al., 2017; MacMath et al., 2017). Findings from the current study may ensure implementation that can prepare students in the LDCSS with needed critical skills and rigorous learning. Results may also contribute to the limited research on educational improvement in the Catholic school context as the environment of the public school has been at the center of most school improvement research (see A. D'Agostino & Kowalski, 2018).

Research in Catholic education was sparse with few current studies. Also, I did not find research in Catholic education focusing on improving academics. There was some evidence from older studies that showed that the Catholic school educational setting uniquely impacts teachers. For example, educators must learn how to permeate a Catholic philosophy of knowledge into the content of academic disciplines (Askew, 2013; Rymarz, 2013). In a study of Catholic institutions in 62 countries, Paletta and Fiorin (2016) showed that besides mastering academic instructional skills teachers had the responsibilities to develop religious tenets and values and integrate quality academic courses and activities with the strength and priority of the school's Catholic mission and identity. Kloser et al. (2018) found that Catholic school educators experienced tensions

from expectations to teach for strong Catholic identity along with increasing pressure to prepare students academically for success in the 21st century. James (2007), Paletta and Fiorin, and Zech (2016) cited other common challenges impacting Catholic schools such as obtaining funding for teaching resources, staff enhancement, and professional development to support new educational innovations and initiatives.

In an overview of research on Catholic schools, Frabutt et al. (2013) found that although challenges have confronted Catholic education in its 200-year history, including financial struggles and enrollment declines, the emerging research on Catholic schools has targeted only broad topics such as religious instruction, history, school governance, school leadership, teacher spiritually and ethics, and school mission. Frabutt et al. concluded that researchers in Catholic education must focus not only on mission but also on factors present in world research indicating high-quality schools. S. Martin (2014) emphasized that practitioners need relevant research in the field. Although the work of the Catholic church in education globally surpasses the work of others in shaping nonpublic educational institutions, research showed that Catholic academic education has seldom been studied (T. D'Agostino & Carozza, 2019).

Knowledge and understanding of teachers' experiences and perceptions of implementing PBL may have significance for all educators and students in the LDCSS of the current study. Findings may enable teachers to learn how colleagues in their school and across the diocese are progressing in the implementation of PBL; what beliefs, attitudes, and dispositions they have; what successful strategies they are using; how they are addressing challenges; and what support they can obtain. Achieving such an

awareness may lead to helpful insights, collaboration, motivation, and encouragement for fellow teachers who may be hesitant or struggling with PBL implementation. Findings may enable diocesan administrators to gain new insight and understanding of how their teachers are progressing; what successful strategies can be shared among other educators; what challenges and barriers they can address; and what improvements and policies they can provide to support teachers in maintaining, enhancing, and sustaining effective PBL implementation. Students may be better prepared for success in higher education, careers, and life and may make valuable contributions and positive differences in their communities in the 21st century because of PBL.

Research Question

I investigated local Catholic school teachers' experiences and perceptions to discover knowledge and gain understanding of the progress of their implementation of PBL in the classrooms. One main research question (RQ) guided this investigation in obtaining rich descriptions from teachers that enabled in-depth discovery of the progress of their implementation of PBL in their classrooms: What are the experiences and perceptions of local diocesan Catholic school teachers regarding the progress of their implementation of PBL in the classroom? To guide the interviews to discover deep meaning, I also developed 12 probing questions aligned with the RQ to maintain focus on the purpose of the study (see Appendix B; Patton, 2015).

Review of the Literature

The purpose of the literature review for the current study was to reflect the research that provided the context and current state of knowledge regarding PBL and its

implementation and that supported this study's investigation of LDCSS teachers'

experiences and perceptions of their progress of implementing PBL in the classroom. I

divided the review into six sections. The first section is the introduction explaining the

purpose, organization, and nature of the review. The second section describes the

conceptual framework that supports the instructional pedagogy of PBL. The third section

describes the background and development of PBL pedagogy. The fourth section

describes the benefits and challenges of PBL pedagogy. The fifth section describes the

importance and issues of PBL implementation. The sixth section concludes the review

describing the contribution of this study to the research, the implications, a project to

follow up the study, and the summary of the review.

My strategy for conducting the review included searching the literature for

scholarly articles, studies, and reports in peer-reviewed journals, publications, and

relevant digital websites and newsfeeds. The review encompassed 196 sources, 13 of

which were seminal or landmark works, 13 of which were n.d. or reference publications,

and 25 of which were published between 6–19 years ago years due to the sparse literature

in Catholic education and in part of the area of methodology yet showing evidence of the

most recent state of knowledge on the topics. Means used in the search involved the

digital search engines of Walden Library and Google Scholar, various digital professional

websites, and platforms such as PBL Works, Edutopia, Education Week, ASCD

SmartBrief, government departments of education, and some professional digital

newsfeeds, blogs, and webinars. Key words that guided the search included *project-based*

learning, *project-based teaching*, *project approach*, *PBL development*, *school reform* and

improvement, *changes in society*, *innovative instruction*, *historical changes in society*,

education shifts and *paradigms*, *Catholic elementary schools*, *Catholic education*,

Catholic school research, *Catholic school decline*, *experiential learning*, *constructivism*,

John Dewey, *Lev Vygotsky*, and *PBL benefits, challenges, and implementation*.

 The search provided access to many sources of educational research, studies, and

articles relevant to the current study's concepts and research question seeking to know

and understand the progress of teachers' experiences of PBL implementation for the local

Catholic school site, the unique field of Catholic education, and the broader field of

public education. The search revealed a significant amount of research verifying the

value and positive impact of the innovative instructional approach of PBL, a sparse

amount of research describing effective PBL implementation strategies, a scant amount

of research addressing Catholic education concepts and issues, and no research

addressing PBL implementation in the Catholic school environment. The review reached

a saturation point in the literature for explaining and justifying the need for and the value

of this study's investigation of teachers' experiences and perceptions of their progress of

PBL implementation for the LDCSS.

 Literature synthesized in the review established the educational value, benefits,

and challenges of teachers effectively implementing PBL's student-centered and

engaging instructional approach in the classroom. Teachers are drawn to try PBL when

they read about ideas and strategies in professional journals and articles and hear personal

testimonials and experiences from their colleagues (Boss & Larmer, 2018; Larmer et al.,

2015). Districts and administrators are drawn to initiate PBL as an instructional approach

as they learn about its ability to improve student learning of academic content and important skills for educational, career, and life success, and its ability to support other progressive educational programs such as the science, technology, religion, engineering, arts, and math (STREAM) program in this study's local site (Administrator, personal communication, January 2018). State departments of education are creating strategic plans that promote instructional reform practices such as PBL that are individualized, challenging, and engaging the whole child in preparing students for the jobs of the future (Ohio Department of Education, 2018). Parents are making known their desire to see PBL in their children's schools, and Catholic parents are drawn to both Catholic and non-Catholic schools that provide not only spiritual and moral values but also innovative instructional environments that prepare their children for success in 21st century careers and life (National Catholic Education Association, and Foundations and Donors Interested in Catholic Activities, 2018).

There are a growing number of professional development books, materials, and websites that are being published to explain the what's, the why's, and the how's of PBL. The research literature showed, however, that along with progress in learning and finding evidence of PBL's benefits for school improvement, barriers remain that challenge teachers to effectively implement PBL to fully realize its benefits. There are teachers in schools such as in the LDCSS of the current study who are reluctant to shift to PBL pedagogy or who feel uncomfortable and struggle in changing their instructional approach to implement PBL (Administrative Coordinator, personal communication, August 2019). I found that little research had been conducted in the Catholic school

environment to determine factors that impact school improvement similar to research

done in public schools (see A. D'Agostino & Kowalski, 2018). Studying LDCSS

teachers' experiences of implementing PBL may lead to understanding what works and

does not work and what supports teachers to successfully address challenges of practicing

PBL in their classrooms.

In initiatives of educational innovations, teachers have a critical impact on the

learning of their students (Anagun, 2018). From results in landmark research synthesizing

over 800 meta-analyses relating to influences on student achievement, Hattie (2002)

demonstrated that teachers have a critical impact on the learning of their students. Patton

(2015) and Hamilton et al. (2022) stated that the effectiveness of a program depends on

its faithful implementation. To bring the benefits of the instructional approach of PBL

into the daily learning life of students in the classrooms, teachers are key in effective

implementation (Hamilton et al., 2022; Hattie, 2002; Patton, 2015). Although

professional development had been offered by the diocese to Catholic elementary school

teachers striving to learn and effectively implement PBL to better educate students, it was

critical to investigate their experiences and perceptions of what teachers were learning to

effectively implement the components and pedagogy of PBL after the professional

development in the classroom. The information gained in this study of representative

LDCSS teachers may enable diocesan administrators to know and understand how to

progress in and sustain effective PBL implementation for all of its teachers and may help

ensure beneficial outcomes for all of its students. This knowledge and understanding

could benefit other educators and practitioners in the field of public and Catholic

education to understand how to bring the benefits of successful PBL implementation to all students.

Conceptual Framework

Experiential Learning

To learn and master the instructional method of PBL for effective implementation, teachers should understand that its various components are based on two theoretical concepts. The frameworks of experiential learning and constructivism are the foundation of PBL. These frameworks supported the current study's investigation of local Catholic school teachers' perceptions and experiences to gain knowledge and understanding of their perceived progress and effects of implementing the instructional approach of PBL for the students in their classrooms. These frameworks also emphasize the critical role of teachers.

The first framework was experiential learning. Through teachers' effective implementation of the methods of PBL, students benefit from learning through making meaning from experience (Matriano, 2020). Dewey's (1938) educational philosophy of experience supported the current study's investigation of teacher perceptions of their progress in PBL implementation. Dewey maintained that experience is not the product of the educational process but is the beginning and thread throughout the educational process. The best and most genuine learning is grounded in experience (Dewey, 1938) and guided by the teacher to apply to real-world problem solving (Wurdinger, 2018). Over 100 years ago, Dewey promoted a progressive pedagogy of knowledge believing that authentic and active learning by doing facilitated by teachers' purposeful instruction

would have a stronger effect on children than traditional passive learning in traditional classroom settings (M. Williams, 2017). This progressive pedagogy informs the teaching and learning processes and describes a key value of project-based learning in 21st century schools. Dewey (1938) emphasized that there is a "fundamental unity in the idea that there is an intimate and necessary relation between the process of actual experience and education" (p. 20). Dewey (1897) believed that educational experience must be an experiential continuum, "a continuing reconstruction of experience" (p. 13). Dewey (1938) maintained that the teacher as the mature adult is responsible for guiding and helping the child in constructing and reconstructing the experiences for the desired learning. Experiential learning provided a foundation for learning and understanding the instructional approach of PBL and its benefits for students in the 21st century.

Constructivism

The second theoretical framework of this study was constructivism. Through teachers effectively implementing the experiential methods of PBL in a social environment, students benefit from constructing their own learning (Matriano, 2020). Dewey's (1938) continuum of experience was a foundation principle linked with constructivist learning. Dewey believed that an effective educational process was not only a succession of isolated studies such as reading, then literature, then science, but a continual reconstruction of experience connecting the subjects. More of a model of how learning takes place than a theory (Akpan & Beard, 2016; Senier, 2022), constructivism is also a strong framework to demonstrate the capacity of PBL to be an effective approach for instruction and learning.

Vygotsky (1986) articulated the importance of the learning environment in constructivism, emphasizing that creating an environment in which learning can occur is vital. Vygotsky (1978, as cited in Darling-Hammond et al., 2008; Senier, 2022) maintained that social relationships are essential to learning, with the process of humans relating to each other being the real source of human intellectual processes such as thinking, reasoning, creating, problem solving, and analyzing. Vygotsky (1978) found that children created learning in a social environment of experiences and interaction with those around them, with meaningful learning for a child passing through another person even in play. Through a childhood of experiencing a context of supportive care and nurture of family and community, Vygotsky believed children are early on active participants in their own learning. Vygotsky (1986) also echoed Dewey's theories of experience in pointing out that children need personal experience to attain richness of content understanding and that direct teaching of concepts results in "fruitless parrotlike repetition of words" (p. 150). Each concept that a child learns is then the beginning of the construction of a new concept, connecting back to Dewey's theory of optimal learning being an experiential continuum.

In the PBL learning environment, students construct their learning as they move through student-centered collaboration, research, problem solving, communication, and creativity of completing an authentic project in social interaction in a learning community. Students come to acquire knowledge and understanding through progressively gathering their experiences for this process (Stubbs & Myers, 2016; Zang et al., 2022). Constructivist theory maintains that students are active agents in their own

learning process, involving the critical thinking of repeated analysis, synthesis, action, and reflection (Hasni et al, 2016). Constructivism supports the PBL learning process of students moving along in their learning of both the content and the skills needed to design the product or solution, in which they construct new ideas learned considering their previous knowledge and experiences, a process well suited to students of all abilities (Akpan, 2016; Zang et al., 2022).

Teacher Role in Constructivism and Experiential Learning

Key to connecting experiential learning and a constructive learning environment that benefits students is the teacher. Vygotsky (1986) noted the sensitive role of the teacher in leading children through levels of experience and development, known as the zone of proximal development. Dewey (1938) made clear that the construction of learning occurs though integration of the experience of students and the environment, in which the guidance and planning skills of the teacher are vital, skills that characterize a critical facilitating position for teachers. In an elementary school setting, bringing an expertise of content and skills and a focus on developing an awareness of the needs and interest of every child, Dewey believed the ideal teacher creates a classroom culture that facilitates children reaching their potential. For teachers to construct meaningful experiences and to skillfully lead their students in a continuum of learning, Hattie (2002, 2009) pointed to the importance of teachers being aware of their students' thinking and knowing. As this construction progresses, a skilled teacher makes certain that students can learn and relearn in a safe environment in which students can take risks and make mistakes as they progress.

A facilitating teacher uses methods framed in authentic experiences that guide students in construction of fruitful learning, which becomes the foundation for constructing the next learning. Dewey (1916) espoused the importance of the teacher keeping alive in students a continual internal interest to create and construct rather than achieving an external goal of perfection such as a high grade. The need for teachers to master these skills provides the basis for requiring teachers to shift to a facilitator role, an essential element in effectively implementing the pedagogy of PBL (Cooper & Murphy, 2021; Larmer et al., 2021). Understanding teachers' experiences and perceptions of their progress in this vital role in PBL implementation was part of the purpose of the current study.

Background of PBL

PBL is an innovative instructional approach in which students learn content and skills through projects facilitated by the teacher, who engages students in the active process of completing complex tasks that result in authentic products or events addressing real-life issues, problems, and situations (Cooper & Murphy, 2021; Darling-Hammond et al., 2008). Roots of the project approach can be seen in 16th century Italian art schools that used a model of *progetti* (projects), a teaching and learning approach of actively problem solving by applying knowledge rather than only listening passively to take it in (Larmer et al., 2015). This was the first known use of the term "project" to signify a process of teaching and learning through creative solutions for design challenges and problems.

In the 16th and 17th centuries of the agrarian rural economy of early American society, families lived in self-sustaining farming communities. Americans' lifestyles included manual labor to make their own clothes, food, buildings, and furniture with home-made hand tools and basic machines, with most children learning practical skills for everyday life and agricultural work, or some learning as apprentices for craftspeople in skilled labor trades (Matus, n.d.). Surpluses of local products and resources created on farms or by craftspeople were traded to generate wealth. Formal schooling was scarce and depended on location, gender, and social class, with some children attending one-room schoolhouses in the local town, learning basic numeracy and literacy and moral behavior (Educational Reforms, n.d.). Meaningful learning experiences for children happened experientially and authentically in the home, connected with daily life and work in the company of older people and each other (Darling-Hammond et al., 2008).

Through the 1700's and the 1800's American society and culture changed from an agricultural to an industrial economy. The United States benefitted from the inventions and machines automating manual labor called the industrial revolution that grew in England and Europe and resulted in many products having wide availability (Matus, n.d. & Teo, et al., (2021). Innovations transformed major industries such as textile, transportation, and communications into industrial mass manufacturing based in large factories, with America leading the world in industrialization by the 20th century (Matus, n.d.). Adults worked in assembly type jobs in the factories and in businesses with top-down hierarchical management. Requiring just the ability to follow local directions, 95% of jobs in 1900 were low-skilled (Darling-Hammond et al., 2008).

As cities grew in American society and the economy became urban and industrial, Horace Mann, a U.S. Massachusetts Representative in the 19th century, introduced and promulgated a reform of education called the "common school" movement (Matus, n.d.). Mann's goal was to establish universal public education "to turn the unruly American children into disciplined, judicious republican citizens", advancing in knowledge and skills needed for work in the growing industrial American society. Children were required to attend the public common schools, originally in small one-room centers, for the duration of the year still dictated by the agricultural seasons, learning a common curriculum of reading, writing, arithmetic, history, and geography (Matus, n.d.). Common schools grew, educating masses of children in a similar factory style environment. Teachers delivered rote learning that instilled in students predetermined knowledge and uniform skills, through regimentation, standardization, and compliance for an industrial era and replaced the experiential hands-on authentic learning of an agrarian era. The focus of education at that time was to prepare students for urban occupations and work in the growing industrial society (Zhao, 2018). Teachers themselves attended *normal* schools for training as professionals to learn common instructional methods to prepare students for the industrialized work force and culture of the United States.

With increased immigration of Catholic populations, and with common non-denominational Christianity being part of the common school curricula, Catholic bishops and parents resisted the common schools and established a separate legitimized system of schools in which Catholic children could also learn the Catholic faith (McDonald & Schultz, 2018). Catholic schools were erected within Catholic parishes and education in

Catholicism was integrated with most of the same academic curricula and teaching

methods as the public common schools.

In the 1900's technology innovations advanced the earlier industrial revolution,

and ways of producing goods and services changed again. Countries around the world

started connecting in trade and other new ways, solving new problems and developing

new products (Darling-Hammond et al., 2008). Technology developed and was used for

improving not only the economy but democracy and the military defense of the country.

Schools and teachers were pressured to expand curricula with science and math content

and the skills needed to prepare all students to be citizens contributing to both the

economy and defense. Russia's satellite innovation and launch of Sputnik in 1957 shook

America as a nation, damaging its reputation as a world leader by creating a perception of

vulnerability due to a weak education system (Kolberg et al., 2017; Mitzi et al., 2016).

Leaders in the United States government maintained that educational attainment was

intrinsic and critical to both the individual and national advancement and welfare, and

criticism grew about the state of America's educational standards and capacity to educate

all students with needed skills. Educational reforms emphasizing improved achievement

of science and math content and skills were called for to prepare students to be citizens

contributing to both the economy and defense (Kolberg et al., 2017).

Reforms to improve science and mathematics education began in 1958 with the

U.S. government creating The National Defense Education Act (NDEA) and The

National Aeronautics and Space Administration (NASA), leading to the eventual landing

of a man on the moon in 1969. The Elementary and Secondary Education Act (ESEA) of

1965 was created to improve educational quality in teaching and provide equality of access to all students. Business organizational structures changed, with jobs becoming more varied, complex, and fluid, and involving more communication and collaboration among all workers. Technology innovation played a large part in determining new types of jobs requiring higher knowledge and personal skills, replacing many industrial era factory low-skilled jobs, and dictating new lifestyles. With other world economies also developing, growing pressure impacted America's schools. Teachers experienced new demands to change instructional practices from traditions of the early industrial era to progressive practices for students to become successful in a new information-knowledge society. Mostly following an earlier industrial manufacturing style of education at that time, schools lagged in serving students' educational needs of preparation for life and success in the 20th century changing society outside of school (van Laar et al., 2017). Amidst conflicting views between traditional manufacturing industrial era methods and reports citing the need for more progressive methods, ideas began developing for reforming education to boost student achievement needed for producing citizens better prepared to strengthen the nation's economy and position in the developing global knowledge-information society.

In 1983 the U.S. received the report *A Nation at Risk* from the National Commission on Excellence in Education that had been commissioned by the U.S. Department of Education as a study to see how the quality of American education was progressing. The *Nation at Risk* report however resulted in shaking the nation again, in sending the message that American education seemed to be caught in a state of decline,

"being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people" (National Commission on Excellence in Education, 1983). The data of the report ended up heightening the government's concern that America's children were falling behind other industrial nations, putting the nation's economic future and defense in the world in peril. (Mehta, 2015). The report proclaimed that educational expectations and standards of excellence had to be raised for all students, and the diverse population of all citizens of all color and race and ethnicity had to be prepared equally to contribute to the American economy and society (Gardner, 1983). This led to several years of "back to basics" reforms and new emphasis in a movement to follow common curricular standards and high stakes testing for accountability (Garte, 2017).

Calls for reform continued, placing more pressure and responsibility on schools and teachers and the field of education to remedy lagging educational progress. Support grew in the research in the years following *Nation at Risk* maintaining that schools and educators make a considerable difference in students' educational growth and achievement. At the end of the 20th century further calls for reform described the need for more powerful learning to prepare citizens with higher knowledge and new personal skills for 21st century jobs and life success (Darling-Hammond et al, 2008). In addition to being taught what content to learn, students needed to be taught how to learn and the skills to apply the content to real-world problems.

Other concerns about the nation's economy pointed to a need for addressing concerns about student achievement scores. The International Organization for Economic Co-Operation and Development (OECD) comprising a collaboration of over 30 main

countries across the globe was established in the last decades of the 20th century to find solutions for world economic challenges for the well-being of all (OECD, n.d.). In the beginning of the 21st century to begin focusing on strengthening education across the globe the OECD developed the Programme for International Student Assessment (PISA) a triennial survey of 15-year-old students to assess not only the knowledge students learned in reading, math, and science, but also the educational skills students learned to apply this knowledge to participate and succeed in the progressing real world (Jacobson, 2019; OECD, n.d.; Schleicher, 2019). Evidence of United States student PISA 2015 test scores being lower than other countries' student test scores including Germany, Japan, and Singapore further compounded worries about the capacity of U.S. education to meet the country's social and economic needs (Jacobson, 2019). Explanations from PISA test creators pointed out that low scores on key educational skills such as problem-solving and collaboration skills assessed in the PISA tests impacted the core subject achievement of students taking the tests (OECD, n.d.; Schleicher, 2019). In the 2018 round of testing, covering 600,000 teens from 79 countries and economies, U.S. students' scores showed no improvement over the three years since the 2015 PISA (Jacobson, 2019).

Moving into the 21st century, the government enacted laws such as No Child Left Behind (NCLB) of 2002 that called for increasing accountability and competency of America's schools and its teachers for all students, and Race to the Top (RtT) of 2009 that called for new reform practices for improving teaching and learning. Colleges found that incoming students seeking enrollment had often not mastered research, writing, and oral skills, and business leaders voiced concerns that many young people seeking

employment with them were lacking basic required skills such as oral presentation,

writing, collaboration, and problem-solving skills (Sawchuck, 2019; Sparks, 2019).

Parents and stakeholders in both public and private schools demanded improvement in

educational preparation for their children to succeed in higher education and society.

America's private Catholic schools showed declining enrollment and increased

school closings (McDonald & Schultz, 2018; NCEA, 2018; Wodon, 2019).

Acknowledging the significant national enrollment decline and the need for addressing

challenges confronting Catholic education, the National Catholic Education Association

(NCEA) in collaboration with Foundations and Donors Interested in Catholic Activities

(FADICA) conducted national market research studying the state of Catholic schools.

The goal was to seek to identify parents' perceptions and priorities for their children in

the U.S that could lead to creative solutions (NCEA & FADICA, 2018; Our Mission in a

Changing World, 2018). Research included interviews of Catholic School insiders, focus

groups of choice and non-choice markets and Catholic high school students in five states,

and online survey interviews of 1,403 Catholic and non-Catholic parents of children

attending and not attending Catholic schools across the nation. In investigations of what

Catholic school characteristics had the greatest impact on influencing parents' choice of

education for their children, the NCEA-supported group of researchers found that parents

wanted a robust, modern science, technology, engineering, arts, and math (STEAM)

program, academics that encouraged individual and critical thinking and provided all

their children with the skillset required to compete in a 21st century global job market,

and a diverse learning environment with values welcoming to all. The study showed that

although Catholic parents wanted an education for their children that provided moral formation and strong religious Catholic identity values, the main driver of their choice of school now was now a quality education that provided learning and skills for higher education, careers, and 21st century success for all their students (NCEA & FADICA, 2018; Our Mission in a Changing World, 2018).

Reform ideas such as the common core standards movement grew with a shift to improving curriculum, school systems, teacher education and professional development, and to emphasizing accountability for the performance of all students in the nation (Garte, 2017). With the advancing pace of technology, the growth of the internet, and pressure for achievement in science and mathematics for all students, educational practitioners and researchers developed instructional innovations to prepare students more with success skills and dispositions that could transfer into the different careers and jobs in the 21st century. Teachers were being called upon to shift to instructional approaches with more hands-on student-centered learning such as inquiry learning, personalized learning, and a problem-solving project approach to learning, along with performance-based assessments to address the diverse needs of all students (Boss & Larmer, 2018).

Educational philosophers and theorists such as John Dewey (1938) that had been developing progressive educational theories in the 20th century promulgating more rigorous and experiential learning, blamed educational problems on an ineffective and outdated factory approach in education. In Dewey's view schools should be a place of promoting democracy and teaching citizenship, be learner-centered representing real-life

situations, and not be a place where students were passive receivers of knowledge delivered by the teacher, leaving skills such as critical thinking and authentic problem-solving by the wayside (Dewey, 1916; Duke, et al., 2021; Garte, 2017; M. Williams, 2017). Early on Dewey (1897) had lamented the loss of the home and local shop learning environment and called for ways to bring a system of experiential, engaging authentic learning back into the schools. Dewey maintained that teachers needed to change from deliverers imposing ideas, to facilitators selecting real life activities and assisting students to engage and respond to them democratically in their own voice and choice, and to see the mind as always in a continuing process of growth. Dewey spotlighted the influential role of the teacher as a member of the community with a calling of dignity, a social servant who selected the experiences which would affect the students and then guide them in their responses to grow in learning. Advancing non-traditional attitudes to learning, Dewey (1938) stated that educators should not start with knowledge that was already organized and settled but should lead students to be independent in discovering meaning in a subject area with the teacher becoming a partner in the learning process. Dewey (1897) also connected to constructivist theory and called for students to be active and engaged in their own learning, and emphasizing not just intellectual, but physical and moral growth as a key identity of an exemplary educative and democratic process.

Dewey became a respected and prominent figure in the developing voices of reform, maintaining that society needed a progressive not traditional education for its children. From his early days Dewey (1897) maintained that the center of the education process is the child, the child's activities, interests, instincts, and feelings. He promoted

the principle that community life should be core to a school, modeling the authentic democratic society children would experience, with education being a social process in the present, not an institution. With society changing and advancing so rapidly and unpredictably, Dewey saw the need for preparing children to grow into independent, self-controlled, life-long learners ready to meet any unknown future challenges with good problem-solving and decision-making skills.

Dewey's basic principles in his philosophy of experiential learning impacted the progressive ideas of other educators for effective teaching in the field of education (Mitchel et al., 2020). In 1918, William Kilpatrick a student of Dewey, published his essay *The Project Method* inspired by Dewey's view of the importance of students engaging in learning by doing, and the ability of projects to promote student motivation as they interacted with voice and choice (Larmer et al., 2015; Mitchel et al., 2020). These ideas along with society's movement towards respecting diversity and the civil rights of all children influenced the creation of the Education for all Handicapped Children Act of 1975, evolving into the Individuals with Disabilities Education Act (IDEA) of 1990, meant to ensure equal access to education services for children with disabilities. The No Child Left Behind (NCLB) Act, was reauthorized into the Every Student Succeeds Act (ESSA) in 2015. The ESSA has surpassed all other federal education bills in its commitment to equal educational opportunity and full preparation for success in college and 21st century careers to students of all races, ethnicities, and abilities. The Act reconfirms access to high-standard learning for all students and directives to educators to find best practices to accomplish this (Apkan, 2016; Darrow, 2016).

With the knowledge-information society and its changing organizational structures from the 20th century continuing into the 21st century, progressive educators called for children to learn new skills, be more independent, and be questioning lifelong learners (Cheng, 2017). Cheng stated that changes in society and the world influence educational reform and must be about "education of a different kind." In ways of educating students and training teachers reform should focus on the future, seeking to achieve higher, beyond just improving and doing better what was done before. Children faced different challenges for careers and life in the knowledge-information era, necessitating school reform from both inside and outside the educational field (Teo et al., 2021). Students would not be prepared for these challenges by just knowing a lot of facts which could be easily accessed through readily available technology but would be better prepared by deeper conceptual understanding of facts and information and how to apply that to the real world (Larmer et al. 2015).

Children's need to learn differently is also supported with research in child development. The National Academy of Science's report *How Students Learn* (Bransford et al., 2005) described principles emerging from neuroscience research that showed effective teaching can be achieved with instructional approaches such as in inquiry learning, a characteristic of project-based learning. Educational researchers and other progressive thinkers such as Vygotsky (1978) found that children developed less in rigid stages and more in fluid and individualized stages due to factors related to personal growth and interaction with the socio-cultural environment. Study findings about how learners learn have shown that children learn best when engaged in relevant, authentic,

and challenging experiences (Zhao, 2018). Research of learning and development showed that a student-centered approach brought the best learning to all (DeMink-Carthew & Olofson, 2020). The industrial era's factory-based approach to education was not effective and failed to serve the needs of 21st century students (Mohamed, 2018; Zhao, 2018). To contribute to creating new ideas and solutions for different kinds of problems in the 21st century service-oriented information society and economy all students needed to learn in changed school learning environments with new kinds of instructional approaches.

Development of PBL

With calls for educational improvement and reform in the 20th century Dewey's ideas influenced progressive instruction and learning approaches (Wraga, 2019). As teachers were urged to do less stand and deliver and one-size-fits all type instruction from the industrial age, the project approach emerged in reputation as a model for a new way of reframing teaching as coaching and leading learners in engaging in authentic and challenging projects and experiences (Zhao, 2018). Growing research demonstrated the impact of the project approach on learning both academic content and skills such as critical thinking through collaborative and real-world problem-solving, through engaging in learning by doing, and through centering on the diverse needs and potential of students (Zhao, 2018). Kilpatrick's project method emphasized the importance of student-centered experience with learning through wholehearted purposeful activity, with students expressing their ideas and choices in their schoolwork (Kilpatrick, 1918; Mitchell et al, 2020).

Due to the theories of experiential learning and constructivism he developed, Dewey is sometimes called the "father" of project-based learning (Larmer et al., (2015). Larmer et al. related however, that the instructional approach named project-based learning is known to have developed from innovative educational pedagogy in the practice of medical education of future doctors. In the 1960's at McMaster University in Canada, medical educators were influenced by Dewey's experiential and constructivist philosophy and Kilpatrick's project approach. McMaster teachers developed and initiated an experiential, constructivist method first termed problem-based learning, to combat the weak traditional learning of the clinical knowledge, skills and dispositions students needed to master for practice as effective physicians (Capraro et el., 2016; Larmer et al., 2015). In problem-based learning the medical teacher acted as a facilitator and was a practitioner already experienced in real problems the students were addressing with actual patients. Acting as a tutor and facilitator, the experienced practitioner used a guiding and scrutinizing method in interacting in problem-solving authentic medical experiences with small collaborative student teams. This method began to replace the traditional lecture method of emphasizing memorization of fragmented medical knowledge with large groups of passive student audiences. In small groups medical students learned and researched information and collaborated and applied what they learned to real life challenging medical cases. Learning was a process of problem solving for a specific patient's authentic health goal, authentically collaborating with medical colleagues, and using inquiry, critical thinking, and authentic hands-on treatment.

Learning was centered on the student doctors in training and their problem at hand, with teacher medical practitioners key in facilitating, coaching, and mentoring student doctors.

Word of the success of the McMaster Medical school instructional approach spread, and the innovation of problem-based learning as a paradigm shift in professional higher education became a movement across the world by the end of the 20th century. It reached acceptance in many medical and other professional schools such as engineering as an effective instructional pedagogy by which students acquired deeper understanding and problem-solving skills through authentic application of knowledge in the real world (Capraro et al., 2016; Larmer et al., 2015; D. Williams et al., 2020). Completing major projects was required for graduation from some early U.S. polytechnic universities (Wurdinger, 2018).

As the problem-based learning movement became a successful innovative pedagogy in higher education, it extended down into K-12 education. Differences evolved in the pedagogy mainly concerning the nature of the problem due to influences of Kilpatrick's project method. Learning through creating a purposeful project for the solution to a problem became a way to make classroom learning more authentic and practical and applying to real life, such as learning math and science and critical thinking skills in making a dress or learning English and social studies and communication skills in writing a letter to a local politician (Darling-Hammond et al., 2008). In the K-12 arena teachers sought problems that could be realistic for students and relevant to the students' world or community, around which an authentic project could be built (Boss & Larmer, 2018; Larmer et al., 2015).

Learning academic content in a new active and collaborative way under the guidance of the teacher was needed for students in the process of completing the project to solve the problem. The term project-based learning was used to describe this approach and distinguish it from problem-based learning when building or creating an authentic project was not only the goal or the solution for a problem but was also the process of learning the content and skills needed to create the project. Larmer et al. (2015) observed that the differences in teaching in a project-based approach placed more pressure on teachers to spend a considerable amount of time finding and planning challenging and authentic problems and projects and teaching students the learning skills and concepts they must master to build a project to solve a problem. In the late 20th and early 21st centuries various educators, individually or in groups in a wide and random array of K-12 schools across the country experimented with implementing PBL. They learned of its promise for accomplishing the powerful learning of content in addition to mastering success and learning skills needed for students and society in the 21st century. Reports of successful results and benefits in learning both academic content and new 21st century skills spurred research and studies of PBL to verify evidence of its effectiveness as an innovative instructional approach for reforming and improving education.

In an early landmark meta-analysis review of inclusive research on PBL Thomas (2000) showed evidence of improvement in student learning yet found a lack of a consistent definition of features and instructional design of PBL. Thomas maintained however, that although inconsistency made it difficult for practitioners to see a definitive model to guide instruction, results of his research of studies began showing a uniqueness

of five core features in real PBL. First, in PBL projects are central as both the curriculum and the teaching strategy. Second, PBL projects are focused on driving questions or problems that cause students to learn academic content through the project. Third, in PBL students engage in investigation in an inquiry process in which they construct knowledge. Fourth, students drive PBL projects through voicing their personal interest and choice as opposed to teacher-led textbook or packaged projects. Fifth, projects chosen in PBL are authentic, and meaningful, relating to real life situations, contexts, and collaboration for students.

While Dewey (1938) promulgated the principle of learning by doing through a student-centered experiential continuum of learning that influenced the development of PBL, researchers studied PBL's effects in various settings of school implementations and designs of a PBL instructional approach and made efforts to focus on its effective core elements to determine consistent descriptions of PBL. In their review of studies of problem-based and project-based learning that was effectively implemented with students in early elementary to grade 8 in mathematics and science classrooms, Merritt et al. (2017) found three core defining components of PBL. Students began the learning process with a problem, were required to learn by doing in a constructivist process, and were instructed by the teacher guiding students rather than by just conveying information. In the implementation of these three components in these studies eight design components were established: variation of problems depending on grade level; small collaborative groups; student-centered inquiry process; communication of their findings

to whole class; resources; technology; partnership with community; and teachers' role as facilitators.

In 1998 Larmer et al. began the Buck Institute of Education (BIE) leading a team of educators in conducting landmark work with efforts and narrow focus on PBL to pinpoint a pedagogical method that would be high quality. Led by staff leaders the educators considered the conceptual theories of Dewey, the project approach of Kilpatrick, the major aspects of the problem based instructional approach of the medical field, research on effectively adding projects to this approach, and research in learning sciences and other studies of PBL. BIE created its landmark deign of ideally implemented PBL labeled *Essential Project Design Elements for Gold Standard PBL* (Larmer et al., 2015).

Based on these conceptual frameworks and their findings from studies in the field, they included seven core elements in the design: first, a real-world problem or question that challenges and drives the learning with purpose; second, sustained inquiry that reinforces purpose with repeated and deep questioning about what is known, what needs to be known, how it can be known, and finding resources; third, authenticity that makes the learning experience match the real world and addresses real issues to give personal relevance and meaning; fourth, student voice and choice giving learners opportunities to make decisions, be part of a team, and develop ownership and independence; fifth, reflection that is the thinking process that is key to learning from one's experience and going deeper than surface knowledge; sixth, critique and revision, that obtain feedback through continual evaluation to responsibly grow, improve, and deepen learning; and

seventh, a public product that displays a solution to the original problem or question and demonstrates understanding of the content and skills learned to others outside the classroom (Larmer, 2018). Larmer et al., (2015) anchored the design in Dewey's philosophy emphasizing that the key component for successfully accomplishing BIE's gold standard PBL design is the teacher acting in the role of facilitator and coach which required a major shift in traditional instructional practice. The teacher must guide students through this process, giving students direct instruction when appropriate, scaffolding where needed, and formatively assessing and coaching them to assess their own progress along the way. The teacher plans incorporation of academic standards and content as goals of learning to solve the problem through the project. Gold Standard PBL was the definition and framework of PBL used for this study.

<div align="center">**Benefits of PBL Implementation**</div>

PBL Develops 21st Century Skills

Although the definition or wording of PBL varies, its core elements are consistently the target of many studies, and a body of research describes significant PBL benefits and positive outcomes. Effectively preparing students with learning skills for success in careers and life in the 21st century is a primary outcome of PBL. Students need to develop the knowledge, skills, and characteristics that will enable them to achieve success in the 21st century workplace and in the complex information-knowledge global world as active and productive citizens (Anagun, 2018; Darling-Hammond et al., 2008; Larmer et al., 2015; Marsick, 2016; Ravelle et al., 2020; Teo, 2021; Wilcox et al., 2017). Ravelle et al. (2020) maintained that skills such as critical thinking and collaboration are

key abilities developed in PBL and are 21st century career and citizenship skills needed by students.

Skills needed can be categorized into three sets: the learning and innovation skills of critical thinking, communication, collaboration, and creativity, sometimes labeled The Four C's; the digital literacy skills of information, media, and technology skills; and the life and career skills of flexibility, self-direction, social and cultural, and productivity and accountability (Anagun, 2018; Battelleforkids, 2019; Wilcox et al., 2017).

Thomas' (2000) landmark research review covering PBL from 1988–1998 examined a general definition and characteristics, implementation, and effects of PBL on students. Thomas' foundational findings demonstrated that PBL could bring about improvement in the skills of problem-solving, critical thinking, metacognitive strategies, collaboration, work habits, and attitude towards learning needed for the 21st century. Teacher comments in the studies noted how developing these skills increased self-esteem enabling students to feel empowered, and thus more productive in learning new knowledge. Condliffe (2017) conducted a later but similar meta-analysis of PBL research from 2000–2017 examining its implementation, its challenges, and its effects on student learning. Results showed that PBL supported students' development of 21st century learning competencies in the cognitive domain related to thinking skills and creativity, in the intrapersonal domain related to affective skills and self-regulation, and interpersonal skills related to collaboration and communication. Condliffe noted that much of the research of PBL found that students' attitudes towards learning were noticeably positive. In a study of primary teachers' perceptions regarding 21st century skills, Anagun (2018)

found that constructivist learning environments positively related to development of 21st century skills.

Research studies showed PBL development of 21st century skills in specific schools. MacMath et al., (2017) conducted a study of secondary school teachers' implementation of PBL in the classrooms. Qualitative data gathered from teacher focus groups and interviews showed teachers' perceptions that students improved in abilities in several intra-interpersonal skill sets over the course of a unit deemed to be 21st century competencies needed to be prepared for the modern world. Students made dramatic improvement in presentation and research skills, self-regulation, and responsibility for their own learning, working independently, confidence, critical thinking skills, application of knowledge across subject areas, collaboration and valuing feedback, and student engagement. Duke et al. (2019) conducted a study of two groups of teachers, one using PBL teaching methods and one teaching as they usually did without PBL methods, teaching Social Studies and informational reading standards to second grade students in a low SES school district. Students in the PBL group grew more in their content knowledge of Social Studies and skills in reading than the students in the comparison group. In addition, students in the PBL group grew in learning skills such as collaboration, sense-making, reflection, and creativity.

PBL Develops Deeper Learning and Understanding

Studies found students benefitted in gaining knowledge, understanding and skills for success in education through deeper learning (Boss & Larmer, 2018; Larmer et al., 2015; Marsick, 2016; Ravelle et al., 2020). The PBL processes of critical thinking,

collaboration, communication, and creativity in doing projects enabled students to go beyond traditional rote learning of concepts in a subject (Larmer et al., 2015; Marsick, 2016; Teo, 2021). In today's knowledge-based society the goal of learning cannot be storage of information through passive rote-oriented memorization and recall but should be understanding of knowledge through active engagement in strategies such as inquiry and problem solving (Darling-Hammond et al., 2008). As students are actively involved in the PBL process, Larmer et al. (2015), Boss & Larmer (2018), and van Laar (2017) found they enjoyed learning that was authentically linked to the real world, enabling them to learn concepts with deeper understanding, and develop the ability to apply that understanding in future learning and life.

Gaining achievement in learning academic content knowledge is an outcome of PBL (Boss & Larmer, 2018; Larmer et al., 2021). Impressive gains in academic achievement were found in a New American Schools Designs study of whole school reform efforts incorporating PBL in Expeditionary Learning Schools (EL) and Co-nect Schools (Thomas, 2000). In nine of 10 EL schools taking the Iowa Test of Basic Skills score increases ranged from well below average to well above district average in almost every area. Students in the eighth grade in a Boston inner-city EL school achieved the highest scores in the district on a reading test, behind a Boston exclusive school, and students in a high Hispanic and African enrollment EL school scored 11th and 17th in reading and math out of 76 elementary schools taking the same test. In Maine in an EL middle school scores in six curriculum areas increased 3 to 10 times larger than that of the state. Other school indicators such as attendance, retention, suspension, and

disciplinary problems improved. In an additional study of the EL model, results from classroom observations and teacher interviews showed that teachers increased in characteristics such as self-efficacy and beliefs in their ability to teach students with a diversity of abilities. In studies of the Co-nect schools, similar gains were reported. In a comparison study in the Tennessee Value-Added Assessment System, Co-nect schools gained almost 26% over a 2 year period in all subject areas. In addition, technology was emphasized in the Co-nect schools. Thomas (2000) pointed out it is a challenge for an instructional intervention to raise scores on standardized tests. Thomas noted that the PBL program of expeditions and projects in these two school models was successful even though it did not specifically target raising scores on standardized achievement tests or changes in other skills, behaviors, or educational factors.

PBL affects students' development of knowledge and cognitive skills (Condliffe, 2017). Design principles evolved in the PBL approach in science classrooms by incorporating student collaboration, embedded technology, creation of student artifacts, and driving questions for inquiry investigations. In Detroit public schools, researchers in the Center for Learning Technologies in Urban Schools (LeTUS) studied sixth, seventh, and eighth grade classrooms over 3 years of PBL science curricula units. LeTUS found that close to 8000 students participating made significant gains in scientific content knowledge and process skills, and outperformed nonparticipants on the state standardized tests.

In STEM schools or schools with STEM programs, such as the LDCSS of the current study, Wilson (2021) found that PBL is often the instructional approach chosen.

The approach of PBL emphasizes what students need that will prepare them with 21st century skills in a learning context that is authentic, connected, active, and strives for rigor and deep learning. Wilson conducted a study in a highly diverse low SES Australian school to examine a developing STEM PBL program, in an environment where low SES students typically had little opportunities for such programs. Findings revealed that despite challenges such as limited time, funding, and staff the school achieved success in building a culture of active and rigorous learning and strong commitment to continually work on improving its program. A 3 year study of three diverse urban STEM high schools by Capraro et al. (2016) results showed that with moderate and high quality PBL implementation students made moderate to impressive gains in achievement in math, science, and reading. Teachers also noted increased engagement of students who were typically unengaged, more meaningful, and real-world learning for students, greater student ownership of their learning, and improvement in relationships with their students.

In a review of studies Duke et al. (2016) found evidence that PBL has the potential for impacting student growth beyond the science and math subjects of STEM. Students can learn various concepts and skills across subject areas through the authentic context of PBL units. Second graders in one study learned important geography and literacy concepts in addition to graphical comprehension and persuasive writing. Second graders in another study learned more through PBL instruction than compared to traditional instruction in economics, geography, history, and civics government. On the high school level students participated in collaborative PBL learning units and scored higher on Advanced Placement (AP) tests than students in typical AP classes. Other

studies evidenced students developing literacy more rapidly and with greater motivation when engaged in writing that had a relevant and authentic purpose and interest outside of school, and that was intended for someone in the community other than the teacher to read and review.

A study by Merrit et al. (2017) found that PBL had positive effects on student achievement for preschool to Grade 8 English language learners. PBL students demonstrated higher performance than non-PBL students in control groups in 87% of the studies. PBL had a positive effect on students retaining information learned in classes, retaining knowledge better than students in the non-PBL groups in 75% of the studies. Connecting with this result was a remarkable positive effect on conceptual development. In 100% of the studies there were significant differences in students' understanding and application of science concepts. Students were better able to develop their skills to reason and apply knowledge in the PBL groups than in the control groups. Finally, Merritt et al. found that students in the PBL groups developed a better attitude about science and scientists.

PBL Addresses Needs of All Learners

As the increasing diversity in the population of the United States carries over into the classroom, meeting students' diverse needs becomes more challenging. Instruction that is all encompassing and individualized must prepare all students for success in school, work, and life in the 21st century (Bryk et al., 2017; M. Williams, 2017). Reflecting the U.S. population diversities such as ethnicity, culture, socioeconomic background (SES), gender, ability, and learning style calls for changes in effective and

responsive instructional resources (Wynter-Hoyte et al., 2017). Studies showed students of all ages, all abilities, all socio-economic status, and all ethnicities could benefit from a PBL learning environment (Boss & Larmer, 2018; Duke et al., 2021; Sormunen, 2020). The ESSA of 2015 mandated sweeping changes for assessments and student-centered innovations that could benefit and prepare all students for 21st century success including those with disabilities or any differences (Dennis, 2017; Saultz et al., 2017).

With a growing number of students needing to learn the English language, research showed schools face challenges meeting needs of English learners (EL) to develop key language and academic skills (Kemaloglu-Er, 2022; Kemaloglu-Er & Sahin, 2022; Kosar, 2021). In a study of 79 Korean students who were working to improve their English speaking and listening abilities, teachers shifted to being facilitators and used the PBL approach to strengthen students' motivation, self-efficacy, and performance in learning the English language. Students worked in groups on creating videos with role plays of applying for a job in the future, demonstrating how to make a resume and how to do an interview. Students were highly motivated to experience solving a relevant real-world problem. Through their collaboration experience of being a team and supporting each other they developed collaboration and reflection skills and strengthened self-efficacy. In addition, as a result they improved their use of and even their preference for the English language (Shin, 2018).

In a study of Catholic schools, De Paul Schmidt (2017) found that teachers were feeling concerned about how to effectively meet the challenges of responding to the needs of the students with special needs entering in the classrooms. Student-centered

pedagogies such as PBL based on Dewey's (1938) philosophy of the uniqueness of all

learners primarily influenced teacher instruction and was based on the constructivism

model in which teachers focused on students' existing knowledge and experience to make

sense of the world and real-life problem solving (Boss & Larmer, 2018; M. Williams,

2017). Such pedagogies could meet the challenges of the diversity of learners' needs.

Boss & Larmer (2018) and Wynter-Hoyte et al. (2017) showed that PBL benefitted not

just older students or academic talented students, but all students, in any grade level, with

any disability or challenge, or with any SES.

Special education students could benefit from PBL. Condliffe (2017) stated that

studies over the past several years showed that PBL compared to traditional instruction

provided an environment for special education students that was less restrictive and more

inclusive. The constructivist teaching framework of PBL is practical and student-centered

in nature, using real-life experiences and connections to aid students in building

knowledge and understanding (Senier, 2022; Zhang, 2022). In a study of teacher

perceptions of implementing PBL through a high school semester, teachers found that

decreasing time as direct instructor constantly in the front of the room freed up more time

to help struggling students (MacMath et al., 2017). In a study of fourth grade students

with disabilities in schools during an 8-week PBL curriculum, results showed that the

scores for the fourth grade students in both content and learning skills were significantly

higher after the unit than before. Researchers suggested from evidence that all students in

general education classrooms experienced added help from student-centered approaches

like PBL for their individual learning needs. Hasni et al. (2016) found in a synthesis of

articles and studies that project-based science and technology learning (PBSTL) supported benefits for students of diverse needs, including students with disabilities, low achievers, low socio-economic status (SES) and students of ethnic groups underrepresented in science careers. Using action research, a preschool teacher conducted a study of implementation of PBL in the classroom. Searching the research for a way to motivate and authentically engage the students who had a variety of special needs, including sensory processing issues, and cognitive and language delays, the teacher found evidence of the project approach as an effective pedagogy to realize the goal for the students (Alfonso, 2017).

In another action research study over a 2 year period led by a regular classroom teacher and a special education teacher, PBL developed the creativity skills of a fourth grade high achieving student and empowered a fourth grade low achieving student labeled English for Speakers of Other Languages (ESOL) to achieve in academic content (Smith, 2016). Through an extended PBL geography unit and science unit, as both students collaborated on their projects, the high achieving student who had approached learning as memorizing and taking tests changed into a learner who could solve problems and apply knowledge while still mastering content. The struggling non-reader non-speaking student with sullen and angry behavior changed into a positive happy student, flourishing in reading and language. A study in a rural New Tech Network (NTN) school showed how a teacher in the school's inclusive PBL environment created high quality projects for a student with disabilities and other students with diverse styles of learning. As the teacher kept the focus on the students and how engagement in projects could help

them learn the skills that would prepare them for life outside of school, strengths were drawn out rather than deficits being magnified (National Center for Learning Disabilities, 2017).

PBL Creates Motivation, Self-Efficacy, and Positive Attitudes and Relationships

Intrinsic motivation from students engaging in projects on real world issues relevant or important to them is often mentioned as a side benefit of PBL (Larmer et. al, 2021). Boss and Larmer (2018) stated that research verifies that student motivation, interest, and a growth mindset are heightened in schools with a PBL culture. The nature of PBL design and components that engage students in meaningful, relevant, and rigorous learning through projects brings about increases in student motivation (Larmer et al., 2015; MacMath et al., 2017). Hugerat (2016) found that with the guidance of encouraging teachers helping students construct their own knowledge, students developed positive attitudes towards the learning process, problem-solving skills, and self-esteem. Greater educational outcomes resulted from such a positive and supportive classroom environment, showing that PBL when implemented well develops more social acceptance in the collaborative work of students with their peers.

Thomas' (2000) early research review of PBL environments found evidence of students developing intra-personal attributes such as positive attitudes toward learning, improved school attendance, and self-reliance. In a case study of a sixth grade teacher initiating and implementing PBL over a 3-year span to better respond to the development of the middle school learners, Bills et al., (2018) found that PBL could be effectively incorporated into a high-stakes standards-based environment. All types of learners made

gains in their achievement, from average and academically talented students surpassing curricular and standards expectations to struggling students who made unexpected progress in reading and writing and became excited about school and learning. Condliffe's (2017) later research of studies about what and how students learned in PBL classrooms found increasing intra- and interpersonal competencies such as self-efficacy and attitudes about working collaboratively with peers of diverse backgrounds and abilities.

Another side bonus noticed by teachers in implementing PBL is the improvement of rapport and positivity in relationships between teachers and students, and among students themselves. In a 3-year qualitative study of PBL in three diverse urban schools, Capraro et al. (2016) found benefits for students that included more meaningful learning, development of a broader skill set, improved teacher relationships with students, and greater student engagement, ownership, and pride in their learning and final projects. These areas of benefits were all usual problems commonly reported in diverse urban high schools. Reports from teachers in focus groups in the study stated that students saw that they learned more than they thought they did, felt safe in learning from mistakes, and achieved higher learning when doing it themselves. In studying the implementation of PBL in two schools of the New Tech Network model, Carr (2017) found that various issues were developing, and the two schools were implementing the model at different degrees. Results showed that despite both schools following several tenets and meeting challenges of PBL implementation in the New Tech model, one school experienced more progress in PBL implementation than the other. Results revealed that both the teacher

commitment and the administrative leadership were weak and sometimes missing which impacted support needed for the development and progress of PBL for the students. Research confirms that teacher commitment is key and the most important element for impacting the effectiveness of school programs. Administrative leadership is also vital for the implementation of any program to succeed. In one school both were not providing the support and strength needed.

PBL Integrates With Other Instructional Strategies

A common misperception of PBL is that there is no place for traditional or "non-PBL" practices. In teaching with PBL pedagogy however, teachers can integrate other effective instructional tools, strategies, and programs (Larmer et al., 2021). Scaffolding is a tool or intervention to help support all students with their unique abilities and needs to progress in their learning (Boss & Larmer, 2018; Larmer et al., 2021; Wurdinger, 2018). Scaffolding in PBL can involve a variety of strategies that teachers can use to respond to students as needed, being as simple as graphic organizers or modeling, as traditional as mini-lessons or direct instruction, or more progressive techniques such as targeted videos or interviews with experts that support students in becoming motivated learners in PBL (Boss & Larmer, 2018; Larmer et al., 2015). In the process of planning and practice in PBL teachers can connect to other tools or initiatives such as Response to Instruction (RTI), Multi-Tiered Systems of Support (MTSS), Differentiated Instruction (DI), Understanding by Design (UbD), and Charlotte Danielson's Framework for Teaching (Larmer et al., 2015; Boss & Larmer, 2018). Differentiated Instruction and forms of differentiation such as RTI and MTSS for example, share some basic PBL tenets.

Students learn best through being highly active in the learning process, through connecting with personal experiences, interests, and needs, through being the center of the learning process, and through being collaborators with a teacher in a guiding and coaching role (Tomlinson, 2017).

In the understanding-based approach of UbD, McTighe and Willis (2019) noted that experiential learning that stimulates multiple senses in students is not only the most engaging form of learning but also the most likely to be stored as long-term memories. Using essential questions for sustained inquiry, cooperative learning, design thinking, solving real-world problems, and other such methods of PBL integrate with the pedagogy of UbD. Niehoff (2019) explained how several of PBL's foundational elements could give teachers a natural path to incorporate social-emotional learning (SEL). Students can deepen self-awareness through voice and choice, take responsibility for their own learning, and self-reflect on their experiences and learning in the process of the project. Students can deepen positive relationships and awareness of peers through the learning and work of collaboration. Students can also deepen awareness of the encompassing global community through the inquiry process and authentic problem-solving connected to real-world issues.

In the ongoing development of reforms and improvement of K-12 education for 21st century society and economy, emphasis has been given to develop STEM education in the elementary and high schools such as in the LDCSS of this study, encouraging students to pursue Science, Technology, Engineering and Math (STEM) majors and careers. In the search for innovative experience-based approaches that promote the

challenging constructivist higher-order thinking and deeper understanding and skills needed in STEM subjects, and that inspire interest and enable improved achievement of all K-12 students in STEM, research has found PBL to be an effective pedagogy (Hall & Miro, 2016; Owens & Hite, 2022; Tsinajinie, 2021).

In a study of PBL in four different STEM high school programs, Hall and Miro (2016) demonstrated that student learning improved in the STEM program that had the best PBL implementation with strong student-centered and interactive learning. As the STEM workplace has become more globalized, it becomes even more important that students develop 21st century skills such as communication and collaboration (Owens & Hite, 2022). In a mixed-method study Owens and Hite (2022) explored how the pedagogy of PBL could be effective globally in two fifth-grade classrooms. Findings showed that virtually collaborating globally in PBL in STEM classrooms could enable opportunities to practice PBL skills to share and understand ideas, be open to differences, and discuss scientific ideas using different images and texts. In a study that investigated the PBL program at a STEM high school Morrison et al. (2021) found that there was strong student-centered engaging learning that was promoted through the guidance and instruction of the teachers. As teachers supported students personally yet challenged them with high expectations as coaches and mentors, students learned through their projects to become "experts" in their academics and developed a wide range of learning, life, and 21st century skills and STEM competencies.

Challenges of PBL Implementation

PBL Requires Changes in Roles, Instruction, and Learning

With the host of benefits that PBL provides comes the challenges to teachers and students of making changes and shifts in roles, beliefs, and practices to realize learning benefits. For teachers, carrying out the kinds of involved tasks and inquiry approaches of PBL is more complicated than instruction through traditional methods of direct one-way delivering of knowledge through textbooks or lectures (Darling-Hammond, 2008; Grossman et al., 2019). The instructional approach of PBL is more demanding of teachers' skills, effort, and time, and entails learning new roles and methods to create the learning environment conducive to experiential and constructivist learning processes (Anagun, 2018; Grossman, et. al, 2019; Vanhala, 2018; Wurdinger, 2018). Teachers may not have developed skills in constructivist instruction methods, causing them to balk at the approach. Anagun (2018) stated that having students take more responsibility constructing their own learning requires teachers to create a conducive learning environment. In such a climate students can grow open to inquiring and investigating, engage more actively and deeply in their own learning, and feel safe to take risks and learn from mistakes. Students learn 21st century skills through the important guiding role of the teacher who designs creative ideas in authentic learning experiences that draw in students to enhance their own learning (Anagun, 2018; Wilcox et al., 2017). Anagun noted that the uncertainty that can be a part of the inquiry of a constructivist learning environment can put a strain on positive attitudes needed by teachers in their new role.

Boss and Larmer (2018) noted that instead of using traditional methods of quizzes and tests for students as passive learners of content, a primary challenge of PBL for teachers is to undertake the non-traditional role of facilitating and guiding students in an engaging inquiry process to be active learners of content learning skills. Researchers Dole et al. (2016) studied the impact on teachers' pedagogy of a summer PD course in PBL integrated with an intensive field experience of applying their new PBL knowledge and skills. With all the learning and confidence gained from the PD course, participants still found obstacles with implementation in their own classrooms. Teachers described needing to have "a leap of faith" in trying the student-centered approach of PBL, with challenges to the comfort of staying with traditional teacher-directed pedagogies. Rather than presenting knowledge as an expert with all the answers, Boss and Larmer (2018) and Larmer et al. (2021) explained that teachers build a classroom culture that supports PBL by moving to a strategy of encouraging and coaching students to question and discover the answers themselves and constructively create the knowledge more independently. Such instructional strategies also promote higher rigor in learning, resulting in higher student achievement, but depend on effective teacher implementation (Judkins et al., 2019; Vanhala, 2018).

A report of PBL capstone projects initiated for a high school senior graduation requirement relayed that teachers gradually learned that implementing effective instruction that brings students success in learning required them to think differently about how they approached their teaching. Their previous focus on tests changed to a focus on instruction, a mindset hard to convince teachers to accept (Avallone, 2019;

Sawchuk, 2019). PBL requires students to make similar changes in roles and practices in learning as well, such as taking more responsibility in managing their own learning and accountability (Chen, et. al, 2021; McCarthy, 2019; Vanhala, 2018). Chen et. al (2021) and McCarthy (2019) relayed that students who are accustomed to a passive manner of learning in which the teacher makes all the judgments and calls to determine student direction and actions in their learning must undergo a mindset change in PBL. Students with passive tendencies learn to actively engage in decision-making, using their individual choice and voice in their learning. The back and forth of teacher-student interactions in PBL requires shifts in which students move to the center of the learning path, actively and independently taking more control as learning constructors while teachers move to the side of the learning path, in more non-traditional strategies of guiding and facilitating students' learning (Condliffe, 2017). These changes can cause tensions and can challenge both teachers' and students' traditional beliefs and practices of their roles in a classroom culture of structured and direct instruction and learning (Chen et al., 2021).

In a performance-oriented environment, engaging students as individuals and as groups in applying academic content and knowledge in PBL projects requires skills students may not have regularly experienced or learned (Lutsenko, 2018). In efforts to enact the engaging skills of collaboration and independent learning, teachers can experience conflicts among students participating in PBL (Condliffe, 2017; Hussein, 2021; Vanhala, 2018). Students changing to PBL styles of learning can be individually unsettled with PBL, perceiving it as a disruption of their regular learning as opposed to an

opportunity to engage in more meaningful work (Condliffe, 2017; Vanhala, 2018). Even high-achieving students can be uncomfortable or anxious. They are used to a traditional way of just doing what they were told, just seeing the teacher as the source from which all knowledge flows, and thus find the responsibility for their own learning more challenging (Lutsenko, 2018; MacMath et al., 2017; Vanhala, 2018).

PBL Can Cause Other Pressures

Boss & Larmer (2018) noted that differences in teaching in a project-based approach places other pressures on teachers. Mentioned in many studies is the need to spend a considerable amount of time finding and planning challenging and authentic problems and teaching students the learning skills and concepts they must master to build a project to solve a problem. Condliffe (2017) found that teachers face greater responsibilities for managing the extra time and work of designing and adapting curricula, lessons, and projects to meet all their students' needs. Beyond the responsibility of managing extra time and work teachers also face the responsibility of accountability for covering the required curriculum and standards and delivering instruction that enables students to achieve high scores on exams and tests (Boss & Larmer, 2018; Dole et al., 2016).

Researchers of PBL bring evidence of improvement in student learning yet find a lack of a consistent definition of features and instructional design of PBL. This pressure of uncertainty makes it challenging for practitioners seeking research guidance to judge whether an instructional practice labeled PBL is in fact real PBL. Teachers wonder whether generalizations can be constructed to define PBL, or whether PBL is just a

different label for previous known practices such as "doing projects or experiments in hands-on activities" (Thomas, 2000).

<h2 style="text-align:center">Implementation of PBL</h2>

Research supports the strength and benefits of PBL, yet due to its challenges benefits are not always realized to the potential possible when PBL is implemented in the classroom. The problem of the LCDSS of this study was that after 6 years of initiating the innovative instructional approach of PBL throughout the diocese, there was a lack of knowledge and understanding of how teachers were experiencing and perceiving their progress in PBL implementation in the classroom. Condliffe (2017) found that studies demonstrated a need for implementation to be done in depth and at high levels to ensure effectiveness of innovative approaches such as PBL. To accomplish implementing PBL to scale and realizing its benefits for students, both the challenges and successes of an implementation must be known, understood, and addressed (Chaaban, 2017; Condliffe, 2017).

In a study of the Research Goes to School (RGS) professional development program Cook and Weaver (2015) studied high school teachers' implementation of PBL in instruction of the STEM curriculum of their school following the RGS summer program of professional development. After participating in the 2 week RGS intensive program to learn the knowledge and skills for effective PBL instruction, results showed that various features of PBL were still not implemented consistently in the school. Many methods and strategies were discussed and role-played with teachers in the professional development. Teachers shared however, that though they believed they had acquired

understanding of the knowledge and skills in the PD, when they tried to use them in the classroom, the challenges of PBL that they encountered became barriers to their intentions to translate their learning into practice.

Patton (2015) explained that faithful implementation is critical, and programs and interventions can be undermined by neglecting to follow up and monitor implementation. Many studies demonstrating evidence of positive outcomes of PBL end with the qualifier, "when done well." (Boss & Larmer, 2018; Larmer et al, 2021). Even though teachers may have learned and understood the knowledge of PBL in professional development, they could have difficulty in managing and accomplishing quality PBL implementation, have misunderstandings of what was taught, or not have opportunities to first apply or practice what was taught before implementing in the classroom (Condliffe, 2017; Wurdinger, 2018). Poor implementation of PBL can cause harm and be worse than previous pedagogies, negatively impacting student achievement, self-confidence, and motivation, and result in the opposite of the acclaimed benefits of PBL (Capraro et. al, 2016). Programs need to be carried out according to design and studied to address questions of implementation challenges (Capraro et al., 2016; Patton, 2015).

Researchers agree that teachers are critical to success in the learning process. In a study of school reform with the New Tech model of implementing PBL, Carr (2017) found that the success of this model depended above all on teachers and their understanding, facilitation, and commitment to PBL. In a groundbreaking study that analyzed state policies and case studies regarding factors affecting student achievement, Darling-Hammond (2000) found that teacher qualifications outweighed the effects of

student demographics, class sizes, spending levels and salaries as predictors of student improvement. In landmark extensive research of teacher practices, Hattie (2002, 2009) found that it was essential to enhance teacher skills and mindsets to positively affect student learning. In the implementation of new constructivist educational pedagogies and innovations such as PBL, the classroom climate and the process and outcomes of student learning depend on the teacher's role and actions (Anagun, 2018).

Hugerat (2016) studied the impact of teachers using PBL instructional approach on classroom climate as perceived by the students. In a comparison study of 458 ninth-grade students divided into two groups learning science with and without PBL instruction, students of the teacher using PBL instruction experienced the classroom climate as significantly more satisfying, enjoyable, motivating, and conducive to learning. A key finding was the dependence on the teacher for the success of the child-centered, learning-by-doing, positive classroom climate nature of PBL. In reviewing PBL studies, Condliffe (2017) found teachers at the center of implementation research. Depth and quality of implementation for innovative pedagogy such as PBL can influence its effectiveness, necessitating efforts to address challenges faced by teachers to achieving depth and quality (Condliffe, 2017).

Studies of other educational reform movements showed similar issues with implementation. In a study of teacher preparation to implement Common Core State Standards (CCSS), Barrett-Tatum and Smith (2018) found that besides having to change what content standards to teach to bring more benefit to students, it became apparent that teachers needed to develop expertise in the process of how to teach the required standards

with fidelity and thoroughness. Teachers learned the new standards and believed in the value of moving to new standards yet stated that their preparation to achieve successful outcomes in implementation was not adequate (Barrett-Tatum, & Smith, 2018).

Challenges unique to the pedagogical approach of PBL can impact teachers' success in the practice of carrying out the design of PBL instruction thus impeding the level and quality of benefit for students. Condliffe (2017) noted that strategies for teachers to address the diversity of learners in the classroom such as special needs students needed to be addressed in research on implementation of PBL. Implementing the pedagogy of PBL to reap its benefits is a progressive philosophical and theoretical shift from traditional instructional approaches (Hugerat, 2016). In studying successful reform initiatives and failures of reform fads for school improvement, Grossman et al. (2019) found that what made the difference was the teachers in their implementation practices. Instead of being driven by the what in reform programs, school improvement should be driven by the how, by the implementation process of reform programs (Grossman et al., 2019).

Although research established the role of teacher as key in the learning process, in further research of how the strengths and benefits of good educational ideas failed to transfer into practice, Bryk et al. (2017) cautioned against a common practice of blaming the competence of the educator. The researchers found for teachers as well as students, that knowing the problem, seeing mistakes as opportunities to learn, and finding a promising solution need an organized, collaborative, persistent and supported learn-by-doing implementation for successful education improvement. In studying schools with

PBL-practicing teachers, Grossman et al. (2019) emphasized that commitment to preparation of teachers for PBL teaching is critical to prevent the failure of PBL's instructional approach to help transform the classrooms of the 21st century.

Some whole-school systems in the United States that use PBL exemplify efforts to find ways to address challenges and customize strategies to accomplish effective implementation. In presenting researched-based education models for meaningful learning for 21st century students Darling-Hammond (2008) described how *Expeditionary Learning Schools* (EL) effectively implemented PBL, acknowledging the challenge and difficulty of change, especially accomplishing the needed cultural change for PBL. EL schools opened in 1991 as a partnership between Outward Bound USA and the Harvard Graduate School of Education. EL joined in a mission and vision to incorporate onsite coaching and intense professional development to support teachers' transfer of new practices ensuring effective implementation (EL Education, n.d.). In 2002 Bob Lenz opened *Envision Schools*, integrating PBL, performance assessment and common core standards to create a vibrant school focused on deeper learning that transformed education to successfully prepare all students for college, careers, and life. Lenz stated that the model of Envision Schools can be used in all types of schools to accomplish the transformation of learning and emphasized that factors in any school can make implementation a challenging task. Today Envision Schools focus on the project approach of teaching and learning and integrating workplace experience to prepare students for success in college, career, and life (Envision Schools, n.d.).

In 1996 in Napa, California, the business community, district leaders, and teachers collaborated to open Napa New Technology High School (NNTHS) with the vision of helping students learn content and skills through pervasive use of PBL. The NNTHS venture developed into the current New Tech Network (NTN) encompassing dozens of K-12 schools across the nation with the mission of creating whole-school transformation through high quality PBL learning environments. A key implementation feature was personalized supportive ongoing professional development and on-site training that was collaborative. A digital collaboration program enabled teachers to never have to face challenges in isolation but be empowered to implement with fidelity a learning environment in which students find value in the work of completing PBL tasks (New Tech Network, n.d.; Virtue & Hinnant-Crawford, 2019; Wurdinger, 2018). In San Diego, California, a group of industry leaders who were worried about the students coming out of education lacking preparation for 21st century jobs developed and opened High Tech High (HTH). HTH expanded to sixteen K-12 charter schools with the learning process focused on PBL, and comprehensive professional development and in-school training for teachers that emphasized implementation by "putting it to practice" (Wurdinger, 2018).

Contributions of the Current Study to the Research

The current study's investigation to discover and understand the perceptions and experiences of teachers' progress in implementing PBL in the classroom may contribute to research needed not only for the LDCSS of this study but for other educators in the field of both public and Catholic education. Educators striving to transform traditional

pedagogy into a PBL instructional approach are seeking more help, advice, and real-time examples of everyday practices from others that are successfully progressing along the PBL path (Boss & Larmer, 2018). In studying PBL implementation methodology, Baghoussi and El Ouchdi (2019), found evidence of teachers' difficulty in shifting to a learner-centered approach and stated that further research using methods like interviews and observations of teachers was needed to explore and support these findings. Cooper and Murphy (2021) found in meeting and working with educators that they often expressed the desire to use PBL to develop student-centered teaching and learning, yet often held back on implementing it. They wondered that with such strong positive views why PBL "has yet to go mainstream." (p. 29) Upon further exploration, they found that teachers have many questions and concerns, needing information and answers. There is a need for more successful PBL professional development, teaching materials and resources, and successful implementation models developed from the input of teachers and decision-makers.

Features in the instructional approach of PBL may hinder effective implementation of PBL. For example, in the core PBL component of creating and completing group projects, educators can meet barriers in getting students to successfully work together. A lack of research and available training for how to integrate both content and teamwork skills, address student conflicts, and set up contexts for problems hindered teachers in their implementation efforts (Sparks, 2019). Condliffe's (2017) review of PBL studies found that implications from research on implementation indicated that teachers needed supportive tools for help in enacting their new practices, an area to be

considered for more research such as the current study may provide. Sawchuk (2019) related that when students felt pressure in PBL implementation in a high school that required a capstone project for graduation, they related that back to their lack of previous skills in early grades. Senior year students remarked that it was hard to master the new PBL skills at a time so late in their education. Teachers relating to their own experience agreed with students and stated that they would like to see colleagues in earlier grades become familiarized with PBL and enact PBL frameworks for students to prepare them for high school PBL experiences.

Wide variations and differences in PBL models and approaches make it difficult to draw general conclusions about challenges in PBL implementation. In the early meta-analysis of studies of PBL, Thomas (2000) noted the need for implementation research. Research on PBL outcomes continued to bring evidence of improvement in student learning yet found a lack of a consistent definition of features and instructional design of PBL. This made it challenging for researchers and practitioners seeking research guidance to judge whether a particular instructional practice labeled PBL was in fact real PBL, whether generalizations could be constructed to define PBL, or whether PBL was just a different label for previous known practices such as "doing projects or experiments in hands-on activities" (Thomas, 2000).

Following the seminal research of Thomas, Condliffe's (2017) meta-analysis of many PBL studies noted the continuing call for more research of implementation strategies to help both teachers and students. Future research could consider implementation of PBL as a district as opposed to implementation initiated independently

by individuals. More research is needed to study strategies to accomplish classroom norms and procedures for group and project work, and to better understand and help some students with frustrations grasping the new learning styles of PBL. Though research confirms that scaffolding is a critical method for facilitating the inquiry process and supporting students' acquisition of 21st century skills more research is needed to help teachers develop effective scaffolding techniques specifically for PBL implementation. Condliffe (2017) cited that many studies also called for more research for student sub-groups such as with disabilities, SES, and ESL to identify effective implementation strategies. More research is needed on how teachers can integrate technology and can create and use ongoing assessments and feedback for deeper and relevant learning in all areas of PBL. The results of this study explored knowledge and understanding of local diocesan Catholic elementary school teachers' experiences and perceptions of their progress in implementing PBL in their classrooms may contribute evidence to the research.

Implications

The purpose of this study was to address the problem of not knowing and understanding how teachers were experiencing and perceiving successes and challenges in their progress of effectively implementing. The review showed that effective and sustaining implementation may benefit students in learning to improve in the skills called for by 21st century employers and needed in 21st century careers (Avallone, 2019; Sawchuk, 2019; Sparks, 2019). The review also demonstrated that there are challenges in the elements of PBL pedagogy that must be addressed to implement PBL well to realize

its benefits (Anagun, 2018; Condliffe, 2017; Dole et al., 2016; Sawchuk, 2019; Sparks, 2019). The problem was that there was no study of the implementation of PBL in the LDCSS setting of this study, no assessing of knowing and understanding teachers' day to day progress in implementing PBL, and no sufficient understanding of the knowledge, experiences, successes and challenges, beliefs, and needs teachers might be experiencing in addressing their implementation of PBL. Were challenges being met? What strategies were working? What were teachers experiencing and believing? How were teachers motivated? What were needs teachers had in shifting to the progressive instructional practices of PBL?

Although the LDCSS had offered teachers professional development workshops, events, and activities and had recommended setting up a network of coordinators in the schools, it was not known if teachers were as trained and prepared for implementing PBL in their classrooms as expected. In line with Dewey's belief about teachers' critical role in facilitating student learning, learning processes such as implementation should involve the participation and input of teachers (Wraga, 2019). The review showed that the literature is scant in studies of implementation strategies in the field, especially in Catholic education, that could give evidence of successful methods that could be helpful for the LDCSS of this study. Evidence is needed regarding how to successfully address challenges and identify factors and tools that will ensure more faithful and effective PBL implementation for student learning in Catholic schools. Effective implementation is an encompassing critical tool for educational improvement (Judkins et al., 2019). Teachers

need to be more involved in decision-making and input in effectively addressing PBL

challenges (Condliffe, 2017).

An implication from the findings of this study was that a professional

development project could be a model for the leadership of this study's LDCSS to put in

place for its teachers to effectively implement PBL in the classroom. This model could

comprise a systematic and structured schedule of professional development covering

understanding of background, purpose, components, and instructional skills of PBL, and

include engaging, collaborative and constructivist activities. The professional

development could start initially in one or two individual LDCSS schools with the plan to

then branch out into other individual schools. This could call for a PBL team for each

individual school, comprising professional experts, coaches, teachers, and administrators.

Along with this a structure of communities of practice that included all teachers at a

school by grade levels or departments could be built or expanded from existing

professional learning communities (PLCs). Guided by the PBL team, teachers in each

school could begin collaborative, on-site, customized practicing of the skills of

implementation and developing deeper understanding of the components of PBL

pedagogy. A schedule of PLC meetings, collaborative peer planning, peer observations

and team-led discussion sessions could extend the professional development in

supporting teachers' individualized needs in practice throughout the year. This could

develop instructional habits of collaborating, problem-solving, and creating and sharing

solutions to master the implementation of PBL in the classrooms. Results could be shared

between schools in the diocese through broader online communities, PBL

demonstrations, or PBL instructional models that could guide and support other Catholic educators in the field and beyond.

Summary

After the LDCSS of this study initiated the implementation of PBL over 6 years ago to improve student learning for 21st century success, it became critical to know and understand how teachers were experiencing and perceiving successes and challenges in their progress in implementing PBL pedagogy in the classroom. Through my search and review of the literature I provided findings in studies, reports, articles, and various media and documents giving knowledge, context, and significance to this study's investigation. The review first encompassed literature regarding the framework of PBL based on the experiential and constructivist theories of Dewey (1938) and Vygotsky (1978, 1976) underlying teachers' implementation of PBL. Based on Dewey's theory that the best and most genuine learning is grounded in experience and in applying new knowledge in real-world problem-solving, and Vygotsky's theory that children participate in their own learning and construct meaning through interacting in a social environment, PBL enables students to develop and learn the knowledge and skills they need to grow and be successful in society.

The review next encompassed literature on the historical background and development of PBL showing its emergence through changes and events that impacted American society and education in the agrarian era, and in the eras of the early industrial revolution and later knowledge-information revolution. In the 18th and 19th centuries the instructional approach of PBL had natural roots in the hands-on farming communities of

the agrarian era (Matus, n.d.). In the late 19th century and for most of the 20th century of

American society education was formalized, mandated, and followed a traditional, rote,

teacher-directed passive approach that prepared students for an industrial age of low-

skilled work in factories, and in businesses with top-down organization and structure

(Darling-Hammond et al., 2008; Matus, n.d.; Zhao, 2016, 2018). Events like Russia's

launch of Sputnik and the U.S. government report *A Nation at Risk* alarmed the nation

that its education system was in decline and needed reform to keep America a leading

world economy (Gardner, 1983; Mehta, 2015).

Back to basics standards-based curriculum changes put pressure on teachers and

education to improve instruction to improve student performance. Moving through the

end of the 20th and into the 21st century technology evolved, and society developed into

an information-knowledge industrial revolution era. Teachers and students were called to

shift to more progressive, rigorous, engaging new ways of teaching and learning based on

progressive ideas such as experiential learning and constructivism. Learning became

more student-centered to prepare students with more soft skills in addition to academic

knowledge. Students needed to be prepared for work and life in an information-

knowledge society with technology-run production, service-based work, and businesses

with more team project and collaborative organizational structures. Teacher-centered

back to basics learning and the traditional factory model type of instruction was not

adequate to prepare students to be successful citizens. Students needed to know,

understand, and apply content and knowledge through development of 21st century skills

such as critical thinking, engaged problem-solving, inquiry, collaboration,

communication, and innovation with relevance to the real world (Boss & Larmer, 2018; Cheng, 2017; Darling-Hammond, 2008; Larmer et al., 2015). PBL emerged as a strong student-centered engaging pedagogy and with a core set of elements such as learning content and skills through the process of creating a project meaningful and relevant to students that solved an authentic problem.

Next the review encompassed literature on the positive outcomes and benefits of implementing PBL along with its challenges to teachers and students to shift to non-traditional roles in pedagogy and learning. Studies showed that PBL's student-centered instructional approach with its foundation in experiential learning and constructivism resulted in improving students learning and skills for the 21st century and was adopted as the core instructional approach of some school systems (EL Education, n.d.; Lenz, 2015; Mozier et al., 2016; New Tech Network, 2022; Wurdinger, 2018). Although research showed that schools wanted to change to PBL practices, however, it also demonstrated that the PBL shifts in instructional and learning approaches brought new challenges that needed to be addressed for implementation to result in beneficial outcomes to student growth and learning. Judkins et al. (2019) and Patton (2015) stated that to bring benefits to students, innovative initiatives such as PBL had to be implemented faithfully adhering to its elements and design. Teachers struggled in changing their traditional instructional practice to progressive PBL pedagogy. Research showed that struggles of teachers to effectively meet the challenges of new innovations could impede positive outcomes, waste the funds invested in the program, or result in the program fading out (Askell-Williams & Koh, 2020; Capraro et al., 2016; Judkins et al., 2019).

The review then encompassed the literature focused on implementation and successful implementation strategies and methods. In this part of the review, I found literature that verified the essential role of the teacher in implementation (Anagun, 2018; Darling-Hammond, 2000; Hattie, 2002, 2009; Hugerat, 2016) Studies addressing implementation identified PBL challenges, and stressed the need to address the challenges teachers encountered to effectively implement PBL (Capraro et al., 2016; Condliffe, 2017). I also found that research was needed on specific strategies, methods, and tools that could support and guide teachers in successfully addressing challenges to ensure realization of the benefits of PBL (Baghoussi & El Ouchdi, 2019; Condliffe, 2017). Some school system studies noted general strategies for effectively meeting implementation challenges and supporting and training teachers (Bob Lenz, 2015; New Tech Network, n.d.; Wurdinger, 2018), but the literature overall that studied strategies was sparse, and in Catholic education non-existent. Research on strategies for empowering educators in the unique Catholic education environment to develop these shifts and changes has been lacking (Frabutt et al., 2013; Martin, 2014). As society calls for the rigors and complexity of educational changes currently needed, pressures mount on educators to evolve and develop through continual pedagogical change (Darling-Hammond et al., 2017). Researchers continues to study the changes and the outcomes for students, such as has been called for in the implementation of PBL in the LDCSS of this study.

In summary, I concluded that the literature review was exhaustive and reflective of the knowledge in the current state of research of K-12 teachers' implementation of the

innovative instructional approach of PBL in the classrooms of American education,

particularly in the classrooms of Catholic education. A significant amount of literature

supported the positive and beneficial foundation and effects of PBL pedagogy that can

prepare students with knowledge and skills needed for success in the 21st century. A fair

amount of literature highlighted challenges critical to address to realizing PBL benefits.

The review showed a sparse amount of literature that can enlighten and help teacher

practitioners in effectively implementing the pedagogy in the classrooms, and none that is

in the field of education in the Catholic school classroom. For teacher practitioners in the

LDCSS the findings of the current study contribute to the gap in knowledge and

understanding of factors that were affecting teachers' PBL implementation progress both

positively and negatively. The findings also contribute to creating support through

customized professional development that may empower teachers to meet these

challenges to better accomplish PBL's benefits for their students. For teacher

practitioners in the broader field of educational research findings also contribute to the

scarcity of studies of effective PBL implementation that could effectively prepare

students for success in their higher education, careers, and life, and for contributing to a

positive difference in society.

    The methodology section following this review explains my choice of the basic

qualitative design and approach of interpretive description that I used to conduct this

exploration of teachers' experiences and perceptions of their PBL progress. The section

also describes my analysis and interpretation of the resulting data collected from the

LDCSS teachers and the findings that led to my response as a scholar practitioner to

design and create a culminating project of professional development.

Section 2: The Methodology

Research Design and Approach

Not knowing how the LDCSS innovative improvement initiative of PBL

implementation after 6 years was progressing with the teachers in the classrooms was a

problem for the LDCSS. This study's purpose of addressing this problem by learning and

understanding the teachers' progress in PBL implementation in the classroom through

investigating their experiences and perceptions of their progress became the justification

for my choice of a basic qualitative research design and the guiding research question of

this study. A core feature of the basic qualitative design is that participants in the study

build their own experience and perceptions of the reality of their world (Merriam &

Tisdell, 2016).

A qualitative design is the best investigative approach for gaining knowledge,

meaning, and understanding through practitioners' own words about their work in their

classrooms (Merriam & Tisdell, 2016). A quantitative design requires measures such as

tests, assessments, and surveys and relies on numerical data to facilitate comparisons and

analysis to test a hypothesis (Patton, 2015). Because quantitative research is an approach

removed from the more natural world of the teachers' own word descriptions of their

experiences and perceptions in the classroom, it would not have been an effective

approach for investigating the knowledge, insights, meanings, and understandings of how

teachers are developing and progressing regarding the components, skills, and

frameworks of the implementation of their instructional approaches that they practice in

the classroom. In contrast, a qualitative approach involves methods such as interviews by

the researcher. Seidman (2019) explained that the foundation of in-depth interviewing is interest in what a participant is living through in their experiences and how meaningful it is to them. Seidman clarified that in-depth interviewing is appropriate to uncover what participants mean in their responses regarding how they may interpret their experiences if that knowledge could be of worth for improvements or making a difference in the life of the participants and those relating to them.

Using quantitative assessments and measurements would have been appropriate to discover student learning outcomes in an instructional environment, but it would not have been effective in discovering what teachers were doing, how they were developing and thinking, and what was affecting their progress in implementing PBL in the classroom. Qualitative research is effective in gathering authentic discoveries and insights due to the sensitivity of the researcher to gather and interpret data in the real world rather than in a laboratory (Merriam & Tisdell, 2016; Patton, 2015). A basic qualitative design matched the purpose of this study in which I investigated sixth through eighth grade teachers' experiences and perceptions to understand their progress in PBL implementation in their real-world setting of the school classroom.

Within the qualitative approach are several common designs that the researcher can consider according to what aligns with the study's purpose. For the current study, I first considered an ethnological approach. Ethnology is best suited to research of a particular group or community of human society for the purpose of creating a composite of identifying features such as the culture and social relationships found in its everyday life (Merriam & Tisdell, 2016; Patton, 2015). I decided an ethnological approach would

not be an effective qualitative design because my study was not focused on studying the general life and culture of the participants as a community with common cultural or social characteristics or relationships. Although cultural and social characteristics could be factors of participants' experiences and perceptions, my focus was studying teachers' experiences and perceptions of their progress in implementation of the instructional practice of PBL in the classroom.

I next considered a phenomenological approach. Phenomenology emphasizes an experience, often involving deep human experiences, for the purpose of creating a composite of the essence of the experience (Merriam & Tisdell, 2016). I decided phenomenology would not be the most effective approach because my study was not focused on seeking information on a common lived experience, event, or culture; rather, it was focused on teachers' experiences and perceptions of a common intentional instructional practice in which they progressed day by day in their teaching lives. Although teachers may express similar feelings, beliefs, and experiences that may be factors affecting their progress in PBL implementation and may be included in the knowledge and understanding gained, that was not the focus of my study.

Next, I considered a narrative analysis approach. In a narrative analysis approach, researchers seek to describe the lived experiences and meanings of participants' lives through hearing stories about their lives. I decided that narrative analysis would not be the most effective approach because my study was not focused on stories of teachers' lives. Although there can be some narrative threads or story excerpts uncovered in studying teachers' experiences and perceptions, my study was focused on how any

narratives along with other factors affected teachers' progress in PBL implementation in their classroom.

Finally, I considered an interpretive approach. In my investigation of qualitative research approaches, I found that basic interpretive study is a basic qualitative design in which an approach type such as ethnography or phenomenology is not declared (Merriam & Tisdell, 2016; Thorne, 2018). The focus is on the central feature of qualitative research, which is how individuals construct meanings from the experiences and reality of their world and how the researcher reveals and interprets these meanings (Merriam & Grenier, 2019; Thompson et al., 2021). I decided that interpretive description would be the most effective qualitative design aligning with the purpose of my study to explore teachers' experiences and perceptions of their progress for understanding and meaning.

Interpretive description is a qualitative design that originated in nursing and was developed to gain knowledge of the applied and practice disciplines in which participants are healing, educating, serving, or building something on behalf of society (Hunt, 2009; Thompson et al., 2021; Thorne, 2016, 2018). Unlike ethnography, phenomenology, or narrative analysis, the purpose of interpretive description is to help practitioners in these fields evolve in how they implement their practice to serve needs of those in society, which aligned with the purpose of the current study. Interpretive description has a goal of showing the potential of research to guide that evolution of implementation of service to those with needs whether healing or educating in society. Similar to ethnography, phenomenology, and narrative analysis, interpretive description includes open-ended in-depth inquiry through one-on-one interviews to discover participants' rich descriptions of

their experiences and perceptions. In interpretive description, I could use analysis and meaningful interpretation of participants' descriptions of experiences and perceptions that could lead to findings and results to offer practicing colleagues insight and guidance in evolving in PBL implementation in the field.

As the researcher, I created the main research question: What are LDCSS teachers' experiences and perceptions of their progress regarding implementation of PBL in the classroom? I then created probing interview questions to offer opportunities to participants for deeper reflection and description of the experiences and perceptions of their practice in implementing PBL. Deeper sharing by participants allowed for deeper discovery, interpretation, and in-depth insight and understanding of the intended meanings and essence of participants' experiences of implementing PBL. That enabled construction of new knowledge in a naturalistic authentic setting that could inform practice in the field (see Patton, 2015; Thompson et al., 2021; Thorne, 2016, 2018). Choosing the qualitative design of interpretive description enabled me to address the challenges of the practitioner teachers in this study to construct findings not only meaningful and trustworthy but also relevant and informing to their applied practice and to a moral mission such as the Catholic identity of schools of this study in their disciplinary fields (see Hunt, 2009; Merriam & Grenier, 2019; Merriam & Tisdell, 2016; Patton, 2015; Thorne, 2018). The qualitative design of interpretive description was the most effective for and consistent with my study's purpose of understanding LDCSS teachers' experiences and perceptions of their progress of implementing PBL in the classroom.

Participants

The site of this study was a large diocesan Catholic school system in the United

States covering a metropolitan area serving over 38,000 students in over 107 pre-K,

elementary, and secondary schools located in both urban and suburban areas. Because the

basic qualitative design of this study did not allow me to generalize findings,

nonprobability sampling was the best sampling method, specifically purposeful sampling

(see Merriam & Grenier, 2019; Merriam & Tisdell, 2016; Patton, 2015). Merriam and

Grenier, (2019), Merriam and Tisdell (2016), and Patton (2015) pointed out that using

purposeful sampling enables the researcher to choose a small number of participants

representing a population from whom the most can be learned and understood.

With a purposeful sample of participants from the sixth, seventh, and eighth

grades in four representative LDCSS elementary schools, I was able to focus on

procuring rich data of participants' personal experiences and perceptions to solve a

problem (see Merriam & Grenier, 2019; Merriam & Tisdell, 2016). To ensure the best

sample of participants to learn from, I used maximum variation, a common type of

purposeful sampling that includes a range in the characteristics and environments of the

participant sample to enable the greatest and most relevant data to be obtained. The

LDCSS in the current study had a common foundation of a Catholic identity mission yet

had a variety of teachers from multiple grade levels from schools that covered a range of

demographic environments from city to suburbs and small to large enrollments. Selecting

a small but maximum variation sample of teachers for qualitative interviews would be

purposeful in understanding teachers' experiences (Merriam & Grenier, 2019; Merriam

& Tisdell, 2016; Thorne, 2016, 2018). Merriam and Tisdell (2016) noted that although maximum variation sampling is not generalizable, it can yield varied perspectives that contribute beneficial findings to a wider population, such as the LDCSS teachers in their implementation of PBL in the current study.

Due to data collection occurring during the COVID-19 lockdown, I did not contact anyone in person to obtain the purposeful maximum variation sample of the population of elementary LDCSS teachers for this study. Instead, I contacted several principals of K–8 schools located in urban and suburban areas of the LDCSS, having both low and high enrollment numbers, and invited them to participate as a cooperating research partner. Four principals responded by email agreeing to be partners, as listed in Table 1.

Table 1

Four LDCSS Elementary Schools

School	LDCSS area	Total school enrollment
School A	Urban central	306 students, PK–8
School B	Suburban south	482 students, PK–8
School C	Suburban east	166 students, K–8
School D	Suburban west	552 students, PK–8

Second, in one-on-one phone call appointments following the emails, I explained my research proposal in detail to the four school principals. Third, I mailed a hard copy letter of cooperation (see Appendix C) to each principal to mail back to me with their signed permission to conduct research in their schools and to obtain classroom teacher rosters of the sixth, seventh, and eighth grade teachers of all subjects including specials and intervention specialists. Upon receiving signed permission from the four elementary

principals and approval by the Walden University's Institutional Review Board (IRB), I

obtained the rosters of the three upper grades by email from the principals, which

included 30 teachers. Fourth, I mailed a hard copy letter of invitation to participate (see

Appendix D) and statement of consent form (see Appendix E) to each of the 30 teachers

on the rosters of the four schools inviting them to volunteer to be participants in the

study. The invitation letter described the research purpose and its procedures, explained

the voluntary nature and risks and benefits of participating in the study, explained how

the interview process would be tailored to participants' availability in a conducive

setting, explained the confidentiality of the process and how it would be protective of

participants by use of de-identification, and gave a means to access the me if there were

questions. The requirement for any teacher in the sixth through eighth grade groups

choosing to participate was to be a sixth, seventh, or eighth grade classroom teacher of

any subject in the school, to sign and date the statement of consent form in agreement to

participate, and to return the signed and dated consent form to me. Ten classroom

teachers from this group of 30 Grade 6–8 teachers in the four selected schools responded

and chose to sign and return the statement of consent form to be participants in this study.

Fifth, nine of these teachers followed through with scheduling interviews. These nine

teacher participants represented Grades 6, 7, and 8, taught 2 or more years in the LDCSS,

and had variations in the subjects they taught, the school positions they held, and the total

number of years of educational experience they accrued, as shown in Table 2.

Table 2

Participant Profiles

Participant	School	Position	Grade taught	Subject taught	Experience (years)
P1	School A	Teacher, director of remediation	Sixth, seventh, and eighth	Math, religion	15
P2	School A	Teacher	Sixth, seventh, and eighth	Religion, English language arts	46
P3	School A	Teacher, intervention specialist	Fourth, fifth, sixth, seventh, and eighth	Science, technology, engineering, math (STEM)	40
P4	School B	Teacher, director of middle school & STREAM	Sixth, seventh, and eighth	Advanced math, homeroom, PLTW director	5
P5	School B	Teacher, science director, LPDC chair	Sixth, seventh, and eighth	Science	30
P6	School C	Teacher	Sixth, seventh, and eighth	Social studies, English language arts	5
P7	School C	Teacher	Sixth, seventh, and eighth	Religion, English language arts	12
P8	School C	Teacher	Sixth, seventh, and eighth	Religion, English language arts	14
P9	School D	Teacher	Sixth, seventh, and eighth	English language arts	21

Data Collection

With IRB approval (08-12-20-0419189) for this study I began data collection. The data collection instrument that I used in the study was a private person-to-person semi-structured interview guided by the main research question (RQ). I also used open-ended probing questions to further guide my questioning in increasing opportunities for obtaining more detailed descriptions and insights, deeper meaning and understanding, and new and more complete information from the teacher participants aligning with the main RQ. Collecting data in qualitative research is an inquiry process. Being part of this instrument as the interviewer, I inquired with questions for each of the nine teacher participants, observed and recorded their responses, and followed up with an iterative data analysis process of open and axial coding to carefully review, analyze, and interpret their responses (Merriam & Tisdell, 2016; Merriam & Grenier, 2019). The inquiry and all probing questions were guided by the one broad RQ indicated by the study's problem and purpose of needing to know and understand teachers' experiences and perceptions of their progress in implementing PBL in their LDCSS schools since its diocesan initiation, and more specifically progress such as any changes in themselves or their pedagogy and any outcomes in their students or their learning as they implemented the elements of PBL in the classrooms.

The interview process is frequently used to collect data in qualitative design studies in education and other applied practices when the purpose is deep understanding and finding real meaning to address a gap in what is known regarding a problem (Merriam & Grenier, 2019; Merriam & Tisdell, 2016; Seidman, 2019). When it is not

known how people feel or act or perceive in specific situations, such as in the implementation of PBL in this study, the interview can effectively provide this information (Merriam & Tisdell, 2016). Through a semi-structured interview process, I obtained data by following a protocol of questioning with the RQ followed by probing questions. (See Appendix B). My questioning focused on PBL's experiential learning and constructivism frameworks, PBL's pedagogy, and teachers' perceptions of student learning, guiding but allowing open-ended responses of rich details from teachers that described their full experiences and perceptions in their LDCSS classrooms.

From this one-on-one semi-structured interview process, I collected data through the remote electronic means of a private teleconference with each teacher. I promoted a comfortable and personal atmosphere conducive to a full and productive interview. I guided each interview by using an interview protocol recommended by Creswell (2012), (Appendix B), designed to assist qualitative researchers in a structured and careful way to record and observe participants responses. Creswell, J.W. and Creswell, J.D. (2018), Creswell (2012), and Patton (2015) pointed out that an interview protocol is beneficial to the researcher in keeping the interview organized and focused and to the participant in keeping responses on track, thus making best use of the time allotted. In this protocol I followed a script that included guidance for gathering teacher background data, for explaining the purpose of the study, for conducting the process of questioning during the interview, for pacing the length of the interview, and for explaining what would be done to protect the confidentiality of each teacher participant. The protocol form included an interview question guide with the guiding RQ of the study: "What are LDCSS teachers'

experiences and perceptions of their progress of implementing PBL in the classrooms?"

and twelve additional probing questions to elicit more specific details and full

descriptions to enhance and expand on the RQ. (See Appendix B)

For the current study I gave a further explanation to the participants that I was

video recording the interview and later would be transcribing it. To ensure accuracy and

quality interaction between researcher and interviewee, Patton (2015) and Creswell, J.W.

and Creswell, J.D. (2018) recommended recording so that the researcher has an accurate

record of participant responses to recall, does not miss anything the interviewee says

because of writing notes to responses, and enables the researcher to give the interviewee

full attention and observation in the questioning and responding process. I documented

some notes of observations and reflections by hand on the interview protocol paper for

each participant during the recording and listening process that did enable me to begin

some basic analysis during the actual data collection of the interview, as pointed out by

Merriam and Tisdell (2016). As Thorne (2016) explained, the approach of interpretive

description demands that the researcher be attuned for *top-of-mind* responses and seek to

uncover a deeper understanding of what else is happening to explain those responses,

leading to construction of new and meaningful findings. I stored all the participant video

interview recordings into password protected files on my computer.

Thorne (2018) and Merriam and Tisdell (2016) also emphasized that in qualitative

research, the researcher plays a meaningful role as the primary instrument of data

collection and analysis in the study. Acknowledging the power to shape the data

collection process and contribute to the knowledge in the field as researcher, I

endeavored to have a strong awareness of the trustworthiness needed for this role. The interviewer must show deep interest and acknowledgement of the worth of the participants' stories and responses, and at the same time keep their own egos and beliefs detached and subdued (Merriam & Grenier, 2019; Seidman, 2019). Identifying biases, allegiances, and personal relationships to ideas and audiences connected with the study is important for producing honest and credible contributions. Since I was a former teacher and principal in the LDCSS of this study with knowledge of the system of schools, I selected four schools unfamiliar to me that covered the diversity of participants and features needed for the study. Although the schools were unfamiliar, my professional ideas, such as my commitment to school improvement could have been known to some in these schools. I bracketed such traits to allow participant openness and to welcome all personal and professional ideas and thoughts of the participants in trust and confidentiality. For the sake of true and beneficial research results I self-monitored comments and actions to avoid an influence that could hinder meaningful discoveries and impactful findings that could ultimately benefit the children and educators in the LDCSS educational community. For example, I repeatedly emphasized to participants during the interview that there were no wrong or right answers, and all their responses would be valuable data contributing in some way to productive outcomes. The outcomes could be beneficial to both teachers and students in Catholic schools. I also reminded participants that they were always free to choose not to answer any questions, or even to end their participation in the study.

Data Analysis

Data analysis in qualitative research is an inductive process that can begin in the data collection of interviewing as the researcher listens to participants and seeks knowledge and understanding in their responses to questions (Creswell, J.W., & Creswell, J. D. 2018; Merriam & Tisdell, 2016). As I conducted and recorded the interview with each of the nine participant LDCSS teachers I listened attentively for patterns and insights and journaled some notes of my thoughts as teachers gave their responses to my open-ended guiding RQ and probing questions of my interview protocol to know and understand the experiences and perceptions of their progress of implementing PBL. In my attentive listening and questioning of each participant I began to hear and find meaning and sense in the data of their responses, a principle and goal of data analysis (Creswell, J.W. & Creswell, J.D. 2018; Merriam & Tisdell, 2016; Patton, 2015).

Following each video interview, I organized the participants' responses by creating nine separate Word tables on my computer into which I transcribed each participant's recorded interview from their video voice to a text script. This enabled me to spend further time reading and deeply reflecting with an inquiry approach, asking myself what participants were really saying and meaning, and what is the nature of their ideas, and writing my thoughts, discoveries, and possible interpretations next to the script in margin columns in the tables. To protect confidentiality, I added the nine tables of transcripts and my notes to the video recordings into private password protected files on my computer. I then engaged in additional readings of each interview transcript to further

explore and deepen my sense and understanding of the data, paying attention to details, and adding any further notes of thoughts and ideas and interpretations in the tables' margins. This process of multiple readings, reflections, and notetaking helped me establish deeper understandings and familiarity with the data collected and with the nine participants providing the data (Creswell, 2012; Thorne, 2018). When conducting analysis throughout all the data Merriam and Tisdell (2016) and Thorne (2018) emphasized the importance of the researcher staying mindful of the purpose of the study to address an important need in the field, not a personal expectation or bias. This process especially prepared me for the next step of coding the data.

After initiating data analysis through my first reading of the interview transcriptions, I continued with multiple readings and proceeded to make deeper sense and meaning of the content of the data. This helped me prepare for coding the data to further interpret it and construct categories and themes. Coding is an inductive process of classifying qualitative data by breaking apart participants' responses to look for regular patterns or repeating ideas that may offer answers to the RQ and assigning identifying meaningful labels (Creswell, J.W. & Creswell, J.D. 2018; Merriam & Tisdell, 2016; Patton, 2015). My first three rounds of coding were open coding, which is being open without limits to phrases and word patterns that I could see as significant meanings, insights, or discoveries (Merriam & Tisdell, 2016; Thorne, 2016).

Beginning with the first round I broke apart participants' descriptions of their experiences and perceptions in the original transcript and my margin notes into classifications of pieces of data into words, phrases, and sentences that I interpreted as

potentially relevant and important to answering the RQ of the study and seemed to

connect in meaning. I labeled and color-coded these classifications with digital

highlighting within the transcripts to mark how they repeated and made patterns

throughout the transcripts. In the second round of open coding, I began interpreting the

meaning of the coded repeating phrases and sentences and created broader categories of

knowledge and meaning of the data and in which I addressed overlapping in categories,

and data that was irrelevant to the RQ. In the next step of the analysis with a third level of

open coding, I designed a new working table for each of the nine transcripts into which I

transferred the color-coded categories, further interpreting the phrases and sentences into

even more encompassing meaningful phrases from the previous coding.

I then completed a process of axial coding in the table to code themes from the

transcript coding, the fourth and more advanced layer of coding in which I inductively

examined, interpreted, and grouped the color-coded phrases from open coding into

broader categories of data with the new theme labels. (See Appendix F) Merriam &

Tisdell (2016) pointed out that this layer of axial coding with new groupings in categories

can result in basic insights and themes that emerge as answers to the probing questions

and RQ of the study, and which also align with the theoretical frameworks of Dewey's

(1938) experiential learning and Vygotsky's (1978, 1986) constructivist theories of this

study. In interpretive description, Thorne (2018) described this as the researcher

continually "deconstructing" what appears to be seen, keeping open to a wide variety of

possibilities of groupings and relationships emerging from the data. Patton (2015)

referenced Boyatzis (1998) who described a researcher's coding work to discover themes

to be "seeing as." With a final layer of axial coding of the nine participants' transcripts and my notes, I interpreted that the categories with similar or connecting patterns and ideas of participants emerged into four broad large themes that described what I "saw as" the significant insights and basic findings of the study (Merriam & Tisdell, 2016; Creswell, 2012). These four themes represented the results and findings meaningful to the purpose of this study of knowing and understanding LDCSS teachers' experiences and perceptions of the progress of their implementation of PBL. These resulting four themes are listed below in Table 3 along with sub themes that named the categories of my final axial coding step.

Table 3

Four Themes and Subthemes That Emerged From Coding Analysis

Theme	Subtheme 1	Subtheme 2	Subtheme 3	Subtheme 4
Teachers' varied knowledge and understanding of the instructional approach of PBL	Framework, background, development of PBL	Purpose of PBL	Essential Elements of PBL	How students learn through PBL
Teachers' personal and professional experiences	Life and job	Beneficial outcomes of PBL implementation	Challenges in PBL implementation	
Teachers' personal and professional beliefs	Values	Philosophies	School environment	
Teachers' needs for support in PBL implementation	Professional development	Leadership	Resources	Parent backing

Accuracy and Credibility

With qualitative research dependent on the judgment and interpretation of the researcher, in an applied discipline field such as education that affects peoples' lives, it is especially critical that knowledge resulting from research be accurate, valid, trustworthy, and credible (Merriam & Tisdell, 2016; Patton, 2015). In a qualitative study based on assumptions, further emphasized by Merriam and Tisdell (2016), a higher level of rigor is demanded in the research. Researchers should use more than one approach to make sure that findings are accurate and believable by readers of the study (Creswell, J.W. & Creswell, J.D., 2018). There are several strategies I used to ensure this study's credibility and rigor and make it possible for the results to be relevant and applicable to schools across the LDCSS of the study.

Member Checks

Member checking is an important method that can strengthen the validity, accuracy, and credibility of research by having the participants themselves examine the researcher's analysis, and interpretation of their interview in reporting findings (Creswell, J.W. & Creswell, J.D. 2018; Merriam & Tisdell, 2016). Even if I as the researcher use other interpretive words in the analysis, participants should be able to agree to the clear meaning of my words and that it is not a misinterpretation of their responses or my personal bias. After I completed the coding analysis, I checked back with the teacher participants to obtain feedback as members of the research process. I gave each teacher a copy of my color-coded theme findings from my analysis and interpretation of their interview responses as written in Table 8 (see Appendix F). This allowed them to

privately review my coding analysis of their interview to check for accuracy of my

written details and description of their words and meanings and convey to me any

clarification needed in the descriptions and results to be reported in the study.

Triangulation

Triangulation is a method that can strengthen the credibility of research by having

a variety of data sources or data collection methods to check both for consistency of

results and for opportunities for better understanding of inconsistencies in a study's

findings (Patton, 2015). In this study although the interview is the only data collection

method I used, I obtained data from varied multiple sources of nine participants, in varied

multiple teaching positions, and from varied multiple LDCSS sites. And finally, the nine

participants accrued variations in years of teaching experience, ranging from 3 to 30

years.

Maximum Variation

Maximum variation is a method that can strengthen the accuracy and credibility

of research by having a careful selection of participants and site location to enable the

widest possible inclusion of diverse interests and important common patterns (Merriam &

Tisdell, 2016). This method, joining with triangulation, will enhance the possibility of the

study's applicability or transfer to a wider audience. In this study I selected the nine

participants from four different school locations with different and varied characteristics,

from urban inner city to suburban outer area demographics found in the LDCSS, from

differing grade levels and subjects taught; and with differing numbers of years of

teaching experience.

Rich, Thick Descriptions

      Rich, thick descriptions are clear and highly detailed descriptions of the data

collected in the interviews that can increase the chances of results being credible and

transferrable to sites other than the local site of the study (Creswell, J.W. & Creswell,

J.D. 2018; Merriam & Tisdell, 2016). An abundance of details provides richness and

thickness for an in-depth fullness that enhances and expands the meaning conveyed by

the participant. Merriam and Tisdell (2016) explained how such rich, thick descriptions

by the researcher can cause the reader to feel and see a more authentic and relatable

context for the study. Creswell, J.W. and Creswell, J.D. (2018) explained that rich thick

descriptions can cause the results to become more realistic and relatable to a reader

interested in carry over and application of the study's findings for their own situations.

Words creating descriptions are used as the current study's data instead of numbers

relaying facts in writing the report of what has been found and learned in a qualitative

study. In a qualitative study the clarity and details of words speak as forcefully to the

reader as the numbers of a quantitative study (Patton, 2015). Patton (2015) also

maintained that collecting authentic, finely detailed data descriptions during the

interviews in a study, including supportive quotes, increases the possibilities of learning

more in the research, for example about the fullest possible perceptions and experiences

of the participants. Findings from analysis and interpretation of such detailed data could

appeal, apply, and relate to the needs of a wider audience such as other Catholic schools

outside of the LDCSS of the study. An administrator in a Catholic school community in

an educational location other than the LDCSS of this study may see similarities in the

layers of details of the study's setting and participants and be interested in applying the findings to their own context (Merriam & Tisdell, 2016).

Discrepant Cases

Discrepant cases are instances found in the researcher's efforts to saturate data collection and analysis, in which there are patterns and evidence from participants that are alternative or contrary to the larger emerging findings. In qualitative research Patton (2015) pointed out that there is no clear cut *yes or no* to whether data support an alternative explanation, but rather the need is for it to support the greater weight of evidence. As I collected data in interviews, I was ready to acknowledge and try to understand any discrepant cases to show my non-bias and thoroughness. Outliers may be relevant even if not supporting the preponderance of evidence for credibility of the rest of the findings. In the current study, there was one case of a teacher sharing responses discrepant from other participants. This teacher shared beliefs about the instructional approach of PBL with a different view than the other teachers. I questioned, respected, and listened to this teacher as I did all the others. I realized first that this teacher's experiences and perceptions did answer the RQ of the study. Second, this teacher could represent others in the Diocese teachers similarly discrepant.

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Data Analysis Results

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In this section I discuss the findings that were the results of my data analysis of the nine LDCSS teacher participants' responses from my interviews with them. I discuss in more details the meanings, insights, and understandings that I saw as revealed and indicated through my analysis and interpretation. Using many of the participants' quotes,

I describe the themes and subthemes that emerged from my analysis, and how they are aligned with the RQ, the literature, the purpose of the study, and led to my choice of an appropriate project deliverable.

Through my analysis and interpretation of the data of patterns, categories, codes, and meanings of this study's nine LDCSS teachers' descriptions of their experiences and perceptions, four themes emerged: 1) Teachers indicated varied knowledge and understandings of the instructional approach of PBL affected their progress in PBL implementation; 2) Teachers indicated their varied personal and professional experiences affected their progress in PBL implementation; 3) Teachers indicated their personal and professional beliefs affected their progress in PBL implementation; and 4) Teachers indicated their needs for leadership and professional development support affected their progress in PBL implementation. In examining the differing descriptions of the teachers' experiences and perceptions, my analysis further resulted in revealing that their descriptions contained recurring data that not only emerged as these four main themes but comprised recurring patterns and groups within the themes which I labeled as subthemes. (See Table 3)

Theme 1: Teachers Expressed Varied Knowledge and Understanding of the Instructional Approach of PBL

Data analysis results showed that the nine teachers participants' responses to the RQ and probing questions in the interviews indicated that teachers varied in their perceptions and experiences of knowledge and understanding of the instructional approach of PBL that they implemented in their LDCSS classrooms. Teachers described

their knowledge and understanding ranging over the four sub-themes of a) the framework, background, and development of PBL, b) the purposes of PBL, d) the essential elements of PBL, and d) how students learn through PBL.

Subtheme 1a: Varied Knowledge and Understanding of the Framework, Background, and Development of PBL

Although no teachers specifically used the terms experiential learning or constructivism to describe the PBL theoretical framework of teaching, some teachers used phrases that suggested these terms. Teacher P1 stated, "it's like they see and create the result with their own hands, not just read about it." Teacher P3 expressed, "PBL is the basis of our STEM program. It is hands-on learning that brings it all together." Teacher P5 stated, "In PBL students discover information, not just have it given to them by the teacher."

Some teachers' descriptions suggested they had some understanding of the background of the PBL approach. Two teachers spoke of connections to Montessori. Teacher P4 said, "It's not old school or the cookie cutter way or by the book. New education principles like PBL really emulate Montessori principles, student-centered, self-directed, engaging the whole person." Teacher P6 stated, "The culture of a school doing PBL should be positive, encouraging, and open to innovation, not traditional. I left my last school because the principal required traditional teaching methods." This teacher also noted, "Currently our school fortunately is using the innovative method of PBL." Teacher P8 expressed, "Education in the United States has been rote learning too long. We need a mindset to be looking for what's best for students." Teacher P6 said, "PBL has

developed for careers and life today. The careers students pursue in this 21st century will

require face to face communication, understanding, and collaboration, main parts PBL."

Teacher P5 expressed some different perceptions:

> PBL is a good instructional method, but it is just one of many methods in
>
> education I use. I mix the new with the traditional and I do not like to shut the
>
> door on any method. If a student likes to learn in a traditional way, that is the way
>
> I teach. PBL is not for all learners. I hesitate to use the term 'real world.' The real
>
> world that they need to be prepared for is this classroom right now, and the grade
>
> they are going into next year. I do, however, see the benefits of collaboration,
>
> problem solving, and becoming responsible, independent learners, skills that do
>
> help them right now in the real world of school.

Subtheme 1b: Varied Knowledge and Understanding of the Purpose of PBL

Teachers shared strong perceptions about PBL's purpose and meanings for them

in the classrooms. Some expressed that the PBL approach overall helped students learn

better. Teacher P1 stated, "With PBL's hands-on approach students better understand and

grasp topics they are studying. They do lots of problem solving that kind of expands their

brains, helps them work through challenges and gets them ready for real life." Teacher P2

expressed, "PBL's goal is to help students to develop into more independent learners

which is important because my students are urban and start school behind due to gaps at

home." Teacher P3 also expressed perceptions of PBL's purpose for urban students:

> PBL gives that real-life hands-on application which is so important once they
>
> leave our school and need to stand on their own. We want to give them all the

tools we can while we have their attention here so they can look back and see

what they learned here. We are an urban school and have a lot of students that

have not been introduced to a lot of things they are going to need in the life

they're going to live out there.

A few teachers perceived that the PBL approach is meant to help meet all

students' diversity of needs so they all can be successful in careers and life. Teacher P5

explained, "In PBL kids learn social skills working in groups no matter their ability. And

children who don't do well on paper do better with hands-on." Teacher P6 stated:

As students work with different abilities solving challenging problems in PBL

they can understand the real-life aspects of what we are teaching them. In working

and learning in groups with students that may have disabilities they learn how to

be respectful, seeing everyone's positive side, and taking turns to make sure every

person has the chance to voice their concerns, ideas, or insights. God has a

purpose for each child's life and PBL helps me achieve my purpose of helping

each child become whoever they are meant to be.

Subtheme 1c: Varied Knowledge and Understanding of the Essential Elements of PBL

Teachers varied in their experiences and perceptions of knowledge and

understanding of the essential elements and processes that comprise their practice of the

instructional approach of PBL in their classrooms. Most teachers noted that PBL was a

method that centered on completing "some kind of project." Teacher P7 explained, "In

PBL a project pervades the unit and culminates at the end." Teacher P8 expressed,

"Students do well when in a project when making a product for someone else." Teacher

P9 stated, "I know there's some kind of project, but I have low understanding of PBL because of lack of training. I try to see what works and what doesn't." Teacher P1 stated:

> The project in PBL could be like an experiment, something visual to demonstrate content learned. Sometimes they do a poster or power point, or I have the older kids do more advanced things such as a model rocket launch.

Teacher P4 said, "A PBL project could be a helpful service performed or product created to help someone." Teacher P8 stated, "PBL must end with a public product, something for others outside the classroom. This makes students more engaged and motivated, knowing this isn't just for a grade but something helpful for someone." Teacher P3 explained, "All curriculum subjects or standards and all skills needed for life can be incorporated into the project."

Teachers commented on how the teacher role changes in PBL. Teacher P9 expressed, "The teacher has to be more of a guide, a facilitator of students' learning." Teacher P3 expressed, "I think I could call what I do coaching." Teacher P6 described, "I guide and encourage them, kind of like a Jiminy Cricket on their shoulder." Teacher P1 explained, "Learning in PBL is centered more on students than teachers, and authentic and relevant to students." Teacher P2 stated, "It is important for students to have input but also be accountable. I help them be independent and find information for themselves instead of just giving it to them." Teacher P5 stated:

> PBL is just like the engineering process. The kids do a lot of critical thinking and problem solving. I did a complex after-school project. It involved me doing a lot of guiding and directing, asking the kids "what if?" over and over so the kids

figured it out. They needed to experience science to learn it. I am like a partner in

learning with students. The kids work as a team. Students will learn more working

this way. They put in more work, but they are engaged and motivated and enjoy

it. The final product was presented to an outside group of educators. The kids

were so excited. It is important for the kids to present their product to an outside

audience.

One type of project described by more than one teacher was older students creating books

for younger students in lower grades. For example, teacher P2 described:

One of my most successful projects is my 5th graders making books for the

younger kids. The kids are engaged, excited, and motivated. They do research

about a particular subject and write a story about it, something a younger child in

1st or 2nd grade could read. I print it out for them, and they illustrate it by

drawing in their own pictures. We have a simple binding machine to complete the

books, then we go and read them to the younger students and let them each keep a

book as a gift. Everyone is so happy and proud, the older students that created the

books and the younger students who received a new book. They learn many skills

and their academic subjects.

Most teachers described the element of collaboration almost as a given. Teacher

P3 stated, "When students learn the skills of collaboration, problem solving,

communication, and creativity that they need to use in students learn in collaboration

everybody contributes creativity, ideas, and what they're good at. They learn to learn

from each other. The diversity of needs and interests of all students can be met through the project approach."

Teachers described other elements such as how students help to drive the planning and give input to PBL projects in different ways. A few teachers explained how they were concerned about how to cover the curriculum content. Teacher P2 explained:

With my kids I have to give them the foundations before a project. They sometimes struggle in a project because they still don't have the basics such as their math facts. They keep coming to me asking, "now how do I do this?" and I stop often to reteach things over or in a different way. Some things are hard to get without me, so I do a lot of direct teaching.

Teacher P1 stated, "Having my students collaborating and working in diverse groups on a PBL project enables mixing abilities and leaning styles so they can learn from each other." Teacher P6 said, "One of the best things about project-based learning is it naturally differentiates. I can move through the groups, and I get more in tune with my kids' different needs and strengths. I adjust and tweak the project as we go along."

Subtheme 1d: Varied Knowledge and Understanding of How Students Learn Through PBL

Participants perceived that they could see that their students learned in various ways through their implementation of PBL. Teacher P1 explained, "The kids learn better definitely by hands-on, also definitely by problem solving and critical thinking. However, I also have to lay groundwork for them ahead of time and give them tools and skills before going hands-on." Teacher P2 stated, "I teach students a foundation first then I give

them assignments to apply what I taught with real things. I let them pick their ways to apply it then let them do that independently and experience trial and error." Teacher P3 stated, "Projects have to incorporate curriculum standards, but it is in the experience of real-life application that they learn." Teacher P8 relayed, "I have to know the curriculum I need to teach in a project but it's the high interest of the students that really helps them learn it. When the kids take ownership and create a public product the learning sticks with them." Teacher P4 explained, "Students learn best in PBL if it is student driven and students have voice and choice in creating the project. The project is the experience. It's like they learn through the lens of the project."

Some teachers experienced students learning through collaboration on projects. Teacher P1 stated, "In collaborating in PBL students do more critical thinking and they see that they can learn from each other and get different ideas and perspectives from each other." Teacher P6 stated, "I often see quiet students become engaged in a group and show their strengths. In a group I can use differentiation and make accommodations so all can contribute and learn." Some explained how they saw their students gain a deeper understanding of a topic and discover things they didn't know before as they researched and built their project. Teacher P9 said, "I see how students learn differently with PBL because they usually start with a question and then in working together, they kind of move backwards, like on a discovery trip." Teacher P1 said, "PBL gets their brains going, so they use their brains more to figure things out on their own."

Summary of Theme 1 Findings

Data analysis results showed that the nine teachers' responses of perceptions and experiences in their interviews to the RQ and probing questions gave evidence that they had knowledge and understanding of the instructional approach PBL that varied in type and depth of content and skills. Teachers described less experiences and personal perceptions of ideas and knowledge of PBL's experiential and constructive framework, of its historical background and development, but a wide variety of descriptions of the purposes and elements of its pedagogy.

Theme 2: Teachers Described Personal and Professional Experiences

Data analysis results showed that the nine teacher participants' responses to the RQ and probing questions in the interviews described varied positive and negative perceptions of their personal and professional experiences. Teachers described their personal and professional experiences ranging over the three sub-themes of a) personal and professional experiences of life and job, b) personal and professional experiences of beneficial student outcomes of PBL implementation, and c) personal and professional experiences of challenges and obstacles in PBL implementation.

Subtheme 2a: Personal and Professional Experiences of Life and Job

Teacher participants shared personal and professional experiences and their perceptions of these experiences in their lives and jobs. Teachers shared about individual experiences that either positively or negatively influenced their perception of traditional and progressive learning in a Catholic school environment. Teacher P4 related:

I had a personal horrible childhood experience being taught in a traditional and very structured education in a Catholic elementary school environment and my mom changed me to a public school. This caused me to develop a strong desire to learn differently and eventually to become a teacher that taught differently in a way unlike my early childhood Catholic school experience. I obtained a teaching position in which I became acquainted with and skilled in the innovative Montessori method. This was a positive experience that reinforced my motivation and determination to teach with a non-traditional innovative approach.

Teacher P6 described:

As a new teacher in a teaching position in which administration mandated traditional methods, I felt very isolated. I did not want to teach this way and it caused tension with colleagues who supported traditional views. I later acquired a new position in a different LDCSS school where the culture was open, positive, and encouraging of innovation and resulted in supporting me in developing in the skills and knowledge of PBL implementation.

Teacher P7 described a different experience:

Throughout my personal and professional life, I aspired to be a regular traditional teacher and I still lean that way. I became acquainted with Montessori method however, and tried to incorporate that philosophy and I became open also to using PBL sometimes as another approach when I saw how some students could benefit more from hands-on active PBL in certain situations. Some students like to learn

passively but some do not. So now I try to differentiate and reach all kinds of learners.

When it came to their formal higher education and teacher training all teachers experienced varying amounts and depths of professional experiences, and experienced varying results in what they learned for effective implementation of PBL. In pre-service experiences none of the nine teacher participants had specific college courses in PBL that they could remember. Teacher P3 stated:

From my own past personal educational experience to my own college experience, it was passive learning, just listening and doing my work quietly. With the recent LDCSS push to do PBL I found I greatly enjoy this hands-on experiential problem-solving way to teach and learn. I am very motivated seeing how students get engaged and excited in PBL, especially those with disabilities.

Teacher P5 related:

I do not remember specifically PBL being taught in my college courses, but I do remember that there was a great emphasis on using the innovative method of cooperative learning to help kids get more engaged in their learning. I always liked the idea, but it was hard to accomplish equal learning this way without a lot of tension because in cooperative groups some kids tended to do all the work and some kids tended to do nothing. Students, and parents, complained this wasn't fair.

Subtheme 2b: Personal and Professional Experiences of the Beneficial Outcomes of

PBL

All nine teacher participants shared diverse personal and professional experiences and perceptions of the positive and beneficial outcomes of their PBL implementation in their classroom. Teacher P4 stated:

I see my students engaged, creative, and highly excited and motivated to learn in successful PBL projects. For example, in junior high I teach students about design through PBL projects. Using rudimentary materials like cardboard, plastic, tape, glue, and popsicle sticks for one special project my students became very motivated and excitedly designed a foot orthopedic device for a real child with cerebral palsy who was learning to walk. When the child put on the boots the students created the child walked by himself for the first time all the way across the room. It was a very emotional experience for both my students and me, all of us feeling the joy, satisfaction, and pride for what they accomplished. In the process they also learned math, science, art and even some medical and health knowledge and skills, along with the skills of collaboration, communication, problem solving, and creativity. The kids' excitement and motivation were extremely motivating to me. I felt confident to continue doing PBL, to trying to find ways to continually improve for the students' sake, to try to influence other educators to embrace the value of PBL.

Other teachers described times that they experienced strong feelings of satisfaction when they were able to implement PBL and see the excitement and

enthusiasm of their students, seeing them engaged, learning, succeeding, and being proud of themselves. Teacher P1 stated, "I love watching quiet, passive students become engaged, excited, and confident, with a sense of pride when they say, 'I created this." Teacher P6 said, "One of my favorite comments from students after we finish a complex and work-intensive project is, 'Can we do this again?" Teacher P2 related, "It is very affirming to me when I see students that have a hard life become independent problem solvers, getting prepared for world problems they will encounter in the real word and make it better." Teacher P3 stated, "I feel great satisfaction when I see the kids learn to collaborate positively like they will need to do in the workforce. I feel proud when I have taught kids to be creative who didn't think they could be." Teacher P1 described:

> I was ecstatic when observing how one student, who used to habitually not participate or put effort into their schoolwork, just blossomed and joined enthusiastically and responsibly in creating a PBL project on entrepreneurship. This student was so proud and so excited as they demonstrated their new skills and knowledge when presenting it with a classmate to a committee of adults. This student just beamed when getting positive praise and reactions from the committee.

Teacher P5 related, "One time when my students were doing a competition project for a competition, they presented their product to an audience of senior citizens for critique before their competition. They were blown away by the helpful and insightful feedback from the senior citizens." Teacher P7 stated:

When a PBL goes well my students learn content, but they also learn personal

skills such as perseverance and responsibility. When I have a successful project,

that gives me more good project ideas. Also, when I see a project go well for

another teacher, I am motivated to discuss it with them and learn how they did it

and to do more projects myself.

Many teachers related that the collaboration required for doing a project helped

students learn to listen to each other, respect each other, help each other, and find a sense

of belonging. Teacher P9 related, "In collaboration it is gratifying to see how students

learn that what others say has value, and even though it may be different, they learn from

each other."

Another type of experience of positive and beneficial outcomes described by

teachers was their personal growth in collaboration with other faculty peers both in their

own school and in other schools. Teacher P4 expressed:

As a staff team with a great principal leader, we have awesome support from each

other through a network of internal teams. We are all on board as a community in

sharing our ideas, searching for best practices, and problem solving our

challenges and needs. Teachers here are incredibly willing to be open to each

other and work cross curricular.

Teacher P1 stated, "We work as a whole school trying to support PBL implementation.

We sometimes work with another school in collaboration on a joint project. We all learn

so much, and both the teachers and the kids love it." Teacher P3 expressed, "We are a

close-knit faculty, and they are like our kids." Teacher P7 stated, "Our school puts a high

value on community and collaboration."

Subtheme 2c: Personal and Professional Experiences of the Challenges in PBL

Implementation

   Teacher participants shared diverse personal and professional experiences and

perceptions of meeting challenges and obstacles in PBL implementation in their

classroom. Teachers indicated that a significant challenge of PBL is to make core

changes to the way they had always taught and the way they had always thought of how

they themselves were taught, and the way students now need to learn. Teacher P4 stated:

   In the progressive educational practice of PBL it is a challenge for teachers to

   guide students through the experience of a hands-on project that is student driven

   with student input. Learning does not happen by the easier old-school Catholic

   way. In PBL student learning is actively constructed not passively received. But I

   think you have to believe in your heart that this is the right way to approach

   education if you want to be successful at this.

Teacher P1 stated:

   Because I used to be a dictator type teacher, it is challenging for me to let the kids

   kind of think for themselves. When I experience an un-successful PBL project or

   lesson I credit that to my own lack of expertise and experience. I'm learning to let

   kids take what I've given them and run with the project and me just being kind of

   a semi-facilitator. I think I still need to give them tools they need first, like prep

them with information, and questions like, "What do you think you know?" And

"How do you think you would do this?' But ultimately, I have to let them roll.

Teacher P8 related:

It is not easy to change. It is a challenge to try to convert reluctant teachers to

PBL that have been doing it a traditional way for such a long time. They are

hesitant about the benefits, unsure how to guide instead of lecture, or how to let

the students have more freedom to go on their own. Changing the culture and

mindset of a school to, 'PBL is the way we do things here' takes time. Whether

teachers are veterans or new, it can't just be demanded, it can't happen overnight.

Teacher P6 expressed, "Reluctant teachers have to ease into it, starting small, just trying

it." Teacher P2 expressed, "With trying to do group work well, keep track of multiple

things going on at once, and reach the diversity of abilities across students working on

projects, having an aide would make a big difference for me succeeding and helping the

students." Teacher P1 stated, "I try to help and support other teachers new to PBL,

encouraging them by saying, 'Just try it! If you try it, you will see and be hooked!" All

teachers expressed that one of the main obstacles and challenges in implementing PBL is

the pressure of trying to find enough time for the extra work that is needed for planning.

Teacher P1 stated, "The pressure of time is very hard, trying to fit in all my competing

responsibilities, and also try to fit in time for planning and outside of school for PD."

Teacher P4 expressed, "Teachers carry many extra roles and responsibilities in Catholic

education." Teacher P9 explained, "Besides extra time involved in implementing PBL,

you need extra time teaching religion, plus dealing with scheduling challenges, plus

having the pressure that we are competing with public schools to offer resources and services." Teacher P2 stated, "There are more demands on our time in a Catholic school so it's frustrating. I would like to do more PBL learning but it's hard to find time to learn new things."

Another challenge that teachers experienced was the issue of assessment and standardized testing requirements. Teacher P1 stated, "Assessing is a challenge, I create goals and try to do formative assessing throughout the project for 21st century skills." Teacher P3 explained, "I start projects with rubrics with points for all the parts of the project, so kids are not confused about how to get good grades." Teacher P4 stated:

> A traditional assessment system is inadequate. Something needs to change. You need to use criteria, use rubrics so students are accountable for achieving a grasp of knowledge and skills. I individualize assessments so students keep trying and correcting until they reach the criteria. Sometimes it seems chaotic but that's because multiple needs are being met.

Teacher P6 said, "Assessment is a challenge. I use rubrics to set expectations and standards, but I want to make sure the students understand the material. I work hard to uplift their personality because that uplifts the learning. I want them to get 100% in self-esteem." Teacher P9 stated, "Grading is hard because students, and parents, are used to letter grades. I use rubrics a lot, so kids know what to do." Teacher P7 stated:

> Assessment is challenging because students are not used to learning this way, so I try to prepare them ahead of time with 21st century skills, then mix various methods for a grade such as rubrics to give benchmarks, observations of their

performance, and traditional tests. It's hard to know how to get assessment right.

Sometimes I don't even assess PBL, not all PBL needs a grade at the end.

Teacher P8 expressed:

Assessment is a great challenge because I use a lot of rubrics, but our LDCSS

report cards are still traditional and not as advanced as we are trying to make our

instructional methods. Using the traditional grading scale is hard to do with PBL.

I combine tests, quizzes, projects, homework, and even notebooks. Some teachers

have been trying to get our district's grading protocols, systems, and report cards

to change to fit the more progressive ways we are teaching.

Another challenge mentioned by teachers was addressing the diverse needs of all

the students." Teacher P1 said:

Whether students are advanced or struggling they all benefit and learn from each

other doing PBL in groups. It is a challenge however to manage giving more

individual time needed to each student especially if they're struggling or have a

different learning style.

Teacher P3 explained, "Intervention specialists co-teach with regular teachers in our

school. This greatly helps teachers include all kids and differentiate for diversity,

sometimes working with kids in a side group on skills or content they need extra help

with." Teacher P6 stated:

Diverse disabilities such as autism bring challenges to PBL such as typing a

paper. So, I just look for ways that I can accommodate those disabilities. The

positive is that there is natural differentiation and inclusion in PBL. I have a

favorite phrase, "Don't hate, accommodate!"

Teacher P7 said, "With diversity in collaborative groups, struggling students learn from

students who learn faster and students who learn faster see strengths of those struggling."

Teachers noted that students also have challenges in PBL. Teacher P7 expressed,

"Although most students like doing projects and working in groups, they are not used to

learning this way, such as learning how to be responsible independent learners and self-

manage their tasks." Teacher P1 expressed, "A successful engaging PBL motivates

students and gives them pride and confidence in learning this way. I teach them how to

work through their frustration and learn through the problem solving."

Some teachers mentioned pressures from parents, and how that could also turn

into support. Teacher P4 explained, "In education parents are key and when they see this

is the right thing to do they go to bat for us. I find that just as parents can be super toxic,

they can also be super toxic in a good way and spread that good toxicity like wildfire."

Summary of Theme 2 Findings

Data analysis results showed that the nine teacher participants' responses of

perceptions and experiences in their interviews to the RQ and probing questions gave

evidence that they had personal and professional experiences in their lives and work and

in the actual benefits and challenges of their practice of PBL that impacted their

implementation of PBL. Teachers described both positive and negative experiences of

their own childhood education, lives, and teaching experiences. They relayed experiences

ranging from motivation and excitement in seeing their students getting excited and

engaged, to satisfaction and confidence in seeing real beneficial outcomes and accomplishments of PBL activities and projects. They relayed that although seeing the beneficial outcomes of implementing PBL was positive, they perceived and experienced that the changes, shifts, and time needed in learning and implementing this pedagogy presented challenges and obstacles bringing frustration and difficulty in effectively progressing in PBL implementation for their students.

Theme 3: Teachers Expressed Personal and Professional Beliefs

Data analysis results showed that the nine teacher participants' responses to the RQ and probing questions in the interviews described varied experiences and perceptions of personal and professional beliefs. Teachers described their personal and professional beliefs ranging over the three sub-themes of a) personal and professional values, b) personal and professional philosophies, and c) and the environmental characteristics of their individual schools.

Subtheme 3a: Personal and Professional Beliefs About Their Values

Teacher participants described perceptions and experiences of beliefs about their varied personal and professional values. All teachers mentioned varied Catholic values that are promoted by PBL. Teachers experienced how the real life and authentic activities and projects of PBL enabled their students to deepen their understanding of the Catholic faith such as virtues, service to others, respect for the dignity and diversity of others, and uniting and forming community. Teacher P6 stated:

The fundamentals of PBL allow my students to contribute to a project with room for making accommodations to uphold the dignity of everyone as a child of God.

In PBL I can help the children to develop their knowledge and skills and be who God made them to be. In a PBL project I can recognize the different qualities of each child that can make the world a better place. The students see each other without labels and learn that each student has the power to make a difference no matter the project.

Teacher P3 shared:

I love how PBL incorporates the Catholic value that no man is an island to himself, so in learning to positively collaborate with one another in projects my students learn that we need one another to carry on in life. I teach students to respect all, even someone beside you that you may not like. It is our ministry to help them be confident and prepared for when they leave this school. The disciples of Christ all had a trade in the real world.

Teachers described projects that connected to Catholic identity. Teacher P4 stated:

The project approach of PBL presents great opportunities for learning and reinforcing Catholic values. When my middle school students did the project to design a foot orthopedic device to help a child with cerebral palsy learn to walk, they did so with such a sincere love and desire to help that child. They learned what Jesus meant by serving others. They did research and learned health, medicine, science, and math skills, but they also integrated studying the corporal works of mercy from scripture. This will be deep and lasting learning for them.

Teacher P9 described:

In a great student-driven project my students had the idea to create stories of

relevant real-life experiences to learn the cardinal virtues. They created scripts for

role plays of moral situations related to their age in which they had to advise other

students their age in making decisions and choices in the situations based on the

virtues. They then were very excited to perform their plays for students in another

classroom in their grade level.

Teacher P3 stated:

The approach of PBL can help the kids learn Catholic faith history and

development. The kids did a project in which they designed and built their own

model of a Catholic church and parish. They collaborated and did research into

the components, design, and purpose of a Catholic church and parish and created

their own unique modern model with its own name and unique characteristics

they thought a Catholic church should have today. Besides learning Catholic

religion content in this project, students learned academic standards in math,

science, and social studies, and learned success skills of critical thinking,

problem-solving, collaboration, communication, and creativity.

Another value promoted by project-based learning mentioned as very important

by some teachers learning is that it builds self-esteem. Teacher P8 explained:

Learning by PBL enables my students to be confident working with others

helping them grow into independent and responsible learners and helps them learn

that everyone can contribute to society. My students need to feel good about

themselves and confident that no matter what their abilities they will be able to contribute to the jobs they will have in the future.

Teacher P5 described, "In the long-term project when students designed a city of the future, they learned curriculum standards in math, science, social studies, and English language arts that will stick with them. They felt proud and kind of smart that they had learned something in a 'grown-up way."

Subtheme 3b: Personal and Professional Beliefs About Their Philosophies

Teacher participants described their perceptions and experiences of their personal and professional philosophies of teaching. A core philosophy to keep students at the center of their teaching was a personal belief of most teachers that drove their practice of teaching in any educational setting. Teacher P1 explained, "I have shifted my belief to student-centered teaching, even though sometimes I am still a semi-facilitator, trying to guide students on the side yet making sure I direct them to stay on task." Teacher P2 stated, "PBL helps me help the students that have learned to be over dependent on others learn to do it on their own. This is being student-centered, doing what is best for kids. It's what the students need." Teacher P3 explained, "I believe I need to take every student's learning style and ability into account when I teach." Teacher P4 stated:

> The best way to do PBL successfully is if students have their say in how a project is created. One time I just shared an idea with my kids about wondering what it would take to fix the parish parking lot behind the school. Soon they were off and running with their own ideas, and with my guidance they started on their real-life journey of learning math, research, science, finance, business, and even language

arts in how they were going to present their idea to the pastor on how to fix the parking lot.

Teachers expressed how they saw their role of teaching as more like coaching or facilitating and guiding. Teacher P1 explained, "A teacher should be more of a coach than a dictator." Teacher P4 explained:

I'm teaching more like a coach. Like a sports coach I let them play the game, then I can jump in and say, 'Hey come here, let's talk about this. Let's reflect, like assess, 'why did you do that? Could you do it differently?' And so on. I give them adult guidance but at the same time help them realize how they can become more independent and in charge of their own learning. I believe it's my job to teach my kids how to understand real life and be ready for real life challenges.

Some teachers had doubts because they were not sure how much the teacher should let students drive everything and how much the teacher should be in control. Teacher P4 expressed, "Although PBL is meant to be student driven I think it can also be successful if the teacher comes up with project ideas and the students can still have input working within teacher guidance and curriculum constraints." Teacher P7 said:

PBL is valuable in various ways, but it is still just one of several methods that can be valuable for students. There are students who learn and respond very well also to traditional lectures and notes. I believe PBL can be too formulaic with all steps laid out. True PBL is organic, so you need to look for teachable moments, jump in, and go with the flow.

Teacher P9 said, "I think teachers need to really believe that the PBL approach is
beneficial, and that students are learning important skills as well as content and
standards." Teacher P8 expressed:

> My professional beliefs and values are the same, that students need a rigorous
> curriculum, need to become independent learners, and need to learn Catholic
> values. But how I teach has changed. I think teaching must be more like coaching
> with less lecturing, more giving examples and pushing students to think of things
> and figure things out for themselves, kind of like they are constructing, almost
> like they are teaching themselves.

Teacher P6 shared, "We must realize it is all about the students, and what they need today
to be successful in jobs and be good, kind, loving persons in those jobs and in their lives
and must strive to make that happen." Teacher P4 expressed:

> The philosophy in our LDCSS school is it's not all about me, it's every child,
> every day. The innovative approach of PBL is critical to our students' 21st
> century success. It is critical for the diocese to take on the opportunity of PBL to
> progress to stay on the cutting edge in a niche role to avoid falling behind and
> fading out. I just believe in my heart that PBL is the right way to approach
> education because this is the way students need to learn right now. Catholic
> education progressing in this kind of cutting-edge teaching if done right can give
> families the whole package, what parents want for their children today. Build it
> and they will come.

Some teachers wondered about that approach of Catholic education. Teacher P1 stated, "I believe we need to rethink Catholic education. Change is needed. Somehow something has to give for all our children to be educated, productive members of society." Teacher P2 explained, "Educators today must be willing to try new things, be open to adapt to new more effective teaching styles and techniques. We are responsible now to guide kids to the future. We've already had our future so now we are the guides." Teacher P3 expressed, "The past passive way of learning is not beneficial. Students need hands-on real-life application learning for when they leave our school. To be independent life-long learners, to be able to be collaborative, creative, problem-solving members in society." Teacher P5 stated, "The traditional way of pouring out information and kids taking it in is not effective anymore. You must change this mindset." Teacher P9 expressed, "We cannot teach the traditional way, but must change our whole shift because that's where kids are." Teacher P6 explained, "Grades are important, but more important to realize is each student learns in a different way. As PBL is student-centered, the Catholic school is God-centered, to do what Jesus would do and live in society not for self but for others."

Subtheme 3c: Personal and Professional Beliefs About Their School Environment

Teacher participants described their experiences and perceptions of beliefs about the environment in their individual schools. All teachers experienced and perceived various ways in which their school environment had a positive climate or atmosphere of community among staff and colleagues. Teacher P1 described, "In our school we have one floor for upper grades to focus on PBL-based Science, Technology, Religion,

Engineering, Arts, and Math (STREAM). Teachers there collaboratively learn and team-teach STREAM and PBL. Teacher P2 expressed, "The lower grades work together in our school to try and support PBL implementation. In our school colleagues are always trying to help each other in grade level teams to do what's best for our kids." Teacher P3 stated, "As teachers in our school we work close with each other including all teachers, aides, intervention specialists, and administrators. Our close-knit faculty makes a big difference, so our students are like our kids." A few of the schools have structured teams and team leaders set up across subjects or grade levels within their school. Teacher P4 noted:

> Our school has a grade level team structure. Teams can better help with individual teacher struggles. Teachers can collaborate with, problem solve with, and seek help from colleagues in teams. They may find colleagues who know more about PBL than they do, or who may be experiencing similar struggles. Collaboration with other teachers enables teachers to learn from their mistakes and learn better strategies from each other.

Teacher P6 described, "PBL is incorporated schoolwide in our school. It is a positive culture that is open, innovative, and not traditional. Teachers share ideas, respect all ideas, and do not hide ideas from other teachers. We work together to find strategies that work best for the students." Teacher P7 explained, "We learn teamwork and how to build a professional community in our school. Community and collaboration are core Catholic values. We serve each other when we have a problem-solving mindset and work collaboratively for solutions." Teacher P1 stated:

A collaborative type of atmosphere exists not just in our own school but in some other LDCSS schools in different areas of the LDCSS, so we sometimes reach out for help and problem solving between schools. I try to plan to spend a day with teachers and staff in another school because even if we have a different size or different demographics there are always successful ideas we can trade, along with problems we can help each other solve. We were so excited when all students in the same grade level in our two different LDCSS schools collaborated on a project, and we saw kids that usually act goofy actually sit there and come up with good ideas.

A few teachers also described a school environment in which their Special Education teachers were critical aides involved in helping them help students who needed more individual help in PBL projects, such as some side direct teaching or some help learning 21st century skills. Teacher P8 described, "When two or more teachers of different subjects sometimes join in projects, such as the math and science teachers combining, or the art and social studies teachers, the students get more motivated and excited and achieve even deeper learning in the combinations."

Summary of Theme 3 Findings

Data analysis results showed that the nine teachers participants' responses of perceptions and experiences in their interviews to the RQ and probing questions gave evidence that they had varying personal and professional beliefs that impacted their implementation of PBL. They described their varying beliefs regarding the values of Catholic identity and Catholic education such as service, community, respect and

compassion for others, and life preparation, and other values such as self-esteem, beliefs

regarding philosophies of teaching such as student-centeredness, diverse needs, voice and

choice, and innovative teaching, and beliefs regarding environments with collaborative

and supportive atmospheres in which they teach.

Theme 4: Teachers Expressed Experiences and Perceptions of Their Needs for Support in Implementing PBL

Data analysis results showed that the nine teacher participants' responses to the

RQ and probing questions in the interviews described varied experiences and perceptions

of needs for support. When responding to the RQ and probing questions, teachers'

descriptions of their needs for support ranged over the four sub-themes of a) professional

development, b) leadership, c) resources, and d) parents.

Subtheme 4a: Needs for Support From Professional Development

This subtheme included the largest amount of data. Participants expressed that

they had needs for support through PD. Teachers described experiencing PD that covered

varied types and levels of content, skills, and applications in practice. The LDCSS

offered some types of PD opportunities for teachers to learn about PBL and its

implementation. These included large conferences with presentations and speakers

usually at the beginning of each school year that included PBL or STEM sessions at

regional school sites for teachers from groups of LDCSS schools to attend. Teacher P5

expressed, "The large conference types of PD from the Diocese were not effective, kind

of crowded and sometimes chaotic, not really tailored to individual school or teacher

needs." Teacher P9 stated, "PD doing just PowerPoint and presentation is not beneficial PD." Teacher P7 described:

> We participated in a yearlong optional after-school program in which small groups of students from different schools could work on a specific project for their school, with all making a presentation at the end of the school year. These types of PD projects were worthwhile, although they reached only a few students and only one of two teachers in each school.

Teacher P8 explained:

> The Diocese set up a group of teacher representative STEM facilitators from each school that met monthly to discuss PBL and STEM programs in the Diocese and carry their ideas and knowledge back to the teachers in their school. I am a member of this group and bring back PBL knowledge to share with other teachers in my school. Some teachers like the information, and try to use it, but I am trying to get more teachers excited about it. I have come to realize the best PD is when teachers can see and try out examples of PBL projects that are meaningful for their specific situation.

Teacher P2 stated, "In-person hands-on PD workshops are the most helpful." Teacher P3 stated, "PD is more effective if it is on-site, and is best if it is ongoing, not just a one-time large conference or workshop. That can better apply to what we are doing as a unique whole school. It would help for PD across the Diocese to be revisited." Teacher P5 stated:

For Catholic school survival the diocesan administration needs to play more of a

role in offering PD opportunities that can make better use of individual schools'

and teachers' time. In the same way students learn best in PBL because it is

student-centered, teachers learn best in PD when it is relevant to their needs and

interests and involves their voice and choice.

Teacher P3 stated, "We need to do experiential learning, learning to do what we will be

teaching out students to do." Teacher P7 expressed, "PD for PBL needs to be organic,

working right in the community of your fellow teachers, in the classroom, not in the

workshop." Teacher P4 stated, "PBL implementation in our school is supported more

from PD within, by colleagues who collaborate to support and motivate each other as

team members."

Some teachers explained they perceive that mostly they are on their own to

acquire PD. Teacher P1 described, "I must try and look for things myself, whether by

word of mouth, online, or in professional journals and books. I must regroup from my

mistakes, and search for my own PD. It would be optimal if PD could be job imbedded,

right here." Teacher P5 said, "PD can meet your personal needs better if it is onsite in

your school." Teacher P8 related, "One summer through word of mouth I found an

outside university program in my city that helped me immediately." Teacher 4 noted:

I have found there are some worthwhile packaged, structured school programs of

teacher PD created for PBL and sponsored by reputable local and national

organizations, communities, businesses, and school districts the Diocese could

bring into the schools. Some are costly, some use grant funding, and some are no

cost. Some include the service of an instructor or facilitator to guide teachers and coach them through the beginning steps, and even visit for follow-ups. It has great value for supporting PBL for students and PD for teachers and I wish these things were more known and done more in all our schools. The LDCSS needs to jump on these opportunities to keep Catholic education moving on the cutting edge and beyond.

Teacher P9 described, "Our Principal brought in an outside program that was very beneficial PD for all the teachers, including service of an instructor and active modeling. I wish this could have been ongoing." Teacher P8 stated, "We find it is best to do whole school PD all at once so we can support each other no matter where each of us are on what we know or think about PBL." Teacher P4 noted, "Efforts to bring along reluctant teachers can succeed if they can influence the teacher to just try it and see the positive outcomes."

Another effective method for PD within a school is strengthening the collaboration and community network of teachers." Teacher P1 stated, "Gathering different minds to collaborate or problem-solve generates great ideas and support." Teacher P4 stated, "Grade level teams and structures are very motivational for PD and for getting support and help with struggles and implementation of PBL through sharing, discussion, and even peer observations." Teacher P7 stated, "Schools themselves should also collaborate more with each other." Teacher P1 expressed, "One alternative kind of PD I use is to visit different schools to observe other teachers demonstrating their teaching. It is educational, inspiring, and motivating to me to see experienced teachers."

Subtheme 4b: Needs for Support From Leadership

Participants expressed the need for support through leadership, often using the word "key." Teacher P2 stated:

The support of the school administration is key. Our administration is very involved with finding ways to help us as teachers. They go into great depth in hands-on learning and guiding the upper grades in developing PBL implementation skills, so the teachers of those grades form a tight team. They also help teachers in the lower grades by giving concrete written guidance for project ideas that incorporate curriculum and help teachers keep a regular pace. They are also very encouraging to teachers to build supportive team relationships among the lower grade levels.

Teacher 4 related:

It is our good fortune that our school has a strong supportive principal and a parish pastor who back us up on our ideas and a lot of the resources we need. Their key leadership mindset is encouragement, openness, strong faith, positive attitude, and seeing failures and hurdles as opportunities. Both the principal and the pastor encourage us to experiment and give us freedom to always try and look for new ways to grow and develop with PBL. Both the principal and the pastor also encouraged and supported us as we worked hard on our PBL progress that earned us school academic awards and special designations."

Teacher P8 expressed:

The principal is key. Our principal mandated everyone to start doing PBL at least once a quarter, explaining that it would enable us to earn a special state designation for our school. The principal was by our side, helping, supporting, encouraging, meeting, and providing the PD we needed so we proudly achieved that designation, and learned PBL content and great PBL skills in the process."

Teacher

Teacher P9 stated, "Leadership must make PD common place, and meaningful." Teacher P5 explained:

The principal needs to be in PD with you, supporting you. That is key. Our principal knows our needs and is pretty good about bringing other people in to help us like with technology. Our principal has given one of our teachers the responsibility of being a facilitator of our STREAM program and PBL implementation. This teacher researches and plans all kinds of ways to help us learn the content and skills of these programs. Our principal also works well with the facilitator to reach reluctant teachers. This is important because they believe that a teacher's heart must be in PBL, or it won't matter what type or how much PD the teacher has.

Teacher P6 expressed, "Principal leadership can make all the difference in the world. A non-supportive principal that is critical of progressive types of teaching like PBL can impact teachers' decisions to teach there." Teacher P3 stated, "We have a large system of schools and diocesan leadership that could help more in encouragement and support of PD for progress in PBL, whether for teachers or administrators."

Subtheme 4c: Needs for Support From Resources

Participants indicated unique needs for support through resources, such as technology and funding. Teachers indicated that resources help them in addressing the challenges of implementing PBL. Several teachers expressed needs for the help of various types of teaching aides and classroom assistants. Teacher P2 expressed, "What a difference it makes when I can have an extra pair of hands and helpers that can help a group with some kids struggling with collaboration, which frees me up to help meet other students' diverse needs working on their project." Teacher P5 expressed:

Our school is blessed with a group of dedicated Special Education teachers such as tutors and intervention specialists. They collaborate with us on projects and curriculum, and since they know the struggling students, they can help them with their needs to learn content and skills in the classroom. Sometimes they coteach with us and teach us how to scaffold learning for them.

Teacher P2 stated:

Besides needing aides, another resource we could use more of is technology, and not only devices, but the professional help in learning what digital resources are available for myself and the students, and how to use them. All our schools really need this to prepare our students for the 21st century.

Teacher P1 stated:

Time is a valuable resource. Whether it is time needed in my classroom, time I need for planning, or time I need to do things for PD, it is a resource. Of course,

time can't be bought or donated, but though it's not physical like materials or

supplies or even aides, it is the most valuable resource and what I need the most.

Subtheme 4d: Needs for Support From Parent Backing

Several participants in this study indicated the important part played in their

school by the backing of parents. Although not often mentioned, several teachers noted

that especially in Catholic education parents can be key supporters. Teacher P4 stated:

As parents start seeing the way we're teaching is right, they go to bat for us.

Parents can be super toxic, but they can also be super toxic in a good way and

spread good toxicity like wildfire. When parents are on our side it is very

uplifting, affirming, and motivating.

Teacher P7 noted, "I have not met resistance doing PBL in our school because our

parents are satisfied. They love PBL because their kids love it." Teacher P8 said, "We get

a lot of praise from our parents for the projects we do that are reported in the news.

Parents want their children to have this project experience in their Catholic education to

have a more complete education for their future." Teacher P5 reported, "I received a great

comment in a note from a parent, 'My child woke up excited to come to school today,

there must be project in the air!' That just made my day." Teacher P8 described, "I had

feelings of being thankful and inspired by parents of students who started offering their

support and offering resources such as materials and supplies to help make projects."

Summary of Theme 4 Findings

Data analysis results showed that the nine teachers participants' responses of

perceptions and experiences in their interviews to the RQ and probing questions gave

evidence that they had various needs for supports that impacted their implementation of PBL. Teachers expressed the need for support of PD for PBL implementation that was active and collaborative, relevant to their unique schools, teachers, and students, taking place on-site, and ongoing to enable immediate practice in the classroom of what they learned. They expressed that they had a key need of support from diocesan and school leadership that was open, positive, encouraging, supportive, and working with them and for them to get them effective PD for PBL implementation. They also expressed the need for support from resources of aides, time, technology, and funding, and for support from parents that was positive and backing them up.

<center>**Discussion of Findings**</center>

In this section I discuss the interpretation of my findings, conclusions, and outcomes from the findings in relation to the problem, the RQ, and the literature. I also discuss the resulting project deliverable that I designed and how it responds to these findings.

Interpretation of Findings

The purpose of this study was to investigate LDCSS teachers' experiences and perceptions to be able to know and understand their progress in implementing PBL, the innovative instructional approach of this study that research affirms prepares students for success in 21st century education, careers, and life (Boardman et al., 2021; Boss & Lamer, 2018). Research affirms that implementing PBL effectively to benefit students involves unique challenges that must be known, understood, and addressed (Boardman et al., 2021; Condliffe, 2017). Since the initiation of PBL by the LDCSS over 6 years ago to

improve the education of their students, it was not known how LDCSS teachers were

experiencing and perceiving the progress of their implementation of PBL in the LDCSS

classrooms. As the researcher of this study, I used on-on-one private interviews to

examine the experiences and perceptions of nine teacher participants that were

representative of the broad demographics of small and large, urban, and suburban,

schools of the LDCSS. Guided by the main RQ asking teachers how they experienced

and perceived their progress in implementing PBL in their classrooms, I used probing

questions to gather more detailed data in which teachers shared experiences and

perceptions that described various factors they encountered in their progress in

implementing the instructional approach of PBL in their LDCSS classrooms. As I

analyzed and interpreted the data of the teacher responses to the RQ and probing

questions from the interviews four main themes emerged with 14 subthemes. These

themes suggested that the current study's teachers experience and perceive that their

varied knowledge and understanding of the instructional approach of PBL, their personal

and professional experiences, their personal and professional beliefs, and their varied

needs for support were factors that impacted their progress in the implementation of PBL

in their LDCSS classrooms.

Theme 1: Teachers' Varied Knowledge and Understanding of the Instructional

Approach of PBL Influence Their Progress in Implementing PBL in Their LDCSS

Classrooms

Teachers come to their professional positions in a school bringing unique, varied,

and diverse experiences of professional learning and training (Zapata et al. 2021). Despite

this diversity research affirms that teachers need to fully know and understand the content, methods, and skills needed to achieve capacity to effectively implement a new and innovative instructional initiative (Anagun, 2018; Bates & Morgan, 2018; Darling-Hammond et al., 2017). In this study teachers relayed a range of varied knowledge and understanding of the facets of the instructional approach of PBL. Having a wide difference in number of years of teaching experience, in types and places of college and in-job learning and training, and in types and locations of teaching positions, teachers all had acquired their own personal knowledge and understandings of the instructional approach of PBL from various sources in various ways.

Teachers indicated that they had a positive view of PBL and knew and understood some basic elements of PBL such as its student-centered focus, its goal of completing a project, its benefit of helping students better learn 21st century skills and curriculum content, and its purpose of preparing students for success in life. The knowledge and understanding that they described in the current study, however, was not consistent in showing that they experienced or perceived they understood all core PBL facets, nor all of the skills needed for its effective implementation. For example, some teachers had gaps in conceptual areas such as PBL's framework theory of experiential learning and constructivism. They described it as hands-on learning, and that their students liked the active engagement, yet they did not relay a sense of the deeper why of PBL, of the nature of the process of learning by doing or constructing their own learning, or how critical the teacher is in the non-traditional role of facilitator guiding and supporting the students (Dewey, 1938; Vygotsky, 1978, 1986). For example, one teacher stated, "My goal is to

prepare them for the type of learning and skills they will need for the high school they will attend." Another teacher stated, "I don't really like the label 'facilitator.'

Anagun (2018) found the teacher's role critical in the implementation of constructivist pedagogies. Teachers in the current study indicated they had gaps in skills areas such as how to incorporate curriculum content standards into the project process. All teachers mentioned they would like to learn more about implementing PBL, indicating as the research verifies that the pedagogy of PBL is a complex innovative instructional approach, more complicated than traditional methods (Boardman et al., 2021; Darling-Hammond, 2008). Progress in implementing innovative initiatives such as PBL depends on implementation done in depth and at high levels (Condliffe, 2017). The inconsistent knowledge and understanding of the teachers about PBL in this study is understandable due to the diversity of their sources of learning. As research confirms despite its popularity, PBL still has an uncertainty and inconsistency of definition, causing teachers to be still in need of knowledge and support for its challenging implementation (Boardman et al., 2021; Thomas, 2000). In this study, teachers have a grasp of basic PBL, but with some inconsistency and gaps in PBL knowledge and understanding being a factor affecting their progress implementing PBL.

Theme 2: Teachers' Personal and Professional Experiences Influence Their Progress in Implementing PBL in Their LDCSS Classrooms

Studies in the literature verifying the beneficial outcomes of PBL are easily found and motivate educators and schools to implement PBL (Boardman et al., 2021; Boss & Lamer, 2018). Studies in the literature that verify the challenges of implementing PBL

are also easily found and show how this can hinder educators in effective implementation of PBL (Boardman et al., 2021; Condliffe, 2017). Many types of professional development have been used to instruct teachers about the benefits of PBL, to learn about its elements and the skills needed to implement PBL in the classroom. In this study, besides discussing what they knew about PBL, teachers focused more on describing how their actual classroom experiences personally felt and how this motivated them. Seeing and feeling how their students benefitted from implementing PBL were such strong motivators to them to keep pushing forward through challenges in implementation. Teachers' responses focused on describing detailed diverse personal and professional experiences from their lives and in their teaching that strongly affected how they developed as teachers, such as styles of teaching in which they had positive or negative learning experiences from as far back as childhood. From these personal experiences of life and teaching they constructed personal knowledge, understandings, and beliefs about what comprised teaching practices that motivated and benefitted students. Dewey (1938) described experience as a moving force, and a power to influence growth and construction of knowledge in a continuum of one experience to the next. This process points to the core of this study's conceptual frameworks of experiential learning of Dewey (1938) and constructivism of Vygotsky (1978, 1986). For example, several teachers relayed both negative and positive experiences in their personal or professional lives that motivated or inspired them to learn, understand and embrace the innovative approach of PBL and be determined to professionally develop in that method of teaching.

In their current classrooms, teachers described how their perceptions of the beneficial outcomes of PBL continued to be reinforced by their experiences of the excitement and motivation of their students when positively engaged in the learning and creating of PBL projects. Teachers remarked about how they themselves experienced pride and excitement as their students' faces "would light up with excitement" when they were able to implement a PBL project successfully with their students. Dewey (1938) espoused that emotions are so powerful that they can cause humans to change and even impact further persons and experiences connected to that change. An educative experience and ensuing experiences purposefully gathered in continuum, especially in social environments, can build on and construct learning and growth in understanding to new levels (Dewey, 1938; Vygotsky, 1978, 1986). In recent research, Boardman et al. (2021) found that the main drivers for teachers implementing PBL were their experiences of their classroom relationships and their students' enthusiastic engagement. Even the teacher in the current study that expressed being neutral in feelings of motivation or desire to implement PBL, described how an instance of PBL experiential learning in the classroom brought the satisfaction of finding a method of teaching in which a student found success in learning, one of this teachers' philosophies of teaching.

In studying why teachers either adopt or resist pedagogical ideas Areljung (2019) found that factors such as "eye-opening" teaching experiences in practice can influence and change teachers' former perceptions of knowledge or competence, giving credence to the power of beneficial experiential learning. Sometimes however, the experience that is negative may not be motivating like the experience previously mentioned but evoking

feelings of frustration and defeat, presenting obstacles to progress in creating the educative experiential learning of PBL. For example, in relaying experiences of the challenges to their progress in PBL from various pressures such as time, teachers described being discouraged to not have the time to be able to fully implement all the components and teach students all the skills needed for a project. The frustration with assessment is a frustration also outside of the Catholic environment. Research confirms there are more demands on teachers striving to implement the complex pedagogy of PBL (Anagun, 2018; Wurdinger, 2016). Whether positive or negative the responses of the teachers in the current study indicated the force of experience was a strong factor affecting teachers' progress of implementing PBL.

Theme 3: Teachers' Personal and Professional Beliefs Influence Their Progress in Implementing PBL in Their LDCSS Classrooms

Research studies mention the challenge of a paradigm shift in which changes in beliefs and values are often needed in implementing PBL (Anagun, 2018; Carr, 2017; Darling-Hammond, 2008; Wurdinger, 2016). Studies in the field do not explore as deeply the origin and nature of teachers past beliefs for meaning and causes of beliefs however, as happened in the current study. In the current study teachers described personal and professional beliefs encompassing the values they believed, the philosophies they believed, and the school environment in which they teach that seemed to connect in several common core beliefs in implementing PBL. As teachers in a Catholic school for example, all described Catholic values and philosophies of teaching they believed and had in common with each other such as the value of service, the value of community, the

belief in the dignity of each student, and the philosophy that in teaching "it's all about the students," and "teaching is doing what's best for my students."

In describing Catholic contemporary philosophies of education, D'Souza (2018) emphasized beliefs in the student as a whole person of will, feelings, emotions, and diversity, and community as the basis of society. Teachers also described how some philosophies of the innovative instruction approach of PBL now in their schools are easier to accept and more motivating to implement because it is also driven by Catholic values teachers have such as community, collaboration, and the belief that all God's children no matter ability, can learn through creating projects that can serve and help others like Jesus did. They described how PBL projects demonstrated a positive power and effect on a Catholic school environment in terms of the value of PBL projects inherently serving others.

In a study of preservice English teachers Pennan-Morales et al., (2022) found that factors rooted in teachers' experiences triggered and reinforced the beliefs that had evolved throughout their lives, supporting in this case teachers' beliefs of values of service and respect rooted and reinforced in the experiences of their own personal development of growing up Catholic. The current study's conceptual framework of Dewey's experiential learning (1938) and Vygotsky's constructivism (1978, 1986), further supports that teachers' beliefs are rooted in and constructed in the force of a continuum of experiences of growing up Catholic. In the case of Catholic beliefs this results in a strong positive context for implementing PBL. In addition to Catholic beliefs however, some teachers have expressed educational beliefs that are traditional, such as

"the progressive approach of PBL is not necessarily the best instructional approach," or "the role shift of the teacher to guiding instead of directing is concerning." Some expressed progressive beliefs, such as "Catholic education needs to change from traditional to progressive methods to survive." Many studies give strong indications that it is imperative students learn differently and acquire critical skills to be prepared for success in their careers and life (NACE Job Outlook 2020, 2019). In the current study, both Catholic and general educational beliefs are strong factors affecting teachers' progress implementing PBL.

Theme 4: Teachers' Needs for Support Influence Their Progress in Implementing PBL in Their LDCSS Classrooms

The great value and benefits of the instructional approach of PBL is why the LDCSS chose to initiate it over 6 years ago (Boardman et al., 2021; Boss & Lamer, 2018). Research studies find that because of PBL's complexity, extra time, and extra work needed for its implementation, there is a vital need for effective professional development for its initiation into a school. (Bates & Morgan, 2018; Darling-Hammond et al., 2017). In some studies researchers are starting to find that professional development needs to be adaptable and customized to be effective with a broad choice of professional development conferences, workshops, and activities for PBL for its schools and teachers, yet this study's findings show that teachers in the LDCSS schools affirm there is still a need for professional development support. Teachers expressed that large periodic LDCSS group professional development experiences were not that effective and indicated that it would be more helpful if they had professional development that was

more customized and relevant to their own school needs, was a more collaborative process with their colleagues, provided more knowledge and skills to better apply on-site in their own practice what they learned in PD, and was more supportive of meeting the challenges of its implementation in the classroom.

Supportive of the need for effective professional development to support teachers' implementation, the findings of the current study establish that teachers perceive that effective leadership is a vital key to support them in implementation and practice of PBL. Teacher P3 expressed, "We need more support from our district leadership, but our school leadership is amazing with their encouragement, support, and help they give us in creating projects." "Good leadership is definitely critical to Catholic school survival," stated Teacher P5. Teacher P2 expressed, "Sometimes the LDCSS administration does not seem sensitive to what we really need when arranging times for professional development." Teachers in the LDCSS schools of this study praised the leadership of their schools as providing the encouragement, openness, and support that they need. Further, findings show that although teachers are learning pieces and parts of PBL pedagogy, striving to keep up their motivation and commitment to implement PBL, and attending various speakers or workshops offered by the LDCSS, they still feel they need to search for needed PBL training and information, resulting in an imbalance of professional development across LDCSS schools. As one teacher expressed "PD is not effective for me if I struggle to successfully apply in my classroom what I learned from the workshop."

All teachers expressed ways that their leaders were key in their teaching. They needed leaders with characteristics such as encouragement, support, open mindedness, listening, and understanding. They needed and were thankful for the support of their leaders, principals and in some cases pastors. Next to the efforts and commitment of teachers, effectiveness of PBL implementation depends on the supportive characteristics and actions of school leaders (Carr, 2017). In addition to the needs for the critical supports of effective professional development and leadership, teachers lamented the hindering influence and effects of the lack or dearth of resources such as time and aid in their implementation of PBL in the classroom. Wicks et al., (2019) found in studying effective implementation that best practice included leadership that was able to build the investment required to obtain needed resources of time and people. Wicks et al. also found that in best practice implementation the ability to round up stakeholders such as parents and businesses that provided support in various ways was a key to effective leadership.

Conclusions and Outcomes

Over 6 years ago, the LDCSS of this study initiated the implementation of the instructional approach of PBL in their schools to improve the learning and preparation of their students for success in their further education, careers, and life in the 21st century. The problem however was that since that initiation began it was not known how the LDCSS teachers were experiencing and perceiving their progress of implementing PBL in everyday practice in their classrooms. My rationale for the current study was thus to know and understand how the teachers were progressing in PBL implementation in their

Catholic school classrooms, whether they were implementing PBL to design and purpose, whether they were succeeding or were challenged, what was working, and how they could be supported in a Catholic school environment. I decided to explore this problem through a qualitative study interviewing representative LDCSS teachers with the research question (RQ), "What are the experiences and perceptions of the LDCSS teachers regarding the progress of their implementation of PBL in the classroom?" I used a one-on-one private interview process, and directly explored the experiences and perceptions of a representative sample of nine individual LDCSS teachers covering four individual LDCSS schools and collect data from their responses describing experiences and perceptions of their progress in implementing the instructional approach of PBL in their classrooms. My analysis and interpretation of the findings from their descriptive interview responses as summarized previously, resulted in evidence indicating that teachers experienced and perceived four general factors that affected their implementation progress.

First, findings gave evidence indicating that teachers perceived that implementing PBL was influenced and affected by their knowledge understanding of the instructional PBL approach, including its background and conceptual framework, its purpose, its essential elements, and how students learned from it. Although teachers had basic knowledge and understanding of PBL's elements, this study's data showed inconsistencies and gaps between teachers, even in the same school, when describing what they knew and understood about PBL and its implementation. Studies affirm that teachers need to fully know and understand the content, methods, and skills needed to

achieve capacity to effectively implement a new and innovative instructional initiative

(Bates & Morgan, 2018; Carr, 2017; Darling-Hammond et al., 2017). Rectifying these

inconsistencies and gaps can contribute to development of teachers' capacity and

empower them to progress in effective implementation of the PBL approach to bring

benefits to students.

Second, findings from this study gave evidence that indicated teachers' progress

in implementing PBL was significantly influenced and affected by their personal and

professional experiences whether positive or negative, including experiences from life

and work events, experiences from student outcomes from their PBL implementation,

and experiences of challenges in their PBL implementation. Teachers described

experiences and how they empowered them with strong feelings of motivation to

implement PBL for their students' benefit. Whether positive or negative, a diversity of

experiences motivated and drove them to push and keep working and continuing their

efforts to progress in implementing PBL. Some teachers suggested that this in turn

affected their beliefs.

Third, findings from this study gave evidence that teachers' progress was

influenced and affected by their personal and professional beliefs, including the Catholic

and educational values they held, the Catholic and educational teaching philosophies they

followed, and the Catholic and educational school environment in which they taught. As

with their experiences, it is a significant finding from this study that the influence of

teachers' beliefs drove and empowered their commitment that was needed to teach in

certain ways (Carr, 2017). The Catholic and educational beliefs that they held drove their

commitment to keep working and continuing their efforts to implement PBL, giving them

a sense of mission to implement the instructional approach of PBL.

Fourth, findings from this study gave evidence that teachers' progress was

influenced and affected by their needs for supports from professional development, from

school and diocesan leadership, from resources, and from parents, and how those needs

for support were met. Teachers described how they wished they had professional

development that was relevant to their school and collaborative and practical, or

leadership that set a tone of openness and encouragement, or resources that enabled them

to have more assistance and time, and a supportive parent community.

The important outcomes of these findings were that first, teacher responses in the

interviews did reveal knowledge and understanding regarding what they were

experiencing and perceiving in their progress of PBL implementation in representative

LDCSS schools at the site of this study was revealed in the interview process, thus

answering the driving RQ.

Second, an important outcome of the exploration of the RQ was that findings

indicated that there were several factors that influenced and affected teachers' progress in

implementation of PBL in their classrooms.

Third, an important outcome was that the factors influencing teachers' progress in

implementing PBL in their classrooms suggested that teachers could use assistance in

developing their understanding and beliefs about the pedagogy of PBL in their progress

for more effective implementation. In their responses teachers expressed that they sought

help and support often on their own to progress in capacity to effectively implement the

full spectrum of PBL for the students in their LDCSS classrooms. In addition, however, regarding this outcome it must be noted that the discrepant case of the teacher I interviewed who did not view the value of PBL in the same light as the others, did not seek support like the others. This outcome caused me to reflect and realize that this teacher with outlying views could represent other teachers who are part of other LDCSS schools and who have different views.

A fourth outcome resulted from my literature review for this study. I reviewed ample research that established the vital benefits and value of the instructional approach of PBL for student learning in the 21st century yet acknowledged that to accomplish these benefits significant challenges must be met to effectively implement PBL. That is, PBL is great if done well.

Finally, a significant outcome of this study in whole is the realization and acknowledgement that the nature of PBL, its purpose, its elements, and its implementation processes may be foundational for Catholic schools in supporting Catholic education and its goal to prepare its students to succeed in their education, future careers, and lives in the 21st century. Reflecting on and interpreting these outcomes led me to conclude that a good response would be to create a professional development program that empowered teachers to progress in effective PBL implementation to enable realizing PBL's significant benefits for students. The features of this professional development I believed should be that it was on-site, customizable, addressed LDCSS teachers' needs, and integrated and blended in teachers' experiences, beliefs, and values, whether or not discrepant, and may meet what teachers have been seeking for best

educating their students for success in 21st century education, careers, and life (Bates &

Morgan, 2018; Darling-Hammond et al., 2017).

Project Deliverable

The outcomes of the findings of this study suggested a comprehensive

customizable professional development program for effective PBL implementation that

could meet the needs of teachers in the Catholic school environments across the various

demographics of the LDCSS that is the site of this study. Potvin et al. (2021) found it

vital for effective implementation that teachers learn how to "make PBL their own." In

addressing the impacting factors indicated by the findings from the teachers' responses in

the current study I developed a professional development program that focuses on

empowering the teachers to uniquely progress in effective and sustainable

implementation of the instructional approach of PBL. With evidence of the value and

benefits of PBL's instructional approach already established in the research, I designed

this professional development program to expand knowledge and understanding of PBL

to develop skills that actively enable effective implementation of PBL in the classrooms.

Effective implementation is the condition needed for fully realizing the value and benefits

of PBL for students (Bates & Morgan, 2018; Condliffe, 2017; Darling-Hammond et al.,

2017; Patton, 2015). I drew further on the body of implementation research, and

especially professional development research in the field, to aid in creating an effective

professional development plan. The essence of this professional development plan itself

overall is that it is uniquely an active inquiry, experiential, and constructive based

instructional approach for the learning and growth of teachers as is the essence of PBL

for the learning and growth of students. As one teacher in this study expressed, "As the students learn this way, so should the teachers." By incorporating essential elements of the instructional approach of PBL as well as considering elements of effective professional development as demonstrated in the research, this professional development program is uniquely also a PBL project. Dewey's (1938) experiential learning, Vygotsky's constructivism, and Kolb's (Kowles, 2015) experiential and constructivist learning theories, along with Knowles' (Knowles, 2015) andragogy and Mezirow's (Martin et al., 2019), transformative learning theories join to give the conceptual framework.

This professional development project addresses teachers' knowledge, understanding, and skills by remediating gaps and inconsistencies in their knowledge and understanding of PBL's background and development, purpose, conceptual framework, essential elements, and the way students learn to strengthen teacher capacity to progress in implementing the PBL instructional approach. It also addresses the factor of teacher diverse experiences and beliefs as expressed by teachers in the study by using continual inquiry, reflection, and collaboration, harnessing the power of teachers' experiences of life and PBL to transform and develop motivation and confidence to progress in implementation of PBL. It addresses teachers' beliefs similarly by inquiry, reflection, and collaboration, strengthening the power of their beliefs through values, philosophies, and school environment to develop and strengthen their commitment to progress in the implementation of PBL. It also addresses teachers' support needs, by working toward solutions such as the professional development itself, to remediate possible lacks in

relevant professional growth and development. It also contains encouragement to seek

and request supportive and encouraging leadership, needed resources such as time and

helping aids, and parent support and "good toxicity" to develop their teachers' self-

confidence and capacity to implement PBL.

Ultimately the components and strategies of this professional development

program by empowering teachers to progress in PBL knowledge and implementation

skills will produce benefits of improved learning, growth, and preparation of all students

in a Catholic educational environment with the important values, skills, and knowledge

needed for their success in education, careers and 21st century life. Committing to

preparation of teachers for PBL implementation is critical to prevent the failure of PBL's

instructional approach to help transform all classrooms of the 21st century (Grossman et

al., 2019).

I chose to have a professional development Program for the project deliverable

first because other genres were broader, more impersonal, and would not give a practical

response directly to meet teachers' experiences and perceptions of their needs in

implementing PBL based on the findings of the study. They could be considered

however, as additional solutions that could support effective professional development in

the schools, and the LDCSS could find as strengthening the goal of continual

improvement of Catholic education for their students. Darling-Hammond et al. (2017)

noted in a multi-study of schools implementing effective professional development for

innovative approaches such as PBL that school policies can help provide the supportive

environment to further ensure the success of effective pedagogies for 21st century

learning.

Section 3: The Project

I conducted this qualitative study for the purpose of addressing the problem of the LDCSS not knowing how teachers were experiencing and perceiving their progress in implementing the innovative instructional approach of PBL that was initiated over 6 years ago in their LDCSS school classrooms. Using one-on-one interviews guided by the RQ and conceptual framework, I explored teachers' experiences and perceptions that resulted in knowledge and understanding of their progress in implementation of PBL in the classroom. I explored the responses shared by nine representative teachers in sixth through eighth grades, enabling me to discover meaning and insights from the teachers about their progress in implementing PBL. From my analysis and interpretation of the teachers' responses, findings indicated that there were several factors that teachers perceived were affecting their PBL implementation progress, including varied knowledge and understanding of PBL; personal and professional experiences from their lives and teaching; personal and professional beliefs and values in their teaching; and the need for support and aid from professional development, leadership, resources, and parents.

Based on these findings, I decided that a unique, sustainable, and effective professional development program targeted for the LDCSS teachers of this study and designed for understanding and training in implementing PBL could empower teachers to improve their progress of PBL implementation in the classroom. The knowledge, understanding, beliefs, motivation, skills training, and help that teachers need to be effective educators are enhanced by effective professional development (Coldwell, 2017). To add support to my study findings and add foundation and guidance to my professional

development design, I conducted a literature review to find research to determine the best

conceptual framework to guide this professional development, and to find methods,

strategies, and components for effective professional development that teachers expressed

a need for in the interviews. The resulting professional development that I developed was

a 5-day program, ongoing and extending throughout the school year, which would be

conducted onsite and customized to teachers' needs. The professional development was

entitled Empowering Teacher PBL Implementation based on the findings from the

teacher responses and supported by the research from the literature review.

The goals of this professional development program were first to provide the

teachers with a sustainable program that would provide the knowledge, understanding,

skills, and training in the development and components of PBL that they need to build

capacity, self-confidence, and growth in their progress in effectively implementing PBL.

The second goal was to provide collaborative and constructive opportunities in the

program for teachers to reflect with their peers on their previous understandings,

experiences, and beliefs working with their peers to encourage transformation and growth

in their progress in creating an effective and authentic PBL project. The third goal was to

provide activities within the program that were engaging, experiential, and constructive

enabling practice of 21st century skills that would increase confidence and growth in

teachers' progress through constructing an authentic effective PBL project that they could

implement in their Catholic school classrooms. Together these goals would compose the

overall goal of this professional development program to provide a relevant and authentic

PBL experience for the teachers using the skills, components, and inquiry process of PBL

to bring motivation, learning, and products that support Catholic identity values and mission in conjunction with academic and skills learning in the growth of teachers' progress of effective PBL implementation in the classroom. The demonstration of this professional development program's effectiveness would lie in teachers' resulting growth and learning preparing them to succeed in effectively implementing PBL, and in students' resulting growth and learning preparing them to succeed in their 21st century education, careers, and lives (see Aguilar & Cohen, 2022; Darling-Hammond et al., 2017; Duren et al., 2021; Ende, 2021; Reeves, 2021).

Rationale

The rationale for this professional development program as the project deliverable for this study was threefold. First, I selected professional development for the project because it could empower the LDCSS teachers with the knowledge, understanding, and training for PBL implementation that they were seeking. Within the professional development experiential, constructive, and collaborative learning would provide the framework. Second, an effective professional development could be transforming for teachers and result in growth in deeper capacity, motivation, and commitment to progress in the challenge of effectively implementing the instructional pedagogy of PBL. Third, teachers empowered and transformed by an effective professional development program could result in empowering and transforming their students with learning experiences that would prepare them with the knowledge, skills, and values they need for success in their careers and lives, and making a positive difference in 21st century society.

This rationale was based on the findings from the interviews in the study and the results of the literature review. In the study's findings, teachers indicated they knew PBL was an active, nontraditional, and challenging way to teach, and understood that it was a good way for students to learn. Even the teacher with different views acknowledged that "PBL is beneficial for some students." However, this teacher also had concerns and misunderstanding of what constituted PBL, such as not realizing PBL is not something done at the end of a lesson, or not realizing PBL originated to meet students' changing needs for learning in a changing society. Teachers attended workshops and conferences of varying types, read materials, searched the internet for ideas, and collaborated with colleagues on PBL units or visited colleagues for help. However, sometimes workshops were irrelevant and disappointing, or applying what was learned in workshops or books back in the school environment was not successful. Teachers described experiences of being excited, motivated, and committed about PBL when they would see their students excited and proud in doing the projects, especially when succeeding in helping someone else through what they created from their Catholic values and beliefs. Teachers felt proud and enthusiastic when a struggling student succeeded, or a quiet, nonengaged student blossomed. Teachers felt satisfaction and joy in collaborating with and finding solutions and support with colleagues. However, teachers expressed being disheartened from negative childhood or previous teaching experiences or frustrated from pressures of time and duties that took away from their planning or hindered them from completing a whole PBL or made it challenging to find adequate time to meet with colleagues.

Some teachers experienced helpful professional development learning experiences within schools, and encouraging leadership, colleague, and parent support, yet others had little or no learning experiences or leadership. Despite the professional development learning, positive attitudes, experiences, beliefs, and supports, teachers expressed there were inconsistencies, differences, needs, and lacks that affected their progress in implementation and thus their ability to give what they wanted to their students. Teachers expressed the desire for more, better, and different professional development, and a desire to progress in implementing PBL for their students. Teachers described how they wished they could collaborate more with colleagues to learn more, have more aids and resources to do more, and meet all of the diverse needs of their students. Teachers described a desire for ways to meet challenges that hindered them in implementing PBL. Teachers also described how strongly they wanted their students to be prepared and how strongly they wanted their students and their school to make the world a better place. Teachers knew these things affected their PBL implementation.

In the results from the literature review, studies indicated that effective professional development spanned more than the traditional one-day, one-time event. In a case study of the New Tech Network based school reform model, Carr (2017) found that teachers needed ongoing, on-site, and in-depth professional development to foster success in implementing PBL in the classroom. In a meta-analysis of 35 professional development models, Darling-Hammond et al. (2017) noted that studies showed professional development is effective if there is an initial event followed by sessions extending over months or years, giving teachers more needed time and support for

collaborating with peers; for extending, reinforcing, and applying their transformed

practices; and for supportive experiences such as coaching. McGrath (2020) found that

teachers' personal and professional experiences and their personal and professional

beliefs and philosophies about teaching their students, about working collaboratively with

colleagues, and about their Catholic school's identity and values using PBL can be

powerful influences in motivation and commitment to progress with PBL. In a study of

the effect of professional development in school reform, L. Martin et al. (2019) found

that learning how to harness the power of personal experiences and beliefs can be

transformative. The meta-analysis by Darling-Hammond et al. (2017) demonstrated that

receiving effective professional development can empower continual progress in

implementing effective PBL in the classrooms for students.

In their study of teacher professional development, Villegas-Torres and Lengeling

(2021) found that in effective professional development teachers can be both teachers

leading learning and development and students experiencing learning and development.

Teachers can learn to socially construct their beliefs and knowledge, problem solve,

develop their practice, and reflect on their feelings of change motivated by their internal

and personal determination to improve as professionals (Villegas-Torres & Lengeling,

2021). Professional development can empower teachers to make the challenging shift

from being the authority who delivers knowledge, as in traditional practice through

lectures, books, and tests, to being the facilitator who guides and supports construction of

knowledge, as in current progressive practice though the inquiry and problem-solving

process (Boss & Larmer, 2018; Farrow et al, 2022). Finally, findings from educators and

educational philosophers Dewey (1938), Vygotsky (1978, 1986), Knowles (2015), Kolb

(Knowles 2015), and Mezirow (Martin et al., 2019), verified that effective learning for

teachers is based on experiential, constructivist, adult, and transformative concepts and

tenets of learning. From this evidence, I concluded that teachers need to know PBL's

background and essential elements in more detail. They need to understand why and how

professional development developed to meet the needs they would have to succeed in

society, to become not only proficient but more confident in skills of its implementation,

to learn how to harness the power of their personal experiences and beliefs that could be

transformative (see L. Martin et al., 2019), and to learn how to experientially and

constructively collaborate with their colleagues in the more relevant on-site setting of

their school.

Review of the Literature

The purpose of the current study was to explore teachers' experiences and

perceptions of their progress in their implementation of PBL in the LDCSS classrooms

since it was initiated in the LDCSS over 6 years ago. From analysis of teachers'

descriptions of their experiences and perceptions, findings indicated that several factors

influenced teachers' progress in effective implementation, including variation in teachers'

understanding and knowledge of the instructional approach of PBL, significant

experiences and beliefs in teachers' personal and professional lives, and learning and

growth needs of teachers for more effective professional development, encouraging

leadership, and accessible resources. Although teachers' knowledge and understanding of

PBL was varied, they expressed that they believed PBL was beneficial and continually

sought to deepen their knowledge and skills to effectively implement PBL. Teachers

desired to learn in a more experiential, progressive, and relevant way in which they could

practice and apply what they were learning before implementing it in the classroom

instead of trying to learn in large or random off-site presentations. Teachers relayed how

both positive and negative personal experiences and professional experiences in the

classroom fueled their motivation in continuing to learn and work at implementing PBL,

as well as presented challenges that fueled frustration.

Teachers pointed out beliefs such as valuing community, teamwork, collaboration

with their colleagues, supportive leadership, and their mission to develop Catholic values

such as service also empowered their commitment to grow and solve problems arising in

their implementation of PBL. In response to these findings revealing what impacted

teachers' progress in implementing PBL, I decided to create a customized professional

development program that would address these impacts, meeting teachers' desires and

needs and empowering them to progress in effective implementation of PBL resulting in

benefits for their students. I conducted an exhaustive search for literature that was

pertinent and would support the design of professional development that would help

teachers progress in their understanding, knowledge, and skills in the instructional

approach of PBL; harness the power of their experiences and beliefs to meet challenges

and meet their needs for support in professional development, leadership, and resources;

and be progressive and empowering for a Catholic school environment.

I sought literature that was pertinent and supportive of the conceptual frameworks

that would be the basis of professional development, including the PBL frameworks of

experiential and constructive learning that were the basis of the study, and any other basic

and guiding conceptual framework for such professional development. Further, I

reviewed literature for studies and findings that would be pertinent and supportive of

professional development designed to respond to teachers' deep experiences and beliefs

and needs regarding teaching in a Catholic school environment. I guided my search with

keywords such as *project-based learning*, *project-based learning in Catholic schools*,

PBL implementation, *PBL implementation challenges*, *effective PBL implementation*,

professional development, *effective professional development*, *professional development*

in Catholic schools, *PBL professional development*, *experiential professional*

development, *constructive professional development*, *adult learning*, *adult learning for*

teachers, *adult experiential learning*, *adult constructivist learning*, *adult learning in*

professional development, *instructional coaching*, *professional learning communities*,

teacher motivation, *teacher commitment*, *teacher capacity*, *teacher beliefs*, and *teacher*

experiences. My searches focused on the literature of peer-reviewed journals,

publications, and relevant digital websites and newsfeeds. Results of my search yielded

literature that affirmed the shifts in education to instructional pedagogies such as PBL

and the need for effective professional development suited to empower teachers to learn,

understand, and move forward with these shifts in progressing in the implementation of

PBL in the classroom.

Today professional development must be more complex and extended, designed

to enable teachers to have clearer understanding and more effective training in

pedagogies that are more complex and challenging to implement but that students need

for success in today's 21st century (Darling-Hammond, 2017; Morrison et al., 2021).

Current literature supports professional development that is not based on traditional

presentations and lectures but is guided by the conceptual frameworks of experiential,

constructivist, and adult learning, and supports the importance of having elements of

implementation in the professional development that make it most effective for teachers'

learning. I found literature that supports professional development formats of multi-day

year-long ongoing programs of professional development as a powerful and needed tool

and means of teachers' sustainable and ongoing growth, learning, and skills in

implementing innovative pedagogy such as PBL in their classrooms. Results of my

research also yielded literature that indicated that effective professional development

guided by experiential and constructivist learning like PBL is for students makes teachers

in effect students. Results yielded literature that showed that the components of effective

learning for adults also contain components like those in effective PBL for students, such

as active learning, collaboration, and producing authentic products in which teachers

apply their professional development learning to sustain and progress in effective

implementation of PBL (Darling-Hammond et al., 2017). Of importance to the

participants in this study results further yielded literature that supports the value of such

professional development to empower PBL implementation that by its nature could bring

benefits to a Catholic school environment and its students in preparing them for success

in college and career, contributing to Catholic values in their life, and making a positive

difference in 21st century society. In sum the professional development program that I

constructed is based on the findings of this study and on the supportive literature of my search and review.

The basis of the program included the conceptual frameworks of experiential, constructivist, and adult learning, and included addressing the findings of the current study. It is professional development that I designed to be implemented on a school site, embedded in the teachers work, and comprised of two full days, and three partial days extending over the course of a school year. It is a professional development program with its components, format, and values like that of PBL and could suit the environment of Catholic schools.

PBL

Pedagogy

PBL is a progressive instructional shift to student-directed active instructional delivery of academic content that engages students in learning skills such as problem solving, critical thinking, collaboration, communication, and creativity through the experiential creation and construction of an authentic real-world project (Boss & Larmer, 2018; Larmer, Mergendoller, and Boss, 2015; Lee and Galindo, 2021; Mehta, 2020; Mentzer, 2017). This shift requires a more complex understanding of student learning. Students need to acquire other skills beyond knowledge to navigate a changing world (Larmer et al., 2021). Education systems must re-think strategies and means to measure this broader range of skills such as critical thinking, self-motivation, well-being, or socialization, and provide adequate and timely support according to students' specific learning needs (OECD, 2019). Although in my interviews in the LDCSS schools of this

study teachers' responses relayed a general understanding and attitude of acceptance of the instructional approach of project-based learning, they also indicated that they varied in their understanding of PBL's background, framework, core elements, which thus affected the progress of their effective implementation of PBL in the classroom.

Project-based learning is a full pedagogy for instructional practice designed to meet the needs of students to learn what they need to be and to do to succeed in careers and life today (Hanney, 2018). True understanding of the pedagogy of PBL entails a deeper understanding of learning. Students shift from learners "doing projects" or "doing hands-on activities" as related by teachers in this study, to a culture of socially lived experiences of projects in which learners discover and become changed in their learning. PBL is not a fad or the latest strategy but is a full method of teaching that has developed in ways that have responded to social and economic conditions throughout history and mirrors common life settings especially in the world of work today (Mentzer, 2017; Hanney, 2018). Although it is innovative for modern society compared to recent teacher directed traditional practices, it is based on the long-standing progressive pedagogy of student-centered experiential and constructivist learning involving students learning by doing and collaboratively constructing knowledge and growth in creating solutions for the changing needs of society and its citizens (Dewey, 1938; Vygotsky, 1976).

Teachers in the current study expressed their understanding of PBL frequently as using "hands-on" activities and projects with real world meaning and interest for students, indicating that PBL is a strategy that actively engages and appeals to students. PBL is engaging and hands-on, but its experientialism and constructivism reach further to

a deeper core of learning in the critical thinking, problem solving, reflection, and creativity that students are doing in the self-directed, inquiry, and collaborative ways they need for their futures. Hanney (2018) states that in the full PBL process students are transforming and "becoming" who they need to be for their futures. In a case study of teachers engaging in a 3 year professional development, Mentzer (2017) found that to be proficient at implementing PBL in project-based science besides knowing the science content, growing in self-efficacy and attitudes to PBL, and practicing implementing it, teachers must attain clear knowledge and understanding of the PBL pedagogy and its core elements. Teachers needed direct PD support and extended time to develop the knowledge, skills, and true understanding to effectively implement PBL. In a study of teachers implementing cooperative project-based learning (CPBL) for EFL students, Zaafour and Salaberri-Ramiro (2022) found that teachers must be thoroughly ready and fully understand CPBL to achieve its effective implementation in any school.

As opposed to being traditional teacher-directed passive instructional delivery of curriculum, PBL is a progressive shift to student-directed active instructional delivery of academic content that engages students. Learning skills such as problem solving, critical thinking, collaboration, communication, and creativity students master knowledge and understanding through the creation and construction of an authentic real-world project. In my interviews in the LDCSS schools of this study teachers' responses relayed a general knowledge and positive attitude regarding the elements that comprise the instructional approach of project-based learning. They indicated however that there were some variations and some gaps in their understanding of PBL's background, purposes,

framework, core elements, and skills which thus affected their progress in their effective implementation of PBL in the classroom.

Experiential and Constructivist Framework

Experiential learning and constructivist learning provide a large part of the framework for the 5 day professional development project that responds to the study's findings. Research affirms the significant benefits to students of experiential learning by doing and constructive learning by building of knowledge and meaning through actively collaborating with peers in gaining understanding and skills needed for student success in the 21st century. In project-based student-centered learning students increase in skills, self-confidence, motivation, and knowledge of topics as they explore, research, interact, collaborate, and problem-solve (Matriano, 2020). The findings of the current study indicate that experiential learning by doing and constructive collaboration with colleagues can also benefit teachers in their understanding of PBL's elements, in becoming proficient in its skills, and in being self-confident and motivated in effectively implementing its innovative instructional approach. Dewey (1938) and Vygotsky (1986) claimed that continuing and connecting educational experiences bring about continuing growth in understanding. In a study by Langlais (2018) to evaluate the experiential learning approach used to improve a course to teach college students understanding and practice of an educational methodology, findings demonstrated that students increased their understanding, their skill for practice, and their personal growth compared to how the course was previously taught. As students can experientially learn content and skills through collaboration, application, and support of guiding teachers to solve real life

problems, teachers can likewise learn the pedagogy of PBL through collaboration with colleagues, application in an experiential professional development with a guiding facilitator, and in real classrooms with real students. As one of the participants of this study expressed, "We teach the kids to collaborate and then we talk about collaboration being good, so let's do it among the teachers too." As students do, teachers will then engage in reflection on what they are doing with support of peers and leadership and resources and use these real results to meet the challenges of implementing PBL for students.

Implementation

Research verifies that for a program to result in improvement and benefits in education and other fields it is critical for teachers' implementation of the program to be effective, to use practices and supports that are proficient in delivering the program's results (Durlak, 2017; Horner et al., 2017). Teachers are key to a program's successful implementation (Chaaban, 2017). With such emphasis on the importance of effective implementation for the instructional program of PBL to result in benefits for students, research shows that its complex approach with its underlying shift from traditional to progressive mindset and higher standards is a challenge for teachers to implement (Chaaban, 2017; Chen, et al., 2018; Lutsenko, 2018; Morrison, 2021; Vanhala, 2018). Findings in the current study of LDCSS teachers experiences and perceptions have further indicated that teachers' personal and professional experiences and personal and professional beliefs are part of the challenge and significantly impact the effectiveness of PBL implementation to result in benefits. In their study of teachers' use of PBL after an

extended PD program, Lotter et al. ((2020) affirmed the strong influence of teacher beliefs contributing to the challenges of enacting PBL. In their research Durlak (2017) and Horner et. al (2017) demonstrated that to succeed and meet any challenges of implementation it is critical to have the support of effective professional development and resources such as leadership and funding. This study's teachers have expressed their need for more effective professional development, leadership, and resources to support their progress in PBL implementation. The teachers further indicated that besides presenting challenges that affect their progress in implementing PBL, their personal and professional experiences and beliefs have at times instilled motivation and commitment to progress in implementing PBL for their students in the classroom. As a few teacher participants of the current study expressed, "you have to believe in PBL …you have to want to do it in hour heart … you have to want to do what's best for the kids, it's all about them …"

Impact on the Catholic School Environment

The LDCSS of this study initiated the instructional approach of PBL for the purpose of teaching and learning to prepare their students for success in their education, careers, and life in the 21st century. The LDCSS teachers of this study expressed that the components of PBL that enable their students to accomplish learning academics and skills through collaboratively centering on projects that can solve real world problems make it well suited for the Catholic school environment. All teachers in this study mentioned how values and benefits of PBL have promoted the learning and growth of Catholic beliefs and values for their students. Current research on the philosophy of Catholic education is pointing to the Catholic school moving more to being a place of

focus on person, mission, and community, beginning with focus on the whole person of

the student through a scriptural basis for the student from Psalm 118, "Teach me

goodness, discipline, and knowledge" (D'Souza, 2018). From the teacher who saw the

value of students collaborating on projects teaching them how everyone is a child of God

with a special purpose, from the ability to construct projects and products that provide

service to others, from providing knowledge to others needing learning, from

strengthening community through projects and work of both students and teachers, to

enabling growth in welcome and openness to students with diverse needs, the findings of

this study show that PBL brought support and strength to the Catholic school mission

preparing and sending forth its students from a culture of Catholic identity.

Professional Development

Purpose

Professional development is a process of learning that enables participants to

grow, acquire, and improve proficiency in knowledge and understanding of components

and practices of professions such as teaching, and is vital in effect for students to better

achieve learnings and performance outcomes (Abul-Majied et al., 2017; Coldwell, 2017;

Dogan & Adams, 2020; Emery et al., 2019). Studies showed that the history of education

has shown continual need for changes in methods of instruction to meet changes in needs

for students to learn best and succeed in society (Duren et al., 2021; Tay et al., 2021). The

diversity of students and their needs for success in learning and life and career readiness

have evolved in the 21st century and call for teachers to make shifts in their beliefs and

practices and to learn innovative, complex, and challenging instructional strategies such

as PBL to educate current and future generations (Darling-Hammond et al., 2017; Tay et al., 2021). In an earlier extensive seminal study of professional development, Darling-Hammond et al., (2009) found that teachers needed to shift the ways they were traditionally teaching to learn, understand, and implement new pedagogies that responded to changing student needs and enabled student success in current society. Such pedagogies and curriculum were requiring lengthier and sustained time in professional development (Chaaban, 2017). Teachers such as those interviewed for the current study have taken a stance more as learners seeking ways to make such instructional changes and shifts, to find effective professional development, and to acquire supports that could meet their professional needs and empower them for progress in implementing these new innovations in their own classrooms. In a study of school culture and teacher empowerment, Gulsen and Celik (2021) found that teachers perceived that school effectiveness most related to a culture that valued professional development for its teachers in a collegial, collaborative, team environment. I designed the professional development project for the teachers of the LDCSS of this study for the purpose of acquiring and improving proficiency in needed knowledge, understanding, skills, and support that will empower them to progress in meeting the challenges of implementing PBL for the success of their students in their LDCSS schools.

Adult Learning Framework

In addition to the experiential and constructivist learning frameworks of Dewey (1938) and Vygotsky (1978, 1986), in the literature review for this project the concept of adult learning added to and supported the frameworks of Dewey and Vygotsky. Teachers

whether in Catholic or public schools are adults with certain characteristic ways of learning that need to be acknowledged, understood, and considered in planning and implementing professional development (Van der Merwe-Mukker, 2021). Adult learning theories connected to the results of teacher data of the current study that expressed the impact of the factors of experience and beliefs on their progress in implementing PBL in the classroom. The current study findings, the concepts of experiential and constructivist learning, and the concepts of adult learning brought different contributions to the design of my professional development program, yet with the one common thread of experience that brought support and guidance to the design of my professional development project.

Andragogy. Developed by Malcolm Knowles in the early 1970's, andragogy is a set of core adult learning principles describing how adults learn, or acquire knowledge and skills, in all situations (Knowles, 2015)) Until recently studies on the characteristics of adult learners regarding professional development in education have been sparse. (Anderson & Boutilier, 2021). Research is beginning to recognize that educators need to think differently about adult professional development and consider more personalized experiences to replace the standard general adult "one-size-fits-all" professional learning experience (Rodman, 2018). Knowles' (2015) idea of andragogy comprises a framework of six principles describing assumptions that guide and support adult learning. A premise of Knowles' six principles of andragogy is that adult learning is learner-centered and different than pedagogy which is child learning and has been traditionally teacher-centered (Bengo, 2020; Knowles, 2015). Knowles' six learner centered principles highlight adults' need to know why and how, adults' autonomous self-concept, adults'

abundance of prior experience, adults' developmental stage of readiness to learn, adults'

orientation to problem solving, and adults' high response to interest and motivation

(Bengo, 2020; El Afi, 2019; Knowles, 2015; Wiseman, 2022). Following these principles

of adults' needs and characteristics when facilitating professional development will

contribute to its effectiveness.

McGrath (2020) pointed out that in planning teacher professional development

adults' learning needs and characteristics need to be considered in the same way that

teachers consider students' needs and characteristics when planning lessons. One of the

strongest of the six principles is that adults have many years of life experiences that have

shaped their beliefs, mindsets, learning, and values (McGrath, 2020; Wiseman, 2022).

Designed with adult needs in mind, an effective adult learning environment is where

adults are clear on the why or the reason for the professional development, have some

autonomy of voice and choice, have time built in for reflection, practicing, and

processing with peers, know they can apply their personal experiences, and that their

experiences are valuable and relevant (Anderson & Bouteleir, 2021; McGrath, 2020). The

teachers of this study placed emphasis on the effects of their personal and professional

experiences on their roles as teachers. Knowles (2015) stated that the principle of adults'

need to know, knowing what and how learning will happen, and especially knowing why

learning is important before even beginning must guide adult learning. Cooper and

Murphy (2121) emphasized that it is by means of knowing the why that adults more

readily progress through the what and the how of learning. Satisfying this need to know is

stronger when adults are involved in the collaboration, input, and planning of the

learning, connecting to another principle of andragogy that adults are self-directed

learners, needing autonomy, with a self-concept of being in control of their own lives.

Teachers in this study indicated varying and inconsistent understanding of the complex

components of implementing PBL and needing to know more about it in a more relevant

and practical way and personal way. In their experiences and perceptions, they expressed

their learning in terms of life readiness, reality, and personal motivation, the other

principles of Knowles' andragogy. Utilizing the assumptions of andragogy, especially of

adults need to know, autonomous self-concept, and abundance of prior experiences in the

project professional development of this study could positively impact teachers' progress

in PBL implementation.

      Transformative Learning. The key in Mezirow's framework of transformative

learning is that adults think and act according to values and experiences (Martin et al.,

2019). These values and experiences with their perceptions and feelings are formed by

the core layers of knowledge that they have gathered and amassed throughout their lives.

When adults meet with new learning or new ideas that require them to incorporate or

modify core beliefs and values, that is, make transformations of their previous learning, it

is essential that they engage in critical reflection and discourse of and on their beliefs,

values, and assumptions even though that may be challenging and involve personal

struggling (Abdul-Majied et al, 2017; Kitchenham, A., 2008; Martin et al., 2019).

Professionals such as teachers are continually engaged in learning that transforms their

practice for continual improvement and benefits to their students. The teachers of this

study counted their layers of life knowledge, experiences, feelings, beliefs, and values as

core to what they think and do as teachers. Martin (2019) relayed in research that has shown that policy makers and administrators of professional development need to keep these concepts in mind in planning learning programs for reform and development of teachers and give teachers opportunities to be involved in decisions regarding their instructional practice and to examine and work together on proposed programs. Teachers in the current study described the influence of past personal and professional experiences on their educational beliefs that impacted their progress in implementing PBL. Incorporating the transformative tenets of discourse, reflection, and collaboration in the professional development project of this study can influence teachers' behaviors and beliefs impacting their progress in PBL implementation.

Experiential Learning. Kolb's educational philosophy similar to Dewey, is that experience is the basis of the continual learning process (Knowles, 2015). This connects to the value adults put on experience as a resource and influence in their life and learning. Kolb proposed that adult learning involves a cycle of being involved in concrete experiences, observing, reflecting on, and making conceptualizations or conclusions about the experiences, and then testing out the concepts or conclusions arrived at in solving problems and making decisions. Teachers in the current study valued their personal and professional experiences. Their descriptions indicated the impact of their experiences resulted from reflections and making conclusions that affected their progress in implementing PBL. Integrating the tenets of Kolb's experiential learning by incorporating newer relevant professional experiences in the project PD of this study can

influence teachers' behaviors and beliefs impacting their progress in PBL implementation.

Effective Professional Development

In the literature Dogan and Adams (2020) noted that the research on professional development and instruction is scarce. Studies such as by Darling-Hammond et al., (2017), Duren et al., (2021), Tay et al., (2021), and Morrison et al., (2021) showed that professional development itself must transform along with the educational innovations it supports so that teachers' implementation of these new innovations can be effective and successful back in the classroom. As students' learning needs have evolved to broader content and more complex skills, so have teachers' instructional needs to learn and develop more complex forms of teaching (Darling-Hammond et al., 2017). The elements and format of effective professional development that teachers need has changed and progressed. Research findings showed that indicators of effective professional development for teachers are the resulting changes and shifts in their knowledge, beliefs, and practices, and indicators for students are the resulting changes in benefits and improvement in their learning outcomes (Aguilar & Cohen, 2022; Darling-Hammond et al., 2017, Duren et al., 2021; Ende, 2021; Reeves, 2021). To empower teachers to make transformative changes in their teaching that benefits students for the 21st century, a traditional professional development structure such as passive lectures delivering knowledge and development was no longer effective (Aguilar & Cohen, 2022; Darling-Hammond et al., 2017; Ende, 2021; Reeves, 2021). As teachers need a shift in mindset for implementing complex progressive instructional approaches such as PBL, those who

design professional development for these instructional approaches need a shift in design thinking. Designing adult learning entails seeing professional adult learning as an ongoing engaging authentic journey building knowledge, understanding, and skills, not just a one-time workshop (Ende, 2021).

In the case study by Tay et al., (2017) results demonstrated that professional development needed to evolve to be effective. Findings showed that effective professional development must be designed for teachers to be active rather than passive learners, and professional development through participation and reflection gain control of their own professional growth. The study also found that professional development needed to be relevant and practical, consider teachers' experiences, and integrate a "long-term mindset" through continuing resources such as network learning communities and coaching to keep reinforcing progress and providing refreshing in case of regression. In all, effective professional development treats teachers like professionals and empowers them with the tools to succeed (Knight, 2021). Effective professional development must have a positive approach to support teachers, such as incorporating time to really hear what teachers are saying (Knight, 2022). Facilitators and planners designing professional development need to understand that teachers progress through different stages, rooted in personal beliefs, experiences, and perceptions in the journey to change and shift instructional approaches. Safe places are created in effective professional development that affirm and empower teachers and decrease fear and resistance.

In a case study by Morrison et al. (2021) targeting the challenges of PBL and the supports of its implementation process in a STEM high school, results demonstrated that

creating successful elements for teachers' changed roles called for specific

recommendations for effective professional development. Findings showed that effective

professional development for teachers should include explicitly learning and

understanding the pedagogy of PBL and practicing how to provide authentic experiences

of student learning through projects in the content area of science they are teaching, and

practicing providing experiences of developing 21st century skills and competencies.

Teachers further need to have opportunities to understand and learn relationship-building

with students that encourages both their choice and responsibility and builds their trust

and feelings of being valued.

In an extensive meta-analysis study of 35 models of professional development in

elementary and secondary schools over the last three decades Darling-Hammond et al.

(2017) sought to identify and understand components of PD that effectively enabled

teachers to transform their instruction to meet their students' 21st century skill and

learning needs resulting in positive student outcomes. The results of this analysis

produced comprehensive findings that demonstrated seven elements were found to be

common to those models of professional development. In each of these effective school

models the seven elements contributed in various ways to successfully enable teachers to

progress in not only knowing and understanding new and innovative practices but to

effectively implement and sustain them to produce improvement in their students'

leaning in the classroom.

The first element identified by the findings was that effective professional

development intentionally targeted understanding and learning content that was relevant

and core to what teachers would be teaching or working with or had desires or interests for in their own specific school or district context. This could mean that a particular pedagogy, intervention, curricular discipline, or technology tool could improve their instruction and their students' learning could be the focus of the teachers' development. It could further mean that this focused learning could be even more customized to their teaching by being imbedded in the instructional activity of their everyday classrooms. The second element identified was that effective professional development incorporated active learning of teachers. Teachers directly engaged in the content of instructional practices they were learning, with opportunities to find meaning through personal reflection and authentically becoming immersed such as through role playing or trying out the content, to allow transformation of their practice and experientially learning in much the same way as their students would need to learn. As supported in experiential and constructive learning and adult learning theory, this vital element honored and utilized teachers' amassed life experiences, beliefs, and interests as being relevant and impactful in their development. It brings in a needed awareness that with their unique and diverse experiences teachers are not all in the same place.

The third element found was incorporating collaboration as a binding structure whether being in a one-on-one, small group, or school level community. The schools of these studies, establishing an ongoing professional learning community effort to grow with and exchange with other professionals following the professional development, emphasized the value and benefit that collaboration brought to teachers' progress, expansion, and support in changes and shifts in their practice.

The fourth element was incorporating use of specific models or modeling of practice, like the second element of active learning but with even more specific structure guided by the content focus of the professional development. Through observations of authentic videos, live demonstrations, or hands-on implementation of the new learning, this element helped teachers in forming a guiding vision, to be able to see their own practice.

The fifth element found common to the studies was incorporation of some form of coaching or expert support in addition to the facilitator of the professional development. This element is not commonly seen in traditional nor some progressive professional development. The live on-site guidance and expertise of a coach or mentor experienced in the practice of the focused content within the professional development helped personalize and respond to the individual needs of the teacher participants throughout and sometimes beyond the development process. In the schools of the studies such coaches and experts were obtained from a variety of backgrounds of experience, such as master teachers in the field, university faculty, or other instructional leaders. This element was recommended by the researchers to be a continuing support for teachers following the initial professional development experience.

The sixth element was the intentional integration of feedback and reflection, marks of adult learning theory and PBL, found to be powerful tools utilized in the professional development of the schools of the studies. It was demonstrated that building in time for reflection empowered teachers to think deeply, listen deeply, and deeply consider how to meet challenges, how to take risks, and make the changes and shifts

called for to learn the content of the professional development. The seventh element, one of the more notable breaks with former traditional professional development, was extending the initial professional event for a sustained duration. As traditional professional development was often sit-and-listen, it was also usually one-and-done. None of the 35 professional development models in the studies of Darling-Hammond et al. ended after a single meeting or workshop but were followed by ongoing continuing learning sessions over months or even years. Teachers in these studies were able to have multiple opportunities of time and support, collaborating with peers such as in peer learning communities, and engaging in personal coaching, to extend, reinforce, and apply their transformed practices for the learning improvement of the students in their classrooms.

In additional to these seven elements Darling-Hammond et al. (2017) added a final cautionary finding to the meta-analysis of the 35 studies. Even with professional development well designed with the tenets of the seven elements and built on the frameworks of experiential and constructivist and adult learning, the effectiveness of the professional development can be impacted and impeded by conditions in the school or the district that are beyond control of teachers or professional development planners. Conditions such as lack of time, lack of resources, and low social economic status of the community can be barriers and challenges to teachers trying to effectively apply and practice the instructional shifts and transformations they have professionally developed. Teachers' experiences also should be tapped into, and their professional voice and leadership should be encouraged. It often enjoins on the leadership of system policy

makers and the leadership of administrators to press for and embrace the philosophy that professional development implemented effectively is vital for educators to prepare and support students to succeed in life and to contribute positive differences in society in the 21st century (Aguilar, 2022; Darling-Hammond et al., 2017).

Other studies offer support regarding the effectiveness of extending the professional development process through collaboration with peers in professional learning communities and through coaching that is personalized with a mentor, expert, or coach. In their regular school environment teachers gather in professional communities to engage in professional practices with their peers to develop their professional learning and instruction to improve student learning and achievement (Dogan & Adams, 2020). In a study exploring the effect of professional development programs or events on teachers' instruction, Dogan and Adams (2020) found that teachers gathered in their school environment in professional learning communities after the professional development program or event they had experienced strengthened its effective impact on their instruction and their students' achievement. Dogan and Adams maintained their study results demonstrated that within the regular school environment various activities such as professional learning communities and coaching increase the effectiveness of professional development experiences. Similar studies of the value and effectiveness of professional learning communities found that such communities and activities when having supportive characteristics and being skillfully led can be a powerful way to give support and encouragement to teachers in their continuing efforts to learn, grow, and change their instructional practice for the success of their students. Characteristics that

are key elements for effectiveness include collaboration, a climate of trust, safety, and

respect for autonomy, a school culture of learning, and a focus on improved student

learning (Fred et al., 2020; Hauge & Wan, 2019; Kahn et al., 2021; Slack, 2019). To

ensure professional development effectively meets teachers' needs Rodman (2018)

exhorted leaders to honor and listen to teachers' voice in constructing the professional

learning process.

In coaching whether within professional development or in separate job-

embedded coaching programs or professional learning communities, a teacher engages in

dialogue with a coach or peer regarding their reflection and feedback for improvement

derived from viewing a session or portion of the teacher's live classroom instruction

(Kraft et al., 2018). In a meta-analysis study of the effects of teacher coaching Kraft et al.

(2018) found that as a distinctive type of professional development the individualized,

personal, and time-intensive nature of coaching can lend itself to a positive impact on a

teacher's instructional improvement and their students' achievement. In its research of

professional development that promoted student achievement, Glover et al. (2019) found

that ongoing job-embedded teacher PD in the form of coaching empowered teachers to

adjust their progress as needed enabling students to benefit directly. Job-imbedded

professional development and coaching support are critical for teachers learning the

changes they must develop in implementing the instructional approach of PBL (Saavedra

et al., 2021).

PD in Catholic Education

With a dearth of research on educational improvement in academics in a Catholic school context, there is even less research on professional development and ways that its value, use, and characteristics impact general educational improvement or specific improvement such as through a pedagogy such as PBL in Catholic schools. Although not within the last five years, there have been some studies on professional development for teachers that happen to have occurred in Catholic schools that contributed findings to the general research on professional development in all education. In investigating the impact of professional development supplemented with instructional coaching support to improve math instruction in several inner-city elementary Catholic schools, Spelman et al. (2016) found a resulting increase in classroom quality. The researchers for this study noted the growing shortage of mathematics teachers in the United States especially in high poverty areas, and the crucial need of children for an early start in forming numeracy skills. Spelman et al. posited that teacher proficiency in new techniques can develop better with non-traditional innovative forms of professional development. Results demonstrated that with on-site instructional coaching support not only did teachers change their practice, but the classroom environment changed to a more conducive learning culture for students with teachers having ongoing coaching for their instructional skills.

In an action research study of the impact of adding coaching support as a job-imbedded professional development in Catholic schools, Lia (2016) posited that teachers would benefit from feedback in their learning of new pedagogies as children benefit in

the classroom from feedback in their learning. After using coaching checklists that Lia customized to teachers' needs, results from Lia's study of being an instructional coach visiting several Catholic schools demonstrated that teachers in a Catholic system with little access to regular professional development programs welcomed the coaching. Teachers found the professional feedback of a coach effectively helped them build knowledge, develop their instructional skills, and improve their ability to blend tenets of Catholic identity into their teaching.

Other research covering the broader spectrum of Catholic education can be found that seeks findings regarding what strategies can enhance its Catholic identity mission, its school effectiveness in educating the whole student, and its continual improvement and sustainability (Dallavis & Svarovsky, 2021; Ozar et al., 2019). There is emphasis both on developing the characteristics of beliefs and skills of Catholic value-based leadership in Catholic education and on forming its young people and its teachers in academic excellence and teaching which produce student outcomes extending farther than success in test scores. The Superintendent of the LDCSS of the current study shared with diocesan stakeholders that Catholic schools strive to educate students for excellence in the academics they need to succeed in 21st century life. This goal of academic excellence should be in conjunction with forming students in values such as service and justice for those in need that contribute to the future of the Catholic Church and of the world (personal communication, September 7, 2022). In recent times of uncertainty from decreasing enrollment and Catholic school closings, Cownie (2021) described the urgency of evolving, renewing, and updating practices to ensure Catholic schools can

stay relevant and remain open. Although this is the common driving mission of Catholic education, there is a great variance of structure, leadership, and governance of Catholic schools K-12 schools following through on this. This is due in part to Catholic education being a system of independent schools connected to individual and independent parishes and communities, not a school district systems under the auspices of one administration.

Calling for building a research agenda, D'Agostino & Corozza, (2019) maintained that for such a large organization affecting schools around the world, more studies of Catholic education are needed. With the goal of creating a common framework for a basis and guide of characteristics and criteria for change and transformation in Catholic education, a representative group of Catholic school educators and practitioners, and Catholic pastors and bishops worked as a team to develop the *National Standards and Benchmarks for Effective Catholic (Elementary and Secondary) Schools* (NSBECS) published in 2012 (Ozar et al., 2019). As standards this guide did not give details of strategies or best practices that make teachers or instruction effective but gave four major domains as overall Catholic education goals. The domains included mission and Catholic identity, governance and leadership, academic excellence, and operational vitality, and various sub principles such as "commitment to educate the whole child" or "love of God and neighbor and service to the world" (Capelka, 2019).

In a study to begin finding what Catholic schools are doing to implement the NSBECS and with what success, Ozar et al. (2019) conducted two national surveys resulting in respondents indicating four themes. They reported success in understanding mission, and success in collaborating as community, but lacking in success and needing

staff, leadership, and governance to develop a more continuous whole school improvement mindset that includes academics and teacher effectiveness and has a stronger focus on finding best practices. These outcomes supported the current study's findings that LDCSS teachers' experiences of varying knowledge, experiences, and beliefs, and desire for individualized professional development and support affects their progress in implementing effective instructional approaches such as PBL. These outcomes also support a conclusion from the analysis of these findings that a project of effective professional development could meet the needs of Catholic school teachers in their progress in implementation of the best practice of PBL to benefit the students in their Catholic education classrooms.

Among the tools teachers need to implement instruction that not only improves student academics and learning but promotes the vision and mission of a Catholic school, professional development is vital (Mayotte et al., 2013). Research is lacking however, in past and current times, on progressive processes and improvements for the learning and professional development of the teachers in Catholic schools. In a study of lay teachers in Catholic schools O'Donahue (2018) noted that collecting data in areas such as instructional skills and professional development activities has been neglected. There are some indications of change developing however such as recommendations made resulting from a conference in Rome regarding primary and secondary schools in global Catholic education for conducting needed research in primary and secondary schools for more effective development for teachers (D'Agostino & Carozza, 2019). Another indication of change came from Boston College's Roche Center for Catholic Education using the

NSBECS to create a professional development program for training school leaders for

Catholic school improvement, and a professional development program for guiding

school-level educators in dual-language immersion (Melley, 2019).

The professional development project that I have designed to respond to the data

of the current study and that is supported by the needs made known in the literature may

contribute to the needs in professionally developing teachers in the LDCSS of this study

and may bring solutions to such needs in Catholic education of other schools and

dioceses. The professional development project for this study could empower teachers in

Catholic schools and beyond to strengthen and deepen their understanding, skills,

motivation, and commitment to progress in effectively implementing PBL in their

classrooms, preparing them for future education, careers, and life that makes a positive

difference in the progress and values of 21st century society.

Project Description

The main goal of this professional development project, *Empowering Teacher*

PBL Implementation, was to provide a relevant and effective year-long professional

development program of learning and training based on this study's findings and on the

literature review findings. Teacher participants would be given tools of knowledge, skills,

and strategies needed to empower them to confidently progress in effective PBL

implementation for their LDCSS students. Further, this professional development would

provide an inquiry based experiential PBL type environment in which teachers will use

collaboration, problem solving, constructivism, reflection, and creativity to research,

learn, understand, and create a public product that will demonstrate and apply the background, development, components, and skills of PBL that they have learned.

The program will be implemented on-site at an LDCSS school and consist of two 8-hour full days of professional development before the start of the school year, then will follow with three 4-hour partial days of professional development that will extend and continue the professional development throughout the school year. The first two full days should be held in August before school starts. The next two partial days are suggested to be held during the early fall of the school year and during the winter of the school year, such as on early release days or on days already designated for professional development in the school calendar. The fifth and final partial day is suggested to be held in the spring of the school year, on a day that can accommodate a schedule of the grade level teams of the professional development to rotate giving presentations of their PBL products to other grade level teachers throughout the day. The target audience of this professional development will encompass the sixth, seventh, and eighth grade teachers of any subjects and positions, including specials such as art and music, of the LDCSS school at which the professional development will be implemented. In addition, the principal and assistant principal of the school will be invited to attend.

Each day the project will incorporate tenets of experiential, constructivist, and adult learning, and will utilize research-based components and strategies of effective professional development. The learning and development processes during the 5 day professional development program will encompass the following topics:

- Collaborative "getting to know you and understand you" inquiry, reflection, and dialogue activity sessions each of the 5 days for recognizing and acknowledging personal knowledge, experiences, and beliefs that can empower transformation and motivation.

- Collaborative on-site active research and discussion sessions for constructing knowledge, understanding, and skills that can improve capacity and self-confidence to implement PBL in practice.

- Collaborative on-site training sessions for designing, researching, and constructing a model public PBL project.

- Collaborative onsite inquiry, reflection, and discussion sessions for assessment and for planning ongoing support.

- Collaborative work with grade level team colleagues, continuing PBL implementation projects in between professional development Program Days in communities of practice and coaching explorations to improve and sustain teachers' continuing progress in implementing PBL for their students in the classrooms.

Each day will have its own topics and agenda.

- Day 1 Topic – *PBL: Why do PBL and What is PBL?* The Power of Understanding

- Day 2 Topic – *PBL: How does one do PBL?* The Power of Planning, Part 1

- Day 3 Topic – *PBL: How does one do PBL?* The Power of Planning, Part 2

- Day 4 Topic – *PBL: How does one do PBL?* The Power of Planning, Part 3

- Day 5 Topic – *PBL: The power of Presentation and Audience*

See Appendix A for the full resources, learning outcomes, agendas, PPT, and facilitator

notes.

Resources and Support

I designed this professional development program to take place on-site in

individual LDCSS schools and to be customized to the needs and stages of PBL progress

of the teachers in each school. Materials such as charts, documents, note paper, pencils,

pens, markers, and PPT presentations both hard copy and digital with links teachers could

access for research; and facilitators such as administrators or other teacher staff

facilitators will be used as support, and guidance for delivering the project to the teachers.

Comfortable seating and refreshments should also be provided to help create an

atmosphere of hospitality and welcome.

Potential Barriers and Solutions

A potential barrier to this project could be scheduling and finding time needed for

planning, for working with colleagues, and for connecting and sustaining ongoing

professional development for full implementation throughout the school year. Other

potential barriers could be obtaining more costly resources and acquiring funding that are

needed for daily materials such as folders, printed documents, refreshments, and

additional aides that may not be available at the school to assist teachers in the

classrooms. Another potential barrier could be acquiring one or more qualified teachers

or administrators with knowledge and experience to act as facilitator and coach for each

day of the project and ongoing professional development. A solution for scheduling,

finding time, and sustaining implementation of the professional development would be having a school administrator gather two to four volunteering and experienced teachers into a small leadership group to plan early and ahead of the school year to start planning the professional development project. Facilitators and coaches for the project could be persons from this group. An experienced teacher or administrator from another LDCSS school could also be a facilitator. The materials for the group to use in planning the project should be put in a packet envelope or folder that includes a guide with goals, agendas, and schedules for each day, along with a list of directions and preparations needed and documents to be copied. These could be assembled by the group, with the help of other volunteering teachers.

Another solution for finding time and scheduling could be to do planning near the end of the school year when the following year's schedule is being made to schedule in the professional development days ahead of time. Another solution could be to utilize faculty meetings, which could entail breaking up the professional development days into more sessions of shorter times. In the design of the professional development session agendas, teachers are directed to gather and collaborate to work on the professional development processes with their colleagues outside of the professional development days, such as in PLCs. A solution for funding could be to investigate the availability of any grant or LDCSS funds, to approach the school's parent teacher organization for help, or to send out notes to parents or the parish community asking for donations of funds or materials. Many schools have these types of organizations or sources that have teacher

help included in their budgets. It would be best to enact all planning and such solutions at the end of the school year for the professional development for the next year.

Proposal for Project Implementation and Timetable

I will first present this study and the proposal for the implementation and timetable of its project of *Professional Development: Empowering Teacher PBL Implementation* resulting from its findings to the LDCSS Superintendent and regional assistant superintendents. I will propose that I share a summary of this study and its project with all the LDCSS principals at an end of school year all-principal meeting and explain how principals can determine a tentative leadership group to plan for implementation in each of their schools for the next school year. I will recommend that the principal join the leadership group, and I will offer to facilitate in partnership with that leadership. Along with the packet of the project's guide and materials, a copy of *Empowering Teacher PBL Implementation Timetable* (see Figure 1 below) can be distributed to the administration as an infogrpahic guide showing the project timetable and topics.

In the end of year meeting with the principals, I will make a presentation that summarizes my study and introduces, acquaints, and summarizes the professional development program for all the school's educators. This will ensure that all school staff understand ahead of the school year's start how this program was designed in response to the findings of my study of representative LDCSS teachers; it will show teachers what could effectively impact their progress in implementing PBL; it will explain what will lie ahead for the professional progress of teachers in their schools; it will explain how a

leadership group needs to be gathered to use the guide and materials to plan, prepare, and facilitate the professional development. In this presentation I will also summarize how each of the five professional development days will target some aspect of background, knowledge, understanding, purpose, skill, experience, belief, and support of PBL, will include discussion, collaboration, and inquiry, will include authentic practices of creating authentic classroom ready PBL projects, and will use available educational PBL websites such as *PBLWorks*, *Edutopia,* and *YouTube* as resources. In the beginning of the school year initiating the professional development program I will connect with the principals to see if they are preparing for the opening session of PD before the school year starts and ask if they need my assistance.

Figure 1

Empowering Teacher PBL Implementation Timetable

Roles and Responsibilities of the Researcher and Others

As the researcher I will present this study and the proposal for the implementation and timetable of its project of *Professional Development: Empowering Teacher PBL Implementation* resulting from its findings to the LDCSS Superintendent and regional assistant superintendents and to the principals.

The role of the principals will be to choose two days for the opening PD, and choose the remaining thee days for each month through the rest of the school year if possible, adjusting schedules if needed. Principals will gather and get the professional development facilitator teacher leadership groups started, and prepare professional development packets. Principals should oversee that all tasks are being carried out and address concerns. I will be available for principals' and teachers' needs to assist at this time.

The role of teachers in the leadership groups will be to choose one or two among themselves to facilitate, and to review and use the packet to prepare for the opening professional development session. They will examine and prepare all the materials in the guide packet and contact me if they have questions or need assistance. They will all be active in guiding teachers through the day of the professional development session. They will also be responsible to prepare for each of the professional development sessions.

The roles of the sixth, seventh, and eighth grade teachers will be to be the active teacher participants in the professional development sessions. They will take the opportunities to be engaging, open to the process, open to being reflective, and open to learning, and open to giving constructive feedback to the leadership group and facilitator

to ensure that all needs are being met in the professional development for each month.

My hope is that their motivation to do this will come naturally after they get started in the

professional development program.

Project Evaluation Plan

A plan for evaluation of the professional development project will enable the

professional development facilitators and leaders to know if goals and purpose of the

professional development were achieved. My evaluation plan will be to assess the

professional development project formatively throughout if I would be the facilitator, by

having participants complete a KEBHWL chart, a version of the commonly used KWL

chart that I designed for participants to complete at the beginning of each professional

development day. They will reflect, write, and discuss with colleagues in their grade level

teams in response to certain questions, and then share out among the broader group, about

the knowledge, experiences, and beliefs that they have had about PBL, how that has

affected their instructional practice, what knowledge, experiences, and beliefs they want

to have or develop, and finally what learning and growth they have obtained from each

day's professional development.

I will also assess the professional development by requesting participants to

complete and submit end of day Exit Slips that are more formative evaluation of the

activities and experiences of the day, and add comments, questions, and needs they may

have for the professional development that day. The facilitator will read these slips after

each professional development session and report back to the participants in the next

session any pertinent information and questions that may help the whole group learn and

grow. As formative evaluation is a valuable tool for teachers to use to know if students are learning and if they need to modify or keep using instructional strategies to help students grow and learn, it is a valuable tool for facilitators and administrators to know if professional development participants are learning and if modification of professional development strategies are needed as well. It is important that the professional development in each school be tailored to the needs of that school to be effective, so the facilitator and leadership group will use results of the Exit Slips to answer questions, address any concerns, and add or revise anything that will improve participants' experience and better meet their needs for the goal of improving their progress in PBL implementation in their classroom.

At the end of the professional development project, teacher participants will complete a final Exit Slip to evaluate the entire professional development program, with any constructive feedback and suggestions they may have. This evaluation can indicate if teachers' progress in the professional development will improve their progress of implementing PBL. It can also indicate what teachers will need in the way of professional support and resources to sustain and keep progress in implementing PBL ongoing, growing an adapting as the teachers grow, not be just a one-and-done program. As some professional development sessions will be addressing ways to consider coaching and supporting each other in teacher PLCs this evaluation can provide valuable feedback. Participation in these professional development programs and completing these evaluations will also give participants professional development clock hour credits.

Project Implications

The findings of this study indicated that teachers' progress in implementing PBL in their school classrooms is affected by their varied understandings of the background and elements of PBL content and skills, by their personal and professional experiences and beliefs, and by supportive professional development and leadership that meets their needs in implementing PBL. Teachers also expressed that they were positively affected and motivated by seeing their implementation of PBL benefit their students' learning, attitudes, and preparation for their 21st century success in education, careers, and life with Catholic values such as community and service. The implication of this professional development program created in response to these findings is that their progress in effective PBL implementation will be positively impacted and will result in bringing their students benefits needed for their education, careers, and success in 21st century society. As teachers experience their students benefitting from their implementation progress, they will grow in capacity, motivation, and commitment to continue progress in PBL. Students will learn and grow to realize their strengths, talents, and their full potential. This can have positive implications for educational improvement not only in the LDCSS schools, but in other Catholic education sites and public-school sites who learn of the effects of this professional development program. The implication is that students benefiting from teachers experiencing professional development that brings progress in effective PBL implementation will be better prepared to be successful in their education, careers, and lives, and to make a valuable and positive differences and changes in 21st century society and beyond.

Section 4: Reflections and Conclusions

Project Strengths and Limitations

The first strength of this professional development project is that the program

provides deep and rigorous experiential and constructive learning for teacher participants.

They are collaboratively and authentically constructing what they are learning. With the

guidance of a facilitator and coaching on the side, teachers are doing what they are

seeking to learn to do: learn PBL by doing PBL. A similar and important strength is that

this professional development program includes not only research-based concepts of

experiential and constructivist learning, but also recent findings on the effectiveness of

using adult learning principles and elements of progressive professional development in

creating effective professional development that enables teachers to successfully progress

in PBL implementation. These concepts and elements make it possible for this

professional development to be relevant, informative, useful, engaging, transforming, and

motivating for the participating teachers to successfully implement PBL to bring benefits

and positive outcomes for their students. This professional development effectively

customizes the professional development to the experiences and perceptions and needs

indicated by the teachers of the current study. Teachers will also experience in this

professional development its empowering personal impact.

The professional development contains reflection, discussion, and collaboration

activities to respond to teachers' expressed importance of the impact of their unique

motivating experiences and their challenging experiences such as lack of time and

resources. Finally, a vital strength of this professional development is its capacity to

respond to the teachers' beliefs of Catholic teaching philosophies, Catholic values, and Catholic educational mission such as collaboration, community, service, and diversity, and to respond to teachers' desires for professional development that is practical and relevant to their unique Catholic school and continuous improvement goals.

Some limitations may occur due to the strong focus on the progressive philosophy of teachers as active and collaborative participants in the professional development. Traditional principles, experiences, and beliefs of teachers in Catholic schools regarding the professional development may cause some participants to take a resistant or passive role. The professional development's experiential, collaborative, reflective design may encourage some positive transformation, but transformation cannot be forced. This could also happen regarding the leadership of the principal. Teachers in the current study remarked that the principal's support was critical in professional development and PBL implementation. In general, the basic and effective implementation of this professional development is dependent on the condition of having a positive, supportive, and open principal leadership (see Darling-Hammond et al., 2017).

Though not a designated participant in the professional development, the principal is the first step in the process and needs to be encouraging and supportive of the group of teachers who will lead the implementation and facilitation, such as garnering resources or scheduling time because the professional development takes place throughout the school year. The principal may join as a participant in a group is everyone so desires, maybe even as the facilitator. This professional development is designed to be a rigorous, active, relevant learning experience or almost any educator. Some teachers in the LDCSS

schools of the current study indicated that the leadership of their principals was supportive and encouraging, and one participant exclaimed "administrator leadership makes all the difference" for implementing PBL in their school.

Recommendations for Alternative Approaches

The problem of this study was that it was not known how teachers were experiencing and perceiving their progress of implementing the instructional approach of PBL initiated more than 6 years ago by the administration of the LDCSS. Data from the interviews with the teachers indicated that teachers need to learn more about implementing PBL and that LDCSS leadership was directing district-wide professional development workshops and conferences that were ineffective in providing the practical and relevant learning and support teachers need. Darling-Hammond et al. (2017) stated that barriers at the system level of a district can hinder effective professional development in its schools and suggested systems could take the lead to facilitate effective professional development. An alternative approach that could be a solution is to create a policy proposal for the district leadership to use with research-based directives and standards for supporting, improving, and sustaining effective professional development that could be used in any schools across the district. The proposal could include a study that could be made to examine schools' needs, resources, and scheduling and a professional development guide to respond to the study designed in a format that could be adapted by any of the schools. This would place the LDCSS leadership in the position of leading and solving the critical professional development problem uniformly across LDCSS system of schools.

Scholarship, Project Development and Evaluation, and Leadership and Change

Scholarship

Although from my earliest childhood memories I aspired to be a teacher, I did not translate this as being a lifelong learner. As I evolved into being a lifelong learner throughout my teaching career, I did not consider that I could also describe myself as a scholar. As I moved into the graduate level of learning, teaching, and educational administration, learning became very personal, and motivating. I began to seek to learn as much as I could, yet I saw that as practical, not scholarly. As a school administrator, I became acquainted with the instructional approach of PBL. I saw that although it had challenges to understanding and learning its skills, its hands-on, engaging, authentic, student-centered approach was something different that could be beneficial to all students. When the LDCSS decided to initiate the approach for improvement in our schools I learned more about the potential of PBL and observed its different approach to learning. I endeavored to present it to enable LDCSS teachers to implement it for their students. It was at that point that I transformed into a learner in the academic field of doctoral study through the process and work of research.

I have come to learn that I am in a lifelong process in my learning that I can now describe as scholarship. The many hours and doctoral courses at Walden opened my mind to developing new skills of searching, critical reading, thinking, and writing as I analyzed books, articles, and research of scholars to apply to the real world and real problems. I began to develop and refine my scholarly analysis and writing skills as being knowledge

and evidence focused. I began to realize that because learning and scholarship were useful for me in educational practice, they could also be useful to others.

As I progressed at Walden, I began to narrow my focus on what topics in the field of education seemed to need more research. I determined my goal in writing would be to bring more knowledge and solutions for educators to teach and help students learn and construct their own knowledge, skills, and habits as young scholars that would prepare them for success in their education, careers, and life and to make positive contributions to 21st century society. My goal to continue the practice of teaching and leading teachers influenced my choice of the doctoral path of scholar practitioner and pursuing my EdD. Through personal life experiences and beliefs, I became moved by the potential power of the pedagogy of PBL I had discovered earlier that could transform teachers' instructional practice and motivate students in their growth and learning. It's really about the children. Learning more about PBL's challenges and its call for shifting and changing instructional practices, my goal became to embark on a doctoral project study on PBL by refining my skills of scholarship to create a research study that could make a difference for schools, educators, and students. My hope is that this study and the resulting professional development that I designed will affect positive social change.

Project Development and Evaluation

Accomplishing the goal of developing a project to respond to the findings from the experiences and perceptions of the participants of my study has been a deeper learning process of developing my own skills of analysis, critical thinking, problem solving, interpretation, application, creating, and continual reflection. My progress in

these skills resulted in accomplishing the goal of developing a meaningful, practical project that responded to the findings of the study and was relevant for teacher participants. For the development of my project, I began with reflection and interpretation of the data for what could be the best response to the findings of teachers' descriptions that revealed their understandings, experiences, beliefs, and needs in progressing in effective PBL implementation. Data indicated that a professional development program that encompassed these revelations would best accomplish the goal of aiding teachers in their growth and development of effective implementation of PBL that would bring benefits for their students.

Due to the nature of PBL that teachers sought help in implementing, I concluded that a PD program that was like the experiential, constructive, collaborative nature of PBL could best support and empower the teachers in progressing in its implementation. Projects such as a new LDCSS policy, a new curriculum development, and a program evaluation did not align with the data of the teachers' responses about their PBL implementation progress. I was excited about this decision and could envision the support and guidance for teachers' progress in PBL implementation that this project could provide. This guided me to reflect on my study's findings and to review the literature to find frameworks, components, and methods that would help me create professional development suitable to the teachers of my study. Although this required more hours of searching, building, researching, rebuilding, creating, and recreating, it was a satisfying experience to see all the work come together in the resulting professional development program.

The resulting multiday, onsite, experiential, and collaborative professional development that I designed, with its teacher PBL project, will be an ongoing, adaptable program that can meet the needs of the teachers of the LDCSS in this study and hopefully their colleagues in other LDCSS schools, in other Catholic schools, and in public school systems. Finally, built into the professional development program is a process of continual and formative assessment and evaluation. This will be a vital feature to keep the professional development a real, relevant, productive, and sustainable experience for teachers that helps them prepare their students for success in their education, careers, and lives.

Leadership and Change

Conducting this study of teacher experiences and perceptions and applying the results in developing a project to respond to the study has transformed me into a scholar and practitioner researcher. Being a scholar of research and a practitioner applying the research empowers me with leadership in contributing positive changes that can show ways forward in the field of education in general and in the field of Catholic education. I see researching as leadership in going forth on journeys of progress and change that can bring improvement in the field being researched. I hope to present findings and interpretations that make a difference in continual growth and progress in the mission of education to send forth students with their talents, skills, knowledge, and values to make a positive difference in their lives and in society.

Now knowing the impact of PBL and effective professional development, I will seek to find opportunities to lead through focusing on the scholarship of research and the

practical application of research I have learned. In opportunities such as presenting this project study to leaders of the LDCSS and other school systems seeking improvement and progress in the development of their teachers and the education of their students, I can lead by providing opportunities for change, shifts, and transformations needed for instruction and learning. I also see researching that seeks in some way to meet others' needs is a servant leadership, a value mentioned by participants in my study calling for honoring the minds and spirits of the educators and students on their path or in their care. As a servant leader and lifelong scholar, I will continue to contribute methods and approaches such as PBL to the field of education that can result in deeper learning, understanding, and skills for students to thrive to their full potential and talents in their learning and preparation for their contributions to society.

Reflection on Importance of the Work

The importance of this work is that it was conducted for Catholic school educators, peers, and leaders, and it contributes research findings needed not only by the LDCSS of this study but also in the field of Catholic education. My findings may impact the growth and improvement of education at the LDCSS of this study and potentially at any Catholic or public school. Because of its underlying evidence-based framework, principles, knowledge, and practice, my study may be considered effective in spectrums of educational problem solving and in determining decisions for change and progressive shifts in instruction and learning. Encompassed within this work are ways in which the study's findings can be applied to a system of schools or one school, to a community of teachers or one teacher, and to a class of students or one student.

Another unique feature of this study is that it contributes to research in the area of effective professional development for teachers in Catholic and public schools. The data that I gathered in my research exploring the experiences and perceptions of Catholic school teachers' progress in PBL implementation demonstrated the powerful impact that teachers' personal and professional experiences and beliefs had, whether positive or negative, on their progress of implementing the challenging and mind-shifting instructional approach of PBL. I found little research recognizing the impact and considering the experiences and beliefs that teachers need to have in their growth and progress in effective implementation of any initiative or curriculum. This indicated that the experiences and beliefs of teachers need recognition, affirmation, and consideration as genuine and valid input academically and philosophically in addition to spiritually in the Catholic educational community, especially when attempting to make changes in instructional pedagogies and strategies.

This need connected to adult learning tenets, which had not been addressed as important components of professional development of teachers. Addressing this need of teachers may result in a positive difference in the openness of teachers to transformation and change that may help them grow in shifting their instructional mindsets for the sake of their students. In creating the professional development project, I integrated opportunities to address and legitimize these facts through reflection, dialoging, and the active learning of doing and constructing in collaboration with peers and educators. The importance of this work is that it may yield benefits and positive outcomes of change for

the effectiveness of Catholic and public education, not only for teachers but also for students on their journey of learning and succeeding in 21st century society.

Implications, Applications, and Directions for Future Research

The implications of this project study are that there may be significant possibilities for improving the capacity, motivation, knowledge, and instructional skills of teachers in the LDCSS of this study. As research overwhelmingly verifies that teachers are at the core of influence on the learning and growing success of students in school, their improvement in these ways will prepare students of the LDCSS of this study for success in their education, in their careers, and in their lives contributing their talents and values to society in the 21st century. Teachers can transform their beliefs and practice of PBL and move forward in progress of effectively implementing PBL to the benefit of their students. Students may experience more success and be proud of themselves, self-confident, and motivated to dream big. They may develop a big heart for helping the vulnerable, the oppressed, and the poor. This is for the kids.

This study's sample was small and purposeful and thus limited in generalizability. There could be applications of this study however, to other schools and systems of differing sizes and demographics by the educators who are open to using and adapting this study's findings and especially its resulting professional development project in their schools' settings. Project based learning can be used in any school of any size or demographics, The professional development project *Empowering Teacher PBL Implementation* is also a flexible customizable template for a professional development that can be used in any school of any size or demographics. It is designed around

professional development for PBL but would not be too difficult to adapt to other

programs. In the categories of experiential, constructive, and adult learning however there

are other education philosophers with impactful principles of adult learning such as

Kilpatrick and Maslow and Bruner to consider. In the field of Catholic education even

more so the findings and project of this study could not only impact the LDCSS of this

study but could bring possible improvements to other Catholic schools and the staff and

teachers that work in that type of environment. The Catholic school itself is also a

template for education, yet in many systems and schools there is a clinging to traditional,

non-active, teacher-centered basis in approaches to education. More Catholic schools

however are starting to transform and branch into progressive, active, inquiry based,

student-centered approaches such as PBL and curricular formats that are enhanced by

PBL such as science, technology, engineering, and math (STEM) education as they see

that although they provide the Catholic value environment, they know that families and

students are seeking more effective and relevant academics. The results of this study and

the capability of this project to be flexible to unique participants and environment also

makes it possible for bringing useful information and possible strategies for improving

the implementation of PBL in non-Catholic schools.

To increase the impact, application, and generalizability of this study further

targeted research is needed. Studies of schools with different characteristics such as in

enrollments, demographics, teacher experience, curriculum, resources, and governance

could provide more and varied findings that could contribute to knowledge and

understanding of what determines effectiveness of teacher progress in both PBL

implementation and in professional development for improving PBL implementation. Learners and scholars in the field of Catholic education have indicated they are on a path of conducting more such academic research, but according to the observations of several participants of this study at the end of their interviews, "Catholic education needs to move more quickly and broadly in transforming to more progressive approaches before it's too late!"

Conclusion

This doctoral project study began with acknowledgement by the LDCSS of the significant benefits of the instructional approach of PBL to prepare students for success in education, careers, and life in the 21st century. The problem I discovered however was that although PBL had been initiated in the LDCSS of this study over 6 years ago, it was still unknown how teachers were experiencing and perceiving their progress in effectively implementing the PBL approach in the Catholic school environment of their LDCSS classrooms. My main hope is that this study's findings will influence educators and administrators to respond for the sake of the students and their future development and success in education and their success and contribution to positive social change in 21st century society. I hope that their response will result in empowering teachers with the learning, skills, research, experiences, and values for effective PBL implementation. As Spencer and Juliani (2017) proposed, I believe that effective PBL implementation may help move the goal of education from empowering teachers to prepare students for success in society for known opportunities, to empowering teachers to enable students to prepare for success in 21st century society for unknown opportunities and possibilities.

Leadership partnering with other educators and stakeholders can strive to empower

teachers through the most effective training and support they could develop to improve

their instructional progress and mitigate challenges and barriers such as time and

resources to this progress. This may lead to empowerment of their students for success in

the journeys, changes, and possibilities in their future education, careers, and lives.

As a targeted first empowering step for educators and administrators, this study

includes the project deliverable of a multi-day professional development program that I

designed to respond to the research literature and to the core findings of this study of

teachers' PBL implementation progress. This program can provide teachers in the

LDCSS of this study and in other school systems with effective PBL implementation

knowledge, understanding, training, confidence, and motivation through developing

projects themselves to transform and improve their PBL implementation in the same type

of experiential, problem solving, constructive, and collaborative settings they will be

teaching the students. Because teachers are key to successful student learning and

development as demonstrated in the research, this empowerment through progress in PBL

implementation may enable them to better prepare their students with the empowerment

to reach their full potential to succeed in their ongoing education and their 21st century

careers and lives that will make positive differences in the world.

With deeper content learning and skills such as critical thinking, problem solving,

collaboration, communication, and creativity through PBL, students may have more

chances for better jobs and careers that may positively impact negative areas of society

such as poverty and injustice. Learning and applying these skills working in teams on

authentic meaningful PBL projects in school years will enable students to learn needed

educational content more rigorously and empower students to be responsible, self-

confident, and self-directed lifelong learners in their jobs and communities in later years

(Larmer, 2018). In the 21st century students need to be competent in more than knowing

facts and concepts to be ready and successful as students, workers, family members,

community members, and local and global citizens (Larmer, 2021). Some of the skills

learned in effective PBL such as collaboration in diverse groups, communication and

reflection on thoughts and action, and problem solving in creating projects that will serve

or care for others can also help prepare students for making contributions for the

specified values of the Catholic mission of their school such as service and community,

and for broad and basic values such as equity, justice, and human dignity of positive and

just social change. The current study's findings regarding teachers' experiences and

perceptions, and the implementation of a professional development project may influence

the LDCSS schools and other schools in Catholic education to continue in progress in

their effective implementation of PBL for its students' success. In careers and life

students may develop to their fullest potential of strengths and talents bringing changes

needed for our 21st century world. As some teachers in this study expressed, embracing

progressive instruction methods such as the innovative approach of PBL can appeal to

and influence parents and stakeholders to enroll their children and support Catholic

schools.

Through the multi-year process of conducting this project study I developed

professionally and grew as a scholarly researcher and practitioner who applies learning

from research. As I reflect on the time and spectrum of my work, I realize the value of the knowledge, understanding, experience, and skills I have gained. I have especially grown in critical thinking and analytical skills. Another way in which I have grown is through the dialogue with the teacher participants in the interview data gathering process. I improved my listening and inquiry skills and learned much from the teacher participants as colleagues bonded in what I describe as our most critical world institution, education. My personal growth and the inspiration of these teachers motivates me to search for opportunities to support education as critical to positive social change.

Education is an applied and practice discipline in which participants are educating children on behalf of society (Hunt, 2009; Thorne, 2016; Thompson et al., 2021; Thorne, 2018). I have grown in respect for effective professional research, and in respect for the education researchers before me who have served as contributors of change and improvement to education to benefit the children. I will strive to be a servant leader in continuing to promote change and ways that empower all educators to make a positive and just difference in education strategies and in training of educators for the sake of our children and our society.

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Appendix A: The Project

A Professional Development Program: Empowering Teacher PBL Implementation

The project I designed for the current study, a multi-day professional development program titled *Empowering Teacher PBL Implementation,* is based on the findings of the study of the LDCSS teachers' experiences and perceptions indicating that various factors affected their progress in PBL implementation in the classroom. I designed a program of 5 days extending throughout the school year to provide ongoing training and support for teachers' PBL implementation progress through collaboratively, constructively, and experientially incorporating knowledge and understanding of the instructional approach of PBL, personal and professional experiences and beliefs regarding PBL, and customized, onsite PD planning guidance for effectively implementing PBL. I also designed this PD based on findings of research in the literature review of effective PBL implementation and effective professional development. This professional development will support LDCSS teachers' PBL implementation progress through incorporating experiential and constructive PBL learning methods, characteristics of adult learning, Catholic values and identity, and strategies of effective professional development. Without the incorporation of Catholic values and identity this PD still contains all that would be needed to also support the PBL implementation progress of teachers in non-Catholic public or private schools.

Goals of this PD

- The main goal of this project is to provide teachers a relevant, authentic, experiential, constructive, customized, and sustainable professional development

program based on the findings of this study that will provide the knowledge, understanding, and training needed to build capacity, motivation, self-confidence, and growth in their progress in effectively implementing PBL in the diocesan Catholic school classroom.

- A second goal of this PD is that teachers will understand the power of personal and professional understandings, experiences, beliefs, and collaboration to learn and progress in effective implementation of the instructional approach of PBL.

- A third goal is that teachers will experientially and constructively learn understanding the power of inquiry, reflection, critical thinking, problem solving, communication, creativity, and collaboration with colleagues throughout and between all 5 days of professional development.

- A fourth goal is that this professional development project will empower teachers to progress and grow in capacity, transformation, and commitment to incorporate Catholic identity and values with academic content in effectively implementing PBL in classrooms in a Catholic school environment.

- A final goal is that this professional development program will not end after the 5 day sessions, but become an established framework for customized, relevant, and ongoing professional development to empower continuing progress in effective implementation of PBL for the students in LDCSS classrooms.

Resources

- Smartboard or Projector Screen.

- Hard copy and PPT slide presentation for each day.

- Large size tablet wall post-it papers for each grade level group.

- Colored markers, pens, pencils, and note-paper.

- Five participant Folder Packets- one for each professional development day's session.

  - Hard copies of PPT

  - Hard copies of handouts: Cornell Notes tool, KEBHWL chart, exit ticket Gold Standard PBL Project Design Elements Wheel and rubrics, Gold Standard PBL Teaching Practices Wheel and rubrics, PBL Project Planner templates, final evaluation forms, and other hard copies of learning and instructional tools.

- NOTE – The Facilitator uses the Learning Outcomes and the times, topics, and procedures detailed in the agendas below to present and guide teacher participants through each slide, activity, and day of the professional development.

Day 1 Topic: PBL: Why, When, Who, and What? The Power of Understanding

Day 1 Learning Outcomes

- Teachers will understand PBL's background, development, essential elements, skills, and starting steps for effective PBL implementation.

- Teachers will understand the power of experience, beliefs, deep understanding, and collaboration to affect their role as teachers and learners.

- Teachers will know and understand the effective PBL approach of solving a real-world problem and creating a real-world project for effective student learning

through the models of the Gold Standard PBL Design Elements and Teaching

Practices created by the Buck Institute for Education (BIE).

- Teachers will use a planner template and other templates, resources, and tools to
  work in their grade level groups to plan and design effective implementation of an
  authentic grade level PBL project for their students that would also be a model for
  continuing effective implementation of PBL as teachers in their classrooms.

Day 1 Agenda: Full Day in August

Time Day 1	Topic Day 1	Procedure Day 1
8:00am – 8:45am	Welcome	(Slide 1) ○ Participants register. ○ Participants join breakfast. ○ Participants move to seats in grade level team tables.
8:45am – 9:00am	Introduction	(Slide 2) ○ Facilitator welcomes all to PD. ○ Leads introduction of leaders and participants. ○ Reviews Day 1 Agenda. ○ Leads opening prayer.
9:00am – 9:15am	Study Basis of PD and Goals	(Slide 3, 4) ○ Facilitator reviews the study that is the origin of this PD and PD goals including outcome for each grade level team to create their own authentic grade level student PBL. ○ Facilitator introduces Cornell Notes tool for use throughout the PD.
9:15am – 10:00am	KEBHW Opening Team Activity	(Slide 5) ○ Video - sample PBL ○ Facilitator explains the daily PD team KEBHW activity of reflection and collaboration for learning about each.

other's PBL experiences and needs and developing connections.

10:00am – 10:10am	BREAK	(Slide 6)
10:10am –11:00am	Why do PBL?	(Slide 7, 8, 9, 10) o Facilitator reviews PBL background, history, and development to help understand "Why do PBL?" o Facilitator presents information on slides. o Video – PBL history summary o Facilitator explains impact of research. o In each grade level team teachers choose one research document to read, reflect, discuss. o Facilitator directs grade level teams to reflect, discuss, summarize, and share out to whole group understandings of impact of PBL background, history, development, and research.
11:20am – 12:00pm	What is PBL today?	(Slides 11, 12, 13, 14, 15) o Facilitator explains BIE study of project-based learning development resulting in BIE framework of components for effective PBL implementation: "Gold Standard PBL that will be guidance used in this PD program. o Facilitator reviews 7 design elements and 7 teaching practices. o Explains incorporation with 21st century skills. o Video – 21st C skills o Facilitator explains how PBL progress. applies also to Catholic education. o Video – Catholic education.
12:00pm – 1:00pm	LUNCH	(Slide 16)
1:00pm – 1:45pm	Inquiry	(Slide 17, 18) o Before moving to Slide 17 Facilitator. directs each grade level team to reflect and discuss personal understanding of *inquiry*,

			summarize on large post-it, then share out to whole group.
			o Facilitator moves to Slides 17 and 18 and explains inquiry in learning and inquiry in PBL.
			o Video – What is inquiry?
1:45pm – 3:00pm	How to do PBL: Where to Start?		(Slide 19, 20, 21, 22, 23, 24)
			o Facilitator explains starting a PBL project with inquiry through four need to know (NTK) startup questions.
			o Facilitator explains each startup question, noting Question 1 about learning is key per Gold Standard Design Wheel Center of Key Knowledge, Understanding, Skills.
			o Facilitator explains videos for each startup question, with extra instructions for help Driving Question extra instructions and video.
			o Facilitator directs grade level teams to follow directives and view videos for answering startup questions to start work on their PBL projects by collaboratively choosing standards, problem, product, and driving question (DQ).
			o Facilitator explains to create DQ all grade level teams will work at same time learning a formula and creating a "Tubric."
3:00pm – 4:30pm	Peer support		(Slide 25)
			o Facilitator explains the importance and need of peer support through collaboration and coaching for teachers between PD Days.
			o Facilitator directs teachers to continue working on startup questions with colleagues in PLC groups between end of Day 1 PD and before Day 2 PD.
			o Teachers discuss when to schedule PLCs for PBL work before PD session Day 2.
4:30pm – 5:00pm	Closing		(Slide 26)

o Facilitator gives wrap-up of Day 1, reviewing accomplishments, and directing teachers to meet in grade level teams before PD Day 2 to collaboratively finish their project startup of creating standards, problem or challenge, product, and audience, and driving question.
o Facilitator reviews PD Day 2 goal and activities.
o Facilitator directs teachers to complete Exit Ticket for PD Day 1, explaining their input will be read and valued for any ways it may help ensure effective PD program.
o Facilitator leads Closing Prayer.
o Facilitator collects Exit Tickets to review and plan responses to individuals or whole group on Day 2.

Day 2: PBL: How? The Power of Planning, Part 1

Day 2: Learning Outcomes

- Teaches will understand the importance of planning and the stages of planning in the process of effective PBL implementation.

- Teachers will work in grade level teams to complete five stages in a project planner template from PBLWorks website to design, create, construct, manage, teach, assess, guide, and implement a real-life meaningful PBL project for their students.

- In the project planner teachers start with beginning stages teachers to learn how to incorporate academic standards, content, skills, and values they want students to learn, and incorporate learning experiences, lessons, rubrics, assessments, and other tasks needed for their students to achieve learning goals, along with a

calendar and timetable for completing the construction and presentation of their public product.

- NOTE: Teachers will be keeping track of their own learning and activities of PD for a slide presentation that will be their public product.
- Teachers will learn how to utilize various templates and guides from the Buck Institute of Education (BIE) and other digital sources to plan, construct, and progress in creating their PBL project.
- Teachers will collaborate with colleagues in PLCs and peer coaching outside the 5 PD sessions to work and progress in their PBL implementation projects.

Day 2: Agenda: Full Day in August

Time Day 2	Topic Day 2	Procedure Day 2
8:00am – 8:45am	Welcome	(Slide 27) ○ Participants sign in. ○ Join breakfast. ○ move to grade level team tables.
8:45am – 9:15am	Introduction	(Slide 28) ○ Facilitator welcomes all to Day 2, reviews Day 2 Agenda, Goal, and pertinent information from Day 1 Exit Tickets. ○ Leads Opening Prayer.
9:15am – 10:15am	KEBHWL Team Activity	(Slide 29) ○ Facilitator directs participants to complete KEBHWL Team Activity for Day 2.
10:15am – 10:30am	BREAK	(Slide 30)
10:30am – 11:30am	Project Planning	(Slides 31, 32, 33) ○ Facilitator explains important purpose of planning and use of BIE resources.

- o Facilitator explains PBL planning can be organized into five stages with tasks that teachers will design and use in the PBL planning process.
- o Facilitator notes the stages are flexible and can overlap or intertwine but stay based on the Gold Standard Project Design and Practices.
- o Facilitator points out that throughout the guidance to the stages in the slides there will be digital links to information and guidance about various tasks and activities that need to be planned in the various stages. These tasks can be called "milestones" and can be paced timewise in the Calendar in the Planner.
- o Facilitator explains the *Project Planner* editable template document (found in folders) from the BIE website *PBLWorks* that teachers will use as a tool to organize, document, and guide planning stages 1-5 for the PBL project implementation.
- o The Project Planner can be created digitally online, or by hand on printed hard copy in folders.

11:30am – 12:00pm   Stage 1   (Slide 34)

- o Facilitator starts with Stage 1 to lead teachers to examine each stage and its place in the planning a PBL project implementation and possible "milestone" tasks, events, and activities that can be designed.
- o In Stage 1 the Facilitator explains that PBL planning encompasses following the Gold Standard design and practices frameworks and rubrics (found in folders) and determining the Project Overview and Learning Goals in the Planner. Teachers consider tasks from defining standards and the problem to creating the driving question and time

frame in this stage and exploring and
using supporting resource links.

12:00pm – 1:00pm	LUNCH	(Slide 35)

1:00pm – 1:30pm   Stage 2   (Slides 36, 37)
- Continuing with Stage 2, the Facilitator explains that PBL planning encompasses continuing to follow the DQ and learning goals from Stage 1 and the Gold Standard design frameworks and rubrics and determining need-to-knows (NTKs) that teachers will use to plan the tasks of designing and creating learning opportunities and experiences. Teachers consider milestone tasks from entry events and lessons to rubrics and learning logs in this stage and exploring and using supporting resource links.

1:30pm – 2:00pm   Stage 3   (Slides 38, 39)
- Continuing with Stage 3, the Facilitator explains that PBL planning encompasses continually following the DQ and learning goals from Stage 1 and the Gold Standard design frameworks and rubrics and further determining supports that will aid student progress in learning and completing the project. Teachers consider milestone tasks from protocols and contracts to mini lessons and assessments in this stage and exploring and using supporting resource links.

2:00pm – 2:30pm   Stage 4   (Slide 40)
- Continuing with Stage 4, the Facilitator explains that planning encompasses continually following the DQ and learning goals from Stage 1 and the Gold Standard design frameworks and rubrics to plan and prepare the final presentation of the project with public product to an audience. Teachers consider tasks from presentation day product construction

and checklists to scripts and equipment experts in this stage and exploring and using supporting resource links.

2:30pm – 3:00pm	Stage 5	(Slide 41) o Continuing with Stage 5, the Facilitator explains that planning encompasses continually following the DQ and learning goals from Stage 1 and the Gold Standard design frameworks and rubrics and determining that the presentation and its arrangements have been completed and all team teachers know where to go and what to do. Teachers consider tasks from set up and scheduling to and audience invitations and evaluation forms. o After this general review of the 5 Stages, the Facilitator directs grade level teams to return to Stage 1 and work collaboratively on Stage 1 PBL planning, and to start Stage 2 planning when they complete Stage 1.
3:00pm – 4:30pm	Return to Stage 1 and 2	(Slide 42) o Returning to Stage 1 slide, grade level teams work at their tables for the rest of the afternoon to complete Stage 1 in the Project Planner. Teams carefully plan and design the details of the tasks needed, to select the standards, content, skills, and values, the challenging problem, product, and audience, and create an effective DQ and overall rubric for the PBL project. o Teachers use the Gold Standard Design and Practices framework and Rubric to reflect in their team to assess their work for Stage 1. Does the project teach knowledge, skills, and values from the standards? Is the problem real-world and meaningful? Is the DQ open-ended?

		o Facilitator directs any teams completing Stage 1 planning before the end of the afternoon to begin on Stage 2. o Facilitator directs grade level teams to work on completing Stages 1 and 2 in PLC collaboration before PD Day 3.
4:30pm – 5:00pm	Closing	(Slide 43) o Facilitator gives wrap-up of Day 2, reviewing accomplishments. Facilitator directs grade level teams to meet in PLC collaboration before PD Day 3 to collaboratively finish Stage 1 and 2 planning in the Project Planner. o Facilitator explains Goal for Day 3 will be to work on Stage 3 planning in the Project Planner. o Facilitator directs teachers to complete Exit Ticket for PD Day 2, explaining their input will be read and valued for any ways it may help ensure effective PD program. o Facilitator leads Closing Prayer. o Facilitator collects Exit Tickets to review and plan responses to individuals or whole group on Day 3.

Day 3: PBL: How? The Power of Planning, Part 2

Day 3: Learning Outcomes

- Teaches will continue to follow their project planner working on the middle

  stages of planning, creating, constructing, managing, teaching, assessing, guiding,

  and implementing their PBL project.

- Teachers will create rubrics to clarify expectations for students, enable formative

  assessment, reflection, revision, and guidance in achievement of learning.

- Teachers will learn how to utilize additional tools from outside sources or create their own that can aid students in their project work such as collaboration protocols, team contracts, checklists, leaning logs, and project bulletin boards.

- Teachers will plan lessons and learning experiences for students in the project.

- Teachers will continue to collaborate with colleagues in grade-level PLC meetings and peer coaching outside the PD program days.

Day 3: Agenda: Partial Day in Fall

Time Day 3	Topic Day 3	Procedure Day 3
12:00pm – 1:00pm	Welcome	(Slide 44, 45) ○ Teachers sign in. ○ Working lunch. ○ Grade level group tables. ○ Facilitator welcomes all to Day 3. ○ Facilitator reviews Day 2 Exit Tickets. ○ Facilitator reviews Day 3 Goal and Agenda. ○ Leads Opening Prayer.
1:00pm – 1:45pm	KEBHWL Team Activity	(Slide 46) ○ Facilitator leads participants in completing KEBHWL.
1:45pm – 2:45pm	Stage 3 Work	(Slide 47, 48) ○ Returning to Stage 3 slide from PD Day 2, grade level teams work at their tables for the rest of the afternoon to complete planning Stage 3 in the Project Planner that encompasses supports that will aid student progress in learning and completing the project. ○ Teachers consider assessment tools such as rubrics, exit tickets, quizzes, and learning log reflections, team management tools such as protocols, contracts, project walls, and Kankan

		boards, and other learning supports such as mini lessons in this stage. o Teachers exploring and use supporting resource links. o Teachers use the Gold Standard Design and Practices framework and Rubric to reflect in their team to assess their work for Stage 3.
2:45pm – 3:00pm	BREAK	(Slide 49)
3:00pm – 4:30pm	Stage 3 work continued	(Slide 50, 51) o Teachers complete work on Stage 3 and look ahead to Stage 4 and Stage 5 when finished with Stage 3 before end of Day 3 PD.
4:30pm – 5:00pm	Closing	(Slide 52) o Facilitator gives wrap-up of Day 3 accomplishments. o Facilitator reviews the goal for PD 4. o Directs Teachers to complete Exit Ticket. o Leads Closing Prayer.

Day 4: PBL: How? The Power of Planning, Part 3

Day 4 Learning Outcomes, Half-day in Winter

- Teaches will continue to follow their group's project planner working on the various stages of PBL planning and completing their PBL projects.

- Teachers will work on the last stages 4 and 5 of their PBL implementation project, learning how to finish up the public product and prepare students for the important public presentation of a PBL project to an audience outside of their class and teacher by preparing to make an effective presentation of their project to other grade level teachers in their school.

- Teachers will continue to collaborate with colleagues and schedule grade-level

  group PLC meetings and peer coaching outside the PD days.

Day 4: Agenda: Partial Day, Early Dismissal in January, or February

Time Day 4	Topic Day 4	Procedure Day 4

12:00pm – 1:00pm	Welcome	(Slide 53 54)
		  ○ Participants sign in.
		  ○ join working lunch.
		  ○ move to assigned group tables.
		  ○ Facilitator welcomes all to Day 4.
		  ○ Facilitator reviews pertinent Day 3 Exit Tickets.
		  ○ Facilitator reviews Day 4 goals and agenda.
		  ○ Leads Opening Prayer.

1:00pm – 1.45pm	KEBHWL Activity	(Slide 55) ○ Facilitator leads participants in completing KEBHWL Chart.
1:45pm – 2:45pm	BREAK	(Slide 56)

2:45pm – 4:00pm	Stage 4 work	(Slides 57, 58, 59, 60, 61)
		  ○ Returning to Stage 4 teacher grade level teams work at their tables to plan the completion of the public product they chose and how to present it to public audience. Teams also work for themselves on a five-slide public presentation product to present a summary and description of the planning process and the work they completed for their student PBL project implementation model to their public audience of a different grade level team of teachers.
		  ○ Teachers consider materials and supplies for products, guidance, templates, and checklists for presentations, agendas, scripts, and

		rehearsals, arrangements for setup with location and audience.
		o The Facilitator explains that "pulling it altogether in Stage 4 can be "messy", but the experience of presenting to a real audience can be an engaging and proud time for students, and as in the whole project planning ahead is vital so that everyone knows their part and role.
		o Planning for audience feedback process including creating an evaluation form further helps teachers with assessment.
4:00pm – 4:30pm	Presentation Schedule	(Slide 62) o Grade level teams will use a model to create a schedule for presenting the slides describing their implementation project.
4:30pm – 5:00pm	Presentation Schedule	(Slide 63) o Facilitator gives wrap-up of activities and accomplishments. o Directives for Day 5 Presentation. o Directs teachers to complete Day 4 Exit Ticket. o Closing Prayer.

Day 5: PBL: Presentation and Audience

Day 5: Learning Outcomes

- Teachers will learn the power of a live presentation of their completed grade level

   PBL implementation project as a public product for an outside audience, to

   demonstrate their progress, growth, and achievement in professional and personal

   capacity for implementing the instructional approach of PBL.

- Teachers will learn how using slides summarizes and describes their growth and achievement not only for themselves but for utilization by other teachers as a model for effective implementation of the instructional approach of PBL.

- Teachers will follow up after the presentation with their peers to reflect and discuss the experience of their presentation and audience feedback.

- Teachers will understand the power of knowing how much can be learned about PBL and about any learning goals, and how much satisfaction can be experienced in the process of creating a public product to solve a problem for an outside audience.

Day 5: Agenda: Partial Day, Exact times to be scheduled per audience and location

Time Day 5	Topic Day 5	Procedure Day 5

3:00pm – 3:10pm	Welcome	(Slide 64, 65)
		  o Audience Teachers (visiting Grade Level Teachers) sign in.
		  o Presenting Team as Facilitator welcomes all to Day 5, explains Agenda (PD Facilitator stays off to side, just observing).
		  o Team Leads Opening Prayer.

	Grade Level Team Presentation of Final Project	(Slide 66)
		  o Team describes PD *Empowering Teacher PBL Implementation* Program purpose and goals of PBL Project leading to this presentation to Audience.
		  o Team presents and narrates the slides demonstrating what they did and learned through their PBL Implementation Project.

		o Team invites audience feedback questions and comments.
4:15pm – 4:30pm	Closing	(Slide 67) o Team gives final remarks distributes Evaluation Form to audience to complete silently and hand in regarding Team's Presentation. o Team dismisses audience thanking them for attending and giving feedback.
4:30pm – 5:00pm	Team After-Meeting	o Team members meet privately to reflect and discuss presentation, audience feedback, and PD program. o Team members complete and hand in final Exit Ticket regarding presentation, entire PD *Empowering Teacher PBL Implementation* program, and earning professional development clock hour credit.

PPT for Professional Development: Empowering Teacher PBL Implementation

Slide 1

Slide 2

Slide 3

Slide 4

Cornell Notes Tool io
**Tool for teachers or students to use to record reflections, ideas, information,
when researching, questioning, discussing, listening**

| TOPIC	
MAIN POINT	**IDEAS AND FACTS**
SUMMARY	

Slide 5

KEBHW Opening Team Activity

- Video – PBL example
- Each teacher in grade level team at table examines the **KEBHW** questions chart in your folder.
- Silently reflect and write responses on chart.
- Share reflections and responses with grade-level team table group.
- Summarize table team responses on one large post-it.
- Share team summaries with whole group, post on gallery wall.
- Reflect and share on reflection "findings" in whole group.
- Discuss how individual findings could impact one's progress in PBL implementation.

Slide 6

SHORT BREAK
Please return in 10 minutes
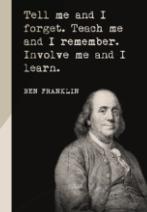
Tell me and I forget. Teach me and I remember. Involve me and I learn.

BEN FRANKLIN

Slide 7

**Background History and Development - 2**

- Citizens' needs – Changed to not just having knowledge, but needing to apply knowledge, to develop new personal and digital skills for collaborating, problem solving, communicating, designing, innovating.
- Emphasis on people running the automation, not just the automation producing goods, also producing people services
- Progressive Educational philosophers and thinkers– how to learn best
  - Developing knowledge of medicine, brain, and psychology
  - Dewey, Vygotsky, Kilpatrick, Piaget, Bruner, Franklin, Montessori and other progressives – experiential, constructive, authentic
- McMaster University Med School - turning point in overall education
  - From mass auditorium lectures to practice and application, interns actively working in small groups, teams learning by problem solving
  - Trickled down to college, high school, elementary school

Slide 8

Background History and Development -3

- 2000's - Educators began shifting from past traditional approaches to progressive approaches such as PBL to educate citizens for the changing culture and skills needed to succeed in 21st century society work and life
  - Based on Dewey, Vygotsky, Piaget, Montessori, Kolb, McMasters Medical School and other progressive educators and thinkers
  - Centered on more independent learning through projects entailing 21st century skills such as problem solving, critical thinking, collaboration, communication, and creativity to answer questions and apply knowledge in authentic real-life situations showing deeper learning, understanding, and mastery.
  - Progressive educators developed various strategies, designs, and structures containing progressive elements for changing society

Slide 9
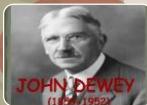
JOHN DEWEY
(1859-1952)

John Dewey
"The best and most genuine learning is grounded in authentic experience."
"Teachers' skills and role of guidance are vital to the construction of learning."

Lev Vygotsky
Nov 17, 1896- June 11, 1934

Lev Vygotsky
"Children create learning in an environment of experiences and social interaction." Teachers have the sensitive role of leading children through zones of experience and proximal development

Maria Montessori
"Education happens not by listening to words, but by experiences upon the environment."

YouTube link: History of Project Based Learning
https://www.youtube.com/watch?v=oQ_78chYZhc

Slide 10

Slide 10

What is PBL Today?
Research: Evidence of Beneficial Elements of PBL

Reflect on Teachers' own Professional Standards (Hard copy in folders)
https://education.ohio.gov/getattachment/Topics/Teaching/EducatorEquity/Ohio-s-Educator-Standards/TeachingProfessionStandards.pdf.aspx?lang=en-US

- Choose one of the documents below to read in your grade level team regarding PBL.
- Reflect on and discuss your thoughts, questions, learning, and understanding of what you read with your colleagues.
- Summarize on large post-it paper, share out in whole group, then post on gallery wall.

Report: *The State of Project-Based Learning: Engaging and empowering our Students for Future Success*

Research: *Knowledge in action efficacy study over two years*

Article: *THE MAIN COURSE, NOT DESSERT: How are students reaching 21st century goals? With 21st Century Project Based Leaning*

Slide 11

PBL Codified: Buck Institute of Education (BIE)

Buck Institute of Education (BIE) in the 1990's studied progressive educational theories, educational philosophers, and educational research. Findings confirmed PBL must be implemented effectively for students to realize benefits and achievement. (Condliffe, 2017; Durlak, 2017; Honer et al., 2017; Patton, 2015)

- ***GOLD STANDARD PBL – "7 Essential Project Design Elements" and "7 Project Teaching Practices"*** *were created by BIE for effective PBL implementation.*
- *"Gold Standard PBL"* became a recognized comprehensive framework of standards for effective teaching and learning through construction of an authentic purposeful project
- *"Gold Standard PBL" became an effective project-based* instructional approach and pedagogy for teachers to use to teach content and subject knowledge along with 21st century success skills for student benefits and achievement.
- **Gold Standard PBL will be used for guidance in this PBL Implementation PD.**

What is Project Based Learning?
https://www.youtube.com/watch?v=erMM4gii6kmQ

Slide 12

7 PROJECT DESIGN ELEMENTS

RUBRIC (IN FOLDERS) HTTPS://MY.PBLWORKS.ORG/RESOURCE/DOCUMENT/PROJECT_DESIGN_RUBRIC
CHECKLIST (IN FOLDERS):
HTTPS://MY.PBLWORKS.ORG/RESOURCE/DOCUMENT/PBL_ESSENTIAL_ELEMENTS_CHECKLIST

Gold Standard PBL
Seven Essential Project Design Elements

Center on:
KEY KNOWLEDGE UNDERSTANDING & SUCCESS SKILLS
Content that comprises Learning Goals of the project

- **Challenging Problem or question**
- **Sustained inquiry**
- **Authenticity**
- **Student Voice and Choice**
- **Reflection**
- **Critique and Revision**
- **Public Product**

Slide 13
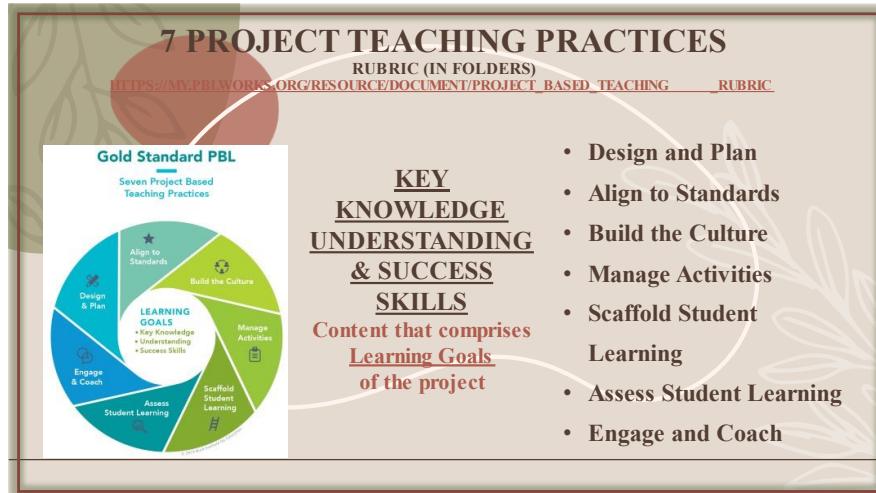
Slide 14

Slide 15

Slide 16

LUNCH BREAK
Please return in 1 hour

"THE MAN WHO ASKS A QUESTION
IS A FOOL FOR A MINUTE. THE
MAN WHO DOES NOT ASK, IS A
FOOL FOR LIFE.."
-CONFUCIUS
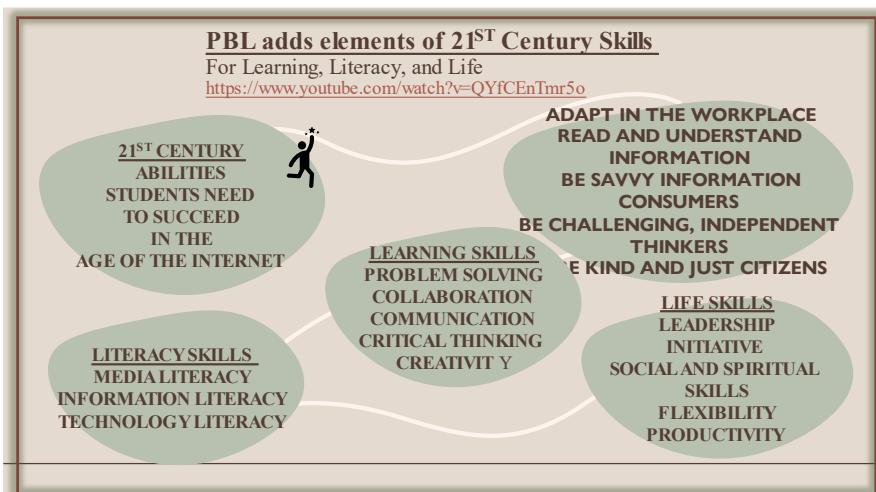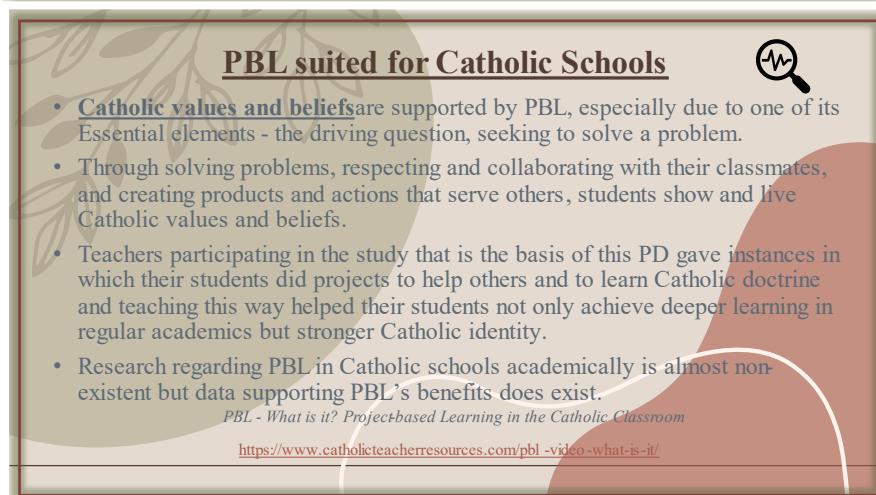
Slide 17

Inquiry in Learning

- The instructional approach of PBL is often described as being in the category of **inquiry-based learning.** ?" Inquiry is at the heart of all meaningful **learning.** (Bruner, 1996)
- In the **BIE Gold Standard PBL** wheel of design elements, a challenging problem or question and sustained inquiry are listed as the first essential elements of effective Gold Standard PBL.
- **Reflect and discuss in each grade level team what you think inquiry is, and how you define and describe the meaning of inquiry as a learning process.**
- **Summarize your discussion on large post-it paper, share out to whole group, then post on gallery wall.**

Slide 18

Inquiry in PBL

- **INQUIRY** in PBL is the process of open-ended questioning, to obtain information, answers, or solutions to solve problems, learn standards and skills, and create projects, asking, "What do we know?, What do we need to know?, then HOW do I find that out??"
- **SUSTAINED INQUIRY** in PBL is at the heart of the PBL approach, with students continually questioning in as many ways possible, leading to deeper and deeper **learning and understanding.**
- **DRIVING QUESTION (DQ)** is the main overall open-ended **question or inquiry** that drives a PBL project and keeps the PBL inquiry experience centered on **learning goals and standards** and an ultimate learning solution or product. It generates **other driving questions (DQs)** of what is needed to know in the sustained inquiry process, such as "How can we …" or, "What can we…?"

What is inquiry? (and other PBL elements!)
https://www.youtube.com/watch?v=vTacO5ZPn8Q

Slide 19

From why, to what, to *how*? ▶
Where to start?

The key to start planning effective implementation of project-based learning comes back to PBL's inquiry-based nature. It is based on the mindset of "need to know", answering four "startup" questions, between now and Day 2 PD.

1) What do students need to learn and know from *standards and content*?
2) What is a meaningful *project idea that will solve a relevant real-world problem* or challenge, or question that can connect to learning standards/content?
3) What is a *Driving Question (DQ)* that will guide students' inquiry process through the project to solve the real-world problem or challenge?
4) What is a *public authentic product(s) or solution(s)* for a public audience in the project and driving question that can be created by students to solve this real-world problem or challenge?

Slide 20

Answering Startup Question 1

1. Asking what do our students NEED TO KNOW AND BE ABLE TO DO?

What state or district Standards of subjects taught in each grade level of teachers do students need to meet?

What grade level subject objectives and specific content of subjects taught in each grade level of teachers do students need to learn and understand?

What key skills, behaviors, and values in subjects taught in each grade level of teachers do students need to understand and learn for success in their education, 21st century careers, and life?

Aligning to Standards

https://my.pblworks.org/resource/video/project_based_teaching_practices_align_to_standards

Slide 21

Answering Startup Question 2

2. Asking what is an authentic RELEVANT REAL -WORLD PROBLEM OR CHALLENGE students can help solve or meet?

How does the problem connect to and involve cross curricular standards and skills students need to learn?

How is the problem or challenge relevant, relatable, and meaningful to the students lives and interests?

How is the problem or challenge appropriate and have a part for students?

https://www.edutopia.org/video/5-ways-begin-shift-toward-project-based-learning/

Slide 22

Answering Startup Question 3

3. What is a RELEVANT AUTHENTIC PRODUCT that can be created by students in the project?

How could it solve or help the real-world problem or challenge?

How could it benefit a particular audience outside the classroom?

How is the product meaningful, appropriate, and doable for students?

How could it engage students in learning the standards, content, skills, and values they need to learn?

Note: At the end of this PD the public product of the teachers will be a 5-10 slide presentation summarizing and describing the PBL implementation process they learned to create a PBL project implementation for their students with a student public product.

Project based teaching practices DESIGN AND PLAN
https://my.pblworks.org/resource/video/project_based_teaching_practices_design_plan

Slide 23

Answering Startup Question 4

4. Finally, how can we create a DRIVING QUESTION that will keep the students focused on the real-world problem or challenge we are aiming to help solve in doing the project?

How could it direct students in creating an authentic relevant product?

How could it keep students focused on the real-world problem and product and outside audience?

How could it keep students focused on the standards, content, skills, and values they need to learn?

The *Tubric* Origin and How-to
https://www.youtube.com/watch?v=D0K3ntj-tcA

Slide 24

The Driving Question

Definition – The driving question for a PBL project is an intriguing yet understandable question which specifies a problem, challenge, or issue to be solved by students with a product to be created, leading students to answer for a purpose and to bring learning.

Purpose – The driving question's purpose is to keep students focused on why they are doing the project, what solution they are seeking to create, and learning to achieve.

Effective – An effective driving question is open-ended, with no single right answer, and cannot be "googled." Students must use critical thinking and information-gathering to choose original and complex answers that create solutions that could solve the problem or issue while also connecting to their learning goals.

Formula – A simple formula given by BIE Gold Standard PBL is to ask, "who does this work? What products are created, or actions taken? For what purpose or to solve what problem and for what audience is the product?"

"(How can) we, as _____ (role), do/make _____ (a task, create a product), for _____ (purpose & audience)
How-to make the DQ *Tubric*
https://www.youtube.com/watch?v=D0K3ntj-tcA

Slide 25

Peer Support in PD and in PBL Implementation

<u>Research</u> – Teachers find instructional improvement and empowerment in learning from supportive, collegial, collaborative, and team environments both inside direct PD programs such as in this one, and outside direct PD programs such as in professional learning communities (PLCs) and coaching. (Darling-Hammond et al., 2017; Dogan and Adams, 2020; Kraft, et al., 2018; Gulsen & Celik, 2021; Saavedra et al., 2021; Tay et al., (2017)

<u>PCLs</u> – In PLCs teachers find knowledge, supportive relationships, and positive support from collaboratively working with peers in various types of peer communities, groups, and teams, as described by the participants of the study on which this PD is based.

<u>Coaching</u> – Through coaching that can be done among teachers in PLCs or by outside professional coaches, teachers find more targeted support in various types of processes of observation, feedback, and modeling as described by the participants of the study on which this PD is based.

A critical part of this PD program, therefore, is the part of learning, growth, and development that happens with colleagues outside in the schools and classrooms of the participants of this PD between each of t he five formal PD sessions.

In collaboration with each other, participants apply, extend, and supplement both in   and outside what is presented and learned within this PD program.

Slide 26

CLOSING - DAY 1

WRAP-UP for Day 1

- Review of Day 1 activities and accomplishments

PREPARATION for Day 2

- Collaborate with grade level team before Day 2 to answer the startup questions to start Day 2 planning for PBL project implementation for students

- Goal of Day 2: Each grade level team will use project planning templates to begin planning and organizing their student PBL Implementation project based on the standards, problem, product, audience, and driving question they selected.

- Reflect on your learning in Day 1 PD and how you may incorporate it in the classroom

EXIT TICKET – Day 1

-    Teachers complete Day 1 Exit Ticket and hand in to Facilitator before leaving.

CLOSING PRAYER

Slide 27

Welcome to Day 2
"Empowering Teacher PBL Implementation"
Planning Phase 1

A Professional Development Program
Multi-Day, Collaborative, Experiential, and Constructive

By Donna Lee Saladino

Please pick up your materials and sign in for Day 2 at the Registration Table

Please join us in a Continental Breakfast

Slide 28

Introduction   **Day 2**   Agenda

- Welcome to Day 2 of our professional development "*Empowering Teacher PBL Implementation.*"
- Day 2 Goal: Review Stages 1-5, complete Stage 1, and begin collaboratively working on Stages 2 of PBL project implementation.
- Refreshments will be available throughout the session.
- Supplies are available for the session (pens, pencils, markers, paper).
- The Folder for this 2nd day of the program contains the agenda, a hard copy of the slides with note spaces, and other documents for the day. Please take a minute to examine folder contents.
- Summary of Exit Tickets Day 1 - Pertinent responses, questions, and answers.
- Opening Prayer

Time	
8:00am	Welcome
8:45am	Introduction
9:15am	KEBHWL Team Activity
10:15am	Break
	Review PBL Project Implementation Planning
	Review Planning Stages 4
5	
12:00pm	Lunch
1:45pm	Complete Planning Stage 1, begin Stages 2
4:30pm	Closing
5:00pm	Return Exit Ticket

Slide 29

KEBHWL Opening Team Activity

- Video – PBL example
- Each teacher in grade level team at table examines the **KEBHWL** questions chart in folder.
- Silently reflect and write responses on chart.
- Share reflections and responses with grade-level team table group.
- Summarize table team responses on one large post-it.
- Share team summaries with whole group, post on gallery wall.
- Reflect and share on reflection "findings" in whole group.
- Discuss how individual findings could impact one's progress in PBL implementation

Slide 30

SHORT BREAK
Please return in 10 minutes

"Education is the Most Powerful weapon which you can use to change the world."

Nelson Mandela

Slide 31

PBL Project Planning

- The importance and purpose of careful project planning is to have a framework for organizing the many pieces and parts and open-ended processes of PLB to ensure its effective implementation for student benefits.
- BIE and various educators and educational organizations offer various tools, methods, and resources in books, journals, and websites.
- Resources and guides used in this PD contain core elements and characteristics of BIE Gold Standard Project Design Elements and Teacher Practices
- This PD will keep focus and foundation on Key Learning Goals and Driving Question using mostly BIE's research based *PBL Works* tools and digital resources, along with materials from other resources such as *YouTube, impactfulpbl.com, and April Smith Performing in Education.*
- Teachers access PBLWorks Project Planner and other documents used in this PD by joining their website at *pblworks.org.*
- *PBL Project Planner Template: https://my.pblworks.org/resource/project-planner* Downloaded paper copies will also be available.
- The BIE Planner Template is designed to be a guide to support teachers in planning and allow flexibility to meet teachers' and students' needs.

Slide 32

PLANNING STAGES AND TASKS

IMPORTANT NOTES
Work can be done on more than one stage at once.
Use reflection and revision as a strategy to assess project work, always a work in progress.
Focus on *Gold Standard Project Design Elements and Teacher Practices* throughout.

- **Stage 1 – Describing Project Overview and Learning Goals**
  Learning goals, Problem, Product, Audience, Driving Question, Project Wall
- **Stage 2 – Milestones Tasks**
  Entry Event, Need to Knows (NTKs), Lessons, Research, Speakers, Learning opportunities, Learning log, Product construction
- **Stage 3 – Need to Know Tasks**
  Rubrics, Protocols, Contracts, Teams, Assessments, Product construction
- **Stag 4 – Completing Product(s) Tasks, Prepare for Presentation**
  Materials, Supplies, Resources, Experts, Product construction, Preparations for presentation
- **Stage 5 – Presentation to Audience Tasks**
  Location, Arrangements, Invitations, Equipment, Supplies, Presentation, Evaluation

Slide 33

***Project Planner* Planning Tool template (copy in folders)**
https://my.pblworks.org/resource/project-planner

The Project Planner is a comprehensive 7-page working editable tool for planning PBL projects:

- Teachers can make revisions and adjustments to meet different needs.
- Rows and columns can be widened or narrowed.
- Rows can be deleted, or new rows can be added.
- Original text in left blue column can be deleted, re-labeled, or have font modified.

Slide 34

Planning Tool: Project Planner Template (BIE)
**Stage 1**

Stage 1 – Describe Project Overview and Learning Goals

Learning goals, Problem, Product, Audience, Driving Question, Project Wall

- **In your grade level teams complete the project overview and learning goals section of the planner. This is where you will use your team agreed upon answers to the four startup questions regarding standards content, and skills, the problem, challenge or issue, the product and audience, and the driving question.**

Project Design Rubric https://my.pblworks.org/resource/document/project_design_rubric

Project Design Checklist:
https://my.pblworks.org/resource/document/pbl_essential_elements_checklist

Project Teaching Practices Rubric
https://my.pblworks.org/resource/document/project_based_teaching_rubric

Project Wall – Visual project guidance and management tool in real classroom:

https://my.pblworks.org/resource/pbl_project_wall

Slide 35

LUNCH BREAK
Please return in 1 hour
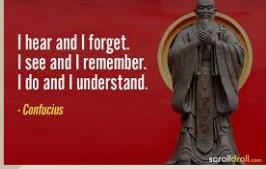
I hear and I forget.
I see and I remember.
I do and I understand.

- Confucius

scrolldroll.com

Slide 36

Planning Tool: Project Planner (BIE)
Stage 2

Stage 2 – Milestones Tasks

Entry Event, NTK, Lessons, Research, Speakers, Learning opportunities, Learning log, Product construction

- **In your table groups using the Project Milestones section discuss and decide the tasks of Entry Event, Lessons, Research, Speakers, Learning opportunities, Learning log, product construction work and any benchmark accomplishments to be completed during the project time-table.**
- **In your grade level teams using the Calendar section also discuss and decide the monthly and weekly time-table for tasks constructing and completing your PBL project.**
- **Entry Event – a "hook" experience to pique students' interest and excitement about the project, such as a document, a video, a community partner, or a trip. To give students more voice and choice, different event options could be offered to them. https://www.youtube.com/watch?v=JN9IEqbU3qU**
- **From entry event generate Need to Knows (NTKs) List of Questions to set up lessons and learning: https://my.pblworks.org/resource/ntks**
- **Lessons – generated from NTKs**

Slide 37

Planning Tools: Project Planner (BIE)
Stage 2 continued

Stage 2 – Milestones Tasks

Entry Event, NTK, Lessons, Research, Speakers, Learning opportunities, Learning log, Product

- **Lesson Planner section: In your grade level teams using the Lesson Planner section at the end of the Planner to discuss and plan specific lessons: topics, content, objectives, major instructional activities and scaffolds, reflections, assessments, and resources to be completed in the monthly and weekly time-table tasks for completing your PBL project.**
- **Keep in mind** instructional activities **can be either traditional lessons such as direct instruction, or progressive lessons such as learning experiences or activities of inquiry and experience. The point is their leaning will be incorporated into project and product they are creating to respond to the driving question.**
- Learning opportunities **– non-traditional learning lessons such as field trips, videos, speakers, interviews, etc. Example interviews: https://my.pblworks.org/resource/preparing -interviews**
- Learning Log **– an individualized tool for students to date and document their questions, goals, research, learning, self-reflections. The Learning Log is also useful to teachers for assessment. PBLWorks Learning Log: https://my.pblworks.org/resource/learning -log**

Slide 38

Planning Tool: Project Planner (BIE)
Stage 3

Stage 3 – Student Support Tasks

Rubrics, Protocols, Contracts, Teams, Assessments, Product construction

- **In your grade level teams still using the Project Milestones section, discuss and decide the student support tasks of Rubrics, Assessments, Protocols, Contracts, Team formations, Team management, and product construction work to be completed for students needing to know expectations, behaviors, rules, and types of assessments that will be used to guide them in their project.**
- Rubrics **– student learning expectations, benchmarks, and scores for standards, content, skills, values, etc. Google blank Rubric Template: https://docs.google.com/document/d/1fk4gvW8Pb3sZ -t8claBDupHCTGDPjlilzo4qqrm4Zz8/edit**
- Exit tickets **– student learning assessment tool for brief formative assessment at end of a lesson or work https://my.pblworks.org/resource/exit -tickets**
- **Guidance for** self reflection**: https://my.pblworks.org/resource/reflection -strategy**
- Project Teams **– Team formation process guided by intentional decisions. Consider size, strengths, interest, needs https://my.pblworks.org/resource/formingteams**

Slide 39

Planning Tool: Project Planner (BIE)
Stage 3, continued

Stage 3 – Student Support Tasks

Rubrics, Protocols, Contracts, Teams, Assessments, Product construction

- **Protocols for teams – guidance for students to critique each other with feedback https://my.pblworks.org/resource/critique -protocols**
- **Contracts for teams – tool to guide students in learning how to agree to work together: https://my.pblworks.org/resource/document/project_team_contract_ template**
- **Project team management tasks: https://my.pblworks.org/resource/document/project_management_log_team_tas ks**
- **Kanban Boards tool for Visual Team Management: https://www.pblworks.org/blog/ultimate -team-work-management -tool-kanban-boards**

Slide 40

Planning Tool: Project Planner (BIE)
Stage 4

Stage 4 – Complete Product and Prepare Presentation Tasks
Materials, Supplies, Resources, Experts, Product, Presentation, Audience
- **In your grade level teams using the Calendar section discuss and decide the monthly and weekly time -table of tasks of materials, supplies, resources, experts, finishing product construction, and preparation for presentation to be completed during the project time -table.**
- **Project presentation – guidance tool: https://my.pblworks.org/node/16922**
- **Presentation template: https://my.pblworks.org/resource/document/presentation_plan**
- **Presentation Day Checklist: https://my.pblworks.org/resource/document/presentation_day_checklist**

Slide 41

Planning Tool: Project Planner (BIE)
Stage 5

Stage 5 – Presentation to Audience Tasks
Location, Arrangements, Invitations, Equipment, Supplies, Presentation of 5-10 slides, Evaluation
- **In your grade level teams using the Project Milestones and Calendar sections discuss and decide tasks of location, dates and times, arrangements, invitations, equipment, supplies, presentation of 5-10 slides, audience evaluation form to be completed during the project time-table.**
- **NOTE: in this PD teachers are directed specifically make a brief presentation of 5 -10 slides to present their PBL Implementation Project to other grade level teams in the school. In doing PBL with students, especially for the first time, this is a simple and effective way to present a project/product to an outside audience.**
- **Presentation Day Checklist: https://my.pblworks.org/resource/document/presentation_day_checklist**
- **Audience Presentation https://my.pblworks.org/resource/document/project_presentation_audience_feedback_form**

Slide 42

Planning Tool: Project Planner Template (BIE)
Stage 1, returning to finish

Stage 1 – Describe Project Overview and Learning Goals
Learning goals, Problem, Product, Audience, Driving Question, Project Wall
- **In your grade level teams complete the project overview and learning goals section of the planner. This is where you will use your team agreed upon answers to the four startup questions regarding standards content, and skills, the problem, challenge or issue, the product and audience, and the driving question.**

Project Design Rubric https://my.pblworks.org/resource/document/project_design_rubric

Project Design Checklist: https://my.pblworks.org/resource/document/pbl_essential_elements_checklist

Project Teaching Practices Rubric https://my.pblworks.org/resource/document/project_based_teaching_rubric

Project Wall – Visual project guidance and management tool in real classroom: https://my.pblworks.org/resource/pbl_project_wall

Slide 43

☀ **CLOSING - DAY 2** 🌙

WRAP-UP for PD - Day 2
- Review of Day 2 activities and accomplishments

PREPARE for PD - Day 3
- Collaborate with colleagues in PLCs between now and Day 3 to finish Stages 1 -2
- Goal of Day 3: Complete Stage 3 of PBL Project Planning, begin Stage 4 if time
- Reflect on learning in today's PD, look for opportunities to incorporate PBL in classroom

EXIT TICKET - Day 2
- Teachers complete Day 2 Exit Ticket and hand in to Facilitator before leaving.

CLOSING PRAYER

Slide 44

Welcome to Day 3
"Empowering Teacher PBL Implementation"
A Professional Development Program
Multi-Day, Collaborative, Experiential, and Constructive

By Donna Lee Saladino

Please pick up your materials and sign in for Day 3 at the Registration Table

Please join us in Lunch

Slide 45

🍍 **Introduction**   **Day 3**   **Agenda** 🏫

- Welcome to Day 3 of our professional development *"Empowering Teacher PBL Implementation."*
- **Goal Day 3: Complete Stage 3**
- **Refreshments will be available throughout the session.**
- **Supplies are available for the session (pens, pencils, markers, paper).**
- **The Folder for this 3rd day of the program contains the agenda, a hard copy of the slides with note spaces, and other documents for the day. Please take a minute to examine folder contents.**
- **Summary of Exit Tickets Day 2 - Pertinent responses, questions, and answers.**
- **Opening Prayer.**

Time	Activity
12:00pm	Welcome
	Introduction
1:00pm	KEBHWL Team Activity
1:45pm	Work on Stage 3
2:30pm	BREAK
2:40pm	Complete work on Stage 3 (work on Stage 4 if time)
4:45pm	Closing
5:00pm	Hand in Exit Ticket

Slide 46

KEBHW Opening Activity

- Video – PBL Exemplar
- Each teacher in grade level team at table examines the **KEBHW** questions chart in your folder.
- Silently reflect and write responses on chart.
- Share reflections and responses with grade-level team table group.
- Summarize table team responses on one large post-it.
- Share team summaries with whole group, post on gallery wall.
- Reflect and share on reflection "findings" in whole group.
- Discuss how individual findings could impact one's progress in PBL implementation

Slide 47

Planning Tool: Project Planner (BIE)
Stage 3

Stage 3 – Student Support Tasks

Rubrics, Protocols, Contracts, Teams, Assessments, Product construction

- In your grade level teams still using the Project Milestones section, discuss and decide the student support tasks of Rubrics, Assessments, Protocols, Contracts, Team formations, Team management, and product construction work to be completed for students needing to know expectations, behaviors, rules, and types of assessments that will be used to guide them in their project.
- Rubrics – student learning expectations, benchmarks, and scores for standards, content, skills, values, etc. Google blank Rubric Template: https://docs.google.com/document/d/1fk4gvW8Pb3sZ-t8claBDupHCTGDPjlilzo4qqrm4Zz8/edit
- Exit tickets – student learning assessment tool for brief formative assessment at end of a lesson or work https://my.pblworks.org/resource/exit-tickets
- Guidance for self reflection: https://my.pblworks.org/resource/reflection-strategy
- Project Teams – Team formation process guided by intentional decisions. Consider size, strengths, interest, needs https://my.pblworks.org/resource/formingteams

Slide 48

Planning Tool: Project Planner (BIE)
Stage 3, continued

Stage 3 – Student Support Tasks

Rubrics, Protocols, Contracts, Teams, Assessments, Product construction

- Protocols for teams – guidance for students to critique each other with feedback https://my.pblworks.org/resource/critique-protocols
- Contracts for teams – tool to guide students in learning how to agree to work together: https://my.pblworks.org/resource/document/project_team_contract_template
- Project team management tasks: https://my.pblworks.org/resource/document/project_management_log_team_tasks
- Kanban Boards tool for Visual Team Management: https://www.pblworks.org/blog/ultimate-team-work-management-tool-kanban-boards

Slide 49

SHORT BREAK
Please return in 10 minutes

It is the supreme art of the teacher to awaken joy in creative expression and knowledge.
~ Albert Einstein

Slide 50

Planning Tool: Project Planner (BIE)
Stage 4

Stage 4 – Complete Product and Prepare Presentation Tasks

Materials, Supplies, Resources, Experts, Product, Presentation, Audience

- In your grade level teams using the Calendar section discuss and decide the monthly and weekly time -table of tasks of materials, supplies, resources, experts, finishing product construction, and preparation for presentation to be completed during the project time -table.
- Project presentation – guidance tool: https://my.pblworks.org/node/16922
- Presentation template: https://my.pblworks.org/resource/document/presentation_plan
- Presentation Day Checklist: https://my.pblworks.org/resource/document/presentation_day_checklist

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Slide 51

Planning Tool: Project Planner (BIE)
Stage 5

Stage 5 – Presentation to Audience Tasks

Location, Arrangements, Invitations, Equipment, Supplies, Presentation of 5-10 slides, Evaluation

- In your grade level teams using the Project Milestones and Calendar sections discuss and decide tasks of location, dates and times, arrangements, invitations, equipment, supplies, presentation of 5-10 slides, audience evaluation form to be completed during the project time-table.
- **NOTE**: in this PD teachers are directed specifically make a brief presentation of 5 -10 slides to present their PBL Implementation Project to other grade level teams in the school. In doing PBL with students, especially for the first time, this is a simple and effective way to present a project/product to an outside audience.
- Presentation Day Checklist: https://my.pblworks.org/resource/document/presentation_day_checklist
- Audience Presentation https://my.pblworks.org/resource/document/project_presentation_audience_feedback_form

Slide 52

☀ CLOSING - DAY 3 ☾

WRAP-UP for PD - Day 3
- Review of Day 3 activities and accomplishments

PREPARE for PD - Day 4
- Collaborate with colleagues in PLCs to complete planning Stage 3 if needed before Day 4
- Goal of Day 4: Complete PBL Planning Stage 4, Prepare Stage 5 Project Presentation
- Reflect on learning in today's PD, look for opportunities to incorporate in classroom

EXIT TICKET - Day 3
- Teachers complete Day 3 Exit Ticket and hand in to Facilitator before leaving.

CLOSING PRAYER

Slide 53

Welcome to Day 4
"Empowering Teacher
PBL Implementation"

A Professional Development Program
Multi-Day, Collaborative, Experiential, and Constructive

By Donna Lee Saladino

Please pick up your materials and sign in at the Registration Table

Please join us in a Working Lunch

Slide 54

Introduction   **Day 4**   **Agenda**

- Welcome to Day 4 of our professional development *"Empowering Teacher PBL Implementation."*
- Goal Day 4: Complete Stage 4, prepare Stage 5 for PLB Implementation Project Presentation
- Refreshments will be available during session.
- Supplies are available for the session (pens, pencils, markers, paper).
- The Folder for this 4th day of the program contains the agenda, a hard copy of the slides with note spaces, and other documents for the day. Please take a minute to examine folder contents.
- Summary of Exit Tickets Day 3 Pertinent responses, questions, and answers.
- Opening Prayer.

Time	Activity
12:00pm	Welcome
12:15pm	Introduction
12:30pm	KEBHWL Team Activity
12:45pm	Grade Level team collaboration: complete Stage 4, Prepare Stage 5 PBL Implementation Project Slide Presentation
2:30pm	BREAK
2:40pm	Continue work to complete Stage 4 and prepare Stage 5 PBL Implementation Project Slide Presentation
4:30pm	Closing
5:00pm	Hand in Exit Ticket

Slide 55

KEBHWL Opening Team Activity

- Video – PBL example
- Each teacher in grade level team at table examines the **KEBHWL** questions chart in your folder.
- Silently reflect and write responses on chart.
- Share reflections and responses with grade-level team table group.
- Summarize table team responses on one large post-it.
- Share team summaries with whole group, post on gallery wall.
- Reflect and share on reflection "findings" in whole group.
- Discuss how individual findings could impact one's progress in PBL implementation

Slide 56

SHORT BREAK
Please return in 10 minutes

The best way to predict your future

is to create it.

Abraham Lincoln

Slide 57

Planning Tool: Project Planner (BIE)
Stage 4

Stage 4 – Complete Product and Prepare Presentation Tasks

Materials, Supplies, Resources, Experts, Product, Presentation, Audience

- **In your grade level teams using the Calendar section discuss and decide the monthly and weekly time -table of tasks of materials, supplies, resources, experts, finishing product construction, and preparation for presentation to be completed during the project time -table.**
- **Project presentation – guidance tool: https://my.pblworks.org/node/16922**
- **Presentation template: https://my.pblworks.org/resource/document/presentation_plan**
- **Presentation Day Checklist: https://my.pblworks.org/resource/document/presentation_day_checklist**

Slide 58

Planning Tool: Project Planner (BIE)
Stage 4

<u>Stage 4 – Complete Product and Prepare Presentation Tasks</u>

Materials, Supplies, Resources, Experts, Product, Presentation, Audience

- **In your grade level teams using the Calendar section discuss and decide the monthly and weekly time-table of tasks of materials, supplies, resources, experts, finishing product construction of PBL Project slide presentation, and preparation rehearsals for team presentation of slides during the project time-table.**
- **All activities of Day 5 will need to be completed in Day4 and in between Day 4 and Day 5**
- **Create plan for contacting appropriate sources to set up location, get technical equipment and experts if needed, and arrange a schedule for a day of continual rotating grade level team slide presentations to other grade level teams**
- **Create a schedule in the project calendar for grade level teams to rehearse presentations to develop confidence and get feedback between Day 4 and Day 5 to make revisions if needed**
- **Create plan for audience live Q & A feedback**
- **Create a PBL Implementation Evaluation Form for audience to complete privately after presentation**

Slide 59

Planning Tool: Project Planner (BIE)
Stage 5

<u>Stage 5 – Presentation to Audience Tasks</u>

Location, Arrangements, Invitations, Equipment, Supplies, Presentation of 5-10 slides, Evaluation

- **In your grade level teams using the Project Milestones and Calendar sections discuss and decide tasks of location, dates and times, arrangements, invitations, equipment, supplies, presentation of 5-10 slides, audience evaluation form to be completed during the project time-table.**
- <u>**NOTE**</u>**: in this PD teachers are directed specifically make a brief presentation of 5 -10 slides to present their PBL Implementation Project to other grade level teams in the school. In doing PBL with students, especially for the first time, this is a simple and effective way to present a project/product to an outside audience.**
- **Presentation Day Checklist: https://my.pblworks.org/resource/document/presentation_day_checklist**
- **Audience Presentation https://my.pblworks.org/resource/document/project_presentation_audience_feedback_f_orm**

Slide 60

Day 4 - Begin Work on Stage 5

<u>Stage 5 – Presentation to Audience Tasks</u>

Location, Arrangements, Invitations, Equipment, Supplies, Presentation, Evaluation

Do grade level team teachers know the purpose and value of a final presentation of a public product to an audience outside their team and grade?

Do team teachers know locations and authority sources to be contacted for equipment, setup, and experts if needed for the slide presentation? Have invitations been sent to the audience?

Are ideas for the slide presentation plan being discussed? With appropriate slides, narrating script, and designation of who speaks in which slides?

Slide 61

Day 5 Agenda
(On Large Poster on Easel)

8:00am -2:30pm Multiple 90-minute Sessions– Scheduled for each grade level presentation to include:

o Welcome, Sign in – Each Grade Level Team welcomes and offers audience refreshments

o Introduction: Each Grade Level Team of teachers introduces PBL Project goals to audience, Opening Prayer

o Presentation: Each Grade Level Team presents their PBL Project Implementation slides to audience

o Audience Q and A Feedback Each Team invites audience to share feedback and questions

o PBL Project Implementation Presentation Evaluation Form– Each Team gives audience Evaluation Forms

o Reflection and dialogue: Each Team discusses audience feedback after presentation

o PD Program Evaluation Form : Grade Level Teams complete individual evaluations and return to Facilitator

Slide 62

Stage 5 - 90 Minute Grade Level Teacher Team Presentations

o Sign in at scheduled time for 90 Minute Presentation Session

o 10 Minutes: Introduction Grade Level Teacher Team introduces PBL Project purpose and goals to audience of peers from different grade level teacher team

o 30 Minutes: Presentation: Grade Level Teacher Team presents and explains slides of PBL Project to peers

o 15 Minutes: Audience Q & A Grade Level Teacher Team invites audience to share feedback, express thanks

o 10 Minutes: PBL Project Implementation Presentation Evaluation Form Grade Level Teacher Team distributes Presentation Evaluation Form to audience members

o 10 Minutes: Reflection and dialogue Grade Level Teams meet to privately reflect and dialogue

o 10 Minutes: PD Program Evaluation Form Grade Level Team completes and hands in PD Evaluation

Slide 63

CLOSING - DAY 4

WRAP-UP for PD - Day 4
• Review of Day 4 activities and accomplishments

PREPARE for PD Final Presentation - Day 5
• Collaborate with colleagues in PLCs between now and Day 5 to finish PBL implementation project presentation and presentation rehearsals.
• Goal of Day 5: Each Grade Level Team will deliver complete Slide Presentation of PBL Implementation Project to audience of peers in different grade level teams
• Reflect on learning in today's PD, look for opportunities to incorporate in the classroom

EXIT TICKET - Day 4
• Teachers complete Day 4 Exit Ticket and hand in to Facilitator before leaving.

CLOSING PRAYER

Slide 64

Welcome to Day 5
"Empowering Teacher PBL Implementation"

A Professional Development Program
Multi-Day, Collaborative, Experiential, and Constructive

By Donna Lee Saladino

Please sign in at the Registration Table

Slide 65

Day 5 Agenda
(Printed on Large Poster on Easel)

**8:00am -2:30pm Multiple 90-minute Sessions** – Scheduled for each grade level presentation to include:

o **Welcome, Sign in** – Each Grade Level Team welcomes and offers audience refreshments

o **Introduction** : Each Grade Level Team of teachers introduces PBL Project goals to audience, Opening Prayer

o **Presentation:** Each Grade Level Team presents their PBL Project Implementation slides to audience

o **Audience Q and A Feedback** : Each Team invites audience to share feedback and questions

o **PBL Project Implementation Presentation Evaluation Form** – Each Team gives audience Evaluation Forms

o **Reflection and dialogue** : Each Team discusses audience feedback after presentation

o **PD Program Evaluation Form** : Grade Level Teams complete individual evaluations and return to Facilitator

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Slide 66

Stage 5 - 90 Minute Grade Level Teacher Team Presentations
(Printed on cards for each team member)

o **Sign in at scheduled time for 90 Minute Presentation Session**

o **10 Minutes: Introduction Grade Level Teacher Team explains PD purpose and goals of PBL Project to audience of peers from different grade level teacher team**

o **30 Minutes: Presentation to Audience: Grade Level Teacher Team presents slides of PBL Project to peers**

o **15 Minutes: Audience Q & A: Grade Level Teacher Team invites audience to share feedback, express thanks**

o **10 Minutes: PBL Project Implementation Presentation Evaluation Form: Grade Level Teacher Team distributes Presentation Evaluation Form to audience members**

o **10 Minutes: Team Only Reflection and dialogue: Grade Level Teams meet to privately reflect and dialogue**

o **10 Minutes: PD Program Final Exit Ticket: Grade Level Team completes and hands in PD Exit Ticket**

Slide 67

☀ CLOSING - DAY 5 🌙

WRAP-UP for PD - Day 5
- Brief review of 5 Day PD program and accomplishments

FINAL REMARKS Day 5
- Thank you to audiences for attending and for giving feedback to final presentations
- Thank you to everyone involved setting up schedule and equipment for final presentations

CLOSING PRAYER

PD FINAL TEAM MEETING
- Team meets briefly after audience leaves to reflect discuss presentation and feedback
- Grade Level Teacher Teams complete and return PD Final Exit Ticket to Facilitator

Handout - KEBHW(L) Template
Teacher reflection for beginning of each day
Date today _____

What is my knowledge and understanding about PBL? Its definition, its description?	
What are my experiences regarding PBL?	
What are my beliefs regarding PBL?	
In what ways do my knowledge, experiences, and beliefs affect my implementation of PBL?	
What do I want or need, to learn or do, to effectively implement PBL in my classroom?	

<u>Handout: Exit Ticket</u>
Teacher Reflections for end of each day
Date _____

Describe the most important thing(s) you learned (from the PD today; from the entire PD on Day 5)	
Describe anything that may have been confusing to you (from the PD today; from the entire PD on Day 5).	
What question(s) do you have (from the PD today; from the entire PD on Day 5)?	
What suggestions or comments do you have (about the PD today; about the entire PD on Day 5)?	
Explain what you feel may make a difference in your teaching (from the PD today; from the entire PD on Day 5).	
How can I help you in your teaching journey in implementing PBL? How did this PD (today; overall) help you? What is your final overall evaluation?	

Handout: PD Timetable: Empowering Teacher PBL Implementation

DAY 1 **Why and What.** Power of Understanding, Power of Experience, Power of Beliefs, Power of Reflection, Power of Collaboration, Power of Inquiry

DAY 5 **Presentation and Audience.** Power of Presentation, Power of Collaboration, Power of Audience, Power of Feedback, Power of Reflection, Power of PLCs

DAY 2 **How I.** Power of Planning: Where to Start? PLCs, Learning Goals, Problem, Product, Audience, Driving Question DQ, Entry Event, Need to Know's, Project Wall

Empowering Teacher PBL Implementation

DAy 4 **How 3.** Power of Planning: Product, Construction, Resources, Feedback, Reflection, Revision, Preparation, Checklists, PLCs, Coaching

DAY 3 **How 2.** Power of Planning: Lessons, Learning Opportunities, Research, Interviews, Trips, Rubrics, Learning Logs, Assessments, Contracts, Teams, Protocols, PLCs

Appendix B: Interview Protocol

Research Study: Experiences and perceptions of local diocesan Catholic school teachers regarding the progress of their implementation of project-based learning in the classroom.

Interview Setting
Time of Interview:
Date of Interview:
Setting of Interview:
Method:
Interviewer:
Interviewee:

Interviewee Background Data
Grade level(s) taught by Teacher Interviewee:
Subject(s) taught by Teacher Interviewee:
Number of Years Teaching Experience of Teacher Interviewee:

Guiding Research Question
RQ: What are the experiences and perceptions of local diocesan Catholic school teachers regarding the progress of their implementation of Project-based Learning (PBL) in the classroom?

Purpose of the Study: The purpose of the study is to know and understand the teachers' experiences and perceptions of the progress of their implementation of PBL in the classrooms of their diocesan Catholic elementary schools. Findings from the interviews could provide information, insights, and views to discover and understand successes, obstacles, needs, and recommendations of Diocesan teachers in their instructional practices to achieve and sustain effective implementation of PBL in all their schools for the benefit of the students in the classrooms.

Data for the Study: Data will be obtained through questions in one-on-one interviews of a purposeful sample of participant teachers in three elementary schools. Each interview will last approximately 60 minutes and will be electronically recorded to capture and ensure the accuracy of all that is said. There will be a consent form for each interviewee to sign and the identities and responses of interviewees will be kept private and confidential.

Welcome and thank you for participating in this study. Do you have any questions before we start?

Interview Questions and Probes:

1. Please explain your understanding of project-based learning (PBL) and how you define it. How do you perceive students learning through a project? Describe how you perceive implementing PBL affects your students' learning and prepares them for the future?

2. Please describe your professional development (PD) and support experiences for learning how to implement PBL. Describe what it was like for you. Explain how you perceive the impact of the PD on your implementation of PBL in a diocesan Catholic school setting. What are your perceptions of optimal PD?

3. Please describe your school's PD and support for you in implementing PBL. Describe administrative help and engagement or collaboration with fellow teachers for support. How do you obtain information and guidance in daily PBL practice? How is your school's support valuable or effective for you?

4. Please describe ways you have changed your instructional practice, and how you teach differently since implementing PBL. Explain how you perceive changes in your teacher role as you implement PBL. Describe any challenges you have encountered and any that are unique in a Catholic school.

5. Please describe specific ways you have implemented PBL to help your students develop problem-solving, critical thinking, collaboration, communication, and innovation skills they need for 21st century learning. Describe how you have helped students meet challenges encountered in learning these skills.

6. Please describe specific ways you have implemented PBL to help your students understand and use voice and choice in learning. Describe examples of ways you have become a *guide on the side* for your students. Explain how your students become engaged in PBL and became independent responsible learners.

7. Please describe how your students have used innovation to create products through implementing PBL. Describe any products that were public and solved problems or provided a service. Describe how the products

demonstrated that students learned academic content and standards in the subject you teach.
8. Please describe in detail a specific learning experience in your implementation of PBL that effectively and positively impacted your students. Describe how you planned and prepared this experience. Describe what you observed happening with your students. What do you perceive made it successful?
9. Describe in detail a specific learning experience in your implementation of PBL that did not go as well as you expected with your students. Describe how you planned and prepared. Describe what you observed happening with students. Explain what you perceived was a barrier or hindrance to its success.
10. Please describe changes in how you assess and evaluate your students in PBL implementation. Describe tools you have used to assess formative progress and growth. Describe tools you have used to evaluate summative achievement of 21st century academic content, standards, understanding and skills.
11. Considering your experiences in implementing PBL in a Catholic school, please describe what you see as its strength and benefits, its challenges, and barriers. How do you perceive implementing PBL has prepared your students for success in higher education, future careers, and life in the 21st century?
12. Please describe how you perceive your overall progress in implementing PBL in your Catholic school classroom. Describe important insights and understandings you have gained for effective PBL implementation. Describe goals and views you have going forward, and thoughts and suggestions for supporting and sustaining PBL implementation in your school and the diocese.

Appendix C: Letter of Cooperation

School name
School address
Date of sending Letter to each school

Dear Donna Lee Saladino,

Based on my knowledge and understanding of your research proposal, I give permission for you to conduct the study entitled *Experiences and Perceptions of Local Diocesan Catholic School Teaches Regarding the Progress of Their Implementation of Project-based Learning in the Classroom* within the (name of school). As part of this study, I authorize you to recruit participants from our 6th, 7th, and 8th grade teachers, by using their contact information to mail Invitation to Participate letters and Statement of Consent forms inviting them to participate in the study individually through private one-on-one hour-long interviews with you the researcher. I understand that interviews will be open-ended, will use one general guiding research question followed by probing questions to enhance clarity in responses, and will be recorded. I understand that after you complete and transcribe the interviews, you will give each participant access to your written transcription to member-check the accuracy of their interview responses. I authorize you to use findings and results of the study to create a report containing recommendations that may benefit teachers' instruction and students' learning for 21st century education, careers, and life in society. Teachers' participation in the study will be voluntary, and at their own discretion.

I understand that our organization's responsibilities include providing you with contact information for your classroom teachers in grades 6 through 8; providing school background data that includes school enrollment size, grades and subjects taught by the teachers; and providing total years of teaching experience of participants. I understand that your interviews of the participants will be conducted off the school site, outside of the school day, and at times and locations convenient to participants. I understand that you will give each participant a small gift card to show your appreciation and gratitude for contributing their time and effort and knowledge to the study. We reserve the right to withdraw from the study at any time if our circumstances change.

I understand that Donna Lee Saladino will not be naming our organization or any participant in the doctoral project report that is published in ProQuest.

I confirm that I am authorized to approve research in this setting and that this plan complies with (name of school) policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of your supervising faculty without permission from the Walden University IRB.

Sincerely,
Name of School and School Principal name
        Contact Information.

Appendix D: Invitation to Participate

Dear (School Teacher Name):

Hello, my name is Donna Lee Saladino. I am a retired administrator and teacher from the local Catholic Diocesan School System (LDCSS) and am now working on my doctoral degree in education (EdD) at Walden University. To complete my degree as a doctoral candidate I am conducting research by doing a project study in the diocesan school community titled *The Experiences and Perceptions of Diocesan Catholic School Teachers Regarding the Progress of Their Implementation of Project-based Learning (PBL) in the Classroom*. This study will focus on regular classroom teachers from grades 6, 7 and 8 in several elementary schools in the Diocesan community. I am inviting you as a qualified teacher in the 6th, or 7th, or 8th grade in a Diocesan community school to volunteer to be a participant by being interviewed for this study. Your principal has agreed to have your school cooperate as a partner in my research and has granted my request for teacher names and contact information in order to send out invitations to you as teachers to join in my project study.

Background Information
The purpose of this research is to know and understand how diocesan teachers experience and perceive they are progressing in implementing the instructional approach of PBL for their students since PBL was initiated in the Diocese. Research in the educational field demonstrates that there is a need for more studies of teachers' implementation of PBL. The rationale of this study is not to evaluate or judge but to discover teachers' knowledge, perceptions and insights about what is working and not working for them in PBL implementation, what challenges and obstacles they may have encountered, and what successes they may have achieved.
Discovering knowledge, perspectives, and insights directly from you, a teacher, can provide the benefit of obtaining valuable new data from your interview responses. Such data can help administrators better understand teachers' needs, see how they may provide support, and help teachers share strategies and information about the PBL implementation that may be helpful to colleagues teaching in the unique environment of Catholic education. Students may benefit by being better prepared for higher education, careers, and life in the 21st century.

Procedures
If you accept this invitation and agree to participate, your part will be to share your experiences and perceptions of the progress of your implementation of PBL in your classroom. through responses to questions in a private video conference interview with me the researcher for 60 minutes, at a time and location convenient for you. Your responses will be data of my study.
The main arching research question I will use to guide each interview is, "What are your experiences and perceptions regarding the progress of your implementation of PBL in the classroom?" I will also use follow up questions in each interview to enhance the main

question, such as, "Tell me about a time you implemented PBL with a lesson or a project that resulted in an effective impact on your students, and what you perceived was the reason for that." Or "Tell me about changes you are making in how you assess your students when implementing PBL, and what you perceive is beneficial, or challenging, about that." Or "Tell me how your role as teacher and your students' role as learners have changed."

Confidentiality
Any information you provide will be kept confidential. Notes and digital records and writings will be kept by me in my own files, locked and password protected. I will not use your information for any purposes outside of this study and I will not include your name or other participants' names, or any information that could identify you or other participants in reports of the study. I will give you the opportunity to read the transcripts of your interview and to check my descriptions and analysis of your responses to ensure accuracy in interpreting what you shared. I will combine and synthesize the data of your interview with the data of the interviews of other participants to summarize, report findings, and propose implications for the study.

Voluntary Nature and Risks and Benefits
Your participation in the interview is voluntary. This means that everyone will respect your decision of whether you want to be in an interview. No one will treat you differently and your employment will not be affected in any way based on your decision.
There will be no risk of harm to your safety or well-being physically, legally, economically, professionally, or psychologically. As researcher I hold no professional role or position in the diocese or in my personal life other than my passion for education that would cause me to have a biased or pressuring interest in or purpose for conducting this research. Being in this kind of study may pose a normal minimal risk of stress or concern however, due to the essence of the interview process or any similar discussions in daily life. I will always protect your rights as a volunteering participant. If you feel stressed or concerned, you may question me or stop the interview or your participation at any time, without question or judgment.
A benefit to you from participating in this study is the opportunity to share thoughts and insights and views from your authentic experiences and perceptions. Another benefit is the satisfaction of contributing information that may benefit your professional colleagues and administrators. This can have positive effects that spread through the entire community of teachers, administrators, and the students in Catholic education.

Compensation and Consent
There is no compensation for participating in this study. I would like to show my appreciation however, by giving you a gift card for your time and effort to contribute to this study. I hope you will accept this invitation and volunteer to participate.
If you accept this invitation and agree to volunteer to participate in the study, please read, sign and return the enclosed STATEMENT OF CONSENT by _____.

Thank you,
Donna Lee Saladino

Appendix E: Statement of Consent

If you agree to volunteer to participate and join with me in this study, please check the box below, sign your name and date, and return this STATEMENT OF CONSENT to me in the enclosed self-addressed stamped envelope. Upon receiving your signed and dated form, I will add my signature, and I will mail a copy of this signed STATEMENT of CONSENT back to you to keep. After mailing you the copy, I will contact you to schedule your interview. If you have questions before agreeing to participate and signing below, feel free to contact me at 440-915-4710 or angels4me46@yahoo.com.

☐ have read the INVITATION to PARTICIPATE letter and I understand the components, procedures, risks, and benefits of the study, and all directions to consent to volunteer to participate. I have received answers to any questions I have at this time and understand I can ask further questions at any time and I am 18 years of age or older, and I consent to participate in the interview for the study titled *Experiences and Perceptions of Diocesan Catholic School Teachers Regarding the Progress of Their Implementation of Project-based Learning (PBL) in the Classroom*.

Printed Name of Participant _____

Written Signature of Participant _____

Date of Consent _____

Written Signature of Researcher _____

Appendix F: Excerpt of Data Coding Analysis for Themes From Interview Script

CODING 1 – FROM ORIGINAL TRANSCRIPT DATA - Teacher 4, School B	CODING 2 – FROM CODED DATA
THEMES – INTERPRETED/INFERRED FROM DATA CODES BELOW: 1 Teachers described VARIED KNOWLEDGE AND UNDERSTANDINGS of the instructional approach of PBL. 2. Teachers described DIVERSE PERSONAL and PROFESSIONAL EXPERIENCES in their life and in their implementation of PBL. 3. Teachers expressed DISTINCT PERSONAL and PROFESSIONAL BELIEFS in their life and in their implementation of PBL. 4 Teachers expressed their UNIQUE NEEDS for PROFESSIONAL SUPPORT in implementing the instructional approach of PBL. **DATA CODES from Transcript** -Hands on learning -All subjects, curriculums -Based on project that has -student input -Student driven, how students want to learn -Teacher selects projects but listens to students -Best if students have voice and choice in creating project -Teacher plugs in pieces of curriculum, content constraints Teacher guides project -Project enables learning experiences -Learning through lens of project -Collaboration - everyone contributes creativity, ideas, what they're good at -Students create real products and solutions for real problems for real people -naturally differentiates to adapt to diverse individual needs -New initiatives in education emulate Montessori principles (self-directed, choice, interest, hands on, context, whole person, creative, collaborative) -Students in charge of their own learning -Students keep trying, reflecting, learning from mistakes -Students learn 21st century skills to prepare for 21st century society	**THEMES + SUBTHEMES + CATEGORIES** **1. VARIED KNOWLEDGE AND UNDERSTANDINGS of the instructional approach of PBL.** PURPOSES -Differentiate for diverse needs and interest -Students learn 21st century skills to prepare for 21st century society -Learning/re-enforcing Catholic values BACKGROUND/THEORIES -Emulates whole child Montessori principles -Progressive, innovative approach -Non-traditional, non-cookie cutter approach ESSENTIAL ELEMENTS and PROCESSES -Based on project -Hands-on -Student voice and choice -Project designed with real world experience of meaningful, authentic, relevant problem or issue -Students create real products and solutions -Cross curricular, all subjects

-Change from cookie cutter approach
-Progressive Programs bring educational role and philosophy shifts
-PBL presents great opportunities for learning/re-enforcing Catholic values

-Personal negative experience from traditional Catholic school approach very damaging
-I have strong Catholic faith and do not blame Catholic faith itself, but "cookie cutter" old school Catholic way of teaching.
-Approach of old school, by the book, sage on stage ways not real, not innovative.
-Obtained position in Montessori Catholic school
-Montessori philosophy became my philosophy
-PBL and Montessori style starting to move Catholic education forward.
-Felt called in faith to my current school, part of a new wave of Catholic schools changing to progressive innovative approach
-PBL supports 21c programs like STEM, and Catholic schools "whole package" of STREAM
-PBL benefit - Students learn academic content in projects
-PBL benefit - Students learn problem solving skills in projects
-Students learn 21st century skills to prepare for 21st century society
-Problem solving – 21st century skill that learners need
-Collaboration - 21st century skill students need
-Collaboration - students learn to learn from each other
-In successful projects students are motivated and engaged, and become excited, creative, proud, and collaborative
-Successful project designing foot orthopedic device to help child with cerebral palsy walk
-Successful project problem solving how best to pave parish parking lot for pastor
-Students used research, math, engineering, science, problem solving, critical thinking, creativity, collaboration, and simple materials to create meaningful, real, valuable product

-Teacher selects project
-Teacher integrates curriculum standards
-Teacher guides
-Students collaborate
-Students create
-Hands-on learning
-Project enables learning experiences
-Learning through lens of project
-Student centered
-Students in charge of own learning
-Students reflect, learn from mistakes

2. DIVERSE PERSONAL and PROFESSIONAL EXPERIENCES in their life and in their implementation of PBL.

LIFE and JOB
-Education
-Past position

BENEFITS
-Benefits for the students
-Benefits for the teacher
-Benefits for LDCSS Catholic identity
-Teacher projects and activities
-Projects implemented
-School programs
-Colleague professional relationships

CHALLENGES
-Challenges for teacher
-Challenges for students
-Catholic school challenges