Social Media Technology Usage in Project-Based Learning: A Case Study

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Abstract

Project-based learning is a key methodology for the 21st century classroom. The teaching pedagogy is grounded in collaborative learning for students and collaborative teaching practices for educators. When social media and digital technologies are used as aids in the project-based learning approach, it adds a new dimension of learning for students and teachers. It also initiates communications and collaboration in the community.

The purpose of the qualitative case study was to explore how teachers and leaders describe social media technology used in order to create a project-based learning environment. Bandura's Social Learning Theory and the Technological Pedagogical and Content Knowledge frame by Mishra and Kohler's was conceptual framework of the study. When both the TPCK and social learning theory are used together, they create a collaborative learning environment. By eliciting responses from 16 participants (leaders and teachers) via questionnaire, interviews, and focus group, the researcher found how social media was used in a PjBL environment. The constant comparative method, through the aid of a computer program, was employed for data analysis.

The findings of the research include three predominant themes and nine subordinate themes based on participants' shared experiences and viewpoints. Thematic Code 1 addressed the implementation of project-based learning, into subsidiary themes of change needed in the learning environment, professional development, and barriers of the pedagogy. Thematic Code 2 arranged technology in the school district, to the subordinate themes of a whole school learning management platform, digital technology usage, and the learning process. Thematic Code 3 organized the communications methods of the leader and teacher participants into the associated

themes of collaboration and communication efforts, sharing and presenting, and traditional to remote learning.

The research and new knowledge established in this study contributes to the literature of social media as a technological approach to sharing and collaborating in the school environment. The research also adds to the literature of organizational change through the implementation of new educational designs.

Keywords: collaboration, Corona Virus, Covid-19, education, organizational development, project-based learning, Social Learning Theory, social media communication, Technological Pedagogical and Content Knowledge framework.

Dedication

This dissertation would not have been completed without the strength and good health I needed from God. I also dedicate this dissertation to my family.

For my mom Shelley who taught me to always be an independent thinker and to always climb the mountain to reach my dreams.

To my husband Keith, without you I would not have been able to complete my educational journey as you gave me the resources to make this dream possible, as well as you listened to my outspoken ramblings of the research itself for me to make sense of it all.

To my sisters Steffie and Allie, whom I bounced ideas off of, for proofing drafts, and for getting me away from the stress of studying or writing.

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Chapter I: Introduction

Introduction to the Problem

Project-based learning (PjBL) is student-centered learning. Educators give students an assignment which is based on a problem that needs to be solved. The students begin investigating the problem through research and then collaboratively learn to form solutions. As new learning occurs throughout the research and development process, revisions are made. Throughout the PjBL activity, teachers use their pedagogical knowledge to guide students with feedback. The goal for the students is to display the specific skills and achievement of these skills. The goal for educators is to facilitate a collaborative learning environment where they allow students' individuality.

Problem-based learning and PjBL are two teaching approaches that are found in the instruction of student-centered and inquiry-based learning paradigms. Both problem-based learning and PjBL are similar, yet different. Both approaches are learner-centered, where the educator facilitates instead of lectures students. The differences are found in the pedagogical design. In problem-based learning, students are given the problem that they must solve. In PjBL, the final result is the project that is created.

Armed with smartphones, laptops, and other gadgets, Millennials (originally called Generation Y), are plugged in 24 hours a day, seven days a week to technology (Middleton & Perks, 2014). Millennials like to communicate with others through email, text messaging, and social media platforms, such as Facebook, Instagram, Snapchat, and Twitter, among other computer applications, which their friends and colleagues are using. While the majority of the millennial generation cannot imagine their world without the internet or cell phones, Generation Z cannot imagine an education without incorporating these technologies into the learning environment (Fredricks, 2014; Middleton & Perks, 2014)

The Generation Z cohort are multi-taskers (Fredricks, 2014; Kick, Contacos-Sawyer, & Thomas, 2015). Because of their personal technology usage, the students would benefit in an educational environment that utilizes all types of technology to promote a diversified learning environment, where learning is personalized (Fredricks, 2014). Generation Z has a different usage of social media (Pew Research Center, 2018). As the millennial generation uses social media for self-promotion and public opinion, Generation Z is more cautious of publicly sharing their posts (Rospigliosi, 2019). Although Generation Z do not publicly share, they are constantly informally communicating with friends through internet computer technologies (Kick, et al., 2015; Rospigliosi, 2019). However, this generation has poor interpersonal communication skills because of the constant use of the computer applications (Kick, et al., 2015).

Educators need to teach Generation Z how to communicate with others (Kick, et al., 2015). Students need activities in schools that mirror the activities out of school. These activities include the use of internet computer technologies, video gaming, online shopping, or playing in sports or clubs (Fredricks, 2014). Because of the continuous technology engagement,

where students are always using technology to communicate, teachers must find a way to use this engagement in their classrooms.

Although Generation Z is constantly using technology, students may not be using it for educational purposes. It is up to the educator to teach how to use technology for education (Fredricks, 2014; DeCapite & Bush, 2016). For this reason of not knowing how to utilize technology correctly, students fall into the category of the digital divide. The digital divide at one time was based on the accessibility to have technology. However, this definition has changed. The digital divide includes the "imbalance both in physical access to technology and the resources and skills needed to effective[ly] participate as a digital citizen" (Jackson, 2015, p. 28), Students are already using technologies such as social networking sites such as Facebook and Twitter, but most are doing so without educational skills, which would be used in school or the workforce (Hills, 2015; Kale & Goh, 2014).

As technology usage is a way of life for Generation Z, teachers must find a way to use educational technology in the classroom. While technology is used by teachers to deliver class materials, the way in which this activity is completed varies by the ability of the teacher's comprehension of technology itself. Some teachers do not know how to utilize technology to its potential for student learning, therefore professional development in technology and its usage for the classroom is needed (Condliffe et al., 2017; Kale & Goh, 2014; Veletsianos, Beth, Lin, & Russell, 2016).

As a result of this digital divide, some teachers would fall into this category, as some are afraid of the technology in general, or afraid that they do not know enough about the technology to teach with it (Jackson, 2015). Teachers need to research these technologies and try them out for themselves and then allow students to experience those technologies and how to use them

educationally in the classroom. Educators use several tools to initiate and continuously motivate students in PjBL. When forming a lesson or unit, teachers would need to find right application or technology tool that provide higher level Bloom's taxonomy learning experiences (Conn, 2013).

Because of the continuous technology engagement, some students are always using technology to communicate. Teachers must find a way to use this engagement in their classrooms; therefore, teachers need to collaborate with students to find what technologies are used for both education and personal enjoyment. If teachers would use technologies that students use in everyday life, teachers would facilitate learning in the classroom through those applications (Fredricks, 2014). If educators use the technologies that students are familiar with, the teachers would be able to model how the computer technology could be used in the classroom.

When teachers use modeling and scaffolding techniques comprising of Bandura's social learning theory, students might master the educational content. The teachers' modeling approach helps students construct new learning schemas. The result is that the students will understand new ideas more easily when it is connected to prior knowledge. However, having technology and understanding how to use technology is a learning barrier.

Technology access is sometimes a learning barrier. Not all students are able to use technology daily. Some research states that socio-economic status still plays a role in technology usage (Holmes & Hwang; 2016). Some of this access is related to the digital divide, where teachers and/or students are lacking in technological knowledge (Hills, 2015; Huang, Jeng, Hsiao, & Tsai, 2017; Lucas, 2018; Ravitz & Blazevski, 2014). Technological delivery issues are due to the fact that some students lack the adequate technology usage for educational

purposes and instead only know how to look for surface type issues such as one-word searches (Kale & Goh, 2014; Hills, 2015). If students were better at digital skills, they would be able to use search engines to find their answers more effectively (Hinostroza, Ibieta, Labbè, & Sotò, 2018).

According to Kick et al. (2015), some members of the Genration Z community communicate through social media technologies, but lack the abilty to communcate face-to-face or in formal writing. Educators need to teach those students how to present formal work via computer technology (Bellanca, 2010). Other barriers for educators are due to the fact that some teachers do not know how to utilize technology to its potential for student learning. Professional development in technology and its usage for the classroom is needed (Kale & Goh, 2014; Veletsianos, et al., 2016; Condliffe et al., 2017).

Background, Context, History, and Conceptual Framework for the Problem

PjBL is not a new teaching pedagogy. In fact, according to Huang et al. (2017) the concept of student-centered education began in the 1960s when Bandura theorized the idea of the social learning theory, where learners conducted self-regulating learning by observing others (Huang et al. 2017). Bandura' s concept could also be applied to collaborative learning in group activities, where group members learn from each other (Lee, Huh, & Reigeluth, 2015). PjBL was used for decades as part of the pedalogical ideologies of teachers. Some teachers stopped using this concept of teaching due to changing goventmental mandates and began teaching towards the state mandated achievement tests (Lucas, 2018). Some researchers stated that curriculum is always changing, and it depends upon theory and politics, as well as how teaching and learning fits into technology (Wilper, Smith, & Weppner, 2013). Researchers such as

Hendry, Hays, Challinor, and Lynch (2017) said the mandates also brought-about a debate of traditional approaches to teaching and learning in age of technology.

In 2001, The Federal Government began looking into revising the education laws for students. The No Child Left Behind Act (the education-reform bill) was signed by President Bush in 2001, which reauthorized the 1965 legislation. The bill increased the role of the federal government in guaranteeing the quality of public education for all children in the United States.

Federal mandates and various states' initiatives were created to have all students guaranteed equal educational opportunities (Plucker, Spradlin, Cline, & Wolf, 2005). At a local level, some teachers opposed the NCLB act as they needed to teach toward the test and not a creatively designed curriculum (Dole, Bloom, & Kowalske, 2016). There was also tension between methods of teaching between technology and conventional methods (Ark, 2017; Hendry et al., 2017; Scoggin & Ark, 2018). Teachers were required to follow district mandates that were then overseen by the state for allocation of State and Federal funding. This was usually measured by test scores and adequate yearly progress (AYP), as measured between discrepancies amongst minority populations.

But, with the passage of the Common Core, some school districts in Ohio have now become schools based on certain teaching pedagogies, such as whole school PjBL. When students publish their work online, the content standards of technology would be satisfied. Students need to show mastery for concepts learned in school. The Ohio Department of Education Standards mandate that students publish their work as part of the Common Core (Ohio's 2003 Academic Content Standards in Technology, 2014). By using PjBL, students can master the curriculum needed without having to do the same thing as the person sitting next to

them because PjBL is considered a form of differentiated-learning (Gòmez-Pablos, del Pozo, & Muñoz-Repiso, 2017)

As the nation's education standards change there has been a re-emergence of PjBL; yet, there is some apprehension that exists with an inquiry-based education because of the Common Core requirements and teaching toward the tests (Bills, Griebling, & Waspe, 2018). Coupled with technology, PjBL allows educators a different way to teach in the learning environment (Scoggin & Ark, 2018). In PjBL classrooms, teachers need to function as facilitators for students to actively learn through collaboration (Dole et al., 2016).

In PjBL environments students are guided to understand a concept, research the concept, then create a solution for the material learned (Dole et al., 2016). When teachers facilitate lessons in the PjBL classroom, teachers help students encounter what needs to be learned (Canaleta, Vernet, Vicent, & Montero, 2014; Dole et al., 2016). Student knowledge of problem-solving skills and career/college readiness skills needed for the Common Core requirements could be facilitated through inquiry-based learning, such as PjBL (Bills et al., 2018; Delgado, Wardlow, McKnight, & O'Malley). PjBL teaches problem-solving skills that students need for future careers to understand key concepts (Wilper et al., 2013). Students need to harness the skills of communications, collaboration, and creating authentic products to succeed in the future (Bellanca, 2010).

Collaboration in the PjBL environment is important for student-centered learning. Social media technologies could be used as means for communication and collaboration. A positive view of social media technology was discovered as researchers found how the integration of Google and social media sites are used to enhance project design in PjBL (Huang, et al., 2017). Huang et al. (2017) measured outcomes of critical thinking in the PjBL environment when

student participants used Google application tools. When student participants used Blogger, students actively engaged in their own learning and became aware of innovative ideas in relation to learning through others.

Lucas (2018), who studied barriers to implementing project-based classrooms and schools said that several barriers exist to create this learning environment, naming teaching towards the state tests as a large reason the PjBL pedagogy is difficult to implement. Another barrier to the pedagogy is the challenge of time schedules needed for learning the material for state-mandated tests or course completion (Carter et al., 2014; Lucas, 2018; Jouneau-Sion & Sanchez, 2013). However, the school day itself allows for a model of education based on teaching for students' passage on the state tests or for an education where a one-size average model is how some teach (Jouneau-Sion & Sanchez, 2013).

The conceptual framework for this qualitative research study is based on the social learning theory of Bandura and the technological pedagogical content knowledge (TPCK) framework, created by Mishra and Koehler (2006). The purpose of using these two educational models is to discover how both theories are utilized as a foundation to create an innovative learning environment. The study also allows for a school district and/or teacher to utilize the research to create a PjBL environment with social media technologies to expand the classroom into a community or global project.

Statement of the Problem

The focus of this qualitative case study was to explore how educational stakeholders use social media technology in a PjBL environment. By eliciting responses from teachers and school leaders via questionnaire, interviews, and focus group the researcher was able to find an accord

to the social media technologies used in a PjBL environment. The qualitative data analysis method employed in this exploratory case study is the constant comparative method.

Purpose of the Study

Communication has evolved through the use of social media technology. Educational stakeholders must also evolve in the learning environment. Past studies have analyzed either the PjBL environment or social media technologies, yet the studies identified in the literature review have not been simultaneously studied as one learning environment. Past studies have also not used Bandura's concept of social learning and collaboration with social media technologies. This study seeks to gain an understanding of how social media technologies is used in a project-based learning environment. The study explored how educational stakeholders (educators and leaders) use social media technology in a project-based learning environment in their classrooms and school environment.

Research Question

The following question will guide this study:

RQ. How do educational stakeholders (leaders and teachers) use social media technology in a project-based learning environment in a northeast Ohio suburban school district?

Through the use of purposeful sampling, data was collected from educator and leader participants at one specific high school in the form of a questionnaire, interviews, and focus group. The questionnaire was used to select participants for the interview and focus groups. There was a different set of semi-structured interview questions for both the teacher group and leader group. The focus group consisting of five teachers allowed for a more in-depth study of how social media technologies were used within the project-based learning environment.

Rationale for Proposed Study

The researcher uses the research methodology of a qualitative case study. The research design is an exploratory, single organization, case study. The researcher utilizes questionnaire, interviews, and focus group to explore social media usage in PjBL environment. By utilizing a qualitative method in one school district, the researcher was able to utilize school leaders and teachers as participants. There was a different set of interview questions for each grouping of participants. The constant comparison method was used for data analysis. The data analysis method allowed for themes to be formulated from the data collected. Once themes emerged, the researcher applied the data to answer the research question.

The researcher used the case study design, based on the recommendations of Merriam (1998), Stake (2010), and Yin (2003, 2018). The use of interviews and focus group to uncover technology usage and technology selection was analyzed through participant perceptions via the data collection and analysis procedures outlined in Chapter 3: Methodology. The researcher integrated the following objectives to coincide with the main research question. These goals were to find:

- Is technology integration beneficial in the learning environment?
- What, if any, are the benefits of using technology with PjBL?
- What types of barriers to technology do teachers and leaders experience in the classroom and/or school setting?
- How could social media be used in the learning environment?
- What are the recommendations of teachers and leaders to implement project-based learning with technology in the classroom?

By utilizing a qualitative method in one school district, the researcher chose participants based on purposeful sampling, where school leaders and teachers have used PjBL to educate

students. The school district was chosen due to the whole school educational design, where PjBL was established in the educational environment.

The purpose of three different data collection methods was to triangulate research for analysis. By using more than one source of information, it brought forth a discovery of how and why social media technology is or is not chosen and utilized in the classroom for PjBL. The themes found during the analysis (Chapter 4) were then compared to other similar studies and recommendations, which will be discussed in Chapter 5. Comparing the data discovered with previous research was one goal of a qualitative researcher (Yin, 2018). The case study method, according to Yin (2018), allows the researcher to find a commonality between a phenomenon and the context. The case study approach allowed the participant to reiterate their encounters which was one delimitation found in this case study (Baxter & Jack, 2008; Yin, 2003).

In this qualitative research, the data consisted of a questionnaire, semi-structured interviews, and a focus group. The data collection in the qualitative study required a direct relationship between researcher and participant, as the researcher gained insight and information directly from the participant(s). The diversity and union of data brought a unique perspective to solve the mystery (Baxter & Jack, 2008). According to Yin (1994), the situation of the case study itself produces much data. Data has been collected from a variety of sources. This data has been collected with a thorough plan, where the triangulation of evidence was needed for proper analysis. For this case study, interviews consisted of five teacher participants and five leader participants who were then asked semi-structured questions, while a five-teacher participant focus group allowed the researcher to explore the deeper perceptions of social media in PjBL environments. This allowed for a comparison between the teacher interview and focus

group participants. It also allowed the triangulation of data through the use the constant comparison data analysis method.

Definition of Terms

Asynchronous Communications. Online threads are conversations, which are led by a prompt, where users either respond to an initial prompt or can reply to others' responses. These postings are independent of audience location, where the time of actual participation in the discussion forum is not required to participate in the discussion (Fredricks, 2014).

Bandura's Social Learning Theory. Educational theory states those learning are educated through modeling and observations of others. When people learn from others through social interactions, cognitive (thinking) processes occur in the learner's mind (Bandura, 2009). This self-reflecting process allows for new learning to emerge from past experiences. When people observe a behavior from others, they in turn try to follow the new behavior, where new skills are tried and then learned (Mezirow, 1991).

Digital Divide. The digital divide at one time was based on the accessibility to have technology (Prensky, 2012). However, this definition has changed. The new digital divide is just not based on the socio-economic resources (Hills, 2015; Kale & Goh, 2014). It is the division of people between having technology and not using the technology to its full benefit or design (Hills, 2015; Huang et al., 2017; Jackson, 2015; Lucas, 2018).

Project-based learning (PjBL). Project-based learning is student centered learning. PjBL is a teaching pedagogy where students are given a problem and they must solve it by researching and producing a project that demonstrates their proficiency in learning. To solve the problem, students must first become investigators, where they must formulate an issue as well as solutions to solve the problem. Afterwards, there is a revision process where a learning curve

and a transformational type of learning takes place (Dole et al., 2016; Gòmez-Pablos et al., 2017; Hou, Wang, Lin, & Chang, 2015).

Social Media Technology (SMS). Computer applications or programs that allow the user to communicate with others. Collaboration and/or communication takes place when users elicit responses and/or dialogue from others which is not bound by a specific time and a place (Pew Research Center, 2018; Walster, 2017).

Technological Pedagogical and Content Knowledge Framework (TPCK). The theory is designed in four stages. The first stage looks at what the curriculum is, how it is designed and what content and Bloom's Taxonomy thinking level is needed. The second stage incorporates appropriate instructional strategies and models to use when teaching certain content. The third stage questions the teacher's technology usage and questions also if there is technology in the building that is needed to support the objective in the first place. The teacher must also question the cognitive level and instructional strategies with or without the technology. And, lastly, the teacher needs to decide on technology resources to best support student learning and knowledge with the skills identified (Mishra & Koehler, 2006).

Assumptions, Limitations, and Delimitations of Study

Assumptions. The researcher assumed that an exploratory, qualitative, case study was an appropriate choice for a research design. This research design allowed the researcher to analyze the perceptions of participants, using purposeful sampling. Since, participation was on a voluntary basis and participants were told in advance that identities would be kept confidential, the researcher assumed that participants answered the semi-structured interview or focus group questions honestly.

Limitations. The case study was bound by the location and time, as well as the participant selection; however, the very nature of this also caused limitations in the study. One limitation was the specific location of the school, as it was a single organizational study. The study was an in-depth study based on interviews and focus group where educators' perspectives were analyzed based on a learning paradigm that shifted from teaching towards the tests to a PjBL environment. Since all participants were members of the same community, the population all had the same lived experiences. The data collection for the study involved a six-week time period, where a questionnaire, interviews, and focus group was employed for analysis. With the bound system of the case study, this also caused the data to not be generalizable to the entire population.

Delimitations. Delimitations were set as the boundary for the study. There are several ways to limit or bound the case that includes, a specific place, an interest, or by qualifying the participants to become part of the study (Merriam, 1998). The length of time the educational stakeholders have taught/led in a specified high school in Ohio, where the school district's educational environment is that of the project-based environment was also the criteria for purposeful sampling.

Chapter I: Summary

The purpose of the study was to explore how educational stakeholders use social networking technologies in a PjBL environment in a suburban high school in Ohio. The social learning theory of Bandura and the technological pedagogical content knowledge (TPCK) framework, created by Mishra and Koehler (2006), was the framework of the study. The study results would allow for a school district and/or teacher to utilize the research to create a PjBL environment with social media technologies to expand the classroom into a community or global

project. The results also allow leaders to realign the ideologies found in PjBL to create a reformed, student-centered learning environment.

The case study for this project was conducted in a suburban high school in Ohio. The school district implemented incremental PjBL where students in grades 5-10 were being educated via the pedagogy of PjBL. There were 102 educators who taught at the high school level for the school district. They consisted of both males and females in different age demographics. The researcher used the research methodology of a qualitative study. The research design was an exploratory, single organization, case study. The researcher utilized focus groups, as well as interviews and questionnaires to uncover technology usage.

By utilizing a qualitative method in one school district, the researcher was able to choose participants such as school leaders and teachers to compare data via the process of questionnaire, interviews, and focus groups where the researcher categorized answers for data analysis using the constant comparative method. By using more than one source of information, it brought forth a discovery of how and why social media technology is chosen and utilized in the classroom for PjBL.

During the 1990s, some teachers lost their ability to creatively teach (Scoggin & Ark, 2018). In a published interview with Bellanca (2010), Darling-Hammond, has discussed necessary policy changes that needed to be completed. Besides aligning standards across the country, the goal was to create an environment where teachers had professional development where innovative technology was learned to create authentic lessons (Bellanca, 2010). The No Child Left Behind Act was to benefit Americans; however, many wanted to change the provisions of how the act was currently written and applied per state or school district (Bellanca, 2010; Wilper et al., 2013).

With the passage of the Common Core, some school districts in Ohio have now become schools based on certain teaching pedagogies. In fact, some schools in Ohio are based on PjBL. The Ohio Department of Education Standards mandate that students use technology in communication and to also publish to share their work with others. (Ohio's 2003 Academic Content Standards in Technology, 2014). One way to do this is through PjBL where students work to research and create projects that would showcase their mastery of educational skills learned in the classroom.

There are several reasons why PjBL and social networking technologies should be studied. Researchers state that curriculum is always changing, and it depends upon theory and politics as well as how teaching and learning fits into technology (Wilper et al., 2013). For instance, when the Federal Government changed the No Child Left Behind Act to the Common Core Standards, teaching and learning standards across the county also had to be updated. Due to the Federal mandate, states had to follow suit and also change their mandate for learning and teaching standards. As the state mandates changed, city school districts also had to change their requirements for education.

The four chapters that follow show a progression from a literature review to the methodology of the study. The data collection and data analysis follow the progression of the study. Finally, a discussion of PjBL with social media technologies conclude the study.

In Chapter 2 of this dissertation, a literature review chapter is found. It includes a review of literature pursuant of PjBL and social media technologies. The chapter contains critique and analysis of both qualitative and quantitative research pertinent to the background of the study. This chapter also holds the essence of the researcher’s conceptual framework in Bandura’s social

learning theory and the pedagogical teaching framework of Mishra and Koehler's (2006) TPCK study.

In Chapter 3 of this study, the methodology is located. It includes a recap of the history of PjBL, as well as the researcher's reasons for a qualitative study. The methodology chapter describes how educational stakeholders were chosen for participation in the study, as well as the data collection and data analysis methods for the single-organizational case study.

At first, Chapter 4 will summarize the purpose of the case study as well as will describe the process undertaken by researcher for data analysis. It also will show the results of the constant comparative method to report the results and findings of the study.

Lastly, Chapter 5 will be the summary of the results of the qualitative case study. It will summarize how the results of the study answers the research question of how educational stakeholders use social media technologies in a PjBL environment. In this chapter, the researcher also gives recommendations to future researchers, as well as educators, in relation to social media usage in learning environments, namely in the PjBL. The chapter further recommends how leaders are able to implement the PjBL model into a district.

Chapter II: Literature Review

Introduction to the Literature Review

One way to teach in a student-centered classroom is to use the pedagogy of project-based learning (PjBL) intertwined with social technologies. Hou, Wang, et al. (2015) compared the results of normal communications versus social media discussions in a classroom setting. The reseachers found that knowledge could be co-formulated with other learners during discussions as they shared information with each other (Hou, Wang, et al., 2015). The shared concepts were then interpreted through the learner's own prior experiences, which created a new learning paridigm (Hou, Wang, et al., 2015).

PjBL bases its teaching style on student-centered learning. It is a teaching pedagogy where students are given a problem and they must solve it by researching and producing a project that demonstrates their proficiency in learning (Dole et al., 2016; Hou, Yu, et al., 2016). The pedagogy is based on a student creating a project to show a skill and achievement in his/her level of education in a welcoming and collaborative learning environment (Gòmez-Pablos et al., 2017; Hou, Wang, et al., 2015).

When PjBL is used with social media technologies teachers can guide students to connect with information from their past experiences to create new meanings, which in turn

furthers their understanding on the subject matter (Canaleta et al., 2014; Scoggin & Ark, 2018). PjBL could use Bandura's theory to also describe situations in the teaching method, where teachers need to know how much and what type of scaffolding the learners need to succeed. "The main task of the teacher is to guide students through this learning process, helping them to discover for themselves the knowledge they must learn" (Canaleta et al., 2014, p. 651).

Background, context, history, and conceptual framework for the problem. PjBL is student-centered learning. It is a teaching pedagogy where students are given a problem and they must solve it by researching (Hou, Yu, et al., 2016) and producing a project that demonstrates their proficiency in learning (Dole et al., 2016). To solve the problem, students must first become investigators where they must formulate an issue as well as solutions to solve the problem. Throughout the learning process, students struggle with their learning until a new understanding takes place. Sometimes a transformational type of learning occurs for the learners as they master the content (Lee & Hannafin, 2016; Mezirow, 1991). In PjBL, with the aid of scaffolding via social media technologies, teachers guide students to connect with information from their past experiences to create new meanings which in turn furthers their understanding on the subject matter (Scoggin & Ark, 2018; Canaleta et al., 2014). One way to guide students is through technology that students already use on a daily-basis—this technology is social media.

Social networking became a new form of communications during the year 1997 when Six Degrees was created (Pew Research Center, 2018). The computer application allowed users to accept friendships from others to communicate via the computer. My Space was also another computer application that was created which allowed friends to accept others for friendships online for internet communications. In 1999, the first blogging sites became available on the

internet, creating a media sensation. Facebook, created by Zuckerberg in 2004, became the communications mainstream that people encountered in the 2000s and onward.

Prior research has shown that PjBL is again being used in classrooms globally (Çakiroğlu & Erdemir, 2018; Chu, Zhang, Chen, Chan, & Lee, 2017). Ravitz and Blazevski's (2014) study was a quantitative approach that compared how teachers used technology to aid students in creating their PjBL methods. The researchers found correlations in that the teachers who worked with technology were more inclined to use technology in the PjBL classroom. Teachers who were not as familiar with technology struggled with the use of it or did not use technology for PjBL lessons in the classroom. The researchers suggested that a qualitative study should be done to analyze the reasons to find out the differences in the way technology is utilized in the classroom as well as what technology is effective for students in a PjBL environment.

Over the last decade, researchers addressed some of the gaps in the current literature including Condliffe, et al. (2017), Hou, Wang, et al. (2015), Kale and Goh (2014), and Veletsianos et al. (2016). The latter researchers analyzed the classroom itself in the PjBL environment or what technologies students used; however, what was not studied included the teacher. A qualitative study using focus groups would be beneficial to those wishing to implore a PjBL curriculum in the classroom or school, based on researching how teachers learned how to utilize the technology for their classroom, as well as the teacher's ability to use the technology to instruct students how to use the technology.

There are several reasons why PjBL and social networking technologies should be studied. Researchers state that curriculum is always changing, and it depends upon theory and politics, as well as how teaching and learning fits into technology (Wilper et al., 2013). For instance, when the United States Federal Government updated the No Child Left Behind Act to

include Common Core Standards, teaching and learning standards across the county also had to be updated. The International Society for Technology in Education (ISTE) began benchmarking requirements for students' usage of technology in the late 1990s, and also benchmarked requirements of teachers, administrators, facilitators, and students for the production and performance of learning via technology and its applications, which is related to the Common Core Standards (Hall, Quinn, & Gollnick, 2016; International Society for Technology in Education, 2016).

In Ohio, when the Board of Education updated core course standards, they also updated technology indicators for student proficiency in those courses (Ohio's Learning Standards for Technology, 2017). These state-mandated updates must also be revised in the school district, whereby school district administrators must create technology plans for their schools, including professional development for teachers.

The purpose of the study is to explore how educators use social networking technologies in a PjBL environment in a suburban high school in Ohio. The social learning theory of Bandura and the technological pedagogical content knowledge (TPCK) framework, created by Mishra and Koehler (2006), is the framework of the study. The findings of the study would provide a school district and/or teacher to utilize the research to create a PjBL environment with social media technologies.

Conceptual Framework

The conceptual framework for this study is the social learning theory and the technological pedagogical content knowledge (TPCK) framework. The links between Bandura's theory and the TPCK become an element for educators using social media applications to instruct students in PjBL environments. When both the TPCK and social learning theory are

used together, they create not only a way to teach, but also a way for collaboration in the learning environment.

PjBL is based on the social constructivism approach because collaboration is needed for learners to obtain new knowledge (Kokotsaki, Menzies, & Wiggins, 2016). Courses designed from constructivist principles should be relevant, interactive, project-based, and collaborative while providing learners with some choice or control over their learning (Gibbs & Partlow, 2003). In PjBL, students learn as they collaborate with others and complete projects (Dole et al., 2016; Hou, Yu, et al., 2016). The learning is based on collaboration. The learning is also based on exploring and researching a topic. The learners would then design a project for a solution (Dole et al., 2016). Bandura' s concept could also be applied to collaborative learning in group activities, where group members learn from each other (Lee, Huh, & Reigeluth, 2015). Before collaboration takes place, communication must occur between the student and the teacher.

Teachers need positive communication with students for students to learn how to utilize technology and incorporate it in the classroom. Teachers need motivational and strategic plans to make the collaboration significant for PjBL to succeed. In the cognitive theory, learning is a mental operation from information acquired through the five senses. These views are based on the theory of Bandura (2009).

Bandura theorized that knowledge results from the learning process, and it is unique to the individual. According to Bandura (2009) behavior is learned through not only modeling, but through the idea of self-efficacy, where individuals tend to set high goals. The learning process challenges the goals, yet; at the same time motivates the learner to master the set goals (Bandura, 2009).

Some of these tasks need modeling and scaffolding, which is Bandura's social theory, that learning occurs due to modeling. In terms of learning, an educator must model the correct way of doing something before the students would be able to do something by themselves. However, not all teachers have the self-efficacy to show students how to utilize computers effectively because they may not know how to use the technology themselves. If educators are unsure of how to use specific computer programs and applications, they must partake in professional development. One way to train educators is through the use of the TPCK.

The TPCK developed by Mishra and Koehler (2006) was written so teachers to understand how to use technology for the best interest of student learning. The TPCK was written so teachers would understand the interrelationships between pedagogical knowledge, technological knowledge, and student knowledge. The TPCK framework supports technology as an aid to the curriculum, but not the main part of it, as technology should be an integration of the learning.

The TPCK framework is designed in four stages. The first stage was to show teachers how curriculum should be designed by content and thinking level through Bloom's taxonomy. The second stage incorporates instructional strategies and models for teachers to use when teaching certain content. The third stage questions the teacher's technology usage and if there is technology in the building that is needed to support the objective in the first place. Teachers must also question the cognitive level and instructional strategies of their lesson to see if technology usage is needed for student proficiency of the material learned, or if students could learn the material without computer technology. And, lastly, the teacher needs to decide on technology resources to best support student learning and knowledge with the skills identified (Grant, Hindman, & Stronge, 2010).

Review of Research Literature and Methodological Literature

The following review of literature is based on internet database searches that were predetermined by the researcher to include only scholarly peer reviewed articles. The research articles for the literature review dealt with the search terms of both PjBL and social media technologies. These limitations for these terms allowed the researcher to exclude students from the search equation. This in turn, yielded the answers into analyzing classroom and school environments for both teachers and school districts, as well as to find out what has not been researched to the extent needed to provide answers to the research question. The following literature review was written as a way to further understand how other researchers analyzed a PjBL environment and the technology used in this environment to answer the research question of how stakeholders use social media technologies in a PjBL environment. Yet, the gap in the literature revealed that educator perceptions were not included by researchers in relation to the use of social media technologies in PjBL environments. This study allows for narrowing in the research gap to understand how educational stakeholders use social media technologies in a PjBL environment.

Benefits of project-based learning. The use of technology to support PjBL has many benefits as social media allows students to collaborate with others and gives students more resources for learning by inquiry than just the textbook (Ravitz & Blazevski, 2014). Collaboration is needed in PjBL; however, it is additionally needed when technology is involved as a tool for collaborative communication (Hou, Yu, et al., 2016; Stozhko, Bortnik, Mironova, Tchernyshev, & Podshivalova, 2015). PjBL management systems that include 2.0 telecom technologies aid in collaborative learning and teaching (Mosier, Bradley-Levine, & Perkins, 2016; Ravitz & Blazevski, 2014). According to Jacobs (2017), when social media technology,

such as Facebook, is added to PjBL, students are able to communicate with their group members during project development and are able to share their finished projects with others in the community for outreach purposes.

Teachers are able to use multiple sources to scaffold students' higher order thinking skills during PjBL through online resources, including social networking sites. With the aid of scaffolding via social media technologies, teachers guide students to connect with information from their past experiences to create new meanings, which in turn furthers their understanding on the subject matter (Canaleta et al., 2014). Ark (2017) stated that students need to be coupled to technology whether this is online or offline through the help of educators. Although scaffolding and collaboration are important in PjBL, the audience for the final project is needed in the learning process.

Students are motivated in PjBL when the audience level is centered on stakeholders in the community (DeCapite & Bush, 2016). When the community is involved, students gain further knowledge from outside sources. Students have an audience that they can show their projects and feel their projects could make a difference in a real-world situation. PjBL is a pedagogy that develops students' higher thinking skills (Gòmez-Pablos et al., 2017).

When students share their final projects with the community, they are able to accomplish two long term-project objectives. First, the goal of the PjBL is for students to use real life experiences to make a difference in society (DeCapite & Bush, 2016). The lived experiences motivate students to master the goals of the project itself, as they produce and then display their product to the community (Hopper, 2014). The second would be that in Ohio, the production of the project would satisfy the Ohio Department of Education Graduation grade level requirements for technology and communication skills (Ohio's Learning Standards for Technology, 2017).

Although PjBL has been used for scaffolding students' knowledge throughout the last several decades, it has also been discarded due to policy changes.

Project-based learning and ever-changing governmental mandates. When the No Child Left Behind Act was signed in 2002, some educators stopped using PjBL and began teaching toward the state mandated tests (Gòmez-Pablos et al., 2017). During the early 2000s and until the Common Core was signed in the 2010s, authors Ark (2017), Gòmez-Pablos et al., (2017) and Scoggin and Ark (2018) claimed high stakes testing took the teaching power away from some teachers leaving them with little empowerment in their classrooms. Centralized strategies, such as state mandated standards, where testing by grade levels for graduation was needed for alignment across the country, and teacher required college coursework or continuing education hours, were enacted by the government (Lucas, 2018). The schools had to realign their courses to align with new state and federal educational standards (U.S. Deparment of Education, n.d.).

Some school districts were still failing state and federal standards thereby required a new educational mandate to take its place (Ohio's Learning Standards for Technology, 2017). A new educational act called Every Child Succeeds Act (2010) was initiated because teachers and schools were failing at managing the federal government mandates. The ESSA granted each state the ability to create their own standards, now known as the Common Core. The mandates also brought-about a debate of traditional approaches to teaching and learning in the age of the Internet (Hendry et al., 2017), where personalized-centered learning again developed as the United States' testing policies changed (Scoggin & Ark, 2018).

When policies were altered, pedagogies correlated with the changes. However, with the balance of power again shifting toward learner centered education, schools have re-evaluated and

changed also. One change that has been seen in the United States is the ability to use best practices from other school districts as a means to instruct students.

Collaboration in project-based learning. DeCapite and Bush (2016) created and designed projects for the California International Studies Project (CISP) where there was a partnership with the National Framework of the Partnership for 21st Century Skills. The teachers created steps for others to follow to globalize the classroom with a PjBL and teaching method approach, where collaboration among stakeholders in the community was needed for success (DeCapite & Bush, 2016). The ideas included: creating an environment using computer graphics to catch and keep attention, grouping students according to interests and not abilities as they would learn from each other, continuously reviewing and revising lessons, and joining a collaborative teaching team, where lessons across disciplines would be used (DeCapite & Bush, 2016).

In a case study, Vickers and Fields (2015) analyzed a global community project, where media broadcasting and social media was utilized for communication purposes for collaboration in virtual learning (Vickers & Field, 2015). Five universities across Europe collaborated for a project called media culture 2020. The purpose of the project was to find out how media broadcasting and communications changed in the 21st century. The project used social media sites Facebook, Blogger, and Google Plus, as well as technology applications such as Google and Google Docs. There were joint courses that allowed for virtual seating in the classes.

Researchers agreed that sharing the learning process with an audience is the end-stage in PjBL (DeCapite & Bush, 2016; Hendry et al., 2017; Hopper, 2014; Vickers & Field, 2015). When students share their final projects with the community, they are able to master the goal of the PjBL assignment. The goal of the PjBL is for students to use real life experiences to make a

difference in society (DeCapite & Bush, 2016). A global collaborative experience allowed students to learn new technology and communication skills (Vickers & Field, 2015). Researchers, such as Hendry et al. (2017) and Hopper (2017) said that when students studied societal issues through technology, they became problem-solvers, which enabled the student participants to share their project outcomes to make a difference.

Technology applications in project-based learning. While computers are ideal for large scale projects and plug-in applications which take large-scale bytes to load, tablets and iPads are ideal for smaller scale projects and activities, as well as for timing issues if teachers need to schedule times for student usage of the desk/laptop (Conn, 2013). There are several applications that students and teachers are able to create and/or use in a PjBL environment (Conn, 2013; Hou, Wang, et al., 2015; Karchmer- Klein, Mouza, Shinas, & Park, 2017). One application is to utilize a web map during the student's planning phases of PjBL. During the planning phases, students would work collaboratively as they express their opinions and find meaning in new information, as material is scaffolded by the teacher (Hou, Yu, et al., 2016). Another application is to utilize social media to communicate the final stage of the PjBL to the public through video conferencing (Hopper, 2014).

Through collaboration and planning, students would satisfy the ISTE standards and Ohio Technology Standards. "The integration of core, technology, and discipline standards is an approach that aligns well with the implementation of the Common Core" (Conn, 2013, p. 37). Students are to understand that they will not only be sharing their projects with the teacher and classmates but will be sharing with the community. This causes an intrinsic motivational strategy for learning takes place (Bandura, 2009). Students take pride in their work with little motivational strategies needed by the teacher for continued involvement in the project. When

students produce and share with the public through social media, they are completing course level standards for the technology standards.

E-Learning and digital competencies. One specific characteristic of computer usage is how technology usage differs between generations. The Baby Boomer Generation, which refers to those born after World War II, are learning new technologies for job security and for communications with family members (Jackson, 2015). According to Jackson (2015), the Baby Boomer Generation has been slow to access new technologies; but, both Generation X (born between 1965-1979) and the millennial generation (born between the 1980-1994) are on a steady increase of using technology in the last several years (Fredricks, 2014; Jackson, 2015;).

According to Jackson (2015), the baby boomer generation has been slow to access modern technologies; but the younger generation is using it daily to communicate with others. Jackson defines the digital divide as the "gap between the people with effective access to digital and information technology and the people with very limited or no access at all. It includes the imbalance both in physical access to technology and the resources and skills needed to effective[ly] participate as a digital citizen" (Jackson, 2015, p. 28). The researcher further stated that the digital divide could be due to any social, gender, age, disability, or class. Educators must understand the subject matter taught, as well as how to use technology for the best way for learners' comprehension (Karchmer- Klein et al., 2017).

As a result of this digital divide, some teachers would fall into the category of the digital divide, as some are afraid of the technology in general, or afraid that they do not know enough about the technology to teach with it (Jackson, 2015). Teachers need to research these technologies and try them out for themselves and then allow students to experience those technologies and how to use them educationally in the classroom. Educators use several tools to

initiate and continuously motivate students in PjBL. When forming a lesson or unit, teachers would need to find right application or technology tool that provide higher level Bloom's taxonomy learning experiences (Conn, 2013).

Educator teaching methods and training. Teachers must also be trained in how to use technology. Professional development is needed to enhance teacher's ability to use technology (Condliffe, et al., 2017). One obstacle that might impede PjBL with technologies in the classroom is that some students may use technology on a daily basis, but do not use it to its potential in an educational format (Kale & Goh, 2014). Teachers may also lack professional development, as well as have no additional time nor resources to enact PjBL technologies correctly in the classroom (Veletsianos, et al., 2016). Teachers need to learn to utilize technology that is meaningful to their teaching discipline for future integration with the PjBL experience in the classroom (Veletsianos et al., 2016).

The main purpose of Gòmez-Pablos et al. (2017) qualitative study was to understand how teachers used digital technologies in PjBL. The research team used a correlational descriptive design, where a questionnaire validated through an expert panel was the main methodology utilized (Gòmez-Pablos et al., 2017). The results revealed a positive PjBL experience for students in terms of learning and collaboration. The researchers also found that students showed an intrinsic motivation, which allowed the students to educate themselves through their own stages of inquiry in order to master the material that was to be learned. However, the data revealed that teachers needed more professional development, more work with technologies, and a more collaborative work environment when PjBL was school-wide (Gòmez-Pablos et al., 2017). Teachers needed to know what new technology advancements are and how to utilize them for their students and the entire learning community (Gòmez-Pablos et al., 2017).

In Rees, Lewis, Easterday, Gerger, and Reisbeck's (2018) qualitative study, the researchers designed a method called "Stand-Up," where students had to utilize an outside advising source for their PjBL. In this study, the design called for students to use an online feed to interact with the mediator at weekly intervals, where students would discuss the progress of their projects through the templates they were working on to show daily goals met. The "stand-up" study also analyzed the collaboration amongst partners and educators.

The study showed that students and advisors continued to use the "Stand-Up" method, while educators did not use it. According to Rees et al. (2018), the process of reporting online to check-in with the educators was time consuming; however; it showed a collaborative approach to learning According to Rees et al., the study demonstrated how collaboration between students and teachers was needed for a blended-learning support system (Rees et al., 2018). When collaboration was combined with the technological tools chosen and used by teachers, it offered additional support. The findings of the study included that students found a supportive environment with the aid of the coach or teacher with synchronous or asynchronous communications (Rees et al., 2018).

Teacher and school implementation of project-based learning. There are many ways to implement PjBL into education. According to Condliffe, et al. (2017), teachers and schools could use an already developed curriculum, develop their own curriculum and projects, and implement the curriculum change in the entire school system. By completing any of the latter, teachers would need to consider how and what is to be taught, as well as use an evaluation that must analyze how both students learned the material and how the teachers implemented it into the classroom. Implementing a PjBL environment also considers professional development for the teachers to use it correctly in the classroom. The professional development would instruct

teachers how to be facilitators of the learning experiences of PjBL as well as how they should scaffold students' learning, through a rigorous learning experience (Condliffe, et al., 2017).

School change and implementation for project-based learning. According to Miller's (2016) mixed methods study, one college campus held the only flipped classroom campus in the United States. According to Miller, the school had a design which allowed professors to use class-time to differentiate coursework for students using PjBL methods. According to the researcher, the educators based the PjBL on projects for the common good of society, as well as solving local issues (Miller, 2016). Miller said that a school should align their mission and vision to a student-centered approach to leaning, such as what is found in project-based pedagogy.

In another qualitative study, Slavit, Holmlund and Lessig (2016) used the case study method to find how teachers planned, designed, and developed PjBL in a STEM school. Teachers were the primary participants in the STEM school, where the researchers studied the participants for collaboration, school vision, curriculum, and the PjBL method, as well as responses to students' needs. According to the researchers, the cross- curricular plans failed throughout year, where the teachers had little help from leadership. The researchers found that educators had different interpretations on their visions of PjBL and they may have succeeded if there were common rubrics utilized throughout the school, as well as the ability to collaborate with co-workers.

Review of Methodological Issues

Prior research has shown that PjBL is again being used in classrooms globally (Çakiroğlu & Erdemir, 2018; Chu et al, 2017). The research used in the literature review were a mixture of both qualitative and quantitative research to find how PjBL or social media technologies

benefited the learning environment. In this section, the different methodology approaches are placed into either qualitative or quantitative subheadings. These subheadings are then subdivided into the specific subject of the study. This ranges from social media to PjBL.

Qualitative studies. Students are already using technologies such as social networking sites such as Facebook and Twitter; but some individuals have no research skills to navigate the internet for educational knowledge (Hills, 2015). In the qualitative study by Karchmer- Klein et al. (2017), student participants said that they used the internet. In fact, 90 of the participants used the internet four hours a day. And 90% of students said they owned gaming systems. They also reported that using the iPad was easy and used it for reading for 57% of the time. Fifty percent of the students said they used their iPad 72% of the time for school homework (Karchmer- Klein et al., 2017).

Implementation of project-based learning. Slavit et al. (2016) used the case study method to find a common theme of creating and managing a STEM school in the PjBL environment. Teachers were the primary participants in the STEM school, where the researchers studied the participants for: collaboration, school vision, and curriculum, as well as responses to student's needs. The teachers partook in the development of school's vision plan, as well as had professional development for the teaching of technology; however, the teachers did not plan for the differences in student learning when it came to technology usage.

Gòmez-Pablos et al. (20017) created a questionaire which was validated by an expert panel in order to understand how teachers used digital technologies in the PjBL. There were two parts to the Gòmez- Pablos et al. (2017) questionnaire. The first portion was based on teacher characteristics, while the second section was a Likert scale related to teachers' tools used in the classroom, the teacher's role, and projects created by students (Gòmez-Pablos et al., 2017). The

findings revealed a positive PjBL experience for students in terms of learning, collaboration, and self-discipline of the students regarding their learning based on the educators' teaching styles.

In another qualitative study, Dole et al. (2016) focused their study on a teacher professional development course called "Creative Thinking and Problem Solving" based on Barrow's 1986 Hybrid Project-based-model. The teaching methods learned during the one-week field experience were then studied through an online structured interview. The researchers wanted to know how the immersion in a one-week long learning environment impacted the teachers' pedagogies in their classrooms, in addition to the obstacles they faced with implementing PjBL. They based the questionnaire on 36 participants. The researchers noted that there were a number of participants who dropped out of the study. The drop-out rate in this study was higher than normal; however, the researchers continued the study with structured interviews and course feedback to triangulate their data.

In another case study, Butler and Christofili (2014) used the qualitative case study method to understand how a school implements PjBL by analyzing four semesters of coursework. The authors analyzed how and why the first attempts to implement the PjBL curriculum failed at the school, as well as what was added for the curriculum to succeed.

In a qualitative case study, Hopper (2014), researched how Kindergarten through eighth grade Texas school students used various forms of social media and technology communications for projects that were based on a newly written curriculum and rubrics. The case study analyzed the rubrics based on grade level and showed how they changed based on teacher and student factors over a period time.

E-learning. In the qualitative study, Carter et al. (2014) found several characteristics with e-learning and computer applications. However, the questionnaire that was given to the

teacher participants should have been followed with either a second more in-depth questionnaire or through interviews or focus groups. Interview and focus group questions should have focused on students' usage of technology applications and the students' and teachers' abilities to complete learning expectations within the timeframe allowed. For Carter et al. (2014), the issue of not having a complete questionnaire may have been prevented if they used an expert panel to evaluate their questions beforehand.

In Rees et al. (2018) qualitative study, the researchers designed a method called "Stand-Up," where students had to utilize the outside advising source for their PjBL. In this study, the design called for students to use an online feed to interact with the mediator at weekly intervals, where they would discuss the progress of their projects through the templates that they were working on to show daily goals met. The "stand-up" study also analyzed the collaboration amongst partners and educators. According to Rees et al. (2018), the process of reporting online to check-in with the educators was time consuming; however, it showed a collaborative approach, student-centered approach to learning.

Chai, Koh, and Tsai (2013) reviewed 54 TPCK literatures and found that there were similarities that were included in the qualitative studies. These included how teachers were trained in the pedagogy. Due to current educational technologies, rubrics have changed to include "mobile technologies, collaborative software, and multi-users virtual environments" (Chai et al., 2013, p. 37). However, internet computer technology expansion has not yet showed a new viable TPCK rubric for integration into educational technology. TPCK was originally for the hard disciplines of science math and engineering, where TPCK, was used in STEM teaching. However, with new software developing, geography and social studies shows integration with

software and pedagogy, as with the fields of English and language (Chai et al., 2013; Mishra & Koehler, 2006).

Butler and Christofili (2014) used the qualitative case study method to understand how a school begins to implement PjBL by analyzing four semesters of coursework. The authors analyzed how and why the first attempts to implement the PjBL curriculum failed at the school, as well as what was added for the curriculum to succeed. During the first semester, timing was an issue as teachers did not have time to plan, collaborate with other educators, and implement PjBL. Instead of teachers working collaboratively, they worked separately with their own goals. The authors said that planning to implement this pedagogy takes time (Butler & Christofili, 2014). During the second time of PjBL, teachers collaborated with coaches to integrate lessons and plans so that students were able to choose a project based on a unified question which the teachers collaboratively designed. However, what was learned was that the question to be answered by students as a project was too narrow in focus to allow for the students to be motivated (Butler & Christofili, 2014).

As the PjBL plans were revised by teacher participants, the researchers gathered more prominent data based on inquiry-based learning. The educators added a service-learning aspect to the coursework. This allowed students to learn from community members as they researched the project. This allowed students' intrinsic motivation because they not only wanted to learn more about how the project and their grade, but how it would affect those of the greater community (Butler & Christofili, 2014).

Educational barriers. In another qualitative study of 35 male participants and 45 female participant students, there were different constraints on the educational barriers including technology and infrastructure, hardware, software learning spaces, digital textbooks, and content

and curriculum (Lucas, 2018). The Lucas 2018 study included: a seven-participant focus group, interviews with four student participants, interviews with four teacher participants, interviews with two parent participants, and three consecutive interviews with one CEO. In the study, the researcher found that teachers agreed that workspace was needed for innovative student projects. Lucas (2018) found that more professional development was needed for PjBL, as well as the utilization of innovative technologies. Timetabling, which the author said was time for curriculum development, was not considered part of the teacher's workday. One common theme that immerged from this study was that teachers needed time to collaborate with faculty to share best practices for technology (Lucas, 2018).

Reseacher Tondeur, van Braak, Ertmer, and Ottenbreit- Leftwich (2017) conducted a qualitative case study to discover proffesional development in 2.0 technology. The researchers state that the lack of teacher professional development causes web 2.0 technologies to not be used to the greatest potential in the student's learning environment (Tondeur et al., 2017). The authors stated that implanting Internet computer technologies in the school or classroom needs to be accomplished systematically. The authors used a case study method that analyzed four different school systems. One study analyzed Facebook for ICT communications. The teachers were in different regions in Australia and could not meet in person; yet, collaboration amongst the teachers became apparent as the school adopted an ICT approach to professional development, where inquiry was based on "collaborating, reflecting, and analyzing self-practices," as well as becoming familiar with ICT technologies which as a result the faculty began to use ICT' such as Facebook for communications and production, instead of consumption (Tondeur et al., 2017, p. 113). Consumption is based on obtaining technological knowledge without understanding what to do with the product (Tondeur et al., 2017).

According to Tondeur at al. (2017) teachers engaged in using technology in their classrooms where local resources played a role in students' learning. Teachers were spreading their knowledge of the ability to use ICTs for the communication of local school district by means of providing professional learning for teachers (Tondeur et al., 2017). The authors state that utilizing the teacher that use ICT's in the classroom are the ones who should train others in the usage of the technology in the classroom (Tondeur et al., 2017). According to the researcher, teachers must be trained in Mishra and Kocher's (2006) framework design of TPCK. The leaders and faculty of the school must use resources for students' diverse learning abilities. Tondeur et al. (2017), stated that teachers need to use internet computer technology and web-based technologies for the students to gain knowledge. Teachers may not know what or how to implement the technology in the classroom; however, if the ICTs are incorporated into the learning environment for teachers during meetings or professional development time, the faculty would have the knowledge of how to use the technology to their specific teaching discipline in the classroom (Tondeur et al., 2017).

Social media. In a qualititaive study, Pektas and Gurel (2014) used the learning management system platform of Moodle to study the outcome of video conferencing and Facebook versus face-to-face learning. The study showed that 85% of student participants said LMS was useful to show on demand class information, but also reported that face-to-face learning was still needed for learning support (Pektas & Gurel, 2014). Participants in the study also said that they disliked synchronous communications because they had to write everything; yet video conferencing centers were more efficient for group conversations than that of the discussion forums, such as Facebook.

Another qualitative study analyzed how a PjBL approach could be used with online learning and discussions. Wu and Hou (2014) coded different topics about how students reacted to posts on social media technologies. The first phase of the study showed a significant amount of off topic discussions. Therefore, applying the learning management platform would likely keep topics on the learning goal (Wu & Hou, 2014). The results showed this type of PjBL would help teachers overcome problems related non-focused students (Wu & Hou, 2014). The results also showed that online discussions between the teacher and student were more interactive and increased students' understanding of the topic (Wu & Hou, 2014).

Teachers must choose applications to create an enriched, hands-on learning environment. In the teaching and learning process, educators must choose applications that have three themes, which engage students in the PjBL process: "multimodality," "collaboration," and "interactivity" (Karchmer- Klein et al., 2017, pp. 92-93). In the qualitative study, researchers used observations and interviews, located at an all-boys school. The student participants said that they used the internet. In fact, 90% of the participants used the internet four hours a day. And 90% said they owned gaming systems. They also reported that using the iPad was easy at 6 % and using it for reading at 57%. Fifty percent of the student participants said they used their iPad 72% of the time for school homework (Karchmer- Klein et al., 2017, p. 94).

The results revealed that a teacher needs to become aware when students are acting only as consumers of knowledge and not producers of knowledge (Karchmer- Klein et al., 2017). The results also showed how computer application could be integrated into instruction (Karchmer-Klein et al., 2017). Since the assumption of this study was based on a consumer driven society to make this research more credible, a quantitative analysis between educational and non-educational usage of computer applications should be commenced.

Quantitative studies. Mosier et al. (2016) surveyed students at New Tech High Schools who utilized PjBL. New Tech High Schools are one several charter school systems in the United States that utilize all online differentiated PjBL for student populations. The quantitative study consisted of using a scale for a student survey, which the New Tech HS district utilized to measure the success rating for the implementation of PjBL. There was a total of five scales or rubrics utilized to measure students' perceptions. The findings included a strong linear relationship with school cultures and community partnerships for skills of speech and higher order thinking skills (Mosier et al., 2016). Another positive linear relationship was found between PjBL and the students' engagement in the classroom. Implications for the study centered around the view that PjBL was utilized by the teachers in the classroom (Mosier et al., 2016). For the dissertation researcher, a question was posed by why Mosier et al. (2016) would use the school's rubrics instead of using a different type of survey to study the outcomes of both students and teachers at this particular school system.

Implementation of PjBL. Researchers Holmes and Hwang (2016) researched what was needed for a whole-school set up for implementation of whole school PjBL. The researchers used eighth and ninth grade student participants in a school district where there was a PjBL school and a regular school. With 532 student participants, there were 88 PjBL in the PjBL school and 444 in the regular school (control group). In the second year of the study, the total number of students in the study was 459 (78 PjBL and 381 control). Independent t-tests found significant differences between the groups. The differences were found in socio-economic status still yielded differences in learning. The digital divide between socio-economic status where statistically significant; yet there was no statistical difference in race. The authors stated that the

collaboration that happened in a PjBL environment allowed students to progress together as a group; thereby minimizing racial barriers in the digital divide (Holmes & Hwang, 2016).

Educational barriers. In Kale and Goh's (2014) study, which took place in two counties of West Virginia, the researchers surveyed teacher participants' who taught either middle school or high school. There were 161 participants, who taught at one of 13 schools. The researchers used an SPSS program for data. In the study, there were four schools that were urban and four that were rural. This includes three schools that were not found in these areas. Of these schools, 55% were teacher participants of urban schools, while 45% were made up of teacher participants in rural schools. The data collected showed that more than half the teachers were in urban schools while less than half were in rural schools, but what about the teachers that were residing in the other three schools. The results did not show an adjustment factor for the differences in the population of teachers.

In Kale and Goh's (2014), survey study, the authors surveyed educators' use of the internet in their teaching. In the overall findings, the teacher participants said that technology access was the number one important factor for students. Other findings for the educators included: the need for creativity at work, the need for educational innovation, the ability to make work easier, the personal interest in technology or computers, further collaborations with co-workers, and expectations of administration for support (Kale & Goh, 2014).

The findings of the latter study found factors that showed how the digital divide through the population age difference affected technology usage. According to the study, Baby boomer and early Generation X teachers with less computer usage showed less confidence with computers than those of the later Generation X and Millennial Generation educators. The study also found that those teachers lacking in technology training did not use current technology in

the classroom (Kale & Goh, 2014). The authors stated that whole school professional development would not help these teachers learn these modern technologies. It would also not helper younger ones who might feel bored over the time spent wasted on something they already knew. The researchers recommended placing teachers in collaborative groups for learning cooperatively as it would be beneficial in developing skills or increasing skill usage.

E-learning. In another quantitiative research study, a regular classroom environment was compared with an online classroom environment during a three-phase research design. Songkram, Khlaisang, Punthaserance, and Likhitdamrongkiat (2015) incorporated 120 student participants. Half of the participants were placed in the test group where all learning was online, while the control group participated in a blended learning section. To account for the 5% statistical difference found in the pre/posttests of the control group, changes were made for the test participants e-learning experience. To make e-learning accessible to learners, higher-level thinking and evaluations of the course material needed to be a part of the learning experience. Teacher feedback and collaboration was also found to have effects on the learning environment.

Quantitative research by Vega, Jimènez, and Villalohos (2013) showed that students were treated successfully when PjBL was incremental via mini-projects, as their study included analyzing data from a pre/post test design. The authors claimed that incremental PjBL is needed because of the need of diverse learners (Vega, et al., 2013). In the study, the reserchers found that online courseware allowed teachers to find ideas in an online community. They also found that teacher participants could also collaborate with others as they contributed their own lesson plans on the courseware (Vega et al., 2013).

In Mohamadi's (2018) study, the researcher studied the end product of student learning. They found that student participants need to understand the concept of learning in lieu of the

project created. These included three elements of PjBL, where students, teachers, and the project itself is needed. There needs to be a learning-by-doing method, where students are engaged in real world activities with autonomy when this learning involves scaffolding. The quantitative study was based on a pre-posttest analysis, where the control group of students did not use PjBL. This yielded the same results of the Ravitz and Blazevski (2014) study.

Social media. Ravitz and Blazevski (2014) conducted a survey where they studied the differences between reformed project-based schools and non-networked schools. In the study, there were several correlations between the groupings; yet differences were found within the grouping themselves. Ravitz and Blazevski state that in the grouping of the reform school there was a difference in teacher participants. The researchers found differences among both groupings in relation to two topics. In the reform group, time and preparation was spent on PjBL, but not on technology, where as in nonreform schools, emphasis was placed on general student-centered on-line technologies, but not the standardized version defined as PjBL.

Ravitz and Blazevski (2014) study found differences between reformed project-based schools and non-networked schools. In the study, there were several correlations between the groupings and differences found within the grouping themselves. Ravitz and Blazevski state that in the grouping of the reform school there was a difference in teacher participants. 81% of the group felt prepared in the PjBL teaching strategy when they used online technology tools, whereas 58% of those who did not use technology felt not as prepared. In the non-reform group, there was a strong correlation in preparation to online tools to help design and manage projects The researchers said there was a significant relationship for correlation between the reform network group at 33% than that of the non-reform group at 20% regarding the usage of online technologies. The results found that there was more preparation and more time needed to create

project-based lessons (Ravitz & Blazevski, 2014). The researchers also state that the correlations found in non-network schools needed a "substantial amount of work [to] establish viable paths to PjBL that include the role of technology" (Ravitz & Blazevski, 2014, p. 72).

In a quantitative study, Hou, Wang, Lin, & Chang (2015), chose 50 Taiwanese college students, and divided the participants randomly into seven groups to study how online communications among group members worked. In these groups, student participants utilized both the online discussion posts, as well as Facebook to communicate with the other participants in their specific group. The participants were given three weeks to discuss and produce a project. The authors combined coding to categorize findings into a matrix, then used a paired t-test to find the statistical difference between the results of Facebook posts to other online discussion platforms.

Synthesis of Research Findings

Some researchers have also discussed how PjBL is used by educators, including Condliffe, et al. (2017), Hou, Wang, et al. (2015), Kale and Goh (2014), and Veletsianos et al. (2016). The latter researchers analyzed the classroom itself in the PjBL environment and the technologies used to help students learn; however, what was missing from these studies was the research of the educators themselves. A qualitative study using focus groups would be beneficial to those wishing to implore a PjBL curriculum in the classroom or school, based on researching how teachers learned how to utilize the technology for their classroom and the teacher's ability to use the technology as well as instruct students how to use it.

Technology tools are important in PjBL for education. In fact, there are several researchers who have studied various aspects of the learning environment with the use of technology tools (Chu et al., 2017; Vega et al., 2013; Vickers & Field, 2015). "Technology can

facilitate educational environments that embody evidence-based approaches to learning" (Hills, 2015, p. 48).

PjBL takes time to implement in the classroom correctly. First, teachers need to be trained in this teaching PjBL. Secondly, technology must be taught to educators through professional development. Thirdly, teachers need to learn about innovative uses in technology for their specific courses taught.

Ravitz and Blazevski (2014) state that PjBL takes much time to prepare for in the classroom. The researchers concluded this as both groups of participants chose to focus their time creating a new classroom atmosphere. One group of participants used their time to create a classroom for PjBL, while the other group centered their time on student-centered computer technologies.

Butler and Christofili (2014) and Slavit et al. (2016) researched how schools implement PjBL. Both studies concluded that incremental changes are better than large scale changes. Hopper (2014) indicated that new curriculums, rubrics, and standards must be adjusted through the change of a traditional classroom when PjBL is implemented.

Gòmez-Pablos et al. (2017) showed possitve results for PjBL. The results revealed a positive PjBL built on cooperation and collaboration. Another study by Dole et al. (2016) confirmed that having teachers partake in a week-long setting to learn how to use PjBL in the classroom allowed for a new skill set before implementing the pedegogy into the classrrooms.

In a qualititaive study, Pektas and Gurel (2014), used the learning management system platform of Moodle to study the outcome of video conferencing and Facebook versus face-to-face learning. Participants in the study said that they disliked synchronous communications

because they had to write everything on paper, but video conferencing centers were more efficient for group conversations than that of the discussion forums, such as Facebook.

One common theme that emerged from several studies was that teachers needed time to collaborate with faculty to share best practices for technology (Kale & Goh, 2014; Lucas, 2018; Rees et al., 2018). While Lucas concentrated on the implementation of PjBL, the studies by Kale and Goh, and Rees et al. replicated some of the results of a 2011 study by Hew. Pektas and Gurel (2014) said that Hew's study showed that Facebook was utilized to study academic measures in schools (Pektas & Gurel, 2014), while Erol, Sevlì, Ulutaş, Sevlì, & Gül (2017) said that Hew's study revealed that people communicate with those that they already know on Facebook (Erol et al., 2017, p. 579). The findings in Erol et al. reveal that participants who were experienced in SMS used social media technologies as a form of research for school, as well as for communication and entertainment (Erol et al., 2017). In Pektas and Gruel's study, findings showed conflicting views on social media usage in the classroom. Some participants said that SMS should be used for information communications, while other participants liked to use it as a potential for group dynamics of teaching and learning (Pektas & Gurel, 2014).

Critique of Research Findings

The research literature produced various answers to both PjBL and social media technologies in the classroom to find how stakeholders use social media technologies in the PjBL environment. Most of the studies analyzed in the literature review answered how teachers used project-based media in a quantitative format. While this was a good indicator as to generalities of PjBL, it did not allow for the perceptions of teachers or leaders. Some of the studies asked for students' opinions in PjBL in qualitative studies; yet did not find commonalities as to educational stakeholders' opinions on the process of a change in the teaching environment. The literature

review also analyzed best practices in learning when technology was used in the classroom; yet it did not allow the perceptions of teachers based on how they use social media technologies in a PjBL environment. The qualitative case studies that were analyzed throughout the literature review would need to be studied more carefully through stakeholders' perceptions, as all case studies are bound by time and location.

Previous researchers such as Ravitz and Blazevski (2014) recommended further qualitative studies to explore why certain technologies are used within the PjBL and the effectiveness of that technology. Kale and Goh (2014) found gaps in teacher attitudes towards teaching with technologies. Professional development is needed to enhance teacher's ability to use technology (Condliffe, et al., 2017). One obstacle that might impede PjBL with technologies in the classroom is that some students and teachers do not know how to use technology. Another obstacle is that some educational stakeholders might not use technology to its full capabilities (Kale & Goh, 2014). Research also indicated that learner behavior patterns have not been fully studied in a social networking community for school stakeholders (Hou, Wang, et al., 2015).

Ravitz and Blazevski (2014) survey study showed differences between schools in relation to how PjBL and social media technologies were used in the classroom. The researchers found out that the PjBL schoolteacher group spent more time in creating lessons in the teaching methodology, while the second school group of teachers concentrated on online technologies. Since there was a discrepancy among the two groups, Ravitz and Blazevski should have continued their study with a qualitative component. One suggestion would be to conduct an interview or focus group to gather additional data to find out why differences occurred within the two groups.

In Kale and Goh's (2014), survey, the results were based on school districts in Virginia. The results of the study were generalized, but it could not account for the entire United States population. The conclusion of the study was that professional development does not help the teachers. The researchers found that teachers needed to be placed in cooperative groups to learn how to use computer applications. This study would be beneficial with a case study approach, where the teachers could be observed and interviewed.

One study lacked the prescribed steps to qualify a questionnaire instrument. Carter et al. (2014), used a questionnaire to find out how e-learning and IT technologies were used in the classroom. They found that cooperation was needed in online environments. The researchers stated that educators who want to implement PjBL need information such as the time and cost of projects, the type of projects that could be created in the PjBL environment, and the collaboration needed for this learning environment.

Another problem with previous research studies was based on research participants. One qualitative study by Dole et al. (2016) focused their study on professioanl development in PjBL. In this study, there was an issue with teacher participants and the follow-up online structured interviews, as there was a high drop-out rate for particpants. To overcome the lack of responses of the online strucutured interviews, the researchers revised their plans to include strucutured in-person interviews and artifact collection to traingulate data.

Chapter II: Summary

The purpose of this literature review was to find ways in which previous researchers sought to explain how technology is intertwined with PjBL. Some researchers state that PjBL is a teaching pedagogy that is used by educators to instruct students. However, some researchers failed to show how PjBL is intertwined through technology in the classroom. Researchers tried

to prove that PjBL could be applied to global issues for students' critical thinking skills, as well as student knowledge of content.

To find how teachers and students are both engaged in the process of PjBL, a research question was finalized for review. The purpose of the study is to explore how educators use social networking technologies in a PjBL environment in a suburban high school in Ohio. The study would allow for a school district and/or teacher to utilize the research to create a PjBL environment with social media technologies to expand the classroom into a community or global project. The research found throughout the literature review failed to show how teachers learned new technology, applied it to their classrooms, and taught with the technology correctly for students to learn both the knowledge content of the course and the technology used as the instructional aid.

The research in the literature review revealed that either Bandura or other behavior psychologists were the basis of researcher's reasoning (Çakiroğlu & Erdemir, 2018; Huang et al., 2017; Lee, Huh, & Reigeluth, 2015; Shepherd & Lynn, 2015). The theoretical concept of Bandura's Social Learning Theory is that people can learn by observing others (Huang et al., 2017; Shepherd & Lynn, 2015). People can also learn self-regulated behaviors in the same manner (Huang et al., 2017). Although Huang et al. (2017) showed that students had a positive outcome for PjBL via social media, they did not disclose how teachers taught the materials to students nor how the teachers performed in their teaching tasks. It was also based on a one-time internet event and not a longitudinal study that analyzed all parts of the classroom environment.

In Lee, Huh, and Reigeluth's (2015) study, research was based on the Bandura's concept of modeling behaviors. The researchers wanted to learn how members of groups worked collaborativly as they created projects. The reseachers found 25 unqiue coding categories and

followed those with follow-up interviews. However, what was not discussed in this research was how teachers advised students in the learning phases of PjBL.

Çakiroğlu and Erdemir (2018) discovered that the online behaviors are transferred from off-line or face-to-face communications. For students this would be how they would learn through the social learning theory through observing others. For teachers, this would be modeling the behavior needed for success (Çakiroğlu & Erdemir, 2018). The study found that teachers did not help with motivational strategies throughout the learning process of PjBL (Çakiroğlu & Erdemir, 2018).

The non-modeling effort for teaching PjBL was also discussed in PjBL, as well as the need for teachers to implement self-regulated learning in phases through modeling, scaffolding, and positive feedback. Without these latter teaching techniques, an important concept of Bandura's Observational Learning found in the Social Learning Theory would not exist. This is the idea that one needs to have self-efficacy, where the individual has the belief to accomplish the specific task regardless of how many times it took for a successful outcome (Shepherd & Lynn, 2015). Bandura cautions if teacher's do not show students how to use technology, such as social media, for an educational benefit, negative effects could occur. "False beliefs could happen, and people could follow suit if deductive reasoning is misaligned or if biases are bad. [biases could include] media influences and side groups" (Bandura, 2009, p. 97).

The use of technology to support PjBL has many benefits as it allows students to collaborate with others and gives students more resources for learning by inquiry than just the textbook. Teachers are able to use multiple sources to scaffold students higher order thinking skills during PjBL through online resources, including social networking sites, according to researchers Ravitz and Blazevski (2014). But, teachers' training in both social media

technologies and PjBL itself is crucial to student development. Currently, there are no found recent research studies found based with the TPACK framework of Mishra and Koehler (2006) and social media technologies via PjBL.

There are several questions that have been answered through the literature study, such as how to instruct educators in the correct manner to use PjBL in the classroom, as well as the pros and cons to student learning using this pedagogy. The literature review has also found that social media technologies are able to be employed for student learning in the classroom. However, the literature argument that still needs to be researched is combining research from across both spectrums of qualitative and quantitative research to discover how social media technologies are taught and used by teachers in the classroom for student learning.

Chapter III: Methodology

Introduction

The focus of this qualitative case study was to explore how educational stakeholders use social media technology in a project-based learning (PjBL) environment. By eliciting responses from teachers and school leaders, as well as employing data from the questionnaires, interviews, and focus groups, the researcher was able to find how technologies are used in the classroom.

Chapter 3 outlines the explanatory case study as a qualitative, methodological approach while discussing procedures, including site and participant choice for the research. The chapter explains the reason for a qualitative case study through the use of questionnaires, interviews, and focus groups. This chapter also includes how the researcher collected and analyzed data. The chapter concludes with discussions and limitations of the data collection.

Research Question

The following question guided this study:

RQ. How do educational stakeholders use social media technology in a project-based learning environment in a school district in northeast Ohio?

Purpose and Design

The purpose of this case study was to explore how educational stakeholders use social media technology in a project-based learning environment. This study was significant because it provides insight into how educators use social media technologies in PjBL. The research will help teachers and school districts understand the pros and cons of social media technology in the school environment. The study will also aid in developing plans for the usage of this type of technology in PjBL environments.

The methodological approach for this study was a qualitative case study research design. The case study design allowed the researcher to investigate the topic to gain insight into a specific experience and phenomenon (Yin, 2018). The qualitative case study design allowed the researcher to choose data and analysis approaches from both qualitative and quantitative studies.

Case study research is the in-depth investigation of a bounded system, such as a teacher, a classroom, a unit of study, or a school (Merriam, 1998; Yin, 2018). The case study method enabled the researcher to involve the participants to become co-creators of the research. Participants, who were part of the interview and focus group have answered questions in their own point of view (Yin, 2018). After the researcher transcribed the data, the participants used member checking to verify the information was recorded and interpreted by the researcher correctly. Participants' answers were then analyzed to discover how and why educators chose certain technology in the PjBL environment.

The research design allowed the researcher to discover how and why certain types of technologies were used in PjBL through data collection and data analysis of a group of individuals bound by a specific place and time. The case study method also allowed an in-depth study of how school stakeholders implemented PjBL environment as a school-wide initiative.

Researchers have stated that curriculum is always changing, and it depends upon theory and politics, as well as how teaching and learning fits into technology (Wilper et al., 2013). In Ohio, when the Board of Education updates core course standards, they also update technology indicators for student proficiency in those courses (Ohio's Learning Standards for Technology, 2017). These state mandated updates must also be revised in the school district, whereby school district administrators must create technology plans for their schools, which would include professional development for teachers, as teachers would need to implement this in the classroom for student learning.

Research Population and Sampling Method

The purpose of this study was to explore how do educational stakeholders describe social media technology used to create PjBL environments in classrooms. The researcher used purposeful sampling. Purposeful sampling, which is a non-probability sample was selected based on both the objective of the study as well as the characteristics of the population.

The researcher used purposeful sampling to "discover, understand, and gain insight" from a sample of the population, where "the most could be learned" (Merriam, 1998, p. 61). Furthermore, Yin (2018) recommended having enough participants that provide rich information of the phenomenon related to the study. To do this type of sampling, the researcher chose 17 participants based on certain criterion.

To be chosen for the study, participants had to meet the criterion of being employed by the school district since the 2015 implementation of whole school PjBL. Participants must have used PjBL in their leadership or teaching. The school district was chosen based on the school-wide implementation of a PjBL environment. In the location where the case study was conducted, there were 102 fulltime teachers. Of these teachers, 99 of them met the criterion to

become participants of the study. There were also several leadership positions, including board members, superintendent, curriculum director, and principals. The leaders of the school all met the criterion to become participants of the study.

The researcher included two groups of participants. Six leaders and five teachers were interviewed by the researcher. These two groups of participants partook in semi-structured questions regarding PjBL. (See Appendix A for the data set of questions). The teacher interviews focused on questions related to PjBL and technology uses in the classroom. The leadership interviews focused on the perspectives of whole school PjBL environment. The leadership interviews also focused on the leaders' technology use, as well as their perceptions of the technology used by the employees they led. (See Appendix A for questions). A focus group of five teachers was also used in the study, where they answered semi-structured questions (See Appendix A for questions). The researcher over-recruited members for the focus group as participants, were predicted to drop out of the study. In fact, two focus group participants dropped out of the study before the interview session began.

Recruitment protocol. The researcher sent out a recruitment letter to teachers at the high school, as well as to leaders of the school district (see Appendix B). In the letter the researcher discussed the purpose of the study, as well as asked this population to become participants in the study. As all teachers in the district were to use PjBL in the teaching environment, all high school teachers, who had been employed by the school district since the 2015 school year, met this purposeful sampling. In addition to the recruitment letter, the superintendent of the school district sent an email to all middle and high school core classroom teachers and leaders to explain that the research was approved. (See Appendix C for the letter that stated the research was approved).

Questionnaire. All teachers in the school were purposefully selected to be participants in the project-based teaching questionnaire. The purpose of the questionnaire was used to find possible participants for the interview and focus groups. The questionnaire focused on the criterion for study participants. The criterion for study participants was that school stakeholders were to have worked in the school district since its implementation of PjBL and who used the project-based pedagogy in their current educational careers. The questionnaire was given to all teachers and leaders. Before the questionnaire began, the researcher used a click-consent form for participation in the study. (See Appendix D for the letter and consent form of the questionnaire). If the click-consent form answer was no, the questionnaire ended immediately. The questionnaire was used for recruitment of the focus group or interview group. (Questions located in the Qualtrics computer application are found in Appendix A).

Interviews. Individual interviews consisted of two groups of the school district's population. One group was the leaders of the school district, including principals and vice-principals, as well as technology and educational program coordinators. The other group of participants consisted of high school teachers who had used PjBL in their classrooms. The purpose of the interviews was to explore the perceptions of social media technologies and PjBL environments of the teaching staff and leadership team. Both groups of participants were asked questions in relation to their job duties to discover how PjBL was implemented in the school district. (For questions and procedures of the interview sessions, see Appendix A).

*Focus group***.** The focus group of five teacher participants was conducted to explore their perceptions of using social media technologies in a PjBL environment. The participants needed to be over-recruited to be focus group participants, as time restraints yielded non-

participatory results (Merriam, 1998; Stake, 2010). (For questions and procedures of the focus group session, see Appendix A).

Sources of Data

The sources of data for this study were the questionnaire, individual interviews, and a focus group. The questionnaire was given to all high school teachers who wished to participate in the study and had signed the informed consent form. Individual interviews were conducted with two groups of participants—the leadership group and the educator group. The leader group consisted of six participants, while the teacher group consisted of five participants. The focus group, consisting of five participants, was used to find in-depth perceptions of how teachers used social media technologies in the classroom. Both the teacher and leader interview groups and the teacher focus group have created the data needed to converge in a triangulating fashion, where all three participant groups had differentiating sources of data (Yin, 2018).

Questionnaire. The questionnaire was used for the purpose of recruitment of participants in either the interview groups or the focus group. The questionnaire was found on the Qualtrics online application. The questionnaire was to discover the length that the participant has taught in the district and the years they have taught with the pedagogy or PjBL, as well as the grade level and courses they currently teach.

Interviews. During the interview process, the researcher followed the questioning technique of the semi-structured interview Yin (2018) said that semi-structured interview questions allowed for flexibility in questioning. The researcher asked each participant of the teacher interview group the same questions, which then equated to the semi-structured questioning technique. The teacher leadership group was asked a separate set of semi-structured

questions. The purpose of semi-structured interview was to allow for discussion (Merriam, 1998). The semi-structured format allowed the researcher the ability to ask questions in any order, depending on the dialogue of the participants.

The semi-structured, face-to-face interviews were used to collect data for this study through in-depth interviews of the leadership group of participants and the teacher group of participants. The researcher developed an interview protocol. The interview sessions were scheduled for one-hour and took place at a private location within the school district. Member checking was used after the transcription process to verify the content of the material received by the researcher. Thematic coding took place throughout the data collection and data analysis stage by using the constant comparison method. (See Appendix A for interview questions).

Focus group. All participants of the group were high school teachers that were recruited from the school district where the research is going to take place. The focus group met one time during the data collection process during a 90-minute session in a private location within the school. The focus group was utilized to explore deeper perceptions of participants than that of the interview questions. Member checking was used after the transcription process to verify that the content received by the participants was correct. A thematic coding process of constant comparison took place during the data collection.

Follow-up questions for interview and focus group participants. Follow-up questions were asked to participants that related to PjBL in conjunction with social media and digital technologies when schools closed abruptly due to Covid-19. These questions were the same for both leader and teacher groups. (For follow-up questions, see Appendix A). Due to the stay-at-home orders in early March 2020, the follow-up questions were performed via email. The email was sent to each participant individually to ensure participant confidentiality.

Data Collection

The methods the researcher used in data collection were the questionnaire, interviews, and focus group. The purpose of using three different sources was to triangulate data for credibility (Yin, 2018). Qualitative researchers frequently collect and use extensive interviews with taped sessions during the data collection process (Stake, 2010).

The researcher set-aside six weeks for data collection. Prior to and during the study, several steps were taken to ensure safety and security of participants in this case study. In months prior to the commencement of the study, the Concordia University- Portland Institutional Review Board (IRB) received an application for the study to take place. The IRB then reviewed the study plans and approved the proposal. (See Appendix E for the IRB approval form).

A consent form explaining the purpose of the case study, as well as consent to use the school district and its employees for the case study, was sent and signed by the school superintendent prior to the start of the research study. (See Appendix F for superintendent consent form). Approval from Concordia University—Portland IRB was forwarded to the school's superintendent with the consent letter for the research study to take place at the school district.

A recruitment letter was then sent to teachers and leaders to ask for study participants, where these participants agreed to the questionnaire portion of the study with a click consent form embedded within the Qualtrics computer application. For the questionnaire to continue, the participant needed to click to confirm consent. For those willing to be part of the interview or focus group portion of the study, a consent form was given to the researcher at the beginning of the interview or focus group session. The consent form was signed, dated, and collected by the

researcher prior to the start of the study. (See Appendix B for the letter and consent of participation).

The teachers and leaders kept their own copy of the consent form explaining the protections and ethical considerations that the researcher took to ensure confidentiality. The participants were protected with the use of an alias through coding practices, as well as the deletion of personal characteristics that could have identified that participant or school district. (See Appendix B for the protection of confidentiality of participants).

All paper data and tape/video recordings were stored in a locked file cabinet for three years. All computer applications with information related to participants were kept on a password protected computer/ computer application. All data related to the research was destroyed within three years of the completion of the study, per Concordia University—Portland and Concordia University--Wisconsin guidelines.

Staff questionnaire protocol. Both a recruitment letter and an informed consent letter were sent to participants with access to a link for an online questionnaire via the Qualtrics online computer survey. After letters of informed consent were signed by participants via a click-consent method, the survey commenced. The participant answered questions about school demographic (See Appendix A for the questionnaire questions). The questionnaire asked basic demographic questions for the school district, where interview and focus groups will be chosen.

Structure of interview and focus groups. During the weeks prior to the interview and focus group, a time and location was agreed upon through email communications and confirmed by the researcher through a reminder email 48- hours prior to the interview. During the day of the interview or focus group, the researcher arrived 30-minutes prior to the scheduled interview, where the video recorder and digital tape recorder was set-up to record the interview session. At

the beginning of the interview or focus group, the participant was given a consent form that discussed the purpose of the study, as well as the rights of being in the study including the right to withdraw from the study for any reason. An introduction occurred between all parties, where record-keeping data was recorded by the researcher. The interview or focus group promptly started and lasted for one-hour. During the interview, informational keywords and times of these keywords were noted on paper for future data transcription (See Appendix A for the interview questions).

Individual interview protocol. One of the most prevalent sources of data in case study research is the interview. The interview allowed the researcher to know participants' perceptions of critical issues (Yin, 2018). Semi-structured, face-to-face interviews were used to collect data for this study. These semi-structured interviews used a different list of questions for the leader and teacher groups. The individual interviews were scheduled for a one- hour session during a time and a place convenient for the participant, within the six-week data collection time period.

These one-on-one interviews were digitally recorded, and notes were taken by the researcher. (See Appendix A for interview questions). These interviews occurred anytime during the six-week collection plan. After the interview was transcribed using a speech-to-text computer application program, the data was reverified by the researcher. Afterwards, to ensure credibility of the data, member checking was utilized, where participants verified their answers to the interview questions. Throughout the interview process, data was recorded and organized to begin a comparative analysis using thematic coding.

Focus group protocol. During the six-week data collection plan, another set of teachers were chosen to be participants in the focus group session. The focus group was a more in-depth study of how social media technologies are used within the PjBL environment with social media

technologies in the classroom. The focus group had two main goals: one was to further understand the teaching and learning environment with the pedagogy of PjBL via social media technology. The second was to discover the teachers' perceptions about PjBL environments and their usage of technology by examining how they performed these learning strategies in their classrooms.

An email was sent to the focus group that included a specific time and place for the focus group to meet. An email was sent to particpants of the focus groups to help teachers prepare for the one-hour scheduled session by giving them a set of definitions. The email included the definitions of PjBL and social media technologies, as well as the explanation of the technological pedagogical content knowledge (TPCK) framework, created by Mishra and Koehler (2006). They were told to examine the definitions and be able to give examples of how they were able to explain these definitions in their own words or through their experiences in the classroom.

For both the interviews and focus group sessions, the researcher used a speech-to-text computer program for transcription. After transcription was completed, the researcher viewed the answers of the questions with each participant. This member checking step ensured credibility in the data collection of the study.

Identification of Attributes

There were several attributes which defined this exploratory case study. The researcher used a sample population of teachers and leaders who worked in PjBL environment. The study involved the usage of social media technology in the PjBL environment. Through the data collection of a questionnaire, extensive interviews, and a focus group, the researcher was to have found the perceptions and first-hand experiences of teachers and leaders in a PjBL environment.

The study also was to discover how teachers and leaders used social media technology in the PjBL environment.

One attribute of the study looked at ways different age groups of teachers and leaders used of social media technologies. According to Lucas (2018), educators have barriers due to the lack of understanding of how to use social media technologies to benefit learning. There are generational gaps in using technology (Jackson, 2015). Another attribute of the study examined how collaboration was used in a PjBL environment. As social media technology offers the ability for communication, this in turn yields the effects of collaborative learning (Mosier et al., 2016; Ravitz & Blazevski, 2014).

To understand technology usage as a method to deliver instruction in a PjBL environment, in-depth perception of technology and the pedagogy itself was analyzed through the premise of the TPCK and Bandura's learning theory. The attributes to understand the use of social media in the PjBL environment also were indicative to include educator in classroom setting; use of PjBL in the classroom; and use of social media technologies in the classroom were all used to find emerging themes. The use of social media technologies in personal life and the teaching or leading experience in the school district was used to find those qualified to become part of the interview and focus groups. These attributes of the participants were analyzed via an online questionnaire, interviews, and focus group using the constant comparative data analysis method. Thus, this study was designed to understand how a PjBL environment would benefit from the educational uses of social media technology.

Data Analysis Procedure

The qualitative data analysis method employed in this exploratory case study was the constant comparative method. After the interviews and focus group discussion were completed,

a transcription process occurred, followed by member checking for accuracy. The constant comparative method allowed the researcher to go forward and backward in the data analysis stages until themes emerged. Once preliminary themes emerged, the researcher re-examined the data collected until no more themes were found. The data analysis procedures allowed the researcher to analyze emerging themes first; then once themes were identified; they were applied to answer the research question that drove this study.

The answers to the questions of leadership and teacher groups for the interviews and the group of teachers for the focus group were the data collected for analysis of this study. During the interview and focus group process, the researcher recorded the sessions using a digital voice recorder. The researcher also had a back-up recording using her camera. After the transcription, both memory cards were placed into a locked cabinet. After each individual interview and focus group session, the researcher transcribed the data collected through a speech-to-text computer application.

After the speech-to-text computer application transcribed the data, revisions occurred as the researcher double checked that the information was transcribed successfully. The researcher then printed these transcriptions on a hard copy and had each participant verify that the transcriptions were accurate which was member checking process to ensure data credibility. The researcher then printed these transcriptions on a hard copy and began reviewing the transcribed data for analysis.

The revised and proofread transcriptions were then printed on a hard copy and the reviewing of the transcribed data commenced. By doing this step, the researcher became more familiar with the data for analysis. The researcher continuously reviewed the data to find key

ideas from participants. These key ideas were first noted during the interview and focus group sessions.

Notes and summaries of key events were then recorded on paper for possible connections that were comparative in nature during and right after the interview and focus group sessions. These notes were analyzed during the six-week data collection session, using the constant comparative method. The data analysis method continued until all data was coded and no more themes emerged.

After, interviews and focus group sessions, analysis via a qualitative data coding (QDAS) computer program began, after data was reviewed in the transcription phase. The transcriptions were transferred to the NVivo Plus 12 QDAS program, where the researcher used descriptive tags, which were continuously transformed into thematic coding. This coding was then re-analyzed several times to find common themes. After all coding and themes were completed, the researcher began interpreting the meaning of the data and began writing an analysis of this data.

A constant comparison method was used for data analysis, where data was compared until themes emerged. Throughout the six-week data collection process, the researcher began analyzing the data through a thematic coding process to find comparatives amongst participants. This method was recommended by Merriam (1998) and Yin (2018).

The analysis was done by the researcher with the aid of a qualitative data coding (QDAS) computer program, where data was stored and secured with an encryption code. To ensure data was not traced to participants, an alias was created, and research data was destroyed within three years, as was required by the university. Paper copies were stored in a locked safe and the saved documents on the computer were password encrypted.

Limitations and Delimitations of the Study Design

The case study methodology needed to bound as this sets limits to what was to be studied. There are several ways to limit or bound the case that includes, a specific place, an interest, or by qualifying the participants to become part of the study (Merriam, 1998). The study was bounded by the location and time, as well as the participant selection; however, the very nature of this also causes limitations in the study. The first limitation was due to the specific location of the study as the study consisted of one specific school and one specific district. Because the school was a specific location, participant selection was bound by the location of the single organization case study, which caused the lack of generalizability in the study itself.

Participant selection was also small in comparison to the generalized teacher population size of Ohio or the United States itself due to the nature of the case study methodology used. Lastly, because data collection was limited to a specific six-week length of time, participants of the study experienced the same lived experiences. While, the study was bound by place, participants, and time, these characteristics also created limitations.

Although the case study was based on one school district during a six-week data collection time period, the research was not generalized to the entire population of teachers in the global society. Similar suburban school districts or educators who want to implement PjBL and will use social media technologies could benefit from the case study. The researcher has utilized 16 individuals to find thematic commonalities, which were applied to create a new teaching and learning environment. Transferability could also be used to replicate this case study in another bounded system.

Validation. Credibility is especially important to qualitative studies to enhance the credibility of research. To enhance the internal validity, there were eight procedures that qualitative studies researchers needed to follow. The eight procedures were prolonged engagement, member checking, triangulation, negative case analysis, peer debriefing, external audit, researcher reflection, and thick description.

Credibility. Using interviews and a focus group, the researcher used prolonged engagement with research participants as they were interviewed for at least 60 minutes, where a rich and thick description of the data was observed, quoted, and analyzed. Member checking occurred after the transcription process, as participants verified their interview content, including their remarks to questions or to make sure the researcher's interpretations of these remarks was what was meant by the participant. Peer Debriefing and an external audit also took place throughout the case study, as the researcher's dissertation committee and IRB board gave critical revision feedback through the entire writing and research process. This entailed a collaborative effort to check the credibility of data and the research itself through an iterative learning and revision process.

Dependability. Self- reflection of the study was also needed to guarantee that personal biases was not present in the study, as predisposed biases, could interfere with all aspects of the study from data collection to data analysis procedures, thereby effecting the entire study itself. The researcher made sure the interpretation made was based on the actual questionnaire, interviews, and focus group where the themes were coded through a constant comparative analysis method. The researcher also utilized the data collection plans and procedures, as well as the data analysis plans and procedures for the dependability of the results for other researchers and educators to use in the future. The researcher was emerged in the data collection and

analysis process; however, before final analysis was formulated and published, the researcher retreated from the case study report and then reviewed the entire dissertation it in its entirety to ensure credibility and dependability of the results of the case study.

Expected Findings

The study explored how educational stakeholders describe social media technology used to create PjBL environments in classrooms. There were several expected findings through the interviews and focus group sessions. These findings were the result of the data collection and data analysis stages.

Bandura focuses his learning theory on the collaborative educational environment, where observing, modeling and cooperation of others yield a unique learning experience (Huang et al., 2017). Social media technologies allow users to collaborate (Jacobs, 2017). Discussion allows for new ideas which in turn equates to new meaning schemes and allows new learning (Mezirow, 1991). This yielded the expected findings that teachers use technologies in their teaching methods to educate students. A subsequent finding yielded the results that teachers do not use social media technologies as a platform that allows for collaboration among users to learn from each other.

Local mandates also caused another expected finding in the school environment. State of Ohio Education curriculum standards have mandates for educators and students in relation to technology usage in the classroom (Ohio's Learning Standards for Technology, 2017). Barriers in organizations, such as training, infrastructure, content, and curriculum cause issues in classroom and school usage of PjBL via technology used to implement the learning (Lucas, 2018). In this study, one finding was that school leaders use social media technologies to

communicate schoolwide events but hesitated in allowing teachers to use this type of media communications in their classrooms for teaching and learning purposes.

Ethical Issues in the Study

To ensure that ethical standards were held to IRB and Concordia University standards, the researcher had written consent of the superintendent of the school district where the study will take place. (See Appendix F for consent of the study from the school superintendent; See also Appendix E for IRB approval of the case study research project). The researcher also had the informed consent of participants in the study, where they were all given aliases, where no identifiers were traceable to the participant. All data was either kept in a locked safe and/or on a password encrypted computer, where only the researcher had access to the information given. Deception was also not be used in the study, as participants were aware of the interviewing procedures before and throughout the study. The researcher also used member checking as participants reviewed how they responded to each question.

The researcher has not taught in several years; however, she has two Master of Education degrees. One is in Organizational Leadership; the other is in Educational Technology. These two different master's degrees yield a pre-determined bias on both the leadership field and the teaching field, where theoretical frameworks overshadow the field work. The researcher also has background as a newspaper reporter, where she learned to never use personal biases in her writing and interviewing techniques.

The main bias of this study focused on the location of the case study and its participants. The bias was that all study participants had been employed by the school district since its inception of PjBL in 2016. While all participants were familiar and taught or led in a PjBL

environment, it was not known how social media technologies were used within this environment.

Yin (2018) said that it is advantageous to study research participants in their predominant locations for easier access to schedule and hold interviews, this could also cause bias toward the researcher as they may feel that this is research directly linked to their teaching style. The researcher ensured the participants that she had no outside affiliation with the school district and that their names were kept confidential. The researcher has neighborhood ties to the suburb where the study took place and had become friends with some of these teachers working in this district before the study took place. The researcher did not select these teachers or leaders for the study to avoid this bias based on this type of friendship.

Chapter III: Summary

The purpose of this study was to discover the ways in which teachers and leaders use social media technologies in a PjBL environment. A single exploratory case study was used to find how educational stakeholders describe social media technology used to create PjBL environments in classrooms. Mishra and Koehler's (2006) framework of the technological pedagogical content knowledge (TPCK) and Bandura's learning theory, based on the conceptual framework of the entire study, was utilized to discover teacher perceptions of social media technologies via PjBL. Throughout the data collection of the questionnaire, interviews, and focus group, as well as through the data analysis strategy to find themes through a constant comparison method, the researcher discovered how and why social media technologies are used in a project-based environment.

Chapter IV: Data Analysis and Results

Introduction to the Findings

The focus of Chapter 4 addressed the findings of the perceptions of teacher's and leader's utilization of project-based learning and the communicative technology that enables collaboration. The use of technology to support project-based learning (PjBL) had many benefits as social media allows students to collaborate with others and gave students more resources for learning by inquiry than just the textbook (Ravitz & Blazevski, 2014). When social media technology, such as Facebook, was used in PjBL, students were able to communicate with their group members during project development and were able to share their finished projects with others in the community for outreach purposes (Jacobs, 2017).

Gaps in the Previous Research. The study addressed several research gaps that are found throughout Chapter 2: Literature Review. The first gap in literature dealt with the lack of qualitative studies analyzing why certain technologies have been used in project- based learning (Ravitz & Blazevski, 2014). Qualitative studies analyzing how professional development has been structured by administration that would enhance a teacher's ability to use technology in a

PjBL environment has also not been studied through the qualitative method based on teacher focus groups (Condliffe et al., 2017). Another gap which emerged in the literature was a limit of qualitative studies which explored the "teaching context and practical needs" of teachers in the school community (Hou, Wang, et al., 2015, p. 611). Hills found that through an analysis of how social networking sites help students communicate, research should focus on teaching pedagogies, such as project-based learning, in which students use cooperative learning (Hills, 2015)

Types of data for triangulation. The researcher created a demographic questionnaire with two groups of participants (leaders and teachers), to prepare for semi-structured interviews and a focus group of teachers. The triangulation of data based on the different sources helped to validate the results of the research. The triangulation of data was recommended by Yin (2018) for qualitative case studies.

The questionnaire was used to identify study participants who used social media with the project-based learning teaching model. The semi-structured interviews provided data on how teachers and leaders perceived and used social media, as well as how these two groupings of participants implemented PjBL in the school environment. The focus group was based on a series of questions relating to Mishra's and Koehler's technological pedagogical content knowledge framework (TPCK), Bandura's collaborative learning theory, and the researcher's definitions of both PjBL and social media (Mishra & Koehler, 2006). The focus group participants discussed their in-depth views on the latter topics in relation to how they implemented and encountered PjBL and social media in their classroom and school.

Influence of the researcher in data analysis. The researcher of this dissertation is a social constructivist. As a social constructivist, the researcher embraces a worldview with a need to develop interpretations from experiences to understand. A second domain of her worldview is

that of the post-positivist, where they "[develop] meanings of their experiences" as they want to "understand the world in which they live and work" (Creswell J. W., 2013, p. 7). Social constructivists want to make sense of the historical and social significance of a culture through inductive means as well as produce meaning from the data and its relationship patterns to other researchers (Creswell J. W., 2014). In case studies, the participants tell their personal viewpoints as stories to the researcher and the researcher is able to comprehend their actions (Yin, 1994).

By using the social constructivism approach, the purpose of the study was to explore how educators used social networking technologies in a project-based learning environment in a suburban high school in Ohio. As a social constructivist, the researcher used the theory of how and people use communication to learn and collaborate with others in a PjBL environment (Hou, Yu, et al., 2016; Dole et al., 2016; Lee & Hannafin, 2016; Wilper et al., 2013; Hendry et al., 2017). The researcher was also interested in analyzing how her findings would intersect with local, state, and federal laws and initiatives of teaching and learning standards. Local, State, and Federal policies have affected the school stakeholders, including faculty, administration, students, and parents, as well as community and business members.

Reiteration of research question. The focal research question was: **How do educational stakeholders (leaders and teachers) use social media technology in a project-based learning environment in a northeast Ohio suburban school district?** This chapter presents the qualitative case study research data, including an in-depth profile of the sample. The researcher also discusses the process of how data collection was completed, as well as how data analysis and coding methods were utilized in the study.

Overview of Chapter 4

In this chapter, there is a presentation and discussion of the qualitative case study research design and findings, including an in-depth description of the sample. The researcher also discusses how the process of data collection was completed as well as how data analysis and coding methods were utilized in the study. Lastly, the findings of the study are conveyed through data analysis and the presentation of data.

Description of the Sample

Potential participants. The participants in this case exploratory study were teachers and leaders who were employed by a school district in the Northeast region of Ohio. The school district was chosen based on the inception of the district-wide learning pedagogy of PjBL. The researcher received a list of the teaching and leadership staff who used PjBL since the district implemented this teaching strategy three years prior to the study.

A recruitment letter was then emailed to the potential participants. The recruitment letter gave a brief description of the research project, the role of both researcher and participant in the case study, as well as an introduction to the researcher herself. The researcher included an email link to a questionnaire, which was hosted on the computer application called Qualtrics. When the possible participants visited the Qualtrics website, they needed to digitally sign the consent form. The form utilized was the click-consent form which was approved by the Concordia University- Portland IRB (See Appendix D for the consent form). At the same time the recruitment letter was emailed to possible participants, the district's superintendent also emailed the same individuals explaining that the researcher and research study was approved by the district (See Appendix C for the superintendent's letter to teachers and leaders)

Participants of the questionnaire. The response rate for the questionnaire was six of 59 participants, for the next three days only three participants joined the survey. The researcher emailed a reminder message one-week after the survey began, which equated to 14 more questionnaire participants. 11 more questionnaire participants were added the next day. A second email reminder was sent out to possible participants two-weeks from the start of the questionnaire, which recruited three more participants. A third reminder was emailed to participants were the response was zero. The total questionnaire distribution was 34 out of 59 possible participants, which was 58%. Of these respondents, 14 indicated that they were interested in becoming participants for the semi-structured interviews or teacher focus group.

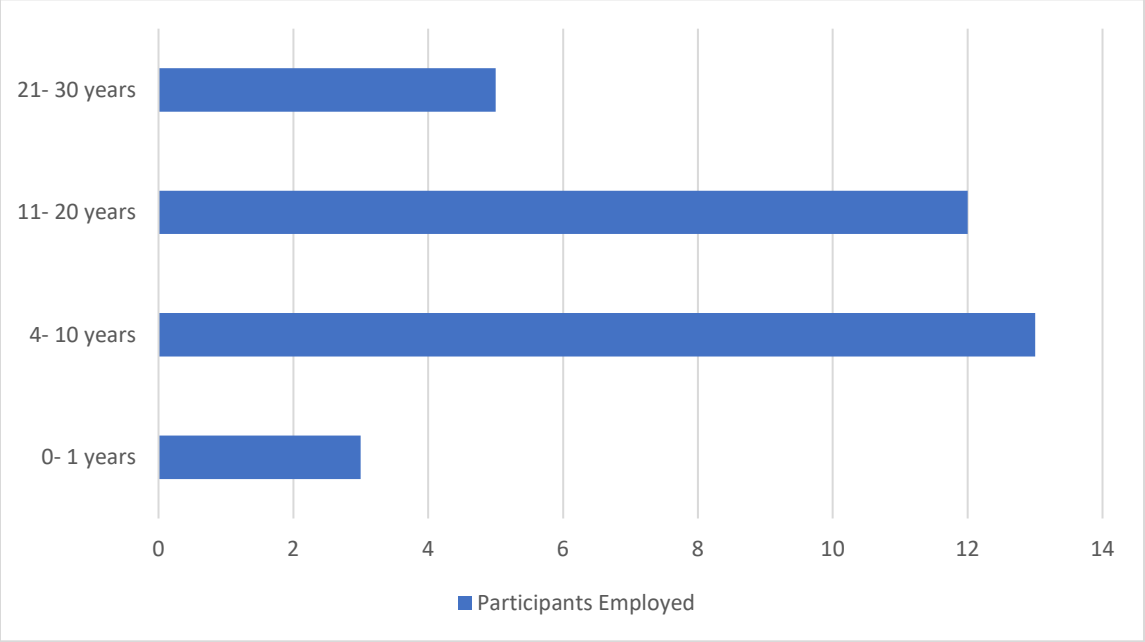

Figure 1. Study Criteria: Participants' Years Employed by the School District

Study criteria. The study criterion was that a teacher or leader needed to work in the district since the implementation of PjBL, (See Figure 1). The possible participants also needed to use some form of social media. (See Figure 2). When the researcher analyzed the questionnaire data 12 respondents qualified for the study. The 12 possible participants were

contacted via email to set-up times for the semi-structured interviews or a tentative future date for the teacher focus group. When contacted by a confidential email, a total of 11 teachers and leaders showed interest to further participate in the study.

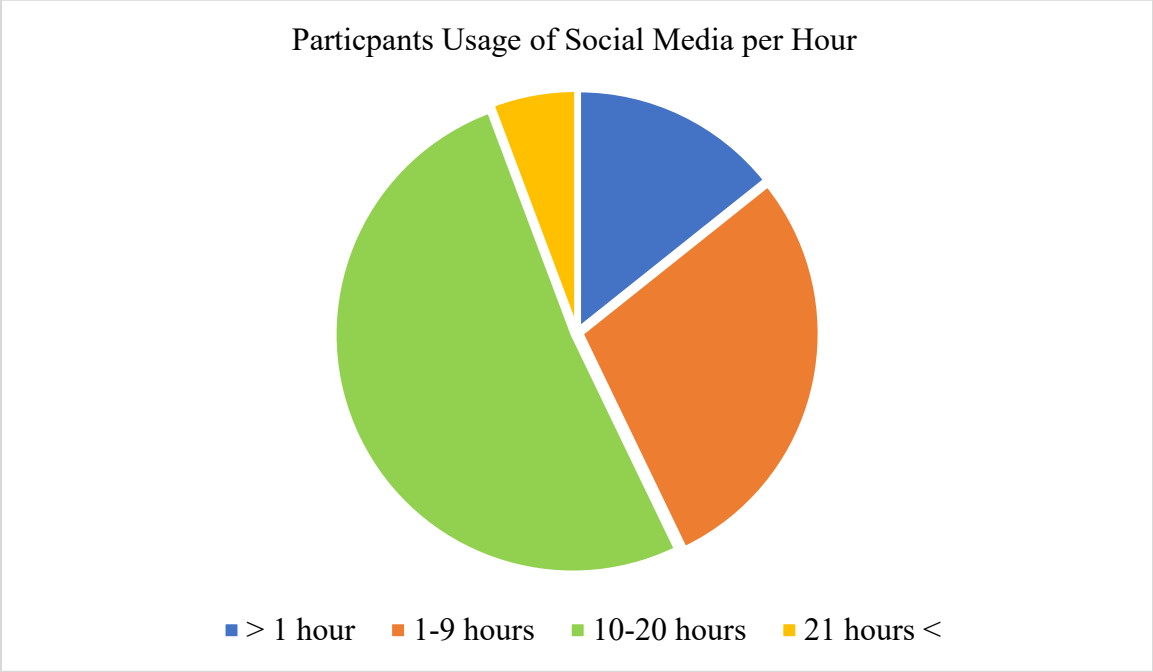

Figure 2. Study Selection Criteria: Participants' Use of Social Media per Hour

Interview and focus group participant selection

Semi-structured interview. The 11 semi-structured interviews, which included five teacher participants and three leader participants were scheduled within three-week period during the school day for face-to-face semi-structured interviews. However, with the low response rate, the researcher left voice mail messages with leaders of the district, introducing herself and the context of the research study. Three additional leader participants were added to the study. While the researcher's intent was to interview 5 leader participants to find a commonalty amongst the leader group, a sixth participant was added. One extra participant was added to the leader group because all district leaders played a different role in the implementation of PjBL.

Focus group. The low response rate of the questionnaire also led the researcher to use Snowball Sampling to find remaining participants for the focus group, in which participants were chosen based on recommendations and personal face-to-face introductions made by the teacher group of participants. This secondary phase of participant selection yielded 5 more possible focus group members. The focus group recruitment was therefore based on both purposive sampling and snowball sampling. In conjunction with a sample selection of five possible participants based on snowball sampling, the purposive sampling of two teacher participants thus yielded a possible focus group of 7 participants. Of those seven-focus group participants, two dropped out of the study.

Demographics of the Sample. In the research sample, the leader participants consisted of 40% female and 60% male and were the ages between 35 to >60. The leader participants consisted of those worked in the district with careers in technology, media, school leadership, or district elected officials. The teacher participants consisted of 3 female participants and 2 male participants in varying teaching assignments within the school. They were between the ages of 26 and 50 years of age. The focus group consisted of 7 male teachers between the ages of 26-50 years of age. However, two of these participants dropped out of the study before the focus group began. In total there were 16 participants, consisting of five teacher participants and six leader participants for the semi-structured interviews, while the focus group consisted of five teacher participants. The following tables displayed the demographics of the participants. Table 1, *Demographics: Gender of Participants* expressed the gender of participants, while Table 2, *Demographics Age of the Participants* illustrated the age of the sample population. The tables show the age and gender demographics for the participants. (See tables 1 and 2).

Table 1. Demographics: Gender of Participants

Gender	Percentage	Count
Male	68.75	11
Female	31.25	5
	Total 100%	16

Table 2. Demographics: Age of Participants

Age	%	Count
18-25 years old	0.00%	0
26-35 years old	18.75%	3
36-49 years old	62.50%	10
50 years old & above	18.75%	3
	Total 100%	16

Research Methodology and Analysis

Research design. A qualitative exploratory case study was utilized to find insight regarding how educational stakeholders (teachers and leaders) used project-based learning with social media technologies. The study used semi-structured interviews and a focus group to find how leaders and teachers viewed PjBL and social media technologies in a Northeast Ohio school district, which has implemented a whole school PjBL teaching and learning environment.

The researcher collected a questionnaire, which included demographic data to recruit for the semi-structured interviews and focus groups. The interviews and focus group explored the

viewpoints of PjBL, as well as social media technology usage. After the participants completed the demographic questionnaires (Phase I) , the personal interviews (Phase II) and focus groups (Phase III) were then scheduled and conducted by the researcher using pre-determined open-ended questions via in-person interview sessions (see Appendices B & C).

Scheduling process of interviews and focus group. After participants completed the questionnaire, an e-mail was sent to participants. Although an identical email was sent to participants for phase II and phase III of the study, the researcher emailed each participant separately to ensure confidentiality for participants. The researcher allowed the teachers and leaders to pick a time during the school day in which they were able to complete the in-person interview. The semi-structured interviews were scheduled and took place within a designated six-week timeframe. After Phase II was completed, the researcher emailed the focus group participants. This was in order to find a common time in which all participants had the ability to participate.

Reminders sent. Additionally, a reminder email was sent to individuals one day in advance of the date of the event for the two interview groups (the leader group and the teacher group), as well as the focus group to ensure that no circumstances existed. Although a reminder email was received by participants, unforeseen circumstances, such as sick-days or a last-minute student /parent meeting prevented interviews as scheduled. When this occurred the teacher and researcher contacted each other to reschedule a time for the interview. Subsequently, with the focus group, there were two individuals who dropped out of phase III of the study as no time was allotted for rescheduling the focus group.

Participant inquiry process. Each participant was asked to confirm his/her permission again for phase II and phase III of the study. While the click-consent form was required for the questionnaire, the researcher gave each participant an additional consent form for the semi-structured interviews and focus group. The consent form explained the use of the videotape and digital recorder during the interviews, the confidentiality agreement between researcher and individual, the participants right to drop out of the study, the member checking procedure, where participants would double check the transcription of the interview, as well as the purpose of the study. After the participant and researcher signed the consent form, the researcher gave a copy of the form to the participant.

During the semi-structured interviews, the researcher asked both participant groups questions based on PjBL, digital technologies, and social media technologies. However, the questions differed in both groups due to the employment. For example, the leader group questions related to how they perceive PjBL and social media in a leadership career, while the teacher group questions related to their perceptions of PjBL and social media based on their teaching experiences.

While the researcher had asked the participants the same questions per interview group, the timeframe of the interviews and question-order differed amongst participants. The semi-structured questioning technique allowed the researcher to change the order of the questions in relation to the response of the individual. For example, each teacher was first asked how do you see digital technology being used in the classroom or school? (See Appendix A for specific questions). If they began discussing this in relation to social media, they were asked a social media questions, if their response was to discuss how digital technology was used in the PjBL classroom, the questions of PjBL followed. The researcher planned each interview as a 45-

minute session; however, the times of the interviews varied greatly. The interviews ranged from 19.07 minutes to 45.10 minutes, where 42.83 minutes was the mean average. Interview and focus group sessions were audio recorded using a digital voice recorder. A back-up method using the video recording on a digital camera was used. After each interview and focus group session, the researcher downloaded the recorded file on a password protected laptop computer.

In discussing PjBL social media, and technology usage, the focus group questions were based on Mishra and Koehler's TPCK framework and Bandura's theory of learning. This allowed for a more in-depth perceptions than the semi-structured interviews. The researcher emailed the participants the definitions of PjBL and social media technology, as well as researcher's definitions of the TPCK framework and Bandura's learning theory for them to think about the definitions before the focus group session. During the focus group, the participants were given a copy of the definitions to refer to as they participated in phase III.

The researcher explained to the leader and teacher group participants, as well as the focus group participants that there were no right or wrong answers to the questions asked by the researcher. They were all given time to respond to each question in order to share their perceptions about PjBL and social media usage in the school environment. After the interview, the researcher transcribed the data. After the transcription process, the researcher gave the participants a copy of the transcript via email for the member checking procedure to make sure the researcher interpreted the data collected correctly. When the participants did not respond to this email, the researcher sent out a reminder email asking participants to either okay the transcription or correct the data transcribed wrong and highlight that information. Only one of 16 transcriptions needed minor spelling corrections.

Transcription process. The data from the interviews and focus groups, which reflected the teachers' and leaders' perceptions of PjBL and social media technologies in a learning environment was transcribed by the researcher. Each MP3 audio file was uploaded into Descript, which was an online transcription service. To ensure confidentiality, the researcher used an alias for each individual before the upload of the file. The online subscription used allowed for a quick turnaround time; however, the researcher wanted to ensure the transcription was correct. To do this, the researcher listened to the recorded audio file while she viewed the word document of the transcription. The researcher corrected the word document of the transcription.

Credibility of data. To increase the credibility of the data collected, the researcher used member checking. The researcher emailed each participant the copy of the corrected transcript. In the email, the participant was instructed to verify that the data collected was correct. The researcher asked the participants to either approve the transcript or correct it by highlighting the information added or deleted in the Microsoft Word Document. A reminder email needed to be sent-out to five participants due to the lack of the response. The process of transcribing and correcting the data, even with the quick 5-minute turnaround of the transcription software was time consuming. It took the researcher five hours to make corrections of the transcription. It then took two weeks for the approvals needed during the member checking phase.

Protection of participants. In order to protect the participants' identities, each participant in the study was given a pseudonym by the researcher. Participants were identified and labeled based on the number of participants of the study; for example, Participant 1, Participant 2, et cetera through number 16. The researcher used aliases of Participant 1-5 for the teacher group, Participant 6-11 for the leader group, and Participant 12-16 for the focus group. The researcher

wanted to further ensure confidentiality, so the researcher drew numbers for each grouping of participants.

All media files and transcript documents were labeled with only the pseudonyms names of the participants also. Each audio file was removed from the digital devices and deleted from the online transcription service. To further ensure confidentiality, the researcher used an encryption email through the university's school account. The researcher printed the response on hard copy for record- keeping for three years as required by both Concordia University- Portland and Concordia University Wisconsin; however, these are held in a locked safe that only the researcher has access to the information. The researcher then deleted the emails after member checking approval was received. Transcript documents of all recordings were kept secured in a locked file on the researcher's computer as well.

It is important to note that data was scrubbed in order to ensure the protection and confidentiality of participants. This included participants career experience at different schools or specific subjects taught. The research also deleted data which might have led to other identifying factors, such as their discussions of their own children or specific projects and subjects taught in their own classroom. Although the specific age of each participant was asked by the researcher, the researcher classified the ages into categories of generations. After the coding process, not all the data coded from each transcript is found in the study, as it did not relate to major themes of the study that occurred through the constant comparison analysis method used by the researcher.

Data Analysis

During the interviews and transcription throughout the data collection, the researcher began to utilize the constant-comparison method for data analysis. According to Yin (2018), the

analysis of the case study has not been standardized. Because of the lack of standardization, the researcher used the constant-comparison method to focus on themes that were found in the data.

Early comparisons with data collection were aligned with the recommendations of Merriam (1998). This occurred throughout the data collection process as the researcher took notes during interviews to group data together to find commonalities in the analysis of the study.

Note-taking during data collection. "Memoing" was essential during the data collection process as it allowed the researcher to group thematic data together for commonalities to emerge in the data (Flip, 2014). Self-reflexivity and memoing was a large part of the analyzed data as it allowed the researcher to formulate and "sketch out the flow [and movement] of the process" (Creswell J. W., 2013, p. 85). The researcher used the constant comparison method to continuously re-examine the data for themes that were found in the coding process. Creswell had described the constant comparison analysis as a "zig-zag process" (Creswell J. W., 2013, p. 86).

Constant comparison analysis. A constant comparison method was used for data analysis, where data was compared until themes emerged. Throughout the data collection process, the researcher analyzed the data through a thematic coding process to find comparatives amongst participants. During the interviews and focus group, the researcher took notes on keywords while the participants discussed their answers to the questions. This was recommended by Saldaña (2016) where "precoding" for key words and quotes are the first stages of the analysis process. As the researcher transcribed the interview sessions, the keywords were analyzed carefully to find emerging themes in the data. This method was recommended by Merriam (1998) and Yin (2018), where a constant comparison is needed for all data to emerge as finding in the research.

After the transcription process, the researcher used computer technology for the data coding process. The data collected from two semi-structured interview groups and a teacher focus group was analyzed by the researcher using computer aided qualitative data analysis (QDAS). The QDAS software utilized was NVivo 12 Plus created by QSR International (QSR International, 2019). The transcripts were downloaded into NVivo, which was used to organize and find themes in the data through coding. This coding was re-analyzed several times to find common themes. After all coding and themes were completed, the researcher began to write the analysis of the interpreted concepts of the data.

Coding process. The first step the researcher completed via NVivo was to organize the data of the interview questions. NVivo software allowed the researcher to group the questions and answers of the interviews. The researcher first aligned the interview groups into categories of the questions and answers. For an example, the leader group was all asked the same semi-structured questions, where questions and answers were sorted together. This categorized process happened likewise for the teacher participants.

The next coding process completed in NVivo was in-vivo coding, for each question and response. This coding process allowed the researcher to conceptualize the data for the second cycle of coding. This cycle allowed the researcher to find themes emerging from the data. The in-vivo coding allowed the researcher to find three main themes in the data, which aligned with the conceptual framework for the research. The themes were: the implementation of project-based learning, the technology in the school district, and communication methods among stakeholders.

The fourth coding process used the word frequency auto-coding query in NVivo for additional thematic categories to emerge from the data. This type of query coding in the QDAS

program was used because of the speediness of computer technology. NVivo analyzed word frequency found in the data in under 10 minutes. The researcher limited this query to 100 stemmed words. This allowed the researcher to identify additional codes to emerge under the umbrella themes created by the researcher. The word frequency word map is illuminated in this illustration below. (See Figure 3).

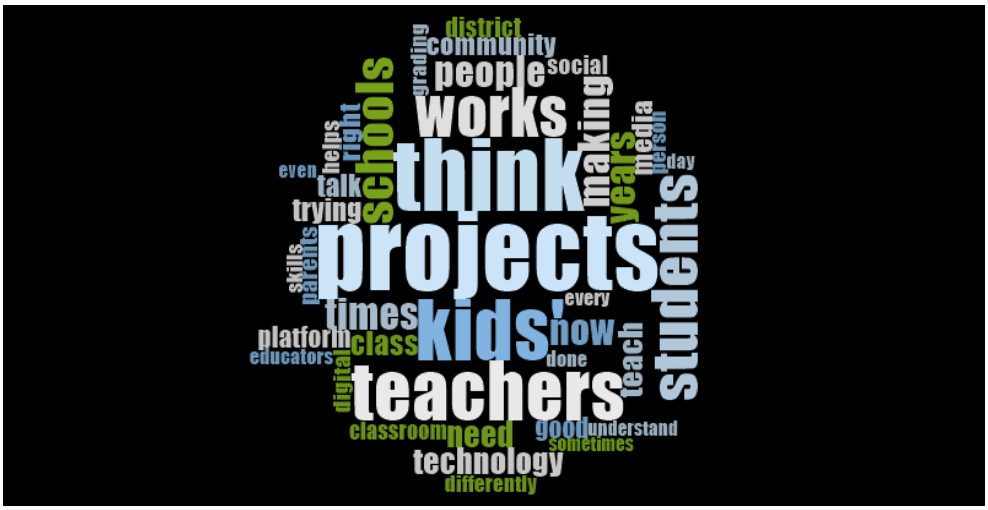

Figure 3. *Word Frequency Map*

The researcher also completed two more coding cycles to ensure that bias did not play a large role in data analysis. These two coding cycles used the auto-coding capabilities found in the program of NVivo. The program coded the data for themes found in the data overall, as well as for previous codes (called nodes in NVivo) assigned by the researcher. The data that was produced through the QDAS program allowed for additional child-nodes to emerge from the data.

The researcher in totality used six coding processes. According to Saldaña (2016), coding occurs until no more themes emerge from the data, which could take more than three levels of coding strategies The researcher used auto-coding in the last two stages of coding to ensure no prevalent data was overlooked in the analysis.

Summary of the Findings

There were three main thematic categories found in a whole school project-based learning environment: The implementation of project-based learning, the technology in the school district, and the communication methods among stakeholders represent the participants' perceptions of a whole school project-based learning environment. Each category has three thematic codes which are representative of the data. Each of the codes is further discussed and elaborated in the following section. These are the three categories, and each of their three codes:

Thematic Code Category 1: The Implementation of Project-based Learning

- Learning Environment and Change
- Professional Development
- Barriers in Project-Based Learning

Thematic Code Category 2: Technology in the School District

- Whole School Learning Management Platform
- Digital Technology Usage
- Learning Process

Thematic Code Category 3: Communications Methods Among Stakeholders

- Collaboration and Communication Efforts
- Sharing and Presenting
- Traditional to Remote Learning

Presentation of Data and Results

Thematic Code Category 1: The Implementation of PjBL

The implementation of PjBL for an entire school district comes with challenges. These challenges include change in general, barriers of that change, as well as training needed for a new environment. Implementing a new learning environment at the school district took place in stages. This caused an environment which forced teachers to change the way they were taught to teach. The leader participants said that the implementation for a whole school PjBL environment was difficult at first. Some leader participants said that they would have implemented change differently where training methods for a specific learning management platform would have been used.

Learning Environment and Change. According to district leaders, there were several reasons that they wanted to implement a whole school approach to learning. One of these reasons was to have students succeed on both state tests and in life. According to Leader Participant 10 a different unified learning environment would allow the district to focus on students' skills needed to succeed. According to the Ohio Department of Education's webpage, the district received low ranking scores in most subjects due to the underperformance in testing. With a change in the learning environment, the district believed that scores on state mandated tests would improve. To improve these tests, district leaders wanted teachers to focus on educating students for them to become better problem-solvers, which in turn would help student's succeed on mandated testing requirements. According to Leader Participant 10, PjBL has an embedded skill set that they wanted students in the district to master. "We want them to still learn math and science and all the things in between, but we want them to be problem

solvers. We want them to be able to work with other people and collaborate," according to Leader Participant 10.

Fully half of the leader participants said that one reason for implementing a whole school PjBL environment was for student learning. State mandated tests have changed over the years. Testing in 2020 involved testing that included not only concepts, but also the application of those concepts. According to Leader Participant 10:

> Its application that is becoming big on those tests now, and they're different. They're different than just the plain old regurgitation of facts. They must be able to apply their knowledge to a wide variety of circumstances… Getting them prepared, actually retaining the knowledge, not just learning it the night before, cramming it in, regurgitating it on whatever Saturday morning, and then forgetting it by Sunday. Now we teach them. They actually analyze questions and understand what things are being taught.

This sentiment was also shared by Leader Participant 6, who claimed that state testing scores have increased each year since PjBL came into practice and was implemented. This perception was also shared by Leader Participant 9. Leader Participant 9 stated that students are involved in learning. "There is more of that reiterative kind of thing, like the students reflecting on it. We all think about reflecting on our own work and knowing it's never done," said Leader Participant 9.

Implementing PjBL came as a four-year plan for the district. Yet, some leaders wanted to make sure that it was working in their building. "I wanted to sniff-test this. I really wanted to make sure it was working. I wanted to see how are our kids as we were all in in the process," said Leader Participant 6. "It wasn't like this was a cohort of kids that we were working with--It was an *all-in* change," said Leader Participant 6. But this change also brought about barriers to the new environment.

Barriers in PjBL. This change also came with barriers. These barriers include change itself for the organization and the stakeholders in that organization. According to Knights and

Willmott (2007), in their book, *Introducing Organizational Behaviour and Management,* workers are concerned about change and how it will affect their workload and downtime. "Change in organizations, including the introduction of new working practices, is always susceptible to some resistance…not because they fear change but because of its effect on established working practices and occupational and professional interests and beliefs" (Knights & Willmott, 2007, p. 386).

According to Leader Participant 9, the district experienced a normal curve when it came to change. The leader said that the district has early adopters that were in the first wave of the change implementation. There were also teachers who were part of the innovators to mirror the early adopters in the change process. "They're not the first to jump in, but then they jump in pretty quickly and they implement it," said Leader Participant 9. However, with any change initiative, there were some teachers who were "slower or less adapt with delivering learning as a project" the leader said. Leader Participant 6 said that in the three years of working to implement the PjBL learning environment, faculty were at a place that the teaching and learning method is now normal; yet, when the district began implementing PjBL, it was " fast and bumpy," said Leader Participant 6.

One reason for the push-back from teachers was because some faculty thought if they would "drag their feet, it would go away," said Leader Participant 6. "You know education has always been a business of what's the next best thing," said Leader Participant 6, adding that leaders combatted this by communicating with teachers about the positives of PjBL, as well as professional development.

The array of barriers for educators as they use PjBL with computer technologies, was a factor in how teachers implement learning methods in the classroom. That barrier was based on

demographics, which is illustrated in the following table. The educational experience in the school district, is also illustrated in Table 3.

Table 3. Age Ranges of Participants (represented with pseudonyms)

Participants	*Age*	*Years in School District*	**Participants*	*Age*	*Years in School District*
Teacher Participant 1	36-50	11-20	Leader Participant 9	50 and >	4-10
Teacher Participant 2	36-50	4-10	Leader Participant 10	36-50	21-30
Teacher Participant 3	36-50	11-20	Leader Participant 11	50 and >	11-20
Teacher Participant 4	26-35	4-10	Focus Group Participant 12	36-50	4-10
Teacher Participant 5	36-50	4-10	Focus Group Participant 13	50 and >	21-30
Leader Participant 6	36-50	4-10	Focus Group Participant 14	36-50	4-10
Leader Participant 7	36-50	4-10	Focus Group Participant 15	36-50	11-20
Leader Participant 8	50 and >	4-10	Focus Group Participant 16	26-35	4-10

According to Teacher Participant 2, teachers who have been in the education field longer have a harder time understanding how to use technology for classroom learning. “I think younger people are more prone to using it and probably using it correctly. They're more comfortable with it,” said Teacher Participant 2. The participant added that although most staff uses some type of technology, sometimes the technology does not fit with the content of the

learning. "It's for younger teachers. It's all about skills and this and that and everything else. Whereas I think a lot of us older teachers are hung-up on content. I mean, you have to have the skills and all that stuff, but I don't know how you could have the skills without a memory."

Teacher Participant 13 said that although teachers use technology daily, sometimes he sees it used just because it's fun for the students. "I think we have to do a better job of teaching the kids how to use technology correctly and know when it's appropriate and not." Yet, this sentiment was not echoed by other teacher participants. "In the building I've seen teachers of all ages really embrace it and go with it and do really amazing stuff. So, I don't think it's the age. I think it's more just your willingness to learn new things and to try new things. And if you're kind of just wanting to do the same thing you've always done, probably not," according to that participant.

There were also other barriers that teacher participants perceived in technology usage both for PjBL and for social media between the students and the teachers. This was due to what age they learned the technology. According to Teacher Participant 5:

> I think there is a disconnect between kids who have never known life without the internet and almost all of their teachers, probably 75% who probably picked-up on it in college or professional life. I think there is a struggle that if you don't acknowledge technology it makes it even worse. You need to learn how to dance in both worlds. And that--I think it's real. I think that that gap is real, and it shouldn't be glossed over, and it should be properly managed.

The participant also found that teachers' age and barriers to technology exist within his school:

> A lot of these younger teachers, went to school in the age of social media, right? Like when they were on the internet, they were on Twitter too. I think they're more apt to use it. Some of the younger teachers here certainly post more than the older teachers do. I think it's the older teachers that just don't document it, and don't use it to its full potential.

Professional Development. Professional Development at first seemed to cause one of these barriers amongst staff. While leader participants said that training teachers for PjBL was a mixture of faculty, some teacher participants disagreed. "When the platform got rolled out, the

people who were sort of in the first round were individuals in our teaching staff who had less than 10 years of experience, and most of them had less than five" said teacher participant 3. The teacher participant continued in saying that at first these professional development meetings, were then run by these faculty members. For veteran teachers, such as teacher participant 3 and teacher participant 1, learning from new teachers was hard because they had little time in the classroom to learn aspects of teaching.

Choosing faculty for the first wave of implementation was not based on any sort of seniority. It was based on a volunteering to learn and implement PjBL in the classroom. According to Leader Participant 5, the district put together "a strong team of both veteran staff and new staff, which created a balance to get them trained and then they helped to get staff of various levels of seniority to buy into the program and understand." Some teacher participants echoed this sentiment. "I'm younger. I'm in a position where I can pick these ideas up relatively quickly, where some people who have been in this profession for 20 years, it's a little more difficult and that's going to come with time no matter what," said Teacher Participant 3. The participant iterated the fact that she was not set in her teaching strategy, like veteran teachers who educate in the same manner year after year.

According to the perceptions of teacher participants in both the semi-structured interview group and the focus group, the change of the learning environment to PjBL had consequences in teaching. In fact, Knights and Willmott (2007) state, "mainstream thinking tends to assume that fear of change is irrational, and that all managers need to do to get employees 'on board' and committed to new working practices is explain to them the need for change," (p. 387). Child, a mainstream theorist, as quoted in Knights and Willmott (2007) said, "when faced with resistance, managers simply need to explain to workers the underlying rationale for change, strive to involve

workers in the change process, then move forward as quick as possible to minimize any further potential disturbances'" (p. 386).

The first step the district leaders took was to hold professional development workshops. These workshops taught the basics of PjBL. The first stages of professional development allowed for a unified teaching front in its implementation of PjBL. The teachers were given books to read and study as they began to implement this new teaching strategy. However, this collaborative effort seemed to not work as expected at first. According to leader participants, some educators did not want to follow the change of the mandated teaching style. Leader Participant 6 said that teachers were scared to give up their powers in the classroom and not rely on the podium to stand in one area of the classroom and lecture. Leader Participant 5 said that educational politics entered the implementation stages when the teacher's union leaders of the district did not want to endorse PjBL because of new working conditions. Leader Participant 8 said that teachers are not as scared of the change anymore. "I guess our teachers are getting more comfortable with the idea of relinquishing control for student learning, encouraging students to do it, understanding that there was initial fear of change," said Leader Participant 8, explaining that the teacher's don't drill for test preparations, but they do teach concepts.

The largest barrier for implementing PjBL was teaching and training the staff and modeling how to incorporate PjBL in the curriculum. Other than teaching the faculty how to teach in the PjBL method, the teachers needed "to be able to communicate to children about it and use it in a meaningful way, so that it was actually educationally oriented" said Leader Participant 11. According to teacher participants in the focus group, professional development is on-going. The district sends faculty to conferences held by the learning management platform. The district has also partnered with nearby state and private colleges in the area to teach faculty

best practices in PjBL. The focus group members discussed one session with a local state university, where the faculty had to learn an entirely new concept of Origami and apply it to their teaching field. According to teacher participant 1, the learning gave faculty a lesson on how their students view curriculum in the classroom as it related to PjBL.

One way in which the district encourages teachers to use PjBL is through communication and collaboration. According to Knights and Wilmott (2007), a way to overcome obstacles of change in the workforce is through discussions. According to Leader Participant 8, “It was a constant, constant, job embedded with our teams. We we're constantly working with each other and the teachers were constantly collaborating with each other.”

One way the district has helped prepare for PjBL was to reorganize how technology is taught to teachers. District Leaders used to train all the teachers at once during whole group training sessions. The Leaders Participants said that this didn’t work well as re-education was necessary months later for the same technology. According to Leader Participant 10, “we've gone much more to on demand. We found that it's much more valuable when a teacher is ready to start a project or is wanting the students to do something in class, we’ll teach them how to use the technology needed.” The leader participant said it was much more effective for learning, timing, and financial issues.

The district has a technology director as well as a team of aides in each district building to help with technology trainings. They also rely on teachers to aid in training as a team approach. “We also have had lots of regular teachers like our digital media teacher that will help with training… It's kind of an approach with lots of different people,” said Leader Participant 10. When a teacher becomes an expert in a technology application “they’ll help us train other teachers in the technology” according to Leader Participant 10.

Thematic code category 2: Technology in the School District

The Northeast Ohio school district began a one-to-one technology initiative in the decade that preceded the commencement of PjBL. The school district "has been in the game for a long time now," said Leader participant 8. Leader Participants 8 and 10 both said that students in kindergarten through fifth grade have IPads, while sixth through twelfth graders have MacBooks. When the district first implemented PjBL they used a learning platform called Power School. However, district leaders quickly found another platform called Summit Learning, which according to Leader Participant 9, is closely related to the school's vision of PjBL. The learning platform is also considered digital technology.

Whole School Learning Management Platform. According to Jacobs (2017), **the Summit Learning Platform** is teaching model of PjBL focusses on "cognitive skills" self—paced learning to mastery in content areas, and one-on-one mentoring to help students set and meet goals (Jacobs, 2017, p. 18). The platform was created by the help of engineers from Facebook; subsequently, there is no social media tool attached to the platform.

Although the company is based in California and has learning concepts based on this state's educational requirements, the company was able to work collaboratively with the district to ensure that Ohio Department of Education requirements were embedded in the LMS. According to Leader Participant 8, "Summit Learning accommodated us. [They were] constantly providing support." This echoed the teacher participants perceptions as they said that if they had a problem with the technology of the LMS, the help center was able to fix the issue in a quick turnaround time.

The software housed in the Summit Learning Platform also allowed for the students' education to be tracked by leaders and teachers. As the implementation of PjBL became more

embedded in the learning experience, the way the high school was structured during day-to-day operations also changed to allow for collaboration. Students went on a block scheduling where they had class with the teacher two times a week. The district leader's set-up Mondays for every student to attend each class on their schedules for 35-minutes to find out the concepts and possible projects for that week. Every day of the week, including Mondays, students would also meet with a teacher advisor, who would help them navigate through the PjBL experience.

Teacher participants did not seem to be congruent in their ideas of how Mondays should work. Focus Group Participant 13 said that on Mondays he would teach one concept for the week and then teach two or three more concepts during his block schedule. Focus Group Participant 12 said that he uses Mondays for project day. While Teacher Participant 5 used Mondays as a day to set the tone for the week, gave the students concepts to learn and then helped them start planning on the creation of the project that would explain the learning concepts.

Leader and Teacher participants said that consistency is needed. According to Leader Participant 8, "Summit Learning is sort of standardized, and it's allowed us to become much more uniform pre-K through 12 with communication and collaboration." Yet, consistency for students was not seen by one teacher participant. Teacher Participant 4 said that consistency is needed in the school, and especially across grade levels.

> There are different ways people are doing that and students are getting confused because they're like, wait a minute, I thought the process was this in this class and in this class, but in this class it's not that. There's expectations that students need in understanding us across the board as we implement project-based learning," said Teacher Participant 4.

The teacher participant and focus participant groups were consistent in their views of the advising class. The advising class was set-up by district leaders to be 25 minutes a day, where students would meet with a teacher the entire year. The advisor would help students further plan

for projects across all classes. Some teacher participants would track students' progress on the Summit learning Platform, where all assignments would be up-loaded, and feedback given to the students from the teachers. Teacher participants said that the advising time was useful because it allowed a way to collaborate with students.

Jacobs (2017) demonstrated that the Learning platform allowed teachers to modify existing projects and activities for their own classrooms. However, according to district leaders, some teachers deleted the checkpoints that were already developed through the collaboration of leaders and the Summit Teaching engineers. According to Leader Participant 9, "Quite candidly, you've probably heard the teachers are able to manipulate the platform and they do." The leader said that for those that fully understand the teaching method of PjBL, they are adding more checkpoints and additional revision stages for PjBL. Leader Participant 9 stated:

> Some of them who are not oriented toward or not comfortable with something are taking-out the checkpoints. They just take them off. It's like what's going on here? I know there are the kids not getting feedback at each juncture [of learning]. They aren't breaking down the learning targets into segments or stages in a process, nor are the kids getting input or feedback.

This sentiment was also made by Teacher Participant 4. "I don't know if it's personally motivated where it's too hard or if it is based on adopting the learning. For some, it's a lot easier to pull out the file cabinet of information and just plug them into checkpoints needed for project-based learning versus utilizing the documents to re-create what was already done in a more purposeful way," said Teacher Participant 4.

Digital Technology Usage. Digital Technology is being used daily throughout the district. It is employed as an educational tool, as well as an enrichment tool for learning. Teachers are "ensconced" in both technology applications and PjBL, said Focus Group Participant 12 adding that "everything is culminating to a project and presentation."

Teachers in the school district implemented digital learning in their classrooms. "Our teachers use it for everything. From the very basics of paper replacement to doing more advanced things like coding, creating videos and editing photos, making presentations, and designing a wide range of projects," said Leader Participant 10. This is reiterated by Leader Participant 9. "I see digital technology as being an accelerator of learning. It has the potential to intensify all the elements of instruction and also to offer more opportunities than have ever been possible previously for differentiation or what people sometimes call personalization," according to Leader Participant 9. The leader added, "Digital technologies are what make a universal design for learning possible."

The PjBL platform allows for digital learning. The platform the district uses allows for teachers and students to use the platform as a plan book/ calendar. According to Leader Participant 6, the PjBL platform:

> is a year-long outlook for students for the entire course, so it's almost used as like a digital planner, as well as something similar to Blackboard where they can turn in assignments. Assignments can be posted. Resources can be posted, so it's definitely increased the use of technology here.

Teachers also agree that the district has embedded digital technology in its PjBL environment. Teacher Participant 1 said:

> That's how they get to their assignments for the most part. Again, not 100%, but a majority. They usually complete their assignments. They get access to their resources that they can use. Again, it's not 100%, we still use texts and stuff; but a lot of what they use, they get through their computers through the platform. The platform is like a vehicle to get to those resources.

According to Teacher Participant 4, digital technology has expanded the access to learning. "Students can work at home. They can work at school," teacher participant 4 said. "I would say that it's pretty much like kind of like breathing as a teacher now to use technology and to have a computer and that sort of thing," the participant added. Teacher Participant 5 also said

that digital technology is a must for today's student. "I think that students should be taught how to live within the technological world. It's not going away. They have a pocket computer, a cell phone. I fully embrace it," said the teacher participant. The participant said teaching the traditional way is no longer needed, because students could find definitions on the internet. He explained that digital technology allows teachers to be more creative in education, where students show-off learned materials through multimedia technologies.

There were two teacher participants who used digital media as an add-on to the learning. "I believe in blended learning, a little bit of old-school paper and pencil, and then project-based digital learning. It needs to be almost half and half," said Teacher Participant 2.

Learning Processes. With the commitment to PjBL the district has also implemented the use of digital portfolios. The digital portfolios allow students to build on concepts learned, revise projects, and showcase their work for an authentic audience. Some teacher participants used the digital portfolio to showcase students' learning. "I have my students post something at the beginning of the semester. According to Focus Group Participant 14:

> The goal at the end of the semester, instead of having an exam, is the process of that goal. It's like a presentation of the journey and experience. It also shows the revision made to gain that experience.

Focus Group Member 16 said that his students use the digital portfolio for the class as the content of the students' lives. The digital portfolio "is all student driven so I see it as basically giving students an idea of how the content is applied in their lives, in government, and then how they would like to see it improved or interacted with as they go forward," the group participant said.

One obstacle that seemed to be an issue with digital learning was about student usage. According to Focus Group participants, more ethical technology usage must be taught to students. "It's as important in my eyes to teach kids because they're still kids of the appropriate

ways to use it," said Participant 15. According to the participant, students need to be taught about citing sources online. "They need to be taught what sources are good and what are bad. They need to learn how to cross-reference resources," adding that students "can't believe that everything out there is valid," the participant said. Some participants in the focus group also said that plagiarism is a large issue with students, as they share and/or copy information from others. Leader Participant 8 said:

> All the docs were Google and some kids around the country we're exploiting that fact to do one another's work. They weren't using Google docs to collaborate; they were using it to cheat. There's now more locked down in the documents of the application, at least in the platform.

Teacher participants indicated that plagiarism is less as the process of PjBL requires revisions, where it leads to major concepts learned to showcase and present students' works to others.

Thematic code category 3: Communications Methods Among Stakeholders

Collaboration and Communication Efforts. Social Media was defined as computer applications or programs that allow the user to communicate with others. Collaboration and/or communication takes place when users elicit responses and/or dialogue from others which is not bound by a specific time and a place (Pew Research Center, 2018; Walster, 2017). The ideology that communication and collaboration is needed for learning to occur was aligned by the researcher through Bandura's Social Learning Theory.

Leader particpants used social media differently than teacher particpants did. Leaders used social media to inform the school stakeholders on what was happening in the school district, as well as informing the public on what teachers and students were actively learning in the classroom or in extra curriculiculars. Leaders also used social media platform to gain public support for PjBL. (See Figure 4).

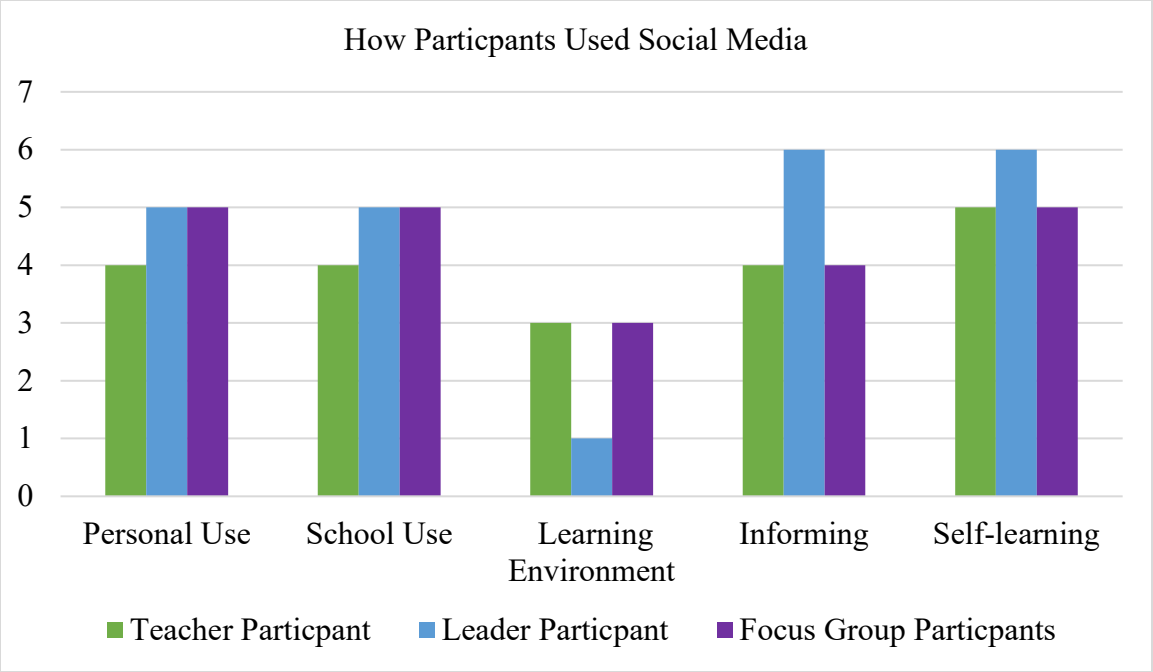

Figure 4. *Soial Media Usage*

Leader Participants said that they used social media for personal learning. Leader Particpant 10 said that he used social media for personal learning. "Twitter is my main social media. It's a place where I learn things from my trade." Leader Participant 8 said that he uses Twitter for his own professional development. According to Leader Participant 8:

> If I have a question about something, a lot of times I'll go out in the Twitter sphere and see who's talking about it. A lot of times I'll just flip through. You can keep up with all of it and I don't follow a lot of people. But there's enough obviously, that there's a flood of information, but there are certain people I really key in on and they'll have links and things I have. Sometimes I'll retweet some of those great learning opportunities that way. Or, just to share good things that are going on here in our district. I drive a lot of my messaging around 21st century learning around political realm.

Leader participants said they also used social media to showcase student and teacher classroom activities. Leader Participant 9 also uses social media for teaching and showcasing creativity in her staff and students. She said that there are "all open operational possibilities.

Teachers would have the vision to imagine the different topics in which kids could be interested." According to Leader Participant 6:

> Social media is used to push out announcements. Anytime we can get a student's name and a face out there saying they did a good job. I mean, I also use it to push out like, Hey, we actually teach things here—like I have a hashtag of '#foundsomethingcool'. I started it this year with my administration team and we just walk around every day and we find lessons that are cool, and we pop into classrooms and we take pictures of what they're doing or videos of what they're doing.

Social media for district leaders was also used to inform the public of the process of PjBL and student projects. With the change to PjBL in the school district, some community members were against the new educational methods for their students. Social media usage for the district tried to help these members understand that students were still learning, and teachers were still educating. In fact, the school district hired a communications specialist that predominantly uses social media to inform the public. "My job is to show you what is going on in the classrooms, because the old window that the community has in respect to how learning occurs, we put out information," said leader participant 7. According to Leader Participant 8, social media channels help the community understand what PjBL looks like for student learning in the district. The leader said:

> We understand that this is foreign to you, but like the labs still look like labs, kids still read books, like actual books, they do write papers. So, let me take some pictures [to add to social media] to really speak a thousand words. The community sees that school and PjBL look okay that it looks normal to them. I do think it's been a positive impact.

Leader participant 10 said that "people across the district, and parents, and everybody can see how [PjBL] is working."

The district uses several social media channels to inform stakeholders of the school district. According to Leader Participant 7 there were different audiences on the social media channels. The leader said that she informs the stakeholders a few times per day on each social media site that the district utilizes.

According to the leader:

> There's a lot of parents and teachers on Twitter, but some students are still using that as a communication tool, especially athletics. There's a lot of students who interact with our page on Instagram just by looking at the analytics and things that you can pull up on the business portion of that, as well as parents too. And then Facebook, most certainly is almost all parents or grandparents. There's not a lot of students on Facebook.

Table 4. Participants' Use of Social Media per Week

Times per week	*percentage*	*Count*
< 1 hour per week	6.25	1
1-9 hours per week	18.75	3
10-20 hours times per week	50.00	8
21-30 hours per week	25.00	4
Total	100%	16

The teacher focus group particpants said that leaders always inform the public through the diffferent social media channels. Participant 14 said that "we're always heavily informing parents through social media. Our district website is also put together really nice. It's easy to follow and navigate through." Participant 13 said that the district "bombarded the community with news on PjBL and the students' projects through the district's social media outlets." Focus Group Participant 12 said, **"**You know a lot of parents say they don't know what's going on in school but that's on them because we blast it out pretty good here in all sorts of media."

Teachers also used social media for their own learning and project building ideas for PjBL. They also used social media applicactions for student learning. Teacher Participants also use social media to showcase the work of their students. (See Table 4).

According to Teacher Participant 5, he uses social media to generate ideas for creative lessons for his PjBL classroom.

> I'm in love with Twitter. I mostly consume and not produce enough for Twitter-- I find other people doing cool things and I try to adapt those ideas for my classroom**.** I also love Ted talks. I show [students] every big project. I find that certainly every big project has an inspirational person-- They've done this, they're short. They're well edited. They make the people know what they're talking about- in very little time. Those Ted Talks give creative ideas for students for projects as well as gives real views on condensed ways to present an idea.

Teacher Participant 1 also uses social media in her classroom. Students need to add their final products of PjBL to their online portfolios.

> Every time we end a project, students will have some sort of production piece for that. Like this project we're doing—my hope is that they'll take it and kind of push it out [adding it to social media] for audience feedback. I like the idea of sharing. If it's something that they've put some time and thought into, they're proud to let others see it. They're passionate about it and sharing that with a wider audience. I like the ideas of them viewing things and making their own comments and analysis of it.

Teacher participants said it should also be a student choice to present information in a public digital portfolio. According to Teacher Participant 3:

> I know a lot of our students have Snapchat and Instagram. I got that. But that is their choice. Me forcing them to have an online digital portfolio where they put their work. I don't feel comfortable doing. I don't think children should be forced to have that online presence if they don't want it.

Teachers use social media, such as Twitter, Facebook, and TED talks for their own personal learning. However some teacher's claimed that they do not use social media at all. (See Table 4). According to Teacher Particpant 4:

> I'm very wary about social media being a part of a generation, and I guess now that my generation's getting older in the eyes of the students. I'm wary to involve it. I'm wary to tweet. I have a Twitter, but I don't do much with it. I have presence on social media, but it's very much just to see what other people are doing.

Teacher Participant 2 said:

> I guess when I feel more confident in bringing that into the classroom I will. I do want to have a profile and a presence as a teacher on social media; but right now, I'm very

> hesitant. Seeing it being used by teachers in a way of "hey, look at the cool things I'm doing, or let me share this article" That's something I want to do, but I'm just not there yet.

Subsequently, both teacher participants, who said they do not use social media in the classroom utilized Google Collaborate, Ted Talks, and You Tube during PjBL. It is important to note that the researcher has included these applications in her definition of social media, and even explained this definition during the semi-structured interviews.

One teacher participant used social media collaborations through Google classroom. Yet the participant said that some students do not understand the concept of using social media for educational purposes. In fact, three teacher participants said that students do not understand that learning takes place everywhere. According to Teacher Participant 3:

> They think of something you can comment on, et cetera, as something that's separate from school. So, when it comes to schoolwork, when we've tried to do online discussions with students, because there is a way to do it on Google classroom, they don't understand how to do it because I don't think they see it that way. They need to learn how to do that. But a lot of my students don't really understand how to engage that way, which is probably something that needs to be taught to them.

Sharing Projects with Others. Teacher Participants said they use social media applications for the students to present their projects to an authentic audience. Participants said that this helps motivate students to learn the concepts of what was taught. Social media allows for a large-scale audience versus just one teacher and classmates. According to Teacher Participant 5:

> Before PjBL, the only one that would see students' work is the teacher. I want to use social media as some positive peer pressure to be like 'hey, this is you. This is your brand. This is what you're doing. This is how you want to represent yourself.' That's how I want students to use social media for collaborating and showing off student work.

Teacher Participant 1 has echoed the latter sentiment.

> If they know it's going to be shared a little bit, I think they put more work into it. I think there are some especially if they know there's a presentation part involved, where they're talking in front of their peers, they put a little more effort for sure.

Other than sharing with others, **social media is a way to create a multimedia presentation of a concept learned in the PjBL environment.** While some teacher participants, such as participant 2, would rather have students learn definitions that would be useful in learning a concept, some teacher participants use social media for students to master concepts in a creative way. According to Teacher Participant 5 and focus group participant 13 and 14 using new social media applications that students utilize on an everyday basis, students are more motivated to learn. Teacher Participant 5 said:

> Students are all in love with videos on YouTube and Tic-Toc. Since they use it, it seems stupid that I'm not using Tic-Toc for a vocab word. They'll make a quick video for fun, so now I'm trying to do this for educational opportunities like having them create something fun for a vocab word- they'll never forget the meaning then because they worked through the PjBL process.

Other teachers have begun to follow the students' social media usage patterns, where they have incorporated some of the social media applications in their classroom, such as the ten-second Tic-Toc video, where a quick concept could be discussed and visualized.

Teacher participant 16 said that for classes, students have analyzed tweets on Twitter to discuss current events to discuss in the classroom, where students would tweet their opinions in the global world. Participant 15 stated was convinced that Twitter is "is an untapped gold mine" for the classroom.

From a Traditional Classroom to Online At Home. In the closure of all schools in Ohio due to Covid-19, the Novel Corona Virus, digital learning through PjBL has been used in all aspects of education for school district. The school closure began at the end of third quarter, so

teachers and leaders across the state had to find a different way of student instruction. While other districts struggled to educate students because of the lack of resources, the school district was in a position where all students already had one- to-one computers. The District leaders quickly mobilized internet access for those students that did not have internet capabilities at home.

According to the leader participants, communications continued to be utilized through emails, as well as social media sites. The district had also implemented the usage of a digital telecommunications application called RingCentral, which is a communications method via an internet capability. The Zoom application and Google Meet were also used for video conferences in order to record meetings for a paper trail of communications. The school board also used YouTube to host committee and board meetings for the public to still be involved in the democratic process. During this time, the leaders and teachers had altered plans of how PjBL should be utilized at home. Teacher Participant 4 said, "the introduction of Google Meet for staff and student collaboration was praised by teachers because it allowed us to see students face-to-face and provide appropriate interventions and support.

Leader Participants 8 and 9, said that it was too early in the epidemic to understand how PjBL was working in a remote school; however, Leader Participant 7 said that parental response had been good.

> We have seen a tremendous response and gratitude from our parents and community in regard to how well-prepared and well-equipped students were to transition to home-based learning through See Saw, Summit Learning, or Google Classroom, said Leader Participant 7.

Leader 10 said that the school community is more supportive of PjBL.

> We have had a great deal of positive feedback about how smooth our transition to remote learning has been and having the technology tools and methodology in place that we did has allowed that to occur.

Teacher Participant 5 also agreed. The participant said, "from what I have been hearing, the vast majority of parents are supportive. Many of them don't really know why we are working this way, but I think they are seeing the difference."

Teacher Participant 4 said that PjBL made them better prepared for the school's closure.

> This unique time has thrust parents into a more interactive role with Summit because they are forced to ensure their children are working and adhering to deadlines. Some parents have voiced frustration simply because of the amount of work or variance in communication styles and mediums for different teachers, but those aren't issues that are a result of using Summit, specifically; instead, they speak to concerns many parents in general have now that schools have transitioned to remote learning. I would hope that parents and the community of [the school] appreciate the advantage that our district had in continuing to provide education through 1-1 devices and usage of Summit. I feel that at the end of this interesting period in education that the community and parents will be thankful for project-based learning not only due to its flexibility, but it's reliance on *whole* learning of concepts and mastery.

One concept that Leader Participant 9 said was that parental perception was "wary" as moods often change over time. She said:

> One thing we need to be careful about is people drawing the conclusion that distance learning was always our goal—because it certainly was not and is not!! Not Summit's either!! We are not online school!!

Leader Participant 9 also said it was time for the community and the schools to work collaboratively. The leader added, "what I see emerging is a new realization that we need to be together in real time before effective PjBL can take place.

While other school districts in Ohio had a hard time transitioning from a traditional school to remote learning, the district due to the access of technology was able to continue their learning routines at home. According to Leader Participant 10:

> Using PjBL within Summit Learning has been a tremendous benefit for both teachers and students because as other schools were scrambling to prepare content and post it online (or print out packets and distribute them), our students just continued their learning on the platform with remote support from teachers.

Teacher Participant 4 said that she was "beyond prepared" as students worked on the "online platform that relied on self-motivation and time-management to complete work." But she added that she extended the timing of checkpoints for PjBL and that students appreciated increased flexibility to complete assignments." Teacher Participant 3 said, "This type of learning, whether in the classroom or not, takes a great deal of self-motivation and the ability to work independently."

Other teacher participants said that the remote PjBL offered more creativity. According to Teacher Participant 5, "students now have some choice in their projects and without someone constantly looking over their shoulder pushing them to work. Voice and choice gets more student buy-in." Teacher Participant 4 said that "the quality of work has not diminished" on behalf of the teacher or student, as students are still required to complete assignments, as well as produce and showcase projects. And teachers still offered "rich feedback" for revisions in PjBL.

PjBL was still present throughout the district learning when students remotely learned concepts. Some projects, according to Leader Participant 9 had changed from class projects to a community project. For instance, to celebrate Earth Week students across the district were encouraged to participate in order to help the environment. Students were then required to use social media applications to showcase what they did for the project. In an AP French course, students created a menu for French food and served the food to the community in need. In another course students were studying WWI before the school closure. Focus Group Teacher Participant 14 said that some of his students created projects that compared the Spanish Flu epidemic to Corvid -19.

Teacher Participant 5 used the time of remote learning for students to create an Astrobiology project based on a fictious alien world. The students were then required to post the

presentation of a fake news report on social media through YouTube then advertise it across Twitter, Instagram, Snap Chat, and Facebook. The teacher participant said that the use of social media was required for audience feedback. The participant said that when information is shared to a wide audience, students seem to try harder on the project itself. "I'm trying to encourage them to make a high-quality final product," he said.

Summary of Results and Themes

The qualitative findings of this case study aligned closely with the previous research and literature. Vivo and thematic pattern coding were used to categorize responses into pertinent themes that were presented and discussed in this chapter. The data results in relation to the literature review, as well as the triangulation of data, are further discussed and explored in Chapter 5. As a result of the analysis of the data from the demographic questionnaires, the semi-structured interviews, and focus groups, nine specific themes emerged in response to the research question. The focal question for the study, developed by the researcher, was: **How do educational stakeholders (leaders and teachers) use social media technology in a project-based learning environment in a northeast Ohio suburban school district?** To answer that question the research explored how PjBL has changed the educational environment in the school district.

The conceptual framework of Mishra and Koehler's TPCK and Bandura's Social Learning Theory were both utilized for the analysis of this study, as well as the researcher's theoretical underpinnings of the social constructivist viewpoint. This will be discussed in more detail in Chapter 5. Furthermore, the data demonstrated the various ways that leaders and teachers implemented PjBL in their educational environment, as well as how they utilized digital and social media technologies to support this environment. Also presented in Chapter 5 are the

conclusions and limitations of the study, as well as recommendations for further research on this significant 21st Century challenge to American education.

Chapter V: Conclusion

Introduction

The purpose of this chapter is to offer a final synopsis of the data analysis and implications based on the findings of the study. Potential limitations which emerged during the study are also identified, as well as a discussion of how the analysis and results are related to information found in the Literature Review. The researcher offers inferences of how the findings are applicable for future practice and theory. That includes recommendations for applied research for school leaders wishing to implement project-based learning (PjBL) and use social media applications for collaborative purposes in teaching and learning. The researcher also describes how the previous literature enlightened this study, and how the results have provided new knowledge for the learning community.

A significant goal of this study was to provide insight for the educational community based on the perceptions of leaders and teachers at one suburban school district in Northeast Ohio. It was expected that new research and knowledge generated by this study data, would contribute to the literature in the field, [1] on how social media usage allows for sharing and collaborating with others in the PjBL environment; and [2] on the positive impact of cultural change in organizations, on the implementation of new designs, especially within education.

Reiteration of Study

In designing the methodology for this case study, the researcher was inspired by the conceptual framework of Bandura's Social Learning Theory, and also the Technological Pedagogical and Content Knowledge model (TPCK). Bandura's concept is a behavioral learning theory where individuals learn via modeling and collaboration with others. The TPCK framework is a step-by-step process which combines educator pedagogy, the lesson/ activity, and technology together. The blended framework allows teachers to connect these three elements in order to have a stable workplan for students. The focal research question was: **How do educational stakeholders (leaders and teachers) use social media technology in a project-based learning environment in a northeast Ohio suburban school district?** The interview questions asked of participants during the data collection phase of the study were based on both Bandura's learning theory and the TPCK framework (See Appendix A for interview and focus group questions).

The study used both a semi-structured interview protocol for teachers and leaders, as well as a focus group of teachers, to find how they used social media technologies in a PjBL learning environment. There were several supporting goals or targets which the researcher set out to identify and understand in this environment as well:

- How technology integration benefited in the learning environment.
- What the benefits were, if any, of using technology with PjBL.
- What barriers to technology have teachers and leaders experienced in the classroom setting in particular.
- How social media was applied and used in the learning environment, or school setting in general.
- The recommendations of teachers and leaders to implement project-based learning with technology in the classroom.

Through the application of the constant comparative data analysis method, the researcher analyzed the interview and focus group participants to find commonalities in their experiences with project-based learning. The researcher recorded the interviews and used a **memoing** technique during this time.

The use of **memoing** provided key terms and themes to further explore. The researcher also grouped the questions together though categories of teachers and leaders. The QDAS software utilized during the data analysis was NVivo 12 Plus created by QSR International (QSR International, 2019). NVivo allowed the researcher to further analyze the data through word maps and word frequency charts. The last coding phase used NVivo to automatically categorize themes for the researcher to further explore for analysis. Careful and consistent use of the constant comparison data analysis method (with the aid of the QDAS program), allowed the researcher to identify three main themes, each of which consisted of three sub-themes as pictured here (see Figure 5).

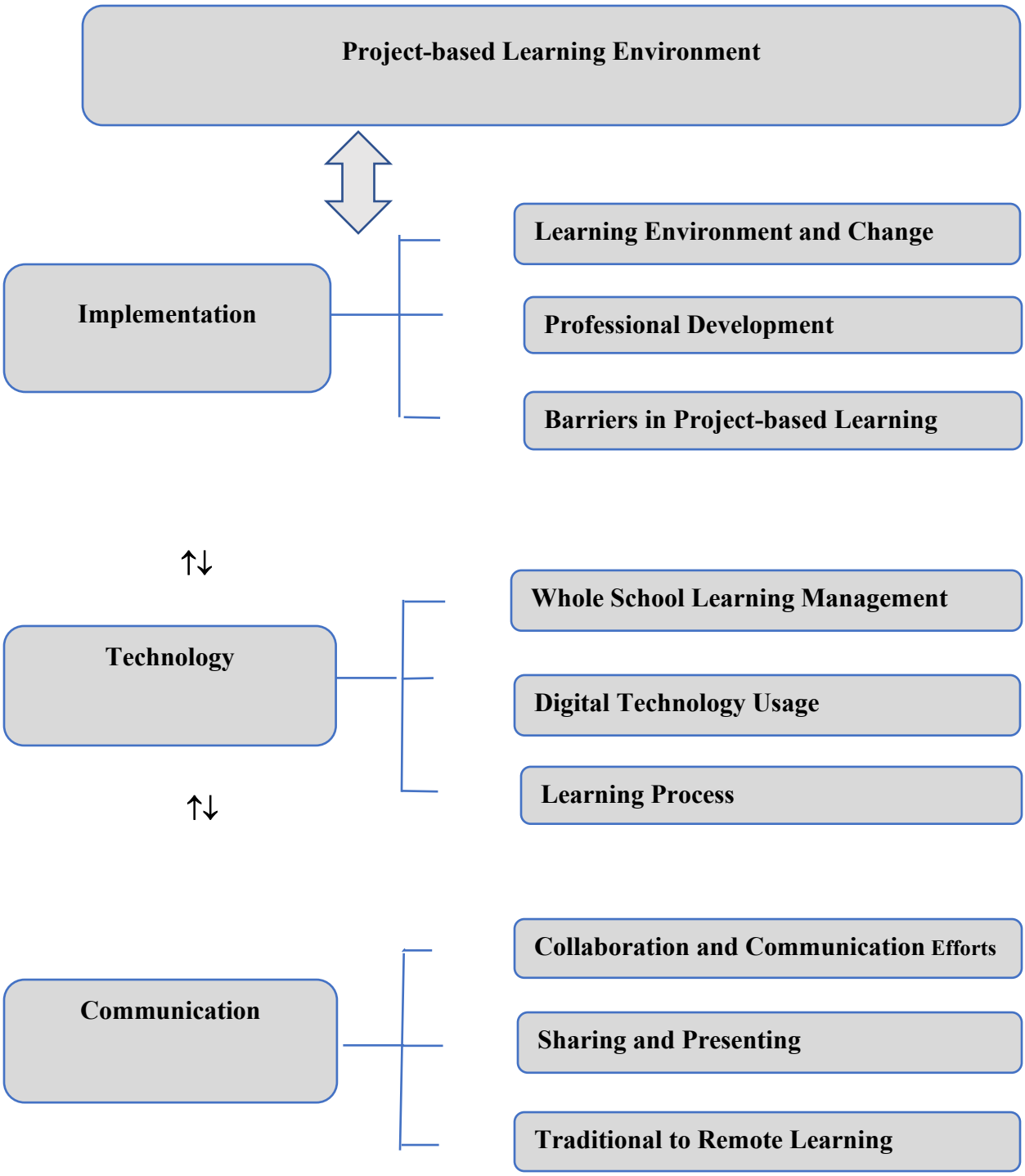

Figure 5. Themes found of Participants' Influences from Project-based Learning

Synthesis of the Study Findings

The conceptual framework of the study was based on Bandura's Social Learning Theory as well as Mishra and Koehler's framework of the TPCK. The study design combined these two concepts to determine how social media technologies were used by stakeholders (teachers and leaders) in a project-based learning school environment. During the analysis stage of the study, the researcher used the constant comparison method to understand how Bandura's theory and the TPCK is used in the school environment. Comparisons of both leader participants and teacher participants in their usage of social media in the project-based learning environment is further discussed below. The findings are arranged in thematic categories which emerged from the constant comparison data analysis method (see Figure 5).

Learning environment and change. Implementing PjBL took place in incremental stages. However, these stages of change were challenging due to barriers in the staff implementing the new learning pedagogy. Stakeholders initially found it difficult to accept the change.

Implementation of project-based learning. Leaders said that using PjBL would aid the district in higher scores for state mandated tests. The use of PjBL was said to aid in the students' ability to become problem-solvers and creative thinkers. Leaders also stated that PjBL allowed the students to reiterate what they learned in different ways as learners reflected on their own education throughout the PjBL learning process.

Barriers in project-based learning. Barriers were challenging as PjBL began to be implementing in the school district. These barriers were due to the changed school environment. There was some push-back from teachers who thought that their way of teaching was the only

way to teach in their subject matter. The age of the participant teachers, and the years taught by the participant teachers also caused barriers when first enacted in the school system. These barriers were due to technology use for classroom learning. Social media use by teachers and leaders also varied by age and years in their teaching careers. While some teachers embraced digital and social media technologies, others found it hard to understand why the district needed to use social media platforms to inform the community stakeholders.

Professional development. Professional development was used to train teachers how to use the PjBL pedagogy in the classroom. The professional development took place throughout the implementation process. First, the leaders asked for volunteers to join a conference of the school's learning management platform. The teachers that attended and learned in this conference, brought their knowledge back to the district, where they became role models for others to mimic in their specific classrooms. District leaders reorganized the school day and created groups out of grade level or subject teachers for collaborative teams to further continue workforce development for PjBL, where groups met daily/weekly.

Workshops for workforce development also included hiring outside consultants to help model to teachers how to use PjBL and technology in specific classroom subjects. Leader participants also began training individual teachers in technologies that they wanted to use in the classroom for specific learning purposes, instead of training the entire staff at once for technology they may not use right away and then forget about how to use it. District leaders remained transparent to both staff and students. The school board and leaders also had open communications with parents and community members. The communications dealt with the reason as to why PjBL was implemented, as well as the progress of PjBL in the learning environment.

Technology in the school district. The school district had a wide variety of technology for employee and student usage. This included a one-to-one computer model, a learning management platform, digital technology used, as well as the intent for the learning process to have utilized technology. These were combined in the district to aid in the PjBL learning environment.

Whole school learning management platform. The learning management system (LMS) used by the district is the Summit Learning Platform. It allowed students to learn at their own pace, where teachers helped student revise and learn in a more in-depth way regarding the subjects that were needed for the state and federal curriculum. Teachers in the district used the Summit Learning Platform, which already had built-in checkpoints needed for lessons. Teachers and leaders heightened students' learning through a process where revisions and more in-depth learning were needed by students to ensure mastery in the subjects. Some teachers, however, did not use checkpoints built in to the LMS, but instead added their own checkpoints. The LMS also allowed teachers, leaders, parents, and students to track the work completed in the classroom.

Digital technology usage. The school district utilized digital learning to make learning possible in any environment. This allowed students to further explore concepts, which are needed for education that are not found in a textbook. Students were able to further explore these concepts on their own or with the collaboration of others. The embedded material found in the Summit Learning Platform was of a digital nature; therefore, the educational environment was able to be accessed at any time. Digital learning has also allowed students to create digital portfolios, where students were able to save work done in their years of school, as well as revise that work for concept mastery, as the student moves to higher grade levels.

There were obstacles that also followed digital technology usage. According to leaders and teachers, some students used the digital platform in a negative way. Teachers in the district have said that computer ethics were needed in a learning environment. Some of the non-ethical behaviors of students have been diminished through the technology department which enabled a filter where students cannot access certain sites which could be problematic, such as sites where students could plagiarize information or find information that is fictitious.

Learning process. The goal of each teacher in the PjBL environment is to facilitate lessons so that students were able to learn through doing. Teachers at the district said that students were required to revise projects as nothing is ever perfect and more learning is always needed. The collaborative process in PjBL allowed students to learn from others. The PjBL process also allowed for students to revise their thinking in order to incorporate new ideas. Teachers collaborated with students in order for students to have a better understanding in the class material. This collaboration was also needed as students revise and rework projects, as PjBL is a process of learning.

At the end of the students' high school career, the school district leaders have students discuss their digital portfolios as an exit requirement. Some teachers required students to post their projects in the portfolio, while other teachers allowed for students to have a choice of content for the exit portfolio. According to district leaders, students were to discuss their projects as outcomes to explain what they learned and how they revised the projects for mastery in the concepts learned throughout their school careers.

Communications methods among stakeholders. The third major thematic finding of the case study data was communications. The sub-themes of communications involved the collaboration and communications efforts of the district and school stakeholders, the sharing and

presenting process of project-based learning, as well as how traditional to remote learning has affected the educational system during the Covid-19 outbreak.

Collaboration and communication efforts. Leader Participants in the district used social media to show-off their students' learning by highlighting classrooms or students' work to the community. They used social media to help the community understand what was being taught in the school district for community support. Teachers used social media, such as Twitter to stay up to date on educational concepts that they could incorporate in their own classrooms. The majority of teacher participants used social media in their personal life. Of the teacher participants, 60% of educators have not used social media in the classroom.

In line with Mishra and Koehler's TPCK framework, teacher participants said they were aware of technology in their specific curriculum. Teacher participants chose applications they have used in order to augment a hands-on learning environment. Some teachers said that students were always abreast of new types of social media. These applications should be incorporated into the classroom for student learning in order to make learning fun. One teacher said that students were always using Tic Toc to show-off what they did away from school. The teacher participant hopes to incorporate the educational aspect of Tic Toc where students could show-off definitions or educational concepts. This would allow students to collaborate and teach others what they learned in school using a social media application, both educationally and socially.

Sharing and presenting. Teacher participants said that they have used social media applications for students to have an authentic audience. Some participants said social media application has helped the students to become motivated throughout the learning process, as it allows for a larger audience than a classroom with a smaller audience. Social media has allowed

students to create multimedia presentations that would not be possible with pen and paper. Some classroom teachers have used Twitter to have students discuss current events. As stated in a latter paragraph, leaders used social media to share information with the public about the learning environment.

Traditional to remote learning. With the change of the school environment from the typical classroom to at-home learning, the district has had less difficulty than they perceived other school district have had in the change of the learning location due to Covid-19. District leaders used the social media platform to keep residents informed of how learning has changed. Social media has also helped stakeholders stay informed about new requirements or announcements. Teacher and leader participants also used digital and social media applications to give announcements to students about assignments or to push-out announcements to community members about the school environment.

District teachers used digital media, such as Zoom, for classrooms to stay together apart for class collaborations. Some leader participants said that the previous usage of the learning management platform allowed students to still learn away from school. District leaders also said that the use of the learning platform also immersed parents into how the LMS worked in conjunction with PjBL. Some teacher participants said that since students were accustomed to PjBL through the Summit Learning Platform, they were able to continue their classroom agenda of teaching, as well as continuously helped students revise their work for the PJBL model.

Discussion of Results in Relation to Literature

The discussion of the results of this study have confirmed the research findings of several studies in response to the project-based learning environment, as well as social media usage in the school environment.

Learning environment. According to Miller's (2016) mixed methods study of a flipped classroom, a specific school design allowed educators to use class time to differentiate coursework for students using problem and project-based learning methods. In this study, teacher participants said that they use PjBL in the classroom to help students gain mastery of the subjects studied through the learning process. Teacher participants stated that feedback is constant in the classroom. This feedback allows students to revise their work and thinking for students' mastery of the subjects.

Aligning mission and vision. According to three leader participants in the school district, school officials have changed the district's mission and vision based on technology and PjBL for student learning. That positive transition echoed or affirmed Miller's recommendation that a school should align their mission and vision to a student-centered approach to leaning, such as what is found in the project-based pedagogy.

Learning management system. Four Leader Participants said that the district alligned its mission and vision statements based on the objectives of project based learning. In this study, leader participants said that the LMS the district used was free. However, the district has taken a pro-active approach for the future. The district has collaborated with parents, business leaders, and teacher stakeholders to analyze other learning management platforms which could also be used for PjBL in the classrooms. These findings corroborated with the findings of Porter (2003) and Slavit et al. (2016) in that there needs to be planning in place for technology. One leader participant said that there is a cost to other programs, which could make other programs unlikely to come to fruition in the school district during the Covid-19 pandemic, due to budget shortfalls.

Teacher and leader participants in the school district have used a learning management platform for the educational environment. In fact, leader participants said the learning platform is necessary to create a PjBL environment. This finding concurs with DeCapite and Bush's 2016 study where, a consistent environment was needed for PjBL learning. The school district has used the Summit Learning Platform, which allowed teachers to have students work collaboratively together to solve questions needed to create projects. The teacher participants used Bandura's social learning theory as they collaborated with students through feedback. The participants used scaffolding techniques, such as modeling, as they used the benchmarking concepts in the Summit Learning Management system. In congruence with Pektas and Gurel (2014) study, teacher participants stated that the LMS showed students on-demand class information, such as the assignments due, the teacher's feedback to students, and a plethora of online resources for the PjBL environment.

When project-based learning is implemented as mini-projects, Vega et al. (2013) found that students learned more knowlege. These mini projects could be viewed as checkpoint lessons for the larger project, where constant learning and revisions were necessary components for PjBL. Not all teachers in the district used the LMS as it was designed. According to Leader Participant 9 and Teacher Participant 4, some teachers deleted the checkpoints that the learning platform was equipped with, which led to student's not having enough feedback in their learning adventure. According to Teacher Participant 4, sometimes teachers just want to use their pre-existing lessons instead of the district's mandate of PjBL, which aligned with Jacob (2017), who found that the LMS was easy to manipulate.

Professional development. One question that was asked of the teacher and leader participants dealt with professional development in the school system as they implemented PjBL,

and their responses strongly suggested that teachers would further benefit from professional development (again agreeing with Miller). Leader participants said that professional development has been implemented since the inception of PjBL, through conferences and meetings. Subsequently, focus group participants said that they would further benefit from professional development if they had instructors that taught with PjBL in their specified subjects.

One leader participant in the district said that years ago digital technology for learning was taught to every teacher in the district at once; however, that has drastically changed. That participant said that if teachers want to use a specific digital technology for PjBL, they will learn it as an on-demand learning, where a small group of teachers would learn how to use the technology. Some teacher participants have taken advantage of the on-demand professional development learning, and some said that PD was necessary to stay in pace with digital technologies.

The district utilized week-long conferences when school was not in session to allow for teachers to learn what PjBL was and how to implement it in the classroom. This confirmed the findings of the Dole et al. (2016) study. The reseachers found that more than half of the teacher participants would use what they learned in the conference during the school year. However, some participants said they would not use this teaching method as it was time consuming. In the district, teachers mentioned that when PjBL was first implemted it was time consuming because particpants were learning how to teach in this pedegogy. Most focus group particpants in this study said that the process of teaching and learning has taken longer because it requires feedback from the teachers and revisions from the students.

Collaboration Among coworkers. In the district where the study took place, teacher participants said that they have one day each week where teachers have team level or subject-

based meetings to discuss curriculum and PjBL in general. Teacher participants also stated that they meet with a specific group of students one day of week to ensure that they are staying on track for the completion of assignments. Timetabling, which Lucas (2018) defined as time to develop curriculum, was not considered for the teacher's workday. One common theme that emerged from this present study was that teachers needed time to collaborate with faculty in order to share best practices for technology. The teacher and leader participants in this study said they had time to collaborate with their co-workers for best practices and results.

Technology in the district. Technology tools are important for project-based learning. In fact, there are several researchers who have studied various aspects of the learning environment with the use of technology tools, including Ravitz and Blazevski (2014). They found that technology to support project-based learning has many benefits as it allows students to collaborate with others and gives students more resources for learning by inquiry than just the textbook. **Teacher Participants in the present study said that they had multiple resources to scaffold students higher order thinking skills during PjBL through online resources, including social networking sites.**

Social media. Social networking sites (SNS) and social media communication systems (SMS) have been studied by several researchers. Facebook has grown in popularity over the last decade and is one of the most widely used social media applications in the United States (Noyes, 2018; Pew Research Center, 2018). In the present study, the researcher found that only one particpant used social media less than one-hour per week; while four particpants used social media platforms more than 21 hours per week. Erol et al. (2017) had found that teachers experienced in SMS, used it as a form of research for school, as well as communication and entertainment. But in this study, only 50% of teacher particpants used social media in the

classroom, whereas leader particpants used social media for the overall school environment to communicate with all stakeholders.

The integration of collaborative computer applications such as Google Collaborate are beneficial in the learning community as students stay more engaged in the learning process. Students actively engaged in their own learning become aware of innovative ideas in relation to learning with others, which aligns with Bandura's Social Learning Theory. More than half of the teacher particpants in this study used social media sites for collaboration in the classroom for students' engagement and motivation . For example, one teacher particpant used Google Collaborate to facilitate learning in the classroom. Two focus group participants also used Twitter to engage students on societal issues for students to obtain global views from others for class discussions.

E-learning and digital competencies. According to Jackson (2015), the *baby boomer* generation has been slow to access modern technologies; but the younger generation is on a steady increase in the last several years. She found that it could be due to any social, gender, age, disability, or class. Leader and teacher participants said that that they do not feel there is a digital divide amongst co-workers. They said that they all have utilized some sort of technology; however, some age groups are more cautious than others via their classroom use of specific applications.

Educators used several tools to initiate and continuously motivate students in project-based learning. When forming a lesson or unit, teachers would need to find the right application or technology tool that provided the "best fit" for "deeper learning in terms of instructional material and engaging experiences" (Conn, 2013, p. 37). The TPCK framework illustrates how technology and instruction are combined to form a lesson. Some teacher participants have

willingly embraced these technologies. One teacher participant said that he wants to integrate new technology applications such as Tic-Toc for a fun way to learn definitions needed to understand class material. Another teacher participant used Ted Talks to help students understand the key aspects of speech and debate. By using these platforms, teachers are keeping in pace with a younger generation's technology usage. This technology could then be used for not only entertainment purposes, but for educational purposes as well.

Technology applications in project-based learning. There are several applications that students and teachers are able to create and/or use in a project-based learning environment. Leader Participants used social media to communicate the final stage of the project to the public through social media applications such as Twitter. Through collaboration and planning, students would have satisfied the ISTE standards and Ohio Technology Standards. Teacher participants had students showcase their final projects to the community through social media or blogging websites. When students produce and share with the public through social media, they have completed course level standards for the technology standards. When students produce their work for an audience, they also tend to learn better and stay more engaged, which was in congruence with Hopper's (2014) findings.

Collaboration. PjBL combined with online discussions effect the learning process because it increases students' knowledge, which in turn revises the intended project (Wu & Hou, 2014). In the brainstorming stage, students planned collaboratively through discussions. Using PjBL combined with online discussions has made the teaching process more interactive, while it has increased students in-depth understanding of discussion topic (Wu & Hou, 2014). This case study showed that communications is a process for both teachers and students. Teacher participants said that technology allowed the students to learn from each other, as well as

allowed the teachers to make needed changes based on failed ideas, which in the end yields to a greater understanding.

Reverse Course Planning. Teachers benefited from professional development of technology to implement new technology into the school setting. Several researchers used the backwards design method, where the coursework was planned in reverse order. This means that the end project or goal is created first when the designing of the curriculum occurs (Condliffe et al., 2017; Veletsianos, et al., 2016). Three teacher partcipants in this study said that they also plan the lessons and units in a backwards design method. One focus group particpant said that he thinks about what types of projects that he wants his students to complete through brainstorming. He also uses the TPCK to think about learning outcomes needed for the unit. The teacher partcipant then plans his lessons backwards.

Limitations

The qualitative data provided significant insight into teachers' and leaders' perceptions on the use of project-based learning in conjunction with digital and social media technologies; but because it was a case study, the data collection was limited in scope. The case study was bound by the location and time, as well as the participant selection. The study criterion was that a teacher or leader needed to work in the district since the implementation of PjBL (See Table 3). The possible participants also needed to use some form of social media. (See Table 4). This case study was limited to one single school district in Northeast Ohio.

Data collection. The data collection for the study involved a six-week time period, where a questionnaire, interview, and focus group were employed for analysis (See Appendix A for participant questions). Follow-up questions were then emailed to all participants of the study.

The questions were based on at-home schooling for PjBL, as well as social media usage, during school closures due to Covid-19 (See Appendix A for follow-up study questions). Approximately 50% of the participants answered these questions. Although the study was limited to a single location that had a small number of participants, the research could be illustrative and extend to other school districts. Leaders may want to explore how PjBL and social media technologies are viewed and utilized in the educational environment.

Participation. The researcher encountered other limitations during the sampling and data collection phases of the research. One limitation was the lack of study volunteers for the questionnaire. The questionnaire was intended to be used to recruit for the interview or focus groups of participants (See Appendix A for the questionnaire). The total questionnaire distribution was 34 out of 59 possible participants, which was 58%. Of these respondents, 14 indicated that they were interested in becoming participants for the semi-structured interviews or teacher focus group. When the researcher analyzed the questionnaire data, 12 respondents qualified for the study. The 12 possible participants were contacted via email to set-up times for the semi-structured interviews or a tentative future date for the teacher focus group.

When contacted by a confidential email, a total of 11 teachers and leaders showed further interest in volunteering to participate in the study. As the researcher wanted a minimum of 15 teachers and leaders for the study, the researcher used recommendations of possible participants from the teachers and leader who had volunteered for the study. The researcher wanted to find all participants through purposeful sampling; subsequently, the researcher had to use the snowball sampling method to gain three more participants. The total number of participants for the interview and focus groups were 16 individuals.

Scheduling interview and follow-up. The leader and teacher interview groups, as well as the focus group, were all contacted by email to schedule interview times. The researcher had a six-week window for data collection; however, the time from questionnaire to the end of the interview process took eight weeks. The interviews were all scheduled and took place during school hours. A follow-up email, which contained questions relating to PjBL and social media/digital technologies was sent out to each participant. The questions were necessarily based on the premise that PjBL was succeeding/ failing in a home school environment during the Covid-19 pandemic, which may have been a limitation.

Implementation: Theory and Practice

There are many ways to implement project-based learning into education. According to Condliffe et al. (2017), suggestions in the study included that teachers and schools could use an already developed curriculum, develop their own curriculum and projects, and implement PjBL in the entire school system. By completing any of the latter, one would need to consider how and what is to be taught. After implementing PjBL, revisions should take place by evaluating how the students learned the material, as well as how the teachers implemented it into the classroom.

Technology usage. In a two-year study by researchers Carlson and Patterson (2015), teacher participants were asked to make sense of the technology utilized in a high school to coincide with the school's mission statement. The answers revealed differences of opinion from those who felt technology was not necessary to those who felt it was necessary for students. The study was used to find a common ground were a mission statement could be further aligned with school district to bring stakeholders together for a common goal (Carlson & Patterson, 2015). The data in this case study revealed that technology is needed in schools as part of the

PjBL environment. However, data also suggests that teachers and leaders use technology in the form of social media differently. In a PjBL environment common usage of digital and social media technologies should be aligned to the district's goals.

Teachers should be using technology in their classrooms, where local resources play a role in students' learning. That recommendation confirms the findings of Tondeur et al. (2017). The teachers and leaders utilizing PjBL in the classroom are the ones who should train others in the usage of the technology in the classroom. Teachers must be aware of differences in the learning styles and diverse cultural concerns based on what is the appropriate internet content for the age, race, economic status, and learning abilities of the students.

TPCK framework. In line with Mishra and Koehler's TPCK framework, teacher participants said they were aware of technology in their specific curriculum. Teachers also need to learn how to use technology to utilize it to the potential in the classroom (Condliffe, et al., 2017). Teachers in the district have the opportunity to learn technology for the PjBL environment through conferences and professional development and then have an opportunity to help instruct other teachers based on the materials learned in these sessions. Teacher participants chose applications they are familiar with and have used in order to augment a hands-on learning environment. One must also consider professional development of the teachers themselves. The professional development would instruct teachers how to be facilitators of the learning experiences of PjBL as well as how they should scaffold students' learning, through "rigor in the learning" experience itself (Condliffe, et al., 2017, p. 29).

It is challenging to hold professional development on an ongoing basis to keep-up with modern technologies for the classroom, such as training teachers in the TPCK model. The leaders and faculty of the school must use resources wisely for the knowledge of the students.

The lack of teacher professional development causes web 2.0 technologies to not be used to the greatest potential in the student's learning environment. More than half of leaders and teacher participants in this study perceived that professional development in PjBL and digital technologies occurred in the school district. For school districts or individual teachers to succeed in a project-based learning environment, the recommendation would be to train teachers in both Bandura's theory of social learning as well as Mishra and Koehler's framework. If the framework is understood correctly, the teachers and leaders should understand and be able to choose the right technology in conjunction with PjBL in order for students to define answers to the problem through the creation of a project, which could be of societal concerns.

Business approach. Using the PjBL model in education needs a business approach as well. A framework to set up at the schools to create new mission and vision statements should be made in conjunction with implementing PjBL. PjBL will increase student engagement, student-centered learning, and community connectionism where all students could learn globally. Research indicates that change must be created with a large-scale initiative; but, with revisions as problems arise. These could include issues with syllabi and curriculum, teacher training, timetables, and teacher's ongoing professional development, clearly curriculum changes are needed as technology advances, thus there is a need to change the way teacher's present materials to their students. Technology now gives us the ability to use applications such as social media technologies to create a more synchronous environment when needed (Fullan & Scott, 2009; Marx, 2006).

Leaving the traditional classroom

The global pandemic of 2020 has ushered schools into an era of uncertainty. However, this study has proved that digital and social media technologies are beneficial to project-based

learning if both the TPCK and Social Learning Theory are utilized (as indicated throughout this research study). PjBL would be a good teaching method for a blended learning environment, where students could meet with teachers two days per week as a class for collaborations. The two remaining days per week, students would work independently on research and revising for projects, with feedback from the teacher. The students would utilize social media for project sharing as social distancing has caused a lesser amount of people for audience members.

Implementing a New Learning Environment

Responsible Innovation is a balance between getting the product to the market for its market share and stakeholder protections, according to (Pavie, 2014). The balance of responsible innovation ways out the consequences in the social and environmental sectors of life (Pavie, 2014). Through responsible innovation stakeholders can look at the product as an innovation and see the "implied risks" (Pavie, 2014, p. 3). There are several factors to consider when innovating. These are liability, economics, responsibility, and the work and life balance of stakeholders (Pavie, 2014). In his book, Pavie discusses who is responsible for innovation. Since a school district is being studied as an innovative change process, one would think that only the school superintendent and board members are responsible innovation, but this is not the case. In this case study, leader participants said that they show the public what is happening in the classroom and schools through posts on social media. They are also responsible to make sure that teachers are using and are continuously trained in technologies for use in the PjBL environment. Teachers use technology in PjBL for collaboration amongst their students in the classroom, as well as to communicate the progress of specific learners with parents and teachers. All teachers and leaders are responsible to educate the outside community stakeholders on the process and progress the district is making in the PjBL environment. The innovative PjBL

model based on the case study, would be shown to the public as social media to gain support and collaboration from the community.

District change initiative. The change initiative was first studied and was a benchmark studied by the curriculum director and school superintendent in the school district, which coincides with the recommendation of Pavie (2014). The leaders of the district said that using PjBL would aid the district in higher scores for state mandated tests. The use of PjBL was said to aid in the students' ability to become problem-solvers and creative thinkers. Leaders also stated that PjBL allowed the students to reiterate what they learned in different ways as they reflected on their own learning throughout the PjBL learning process.

Barriers. However, barriers were challenging as PjBL began to be implementing in the school district. These barriers were due to the changed school environment. There was some push-back from teachers who thought that their way of teaching was the only way to teach in their subject matter. The age of the participant teachers, and the years taught by the participant teachers also caused barriers when first enacting in the Schools. These barriers were due to technology use for classroom learning. Social media use by teachers and leaders also varied by age and years in their teaching careers. While some teachers embraced digital and social media technologies, others found it hard to understand why the district needed to use social media platforms to inform the community stakeholders.

Education. Leader and Teacher participants said that professional development was used to train teachers how to use the PjBL pedagogy in the classroom. The professional development took place throughout the implementation process. First, the leaders asked for volunteers to join a conference of the school's learning management platform. The teachers that attended and

learned in this conference, brought their knowledge back to the district, where they became role models for others to mimic in their specific classrooms. District leaders reorganized the school day and created groups out of grade level or subject teachers for collaborative teams to further continue workforce development for PjBL. Workshops for workforce development also included hiring outside consultants to help model to teachers how to use PjBL and technology in specific classroom subjects. Leader Participants also began training individual teachers in technologies that they wanted to use in the classroom for specific learning purposes, instead of training the entire staff at once for technology they may not use right away and then forget how to use it.

The findings in this case study revealed that effective district leaders remained transparent to staff, students, and community members affirming Swanson and Holton III (2009), data for this case study. When the model of the school district changed from traditional learning to that of PjBL, the school board and leaders had open communications with parents and community members in the reasons and progress of PjBL in the learning environment. However, not all staff members were receptive to the change.

Innovation Diffusion Theory. The Innovation Diffusion Theory could explain why this change came with barriers in its implementation, according to teacher and lead particpants in this study. The diffusion theory is based on the Rogers humanist view of organizations as they adopt to changes in the environment and the "rate" that "change and innovation is spread and adopted by members of the social system (Swanson & Holton III, 2009, p. 326). However, according to Swanson and Holton III (2009), leaders and mangers also need to learn side-by-side with staff members to build a collaborative effort. Therefore leaders should also become involved in professional development courses and other vairous workshops/ conferences.

HRM innovation idea. However, like a changing business approach, the plan could encounter resistance from teachers as they may not understand how to utilize new technology in their curriculum. Therefore, the Diffusion of Innovations Theory (DOI) could be used in conjunction with a human resource management (HRM) approach, where workshops would allow innovative and early-adopter educators to learn how to utilize PjBL. The stand-out teachers in this arena that have the respect of their co-workers should be the ones who hold the training sessions. Yet, in this Northeast Ohio school district, leaders utilized younger teachers for training that caused a barrier because of the age and experience that were perceived by tenured teachers in the district. School leaders should not worry about trying to get everyone on board with technology at once--it is a process. Sometimes it is more beneficial to start with a group of the technologically- advanced teachers to get the word out to other teachers.

Diffusion Theory process. There are four main components of the DOI process. These are "innovation," communication "channels," "time," and "social system" (Swanson & Holton III, 2009, p. 326). In the DOI, Rogers points out a distribution curve, which is almost like the curve teachers encounter in the grade scale in the classroom, where the majority is seen in the middle, followed outwards by percentages on both sides. These consist of early adopters on one side of the scale to laggards on the opposite side of the scale.

LaMorte (2019) demonstrated that it is beneficial to look at the Integration Planning Model and review each step so that there is evidence that supports if we know it is working or not. In addition, it is possible to use the DOI and professional development so that innovative and early adopter teachers learn how to utilize these new systems in their classroom. Rogers stated that over a period of time that the new innovation will eventually be accepted and adopted by everyone (LaMorte, 2019), which in the school district where the study took place, data

revealed that the adoption of PjBL has taken place in the same way as what has been theorized by Rogers.

LaMorte (2019) also recommended that goals for change also include technology change. Plans must also include T&D. Plans should have the inclusion of professional development planning for staff, alignment to curriculum, implementation pilots, and the evaluation of demo copies. LaMorte also recommended that when purchasing new software, teachers are included in the process of selecting those that align with their curriculum. Wiburg (2001) conveyed that schools should not worry about trying to get everyone on board with technology at once, it is a job for the innovators and leaders to begin word of mouth for the change initiative as well as to help with training staff members. In addition, teachers should have the opportunity for professional development and the chance to pilot the software before including it in the classroom (LaMorte, 2019).

Mission vision, and goals. A technology plan starts with mission/vision statements. It is essential that effective schools create mission/vision statements on how the school is planning to implement change and technology. The vision includes utilizing technology for student success. Since PjBL and its technology use is a new phase in the school, there are four common elements of planning that could be utilized for this purpose— comprehensiveness, collaboration, commitment, and continuity (Vonderwell, 2004; Wiburg, 2001).

HRM plan initiative. A new HRM plan for a school district should incorporate various ways for people to share their ideas with one another. The plan should incorporate advisory and technology committees and the IT department. These members are committed and have various responsibilities. In addition, the technology plan recognizes the document as a changing document. The technology plan includes continuity, as it is revised along the way.

Opinions matter. With the change of the mission and vision of the school, there will be a change in the organization. "The introduction of new working practices is always susceptible to some resistance…from middle management and other occupational groups." The leadership approach to create a school driven by technology should be based on innovation mediated production, which "brings together research and development, product design, operations and chain management in a 'functionally integrated' and 'strategically focused' way." In order to have a workforce that will feel comfortable with changes, leaders should encourage teachers and various other educational members to share ideas to the public who might fight the idea of having this much technology in the hands of students. By opening-up communications, it will give workers the opportunity to share their ideas and opinions as a joint effort, so that they think their opinions' and ideas matter (Knights & Willmott, 2007, p. 379- 388).

Further recommendations. First teachers would be evaluated in how they are categorized in the Technology Diffusions Theory. The selection of how educational software is used for PjBL should be an area of improvement in any school. Collaboration is important as it includes input from both students and teachers in this process, as these groups are utilizing this 2.0 technology daily. It is recommended that schools continuously survey stakeholders' opinions. Schools must continuously revise their plan to incorporate state and federal policy, as well as the recommendation of staff members. These recommendations would be based on survey data collected by teacher and students in the school district.

As an entire staff is learning and navigating through the change in the teaching environment, it is necessary to not only have technically-advanced staff educate other staff members; but to also have staff visit others classrooms across the state, where teachers use PjBL and social media to instruct students. The researcher further recommends that schools create

opportunities where teachers can advance their skills in these specific tools, then teach to others. Having a team for professional development will help teachers receive relevant learning opportunities. Support could include team who trains teachers and who also works closely with the technology committee for needed revisions to the plan.

Social impact. The social impact is one aspect of HRM. Wiburg (2001) found that "schools that have been successful in integrating technology have had significant help from an outside group" (p. 231). The researcher recommends that this is done by utilizing all stakeholders in the community. Schools should plan for the future with the help of public support, as they not only serve students, but workforce as well. According to leader participants in my research, the district leaders have collaborated with NASA, as well as engineering firms and local business to further aid in the collaboration needed in the PjBL environment. However, educators very rarely use this support in the classroom. According to teacher participants less than half rely on business and public support for the PjBL learning experience. Teachers should be informed about public support to further the learning of students. This could take place as a staff memo or short meeting.

Since the school district in this study has had both negative and positive reactions to the change from a traditional learning environment to that of PJBL, the organization needs to hear the voice of these public stakeholders (parents and community members). It would be an advantage to have more teachers trained in the PjBL teaching strategies before it was implemented district wide. This would have given staff the necessary training and change of perception needed in the environment to further gain client- stakeholders support. At least 75% of district leaders use social media sites to inform the public on what is happening in actual classrooms. However, less than 30% of teachers use it to educate the public about their specific

classroom learning to gain client support. The district staff should inform the community to support the change initiative. A committee where community members participate in the PjBL evaluation project for continued classroom use should also aid in support of the learning initiative as reviews should take place on an ongoing basis. With community stakeholders support, others in the community would fall into the categories found in the diffusion of innovation theory and be participants in the change process.

Effective system. An effective system evaluation for the change to a PjBL learning environment could be conducted through ongoing staff questionnaires as to how they teach and the projects that they complete with students. The students would also have ongoing surveys on their experiences with tasks associated with PjBL. State-mandated tests scores should also have an impact in analyzing the change. If tests scores remain the same or rise, the new initiative would be considered successful; however, if the tests scores diminish, the change would need a revision process, which includes more staff training and student support by staff. Costs of the system would also be needed to ensure an effective system. The community committee to review PjBL technology in relation to budget expectations would also be needed to ensure that the cost based on social and economic factors are beneficial to all stakeholders.

Recommendations for Further Research

As qualitative research, this exploratory case study may be replicated in order to gain a deeper knowledge of social media/ digital technologies in a project-based learning environment. The researcher expects if this study is replicated, the new data would concur the finding of this research. If replicated, it is recommended that follow-up emails should be delivered daily until questionnaires are completed.

In project-based learning, students can master the curriculum needed without having to do the same thing as the person sitting next to him or her because project-based learning is differentiated learning. Further recommendations would be to observe both students and teachers in the learning environment for a deeper understanding of project-based learning and how teachers and students work on different projects leading to the mastery of the subject studied. The researcher also recommends data collection and analysis specifically on social media/ communications applications to compare applications that are used by teachers and by students. This would allow an in-depth study to find if and how teachers stay up to date on the latest technology that could benefit students use.

Project-based learning is one pedagogical method which could be utilized whether it is taught in the classroom or online. Project-based learning would allow students to have knowledge of the subject as well as preparation teaching where a professor would facilitate and lead students to finding the right solution. The researcher recommends a semester long case study to compare the outcome of teachers and students in PjBL learning environments that are both online and in the classroom.

Conclusion and Final Thoughts

The focus of this case study was to explore: **How do educational stakeholders (leaders and teachers) use social media technology in a project-based learning environment in a northeast Ohio suburban school district.** The following baseline markers were also present throughout the data collection and remain fluid for school leaders to effectively implement the new teaching model.

- How is technology integration beneficial in the learning environment?

- What do the school leaders and administration do to ensure technology use in project-based learning?
- How is the district implementing project-based learning in the school environment?
- How is the district training educators in digital technology for project-based learning?

The use of technology to support project-based learning has many benefits as it allows students to collaborate with others and gives students more resources for learning by inquiry than just the textbook. Teachers are able to use multiple sources to scaffold students higher order thinking skills during project-based learning through online resources, including social networking sites, according to researchers Ravitz and Blazevski (2014). The conceptual and theoretical framework for this study was Bandura's social learning theory, based on collaborative learning, as well as Mishra and Kohler's TPCK framework.

The Literature Review contained the analysis of previous researchers' studies to explain how technology is intertwined with project-based learning. Some researchers discovered that project-based learning is a teaching pedagogy that is employed by educators to instruct students. Others, however, failed to show how project-based learning is intertwined through technology in the classroom. Still others tried to prove that PjBL could be applied to global issues for students' critical thinking skills. Researchers either centered their conclusions of either how students learned material in schools or how teachers employed the project-based learning method in their prospective classrooms.

There were several data collection methods in the study for triangulation of data. They included the demographic questionnaire, two groups of participants (leaders and teachers) for interviews and a focus group of teachers. Participants were selected based-on their employment within the school district since the inception of whole-school PjBL. They also had to use social media. By eliciting responses from teachers and school leaders via questionnaire, interviews,

and focus group the researcher was able to analyze social media technologies used in a PjBL environment. The qualitative data analysis method employed in this study was the constant comparative method to find commonalities of themes via the aid of a qualitative data coding (QDAS) computer program called NVivo.

Chapter 4 reported and analyzed qualitative findings arranged under three thematic categories. Each category had three sub-themes. These finding were discussed in detail in this chapter, as well as chapter 4. Lastly, the researcher discusses the recommendations she has for further research of digital/social media via project-based learning, as well as recommendations for implementing PjBL in a school setting.

Darling-Hammond summed-up the 21st Century style of learning, where teachers need professional development to teach new technology for them to create authentic lessons and assessments. Students need to harness the skills of communications, collaboration, and creating authentic products in order to succeed in the future. School districts in the United States and elsewhere need to continuously harness the power of digital and social media technologies to have student success in the future. Digital/ social media technology is one way to create a learning environment which is based on collaborative learning. When teachers and leaders use these media forms to inform the public on the students' activities and learning in the classroom it creates a heightened reality for all stakeholders because it yields not just more communication, but collaboration as well. This access for collaboration in turn wields a way for community members to become involved in educating the students in a way that offers real life situations where students could solve a problem by creating projects. When the innovative teaching model of Project-based Learning is added to the technology requirements of the 21st Century learner, a realistic education begins. This model not only creates a one-of-a kind learning experience for

the students, it creates a learning consistency from classroom to classroom. When collaboration is added to this model, it allows community members to become involved as they may partner with the school district or classroom for students to solve problems through creative projects that students learn and research with the help of teacher feedback.

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Appendices

Appendix A

Questionnaire, Interview Questions, Focus Group Questions

Questions for Qualtrics Questionnaire.

- How many years have you worked as a teacher?
- How many years have you worked in the school district?
- How many years have you taught project-based learning?
- What grade level do you teach?
- What subject do you teach?
- Do you use social media?

Semi-structured teacher interview questions.

- How do you see digital technology being used in the classroom or school?
- What are your experiences with project-based learning?
- What are some of the barriers of using project-based learning?
- What types of professional develop training have you had?
- What is your experience with social media technologies if any?
- How can social media technologies be integrated into your classroom or school for a project-based learning environment?
- Does the ages of the students or teachers have relevance to how or what technologies are used in the classroom?
- Explain what is working or not working with project-based learning. How do you think you could make the learning environment better?

Semi-structured leader interview questions.

- How do you see digital technology being used in the classroom or school?
- How are educators trained in digital technology for project-based learning?
- What types of professional development trainings do you encourage for faculty members?
- How do you see teachers and students using project-based learning in the classroom?

- What types of barriers exist with project-based learning?
- How do you integrate project-based learning into your entire school and/or district?
- How could you use social media technologies in the district or school level?
- Explain what is working or not working with project-based learning. How do you think you could make the learning environment better?

Teacher focus group.

1. Read definition of project-based learning.

Definition: Project-based learning is one pedagogical method which could be utilized with technology whether it is taught in the classroom or online. Project-based learning will allow students to have knowledge of the subject, where the teacher will function as a facilitator to lead students to find the answers for themselves. Project-based learning is student centered learning. Project-based learning is a teaching pedagogy where students are given a problem and they must solve it by researching and producing a project that demonstrates their proficiency in learning. To solve the problem, students must first become investigators, where they must formulate an issue as well as solutions to solve the problem. Afterwards, there is a revision process where a learning curve and a transformational type of learning takes place (Dole, Bloom, & Kowalske, 2016; Gòmez-Pablos, del Pozo, & Muñoz-Repiso, 2017; Huang et al. 2017; Hou, Wang, Lin, & Chang, 2015).

2. Ask the following questions:

- How do you see project-based learning being used in the classroom or schoolwide?
- What are your experiences with project-based learning?
- What is and is not working with project-based learning? What are recommendations you want to see in the future?

3. Read definition of social media technology

Definition: Social media technology is a way for communication and collaboration (Pew Research Center, 2018; Walster, 2017). In asynchronous environments such as Facebook, LinkedIn, Twitter, Blogs, or Ted Talks discussions are needed. Online threads are conversations, which are led by a prompt, where users either respond to an initial prompt or can reply to others'

responses These postings are independent of audience location, where the time of actual participation in the discussion forum is not required to participate in the discussion (Fredricks, 2014).

4. Ask the following questions:

- How do you see digital technology integrated in the learning environment?
- What types of barriers exist for the use of technology?
- How do you use either social media or project-based learning in the classroom?
- How do you see social media technologies integrated into the classroom or schoolwide environment?

5. Read an insert from conceptual framework based on Mishra & Koehler (2006) pedagogy of technology usage.

Excerpt: The TPCK developed by Mishra and Koehler (2006) was written for teachers to understand how to use technology for the best interest of student learning. The TPCK was written so that teachers will understand the interrelationships between pedagogical knowledge, technological knowledge, and student knowledge. It supports technology as an aid to the curriculum, but not the main part of it, as technology should be an integration of the learning. The framework is designed in four stages. The first was written to show teachers how curriculum should be designed by content and thinking level through Bloom's taxonomy. The second stage incorporates appropriate instructional strategies and models for teachers to use when teaching certain content. The third stage questions the teacher's technology usage and questions also if there is technology in the building that is needed to support the objective in the first place. The teacher must also question the cognitive level and instructional strategies with or without the technology. And, lastly, the teacher needs to decide on technology resources to best support student learning and knowledge with the skills identified (Grant, Hindman, & Stronge, 2010; Mishra & Koehler, 2006).

6. Ask teachers if they have been trained in this type of environment
    - What types of professional development have you had in relation to project-based learning?

- How is the district implementing project-based learning in the school environment?
- How do you decide what technologies best suit the content of the lesson?

Follow-up Questions (all participants)

- How has your prior use of PjBL with Summit Learning benefited you since the school closure? How has it benefited students?
- Do you feel that the community of [redacted] and parents are more understanding and supportive of PjBL? Why or Why not.?
- What do you use now for collaborative communications, such as social or digital medias, for both education and communicating with parents and students?
- What are some examples of the PjBL that you're doing now or that students are doing individually?

Appendix B

Research Participant Recruitment Letter

Mrs. Jennifer McMahan-Krepop
[redacted]

[redacted]
Leadership team and high school teachers
[redacted]

To whom it may concern,

I, Jennifer M. McMahan- Krepop, am seeking your consent to become part of a research study dealing with the project-based learning environment. Dr[redacted]xxx[redacted], superintendent, has already given written consent to use the school district and its land and employees, as part of the case study.

The purpose of the case study is to explore how educators use social networking technologies in a project-based learning environment in a suburban high school in Ohio. The social learning theory of Bandura and the technological pedagogical content knowledge (TPCK) framework, created by Mishra and Koehler (2006), is the framework of the study. The study will also allow for a school district and/or teacher to utilize the research to create a project-based learning environment with social media technologies to expand the classroom into a community or global project. The purpose of this case study is to explore how educators use social networking in a project-based learning environment in a suburban high school in Ohio.

I will be using the research methodology of a qualitative study. The research design will be an exploratory, single organization, case study located at the high school. I will be using a questionnaire, to gain background information of teachers and leaders. After the questionnaire is completed, I will then interview five members of the leadership team, which will include curriculum and technology directors, principals, and members of the school board. I will also interview five teachers who have used project-based learning from the school's implementation of project-based learning. These 10 individual interviewees will be asked the same questions for a comparative analysis. Lastly, I will form a focus group of five to seven teachers at the high

school level to receive more in-depth personal information regarding project-based learning using social media technologies from them as a group

I will integrate the following objectives to coincide with the main research question. These goals are to find:

- Is technology integration beneficial in the learning environment?
- What, if any, are the benefits of using technology with PjBL?
- What types of barriers to technology do teachers and leaders experience in the classroom and/or school setting?
- How could social media be used in the learning environment?
- What are the recommendations of teachers and leaders to implement project-based learning with technology in the classroom?

There are several reasons why project-based learning and social networking technologies should be studied. Researchers state that curriculum is always changing, and it depends upon theory and politics, as well as how teaching and learning fits into technology (Wilper, Smith, & Weppner, 2013). Secondly, this will be essential to your school district to study the views of project-based learning through the firsthand experiences of your teachers and leaders.

Attached is a consent form for utilizing the district for the case study.

Concordia University – Portland Institutional Review Board
Approved: December 18, 2019; will Expire: December 18, 2020

CONSENT FORM

Research Study Title:	Social Media Technology Usage in Project-Based Learning: A Case Study
Principal Investigator:	Jennifer M. McMahan- Krepop
Research Institution:	Concordia University—Portland
Faculty Advisor:	Dr. Donna Graham

Purpose and what you will be doing:

The purpose of this case study is to discover how educators use project-based learning with social media technologies in the educational environment. I expect 15-17 volunteers. No one will be paid to be in the study. We will begin enrollment on December 1, 2019 and end enrollment on February 1, 2020. To take part in the study, you will take an online survey based on demographics, have a 45 minute individual interview with the researcher, or become a focus group member, where the focus group will meet once during the study at a group agreed upon time.

The questionnaire, interviews, and focus group will be planned during a six-week window between January and February 2020. You could be chosen for the interview or focus group if you meet two of the following criteria. You must use project-based learning as one of your teaching methods. You must have been employed in the district since 2015, when project-based learning was implemented schoolwide.

The questionnaire will take less than 5 minutes of your time. The interview or focus group will be scheduled for one hour. The interview session will be scheduled whenever it will be convenient for you. The focus group will be scheduled at a time convenient for the entire 5-7-person group.

Risks:

There are no risks to participating in this study other than providing your information. However, we will protect your information. Any personal information you provide will be coded so it cannot be linked to you. Any name or identifying information you give will be kept securely via electronic encryption or locked inside a safe. When we or any of our investigators look at the data, none of the data will have your name or identifying information. We will only use a secret code to analyze the data. We will not identify you in any publication or report. Your information will always be kept private and then all study documents will be destroyed 3 years after we conclude this study.

Benefits:

Information you provide will help those teachers and school districts implement a project-based learning environment. It will also help the district learn how project-based learning is used and implemented by teachers. You could benefit this by finding how others in your school use and view project-based learning.

Confidentiality:

This information will not be distributed to any other agency and will be kept private and confidential. The only exception to this is if you tell us abuse or neglect that makes us seriously concerned for your immediate health and safety.

Right to Withdraw:

Your participation is greatly appreciated, but we acknowledge that the questions we are asking are personal in nature. You are free at any point to choose not to engage with or stop the study. You may skip any questions you do not wish to answer. This study is not required and there is no penalty for not participating. If at any time you experience a negative emotion from answering the questions, we will stop asking you questions.

Contact Information:

You will receive a copy of this consent form. If you have questions you can talk to or write the principal investigator, Jennifer M. McMahan- Krepop at email, [redacted]

If you want to talk with a participant advocate other than the investigator, you can write or call the director of our institutional review board, Dr. OraLee Branch (email [redacted] or call [redacted]).

Your Statement of Consent:

I have read the above information. I asked questions if I had them, and my questions were answered. I volunteer my consent for this study.

Participant Name

_____

Participant Signature Date

_____ _____

Investigator Name

Jennifer M. McMahan- Krepop

_____

Investigator Signature Date

Jennifer M. McMahan- Krepop 1-10-2020

Investigator: Jennifer M. McMahan- Krepop

email: [redacted]

c/o: Professor Dr. Donna Graham

Concordia University – Portland

2811 NE Holman Street

Portland, Oregon 97221

Appendix C

Letter From School Superintendent to Employees

From: [redacted]>

Subject: Research project with local doctoral student and Concordia University

Date: January 15, 2020 at 7:56:39 AM EST

Middle School and High School teachers, administrators, and Board members,

The [redacted] City School District is working with a local doctoral student and Concordia University on a qualitative study to explore how educators use social networking technologies in a project-based learning environment. The study will consist of a survey and focus groups. You may receive an email from [redacted] resident, Mrs. Jennifer McMahan-Krepop [redacted]), explaining the project and asking for your participation. Please do so. The time commitment will be minimal. The email will contain a link to the Qualtrics survey.

I've attached the formal letter of authorization for additional information.

Thank you for assisting with this project.

[redacted]

[redacted]

Superintendent

[redacted] City Schools

Appendix D

CONSENT FOR SURVEY (click consent) with follow-up

The purpose of this study is to discover how educators use project-based learning with social media technologies in the educational environment. I expect 15-17 volunteers. No one will be paid to be in the study. We will begin enrollment in December and end enrollment in February 2020.

To participate in this phase, you will be asked to complete an online questionnaire. Completing this phase should take less than 15 minutes of your time.

You will be invited to share contact information if you wish to enter the next phase of this research project. This information will be destroyed immediately after the conclusion of this research. All other study data will be held securely and then destroyed after 3 years.

There are no risks to participating in this study other than the everyday risk of your being on your computer as you take this survey. Information you provide will help those teachers and school districts implement a project-based learning environment. It will also help the district learn how project-based learning is used and implemented by teachers. You could benefit this by finding how others in your school use and view project-based learning

Your personal information will be protected. This survey is firewall and password protected so that only the researcher (me) can see your answers. I will keep this in strict confidence. The information/topic of the questions are not sensitive or risky. However, if you were to write something that might allow someone to possibly deduce your identity, we would remove this information and we would not include this information in any publication or report. Any data you provide would be held privately. All data will be destroyed three years after the study ends. You can stop answering the questions in this online survey if you want to stop.
Please print a copy of this for your records. If you have questions you can talk to or write the principal investigator, [redacted]. If you want to talk with a participant

advocate other than the investigator, you can write or call the director of our institutional review board, Dr. OraLee Branch (email oxxxxxxxxxxxxxxx or call [redacted]).

Click the button below to consent to take this survey.

Appendix E

IRB Approval Form for Study

DATE:	December 18, 2019
TO:	Jennifer McMahan-Krepop, Ed. D Higher Education
FROM:	Concordia University - Portland IRB (CU IRB)
PROJECT TITLE:	[1531144-1] 20191120_McMahan-Krepop
REFERENCE #:	EDD-20191123-Graham-McMahan-Krepop
SUBMISSION TYPE:	New Project
ACTION:	APPROVED
APPROVAL DATE:	December 18, 2019
REVIEW TYPE:	Limited Review

Thank you for your submission of New Project materials for this project. The Concordia University Portland IRB (CU IRB) has APPROVED that your submission fits the requirements for Limited Review. We approve you project with the stipulation that you will use the click consent method within the electronic survey method. This project is EXEMPT from further CU IRB review according to federal regulations.

Attached is a stamped copy of the approved consent forms. You must use these stamped versions. The consent form was edited slightly and stamped as approved. Please remember that informed consent is a process beginning with a description of the project, participant understanding, and following with a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receive a copy of the consent document.

We will retain a copy of this correspondence within our records. Please keep this correspondence within your records.

At the time when you need to demonstrate that you have closed out your project, you can provide your faculty chair with a copy of this letter, explaining that you are exempt from needing to close out your project.

The researcher is responsible to conduct research, even if it is exempt, with integrity and care. You are encouraged to continue to work with the CU IRB Office and involve others at Concordia University as necessary and prudent in your research.

If you have any questions, please contact Amon Johnson at [redacted] or [redacted] Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Concordia University - Portland IRB (CU IRB)'s records. December 18, 2019

Appendix F

Consent Letter for Superintendent to Use School District for Study

Mrs. Jennifer McMahan-Krepop
[redacted]
[redacted]

[redacted] City School District
[redacted] Superintendent
[redacted]
[redacted]

Dear [redacted]

I, Jennifer M. McMahan- Krepop, am seeking your consent to utilize [redacted] City School District, and its employees, for my dissertation research project.

The purpose of the case study is to explore how educators use social networking technologies in a project-based learning environment in a suburban high school in Ohio. The social learning theory of Bandura and the technological pedagogical content knowledge (TPCK) framework, created by Mishra and Koehler (2006), is the framework of the study. The study will also allow for a school district and/or teacher to utilize the research to create a project-based learning environment with social media technologies to expand the classroom into a community or global project. The purpose of this case study is to explore how educators use social networking in a project-based learning environment in a suburban high school in Ohio.

I will be using the research methodology of a qualitative study. The research design will be an exploratory, single organization, case study located at the high school. I will be using a questionnaire, to gain background information of teachers and leaders. After the questionnaire is completed, I will then interview five members of the leadership team, which will include curriculum and technology directors, principals, and members of the school board. I will also interview five teachers who have used project-based learning from the school's implementation of project-based learning. These 10 individual interviewees will be asked the same questions for

a comparative analysis. Lastly, I will form a focus group of five to seven teachers at the high school level to receive more in-depth personal information regarding project-based learning using social media technologies from them as a group

I will integrate the following objectives to coincide with the main research question. These goals are to find:

- Is technology integration beneficial in the learning environment?
- What, if any, are the benefits of using technology with PjBL?
- What types of barriers to technology do teachers and leaders experience in the classroom and/or school setting?
- How could social media be used in the learning environment?
- What are the recommendations of teachers and leaders to implement project-based learning with technology in the classroom?

There are several reasons why project-based learning and social networking technologies should be studied. Researchers state that curriculum is always changing, and it depends upon theory and politics, as well as how teaching and learning fits into technology (Wilper, Smith, & Weppner, 2013). Secondly, this will be essential to your school district to study the views of project-based learning through the firsthand experiences of your teachers and leaders.

Attached is a consent form for utilizing the district for the case study.

CONSENT FORM

Research Study Title:	Social Media Technology Usage in Project-Based Learning: A Case Study
Principal Investigator:	Jennifer M. McMahan- Krepop
Research Institution:	Concordia University—Portland
Faculty Advisor:	Dr. Donna Graham

Purpose and what you will be doing:

The purpose of this case study is to discover how educators use project-based learning with social media technologies in the educational environment. I expect 15-17 volunteers. No one will be paid to be in the study. We will begin enrollment on December 1, 2019 and end enrollment February 1, 2020. To have the school district be in the study, the employees of the school district will take online survey based on demographics, have a 45-minute individual interview with the researcher, or become a focus group member, where the focus group will meet once during the study at a group agreed upon time.

The questionnaire, interviews, and focus group will be planned during a six-week window between January and February 2020.

Risks:

There are no risks to participating in this study other than providing your information. However, we will protect your information. Any personal information you provide will be coded so it cannot be linked to you. Any name or identifying information you give will be kept securely via electronic encryption or locked inside a safe. When we or any of our investigators look at the data, none of the data will have your name or identifying information. We will only use a secret code to analyze the data. We will not identify you in any publication or report. Your information will always be kept private and then all study documents will be destroyed 3 years after we conclude this study.

Benefits:

Information you provide will help those teachers and school districts implement a project-based learning environment. It will also help the district learn how project-based learning is used and implemented by teachers. You could benefit this by finding how others in your school use and view project-based learning

Confidentiality:

This information will not be distributed to any other agency and will be kept private and confidential. The only exception to this is if you tell us abuse or neglect that makes us seriously concerned for your immediate health and safety.

Right to Withdraw:

Your participation is greatly appreciated, but we acknowledge that the questions we are asking are personal in nature. You are free at any point to choose not to engage with or stop the study. You may skip any questions you do not wish to answer. This study is not required and there is no penalty for not participating. If at any time you experience a negative emotion from answering the questions, we will stop asking you questions.

Contact Information:

You will receive a copy of this consent form. If you have questions you can talk to or write the principal investigator, Jennifer M. McMahan- Krepop at email, [redacted] if you want to talk with a participant advocate other than the investigator, you can write or call the director of our institutional review board, Dr. OraLee Branch (email [redacted] or call [redacted].

Your Statement of Consent:

I have read the above information. I asked questions if I had them, and my questions were answered. I volunteer my consent for this study.

Participant Name
[redacted]

Superintendent [redacted]

Participant Signature Date

[redacted] [redacted]

Investigator Name

Jennifer M. McMahan- Krepop

Investigator Signature

Jennifer M McMahan Krepop 12/3/19

Investigator: Jennifer M. McMahan- Krepop
c/o: Professor Dr. Donna Graham
Concordia University Portland
281 1 NE Holman Street
Portland, Oregon 97221