K12 TEACHERS' EXPERIENCES WITH FACILITATING STUDENT-CONTENT ENGAGEMENT IN BLENDED LEARNING ENVIRONMENTS

by

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ABSTRACT

KAREN DONALDSON INGRAM. K12 Teachers' Experiences with Facilitating Student-Content Engagement in Blended Learning Environments (Under the direction of DR. AYESHA SADAF

COVID-19 abruptly changed educational institutions globally and challenged teachers and students. This immediate shift was difficult for K12 teachers because they were required to teach their courses online or using a blended learning (BL) model. As BL use continues to grow, concerns about student-content engagement have emerged. This single case study investigated experiences with facilitating student-content engagement in BL environments. Eleven teachers from two districts were surveyed and individually interviewed using semi-structured interviews. The complex adaptive blended learning systems model was used as the theoretical framework to guide data collection and analysis and interpreting results. Findings from this study revealed that learner demographics showed diversity in economic status and academic abilities, with socioeconomic status being a potential factor affecting students' access to technology within BL environments. Digital literacy skills varied among students, influencing their content engagement in BL environments. Teacher experiences with BL varied from embracing the mix of technology mediated instruction to strictly using F2F methods. Results further showed that support systems such as instructional coaches and professional learning communities had a crucial role in facilitating student-content engagement and enhancing pedagogical practices. Districts and institutions demonstrated commitment to supporting BL environments with multiple layers of support. As technology evolves, addressing challenges and leveraging collaborative efforts will be essential to ensure BL environments thrive and promote student-content engagement. This study can inform developing best practices, guidelines, and resources to enhance engagement.

DEDICATION

I dedicate my dissertation to two loved and special family members who loved and supported me throughout this journey.

To my beloved sister, Donnette, and my beautiful cousin, Sheila: You both were a very special part of my life, especially my sister, Donnette. I miss both of you more than words can express. I will always love you and you will never be forgotten as you both have had a positive and lasting impact on my life. Thank you for believing in me and leaving behind your legacy of love.

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LIST OF ABBREVIATIONS

BL	Blended Learning
CTE	Career and Technical Education
PLC	Professional Learning Community

CHAPTER 1: INTRODUCTION

In March 2020, life abruptly changed as schools for over 168 million students worldwide closed (UNICEF, 2021). Education systems globally experienced an abrupt shift at all levels as a result of the COVID-19 pandemic (Aditya, 2021). Teachers were expected to make an immediate adjustment to online or blended learning (BL) with nothing more in many cases than a brief introduction to teaching online (König et al., 2020). This adjustment proved particularly difficult for K12 teachers who were now expected to teach a blended model that combined face-to-face (F2F) and online (Milheim, 2006). Teachers struggled to really define what blended learning was. During the transition from F2F instruction to online and BL, teacher attitudes ranged from embracing the new opportunities for innovation to decrying difficult technology challenges (Francom et al., 2021).

While there is little literature addressing BL and using it in the K12 classroom generally, there are even fewer studies of this model applied to specific subjects such as English, math, and career and technical education (CTE) courses (DiPietro et al., 2008; Short et al., 2021; Harrell & Wendt, 2019). The gaps in the literature for BL at the K12 level is slowly being addressed but still needs more thorough investigation (Hesse, 2017). As BL is projected to continue its growth and popularity, the problem this poses for K12 education regarding its impact on student-content engagement still exists.

Statement of Problem

As a result of the pandemic students were suddenly propelled into digital, remote, and hybrid environments as the dominant pedagogical paradigms. They were now required to work with different instructional technologies being delivered in unconventional ways. Aguilar et al. (2022) posited that the mode of instruction used during the COVID-19 pandemic necessitated

using unfamiliar technologies by students, parents, and schools. This was not a new issue for educators as an ongoing focus on student-content engagement in the traditional classroom has existed for decades (Ehsanifard et al., 2020).

The term BL is often used to reference the combination of teaching F2F in addition to online learning creating a blended environment. In this setting students have the opportunity to engage with course content digitally and through physical classrooms. The ultimate goal is to provide a flexible learning experience for students by allowing them to access multiple resources in a variety of ways. The implementation of BL in the K12 sector now aligns with the societal push to support diverse learners in multiple ways by focusing on the integration of digital learning.

As society moves beyond the pandemic, the use of BL continues to increase. Groccia (2018) acknowledged how blended, virtual, and hybrid models are gradually replacing the F2F methods of instruction that were the norm to this point. Wong and Estudillo (2021) asserted that BL is the new standard in instructional models. According to Dziuban et al. (2018), BL as the new norm in instructional methods will be consistently changing as aspects of paradigms of curriculum and policy continue to shift. One of the most salient shifts presented as a result of the pandemic was thinking about how BL could impact student-content engagement overall. This endeavor is vital to the field of education (Jain et al., 2013).

Definition of BL

There are multiple definitions of BL. Kassner (2013) acknowledged how using the term 'blended learning' encompasses a mixture of instruction comprised of traditional and online delivery methods utilizing various tools and pedagogies. Researchers found that some of the more common definitions of BL use some form of the word, 'combine' to describe how

online and F2F instruction work together (Arnesen et al., 2019; Ashraf et al., 2021; Bergdahl & Bond, 2021; Pardede, 2019; Short et al., 2021;).

Blended learning is often defined as combining F2F instruction with remote or online learning. Another commonly used word is some form of the term 'integrate,' also describing the two modes of instruction (Dziuban et al., 2018; Edannur & Marie, 2017; Graham et al., 2019; Kundu et al., 2021; Schechter et al., 2017). This means that two modes of instruction are being used simultaneously. For BL some students attend a class in person for instruction while others log into an online learning management system (LMS) on alternating days of the same week. This represents an integrative form of BL. The definition for BL used in this study is from Watson and Kennedy (2014), which incorporates Staker and Horn's (2012) definition:

> [A] formal education program in which a student learns at least in part through online learning, with some element of student control over time, place, path, and/or pace; at least in part in a supervised brick-and-mortar location away from home; and the modalities along each student's learning path within a course or subject are connected to provide an integrated learning experience (p. 4).

These modalities could include small group instruction, online learning, individual instruction, group projects, and pencil-and-paper assignments (Watson & Kennedy, 2014).

Importance of BL in K12 Education

Since the onset of the pandemic, BL has remained as an instructional modality in the K12 sector. As a matter of fact, An et al. (2021) has found that the use of online instruction and BL has substantially increased in the K12 classroom. Now that K12 students have been provided the option of remote learning that occurs through the use of BL, this would be difficult to retract. With the new mindset that BL is now a part of the educational fabric of K12, teachers believe

they will engage in more BL and online learning for possible future emergencies (An et al., 2021) where student-content engagement through BL is a critical factor.

Importance of Student-Content Engagement

The term "student engagement" is a particularly broad term that can be divided into three types of interaction: student-student, student-teacher, and student-content (Martin & Bolliger, 2018). This study focused on student-content engagement because it is the foundation for all aspects of engagement. Moore (1989) asserted that student-content engagement is essential to establish education. Student-content engagement from the broader perspective of student engagement warrants an examination into the establishment of its origins as a foundational premise for this study.

Student-Content Engagement

Student-content engagement has emerged as one of three aspect of student engagement. The concept of student engagement has existed for some time. Axelson and Flick (2011) pointed out that the historical concept of student engagement could be as much as a 70-year-old construct. According to Kuh (2009), who studied student engagement in higher education, one of the earliest mentions of time-on-task was recorded by Tyler in the 1930s. Almost 40 years later, an instrument was introduced by C. R. Pace called *The College Student Experience Questionnaire* (CSEQ), which was used to measure "quality of effort" (Groccia, 2018, p. 11). Pace (1990, as cited in Kuh, 2009) believed that the CSEQ revealed how students benefited when they intentionally engaged and expended more energy on educationally related duties and assignments. Today, student engagement is a critical element included in the teaching and learning environment (Groccia, 2018). Kuh (2009) echoed the importance of student engagement by attesting to its role as a crucial construct in the learners' involvement in the educational

setting. As the historical context includes literature that has been frequently referenced, there remain differences in the ways student engagement has been defined.

When defining student-content engagement, Moore (1989) provides the succinct definition of stating this level of engagement is the process of how the learner engages on an intellectual level deepening their cognitive and comprehensive abilities. The significance of student-content engagement as it relates to this study is that the learner is no longer involved with educational texts as in previous times, but in the BL environment this learning occurs through facilitated engagement with some form of technology-mediated devices. While the nature of some educational programs are primarily focused on how the learner engages with content, the learner has typically been self-directed only allowing the them to engage with the content expert but in more recent times this has changed (Moore 1989). Students can now engage with content through digital mediums employing multiple levels of engagement by reading, analyzing, discussing, creating and applying knowledge allowing the subject matter expert to serve in a more facilitative role. As student-content engagement plays an essential role in successful student outcomes in the BL environment, there have not been many studies on this particular topic.

Gaps in Research on Student-Content Engagement

While the subject of student engagement is widely discussed, research about it is lacking and even less research has been conducted on student-content engagement (Bergdahl & Bond, 2021). As the concept of improved student-content engagement is not commonly studied, it is used as a justification for incorporating blended approaches (Moore & Graham, 2019). As the body of literature addressing overall engagement continues to grow, gaps in the literature about the BL environment in K12 education still remain (Mulqueeny et al., 2015). Kassner's (2013)

research acknowledged that "the number of journal articles that directly addressed online or blended learning in K12 settings was astonishingly low" (p. 2). This study sought to address these gaps not just looking at the lack of literature on BL but specifically student-content engagement within this setting.

Purpose

The purpose of this qualitative single case study was to investigate K12 teacher experiences with facilitating student-content engagement in BL environments. The concept of student-content engagement of any type is critically important to online or BL; engagement often determines student satisfaction and motivation (Kadir et al., 2022). As K12 educators returned to in-person learning, student-content engagement continued to be crucial in the BL environment.

Anderson (2021) emphasized student-content engagement as an essential part of the overall learning environment that promotes student achievement, lowers dropout rates while increasing graduation rates, and strengthens pedagogical practices for K12 teachers. Student-content engagement has changed since the pandemic and educational researchers need to study how this shift happened to determine how we keep this momentum and continue to develop student-content engagement strategies that work across curricula.

Research Questions

Constructivism is a central characteristic of qualitative research (Merriam, 2009). The perspective of constructivism in this research is consistent with the worldview that shapes this study and the research questions that have been developed as a result (Jones et al., 2022). The research questions guiding this study were:

1. What are K12 teachers experiences with facilitating student-content engagement in blended learning environments?

2. What strategies and practices do K12 teachers use to promote student-content engagement in blended learning environments?
3. What are K12 teacher perceptions of the teaching and learning practices used within their school districts for blended learning?

Theoretical Framework Overview

The present study was grounded in a theoretical framework referred to as the complex adaptive blended learning system (CABLS) (Wang et al., 2015). This framework is rooted in Ludwig von Bertalanffy's (1972) general systems theory, which was introduced by the biologist in the 1920s. The theory was derived from theoretical biology and stated that the most basic characteristics of living things are contingent on its organization.

Investigating the components of living things is not solely the phenomenon of how these systems and processes work and function together cohesively as opposed to being in isolation. However, what is gained by this perspective is being able to establish laws governing biological systems. Another characteristic of this framework is that of being an open system. Bertalanffy contributed to the concepts of open systems that remained in a steady state representing complexities that serve as part of a dynamic, non-linear system (Drack, 2015). This concept was also addressed by Waddington (1977) who described a system where external elements pass through an internal process to produce new outcomes. The principles described in this system have more recently been applied to BL to form CABLS.

The CABLS model, when applied to the construct of BL, places the learner at the center and has the following six interrelated subsystems: learner, teacher, content, technology, learning support, and the institution (Wang et al., 2015). While each component maintains its own distinctiveness, there are still relationships and interconnections within the six elements. The

structure of the CABLS model makes this a relevant framework for this study because of its primary focus on BL and the engagement that is interwoven in the six subsystems.

Significance of the Study

The motivation for this study was first to address gaps in the literature (Ashraf et al., 2021; Wong & Estudillo, 2021). According to the findings of Harrell and Wendt (2019) there is a lack of research addressing BL in K12 education. The study conducted by Mulqueeny et al. (2015) added to the few BL studies in the K12 environment but the authors also noted the paucity of literature considering the impact of BL related to student-content engagement.

Another critical reason that this study was needed is that the nature of the subject makes it fundamental to education. Moore (1989) concluded that without student-content engagement "there cannot be education, since it is the process of intellectually interacting with content that results in changes in the learner's understanding, the learner's perspective, or cognitive structures of the learner's mind" (p. 2). Before technology became a core part of the BL environment, students became involved with course content by reading didactic texts of some sort (Moore, 1989).

Moore (1989) noted that with the use of various devices, learning content is not only interactive but requires students to be self-directed and self-motivated. The content is required for learning, whereas student-teacher engagement is considered important, and student-student (the more recent of the three modes of engagement), is viewed as a useful element of the learning process (Moore, 1989). In the BL environment with its blend of technology and traditional learning methods, the student-content interaction is vital because students in this setting can find themselves with little or no interaction with instructors or peers.

The results of this study could make an impact on district leaders, school administrators, instructional technologists, teachers, and students—particularly those that have continued using BL post-pandemic. As effective pedagogical strategies and practices emerged that are applicable across disciplines, the most beneficial is the substantial awareness of the various aspects of student-content engagement. Ashraf et al. (2021) asserted that a primary benefit of BL practices is how they help teachers improve students' learning and increase engagement.

Overview of Research Methodology/Design and Rationale

Method

Merriam and Tisdell (2016) defined qualitative research as founded on the belief that people construct their knowledge based on their experiences and how they make meaning and sense of those experiences. The qualitative approach is a more common and modest research design that provides flexibility (Caelli et al., 2003). The lack of guiding criteria for this design allows the researcher to choose the setting and participants. For this study, the single case study design within a qualitative approach explored the experiences of K12 teachers when engaging students in content within the BL environment. According to Stake (2006), the case study design is appropriate specifically when examining "how educators facilitate the understanding and capability of learners" (p. 3).

From an epistemological perspective, the constructivist method has been used for the case study design of this study. A constructivist approach is one that not only represents the construction of the knowledge and experiences of the participant but also considers the researcher's level of subjectivity and connection to interpreting data (Charmaz, 2014). While this characterizes the foundational aspects of qualitative research there are other aspects to consider.

The method by which data were collected for this study included semi-structured individual interviews. The researcher conducted virtual and in-person interviews of 11 middle school and high school teachers using *Zoom* and a classroom to conduct in-person interviews. At the close of each interview, data were collected, recorded, transcribed, and analyzed.

Participants were asked to provide demographic information using *Survey Monkey* with the intent of maintaining cultural diversity among participants. The demographic data provided was about gender, race, ethnicity, and years of teaching experience. This study was conducted utilizing a convenience sample from two districts – one district of traditional schools with a standard sample and from another district with a traditional and an online school in two different regions of the same southeastern state.

Participants were 11 K12 teachers consisting of five middle and six high school teachers that taught English, math, science, social studies, and CTE courses. The number of years of teaching experience was a critical part of the criteria for selection in order to gain varying perspectives on strategies used for student-content engagement in the classrooms before, during and post the pandemic. Participants were selected intentionally to promote equity and diversity among the groups.

A descriptive method was employed to analyze the data and allowed the researcher to hear the narratives and stories of the participants in an effort to understand real life experiences through in-depth descriptions (Yin, 2009). This analysis was from an inductive perspective and as codes emerged, themes and sub-themes were identified during the data analysis process. Interviews were transcribed using the professional transcription service known as *Rev*. The data was then mined for codes that were selected using the *NVivo* coding instrument as well as manual coding.

Delimitations/Assumptions

This study was delimited due to using only two school districts. In my role as a CTE administrator, I had access to multiple school districts throughout the state based upon my connections with colleagues. However, due to the difficulty of obtaining the required approvals to interview teachers, even with IRB approval, I chose to confine my study to two districts.

Another delimitation was the process used to select participants. While several CTE teachers in one district were known to the researcher, it was necessary to rely on school administrators to be the gatekeepers to provide references to teachers in both districts (the second district had no previous connections with the researcher). This process presented the risk of administrators being biased in the teachers referred to in the study. There was little opportunity for other teachers that may have had the required years of experience in the field but lacked any leadership role.

Lastly, there is an assumption of potential bias by the researcher who was a former CTE teacher. The reason for this is the way CTE teachers may define student-content engagement in their own content. For example, in a culinary arts class, student-content engagement may involve cooking; in a Microsoft *Word* course it may be working with technology on some level.

Having this previous knowledge could affect the subjectivity of the study and its interpretation. To ensure clarity in understanding what the researcher was seeking, interview questions were designed in a way that minimized ambiguity while leaving room for further probing. This is a crucial aspect of this study because the researcher understood that CTE courses were designed to add rigor and student-content engagement into the CTE curriculum.

This led to a second assumption that CTE teachers would have an easier time identifying pedagogical practices and strategies due to the content. As reported by Applied Educational

Systems (2022), the technology integration often used in CTE courses can positively affect student-content engagement. This assumption automatically led to the expectation that this principle, if applied to English or Math courses, would not give the same responses regarding the impact of BL on student-content engagement.

Definitions of Terms

The following terms are used in this study:

Blended Learning: An integrated educational model where students engage in a learning environment combining face-to-face instruction with online instruction allowing them to maintain some level of control over time, place, path, and/or pace partially at a location away from home. (Watson & Kennedy, 2014). (i.e., flipped classroom, rotation model)

CABLS: Acronym that stands for the Complex Adaptive Blended Learning System that is the theoretical framework of this study (Wang et al., 2015).

Hybrid Model: Combining face-to-face and online teaching and learning into one seamless experience (Watson & Kennedy, 2014).

Online learning: Teaching and learning using a technological device or computer-mediated system.

Pedagogy: Theory and practice of teaching influenced by an educator's principles (Shirke, 2021)

Professional Learning Community (PLC): A group of teachers that share commonalities and meet regularly to promote student engagement through the sharing of strategies, best practices, and resources.

Student-content engagement: Described by McLaughlin et al. (2005) as a focus on the role of the student and the subject matter knowledge in the learning process that speaks to "the student's in-the-moment engagement with instructional content" (pp. 4-5).

Student Engagement: Students' ability to express an interest, involvement, and connectedness to their classes, learning, schools, and peers (Axelson & Flick, 2011).

Organization of the Study and Summary

This qualitative case study addressing K12 teachers' experiences with facilitation of student-content engagement in BL environments is organized into five chapters.

In the opening chapter, an overview and the challenges of BL noting the impact this model would have on student-content engagement specific to the K12 sector, was established (An et al., 2021). Chapter One identified the problem and provided a basis for the research questions and the theoretical framework known as CABLS (Wang et al., 2015). Chapter Two presented the literature used in this study. Chapter Three described the methodology of the research. Specific information about participant data and a summary of the procedures used are also given. The study's findings and overall results are given in Chapter Four. The final chapter, which is Chapter Five, reflects on the significance of this study through descriptive analysis of the results and shares the researchers' overall thoughts.

CHAPTER 2: LITERATURE REVIEW

At the onset of the COVID-19 pandemic, the educational world experienced a revolutionary shift in teaching and learning (Dvir & Schatz-Oppenheimer, 2020). Education systems globally experienced an immediate shift at all levels (Alsarayreh, 2020; An et al., 2021; Dindar et al., 2021; ElSayary, 2021; König et al., 2020; Shamir-Inbal & Blau, 2021; Short et al., 2021). Aditya (2021) recounted how the pandemic caused students to continue their learning using only digital technologies. Birch and Lewis (2020) observed that instruction provided in a traditional format was now moved online and affected both higher education and the K12 sectors, though K12 was affected more. Overall, K12 teachers were ill-equipped to quickly transition to virtual or blended formats (An et al., 2021; Birch & Lewis, 2020; Dindar et al., 2021).

Those who taught the standard courses of math, science, English, and social studies were not the only ones affected; career and technical education (CTE) teachers were also impacted. As school systems and society at large continues to move beyond this transition, BL has continued to increase. Groccia (2018) acknowledged how blended, virtual, and hybrid models have begun to gradually replace F2F instruction. The research for this study focused on student-content engagement in the BL environment and Table 1 provides the framework for this literature review.

Table 1

Effective Strategies from the Literature

Theme 1: Blended Learning	
Sub-Theme	Sources
Definitions and types of blended learning	Asif et al., 2020; Ciftci, 2020; Ferdig et al., 2014; Graham et al., 2020; Kassner, 2013; Kostaris, 2017; Kowalski et al., 2017; Moore et al., 2017; Oliver & Stallings, 2014; Shin, 2014; Staker & Horn, 2012; Watson & Kennedy, 2014; Wong et al., 2016
Operational aspects of blended learning and its value	Azukas, 2019; Boboc, 2016; Borup et al., 2019; Christensen et al., 2013; Fazal & Bryant, 2019; Harrell & Wendt, 2019; Horn & Staker, 2011; LaFrance & Beck, 2014; Milheim, 2006; O'Byrne & Pytash, 2015; Schechter et al., 2017; Stevens & Rice, 2016; Wayer et al. 2015
Uses, barriers, and benefits of technology in the BL environment	An et al., 2021; Association for Career and Technical Education, 2020; Brodersen & Melluzzo, 2017; Dziuban et al., 2018; Enyedy, 2014; Koivula, 2020; Rahman et al., 2015; Rasheed et al., 2020; Short et al., 2021; Tang & Chaw, 2016; Wong & Estudillo, 2021; Yang et al., 2021
Teacher experiences of online and BL	Aditya, 2021; Alsarayreh, 2020; An et al., 2021; Arnesen et al., 2019; Ashraf et al. 2021; Bryson et al., 2015; ElSayary, 2021; Francom et al., 2021; Jerry & Yunus, 2021; König et al., 2020; Kundu et al., 2021; Kuo et al., 2014; Luo & Murray, 2018; Naidoo & Singh-Pillay, 2020; Napier et al., 2011; Pardede, 2019; Shamir-Inbal & Blau 2021; Yilmaz & Malone, 2020
Theme 2: Student-content Engagement	
Sub-Theme	Sources
Definitions and types of student-content engagement	Aguilar et al., 2022; Anderson, 2021; Applied Educational Systems, Inc, 2022; Axelson & Flick, 2010; Butts et al., 2013; Castelo, 2020; Castro & George, 2021; Edannur & Marie, 2017; Finn & Zimmer, 2012; Fletcher, 2015; Goh et al., 2019;

Table 1 *Effective Strategies from the Literature* (cont'd.)	
Strategies to promote student-content engagement in BL	Groccia, 2018; Moore, 1989; Mulqueeny et al., 2015; Prouty & Werth, 2015
Teacher experiences of student-content engagement	Brodersen & Melluzzo, 2017; Chiu, 2021; Dziuban et al., 2018; Harris et al., 2020; Henrie et al., 2015; Jain et al., 2013; Kurt et al., 2022; Youngers, 2014
	Bergdahl & Bond, 2021; Borup, 2016; Dindar et al., 2021; Geiger & Dawson, 2020; Huh & Reigeluth, 2017; Kumi-Yeboah, 2018; Louwren & Hartnett, 2015; Luo et al., 2017
Theme 3: Pedagogical Practices and Effective Strategies in Blended Instruction	
Sub-Theme	Sources
Pedagogical strategies and digital technology management in BL	Bryson et al., 2015; Cakir & Delialioglu, 2009; Chiu, 2021; Ehsanifard et al., 2020; Henrie et al., 2015; Jain et al, 2013; Kocour, 2019; Lauer & Mihok, 2017; Loera et al., 2013; McKinstry, 2012; Stauffer, 2020
Teacher experiences with educational technology, accessibility, and effectiveness in BL	Aditya, 2021; An et al., 2021; Basham et al., 2013; Carver, 2016; Dindar et al., 2021; Edannur & Marie, 2021; Francom et al., 2021; Huh & Reigeluth, 2017; Kormos & Julio, 2020; Luo & Murray, 2018; Naidoo & Singh-Pillay, 2020; Shin, 2021; Yilmaz & Malone, 2020
Teacher experiences with professional development and training support for BL	Archambault et al., 2014; Graham et al., 2019; Hall & Trespalacios, 2019; Moore et al., 2017; Puhala, 2018; Pulham et al, 2018; Rice & Dawley, 2009;

Blended Learning

Definitions and Types of Blended Learning

As noted in the literature, there continues to be varying definitions of BL. Although other terms used include 'merge,' 'mixture,' 'incorporate,' (Enyedy, 2014; Fazal & Bryant, 2019; Ferdig et al., 2014; Kumi-Yeboah & Smith, 2018; Oliver & Stallings, 2014), there is one

definition that is more comprehensive from Staker and Horn (2012) and included in Table 2 (Asif et al., 2020; Ciftci, 2020; Horn & Staker, 2011; Jerry & Yunus, 2021; Moore et al., 2017; Naidoo & Singh-Pillay, 2020; Yilmaz & Malone, 2020). The definition from Staker and Horn (2012) is referenced in multiple studies and describes BL in more detail from the perspective of a student, thus indicating where and how this learning takes place. Table 2 below highlights some of the more common definitions of BL as seen in the more current literature references also showing additional cross-references to other authors.

Table 2

Definitions of BL

Authors	Date	Definition
Arnesen et al.	2019	Horn and Staker (2011, as cited in Arnesen, 2019) "describes students as learning at least in part through online delivery, with some element of student control over time, place, path and/or pace" (p. 3).
Bergdahl & Bond	2021	Bonk and Graham (2012 as cited in Bergdahl & Bond, 2021) wrote that "BL combines online and physical elements, such as instruction, material, resources, and learning activities" (p. 3).
Dziuban et al.	2018	Graham (2013, as cited in Dziuban, 2018) defined blended learning as "the integration of face-to-face and online instruction" (p. 1).
Edannur & Marie	2020	"Blended learning is defined as a hybrid of classroom and online learning without the complete loss of face-to-face contact" (p. 32).
Graham et al.	2019	Graham (2006; 2013, as cited in Graham et al., 2019) stated "blended learning (BL) involves integrating in-person and online instruction" (p. 1).
Staker & Horn	2012	"A formal education program in which a student learns at least in part through online learning, with some element of student control over time, place, path, and/or pace; at least in part in a supervised brick-and-mortar location away from home; and the modalities along each student's learning path within a course or subject are connected to provide an integrated learning experience" (p. 4).

Just as BL is defined from varying perspectives, this method of learning has also been broken down into categories or types. Christensen et al. (2013) identified the following types or models of BL as rotation, flex, à la carte, and enriched virtual. Each model differs slightly in the way teaching and learning takes place representing variations of BL, but the rotation model is the only one that Christensen et al. (2013) further divides into four sub-models. The station rotation, lab rotation, flipped classroom, and individual rotation are all considered to be types of the rotation model (Christensen et al., 2013).

In the rotation model, students rotate based on the teacher's judgment or on a preset schedule within a given course or subject. Within the model, the station rotation occurs when students rotate within the classroom. Rotating between the classroom and a learning lab is called the lab rotation model. The flipped classroom model is one of the most popular models. In this model, students rotate between F2F and the online environment is accessed from another site. Kostaris et al. (2017) posited that this type of BL maximizes F2F instruction and prompts hands-on activities. Lastly, the individual rotation model does not require stations but is individualized based on students' needs (Christensen et al., 2013).

The flex model of BL is not only seen as a means of learning but can be applied to the whole school, yielding a flex school. This model provides students with the flexibility to customize their learning, including scheduling and accessibility to teachers serving as facilitators (Christensen et al., 2013). Students who opt for the à la carte model can engage in multiple online courses while also attending school campus. The entire school experience coupled with remote learning is available to students through the enriched virtual model. The four models and sub-models presented by Christensen et al. (2013) are gaining in popularity with the flipped

classroom leading the way. However, other literature also categorizes BL into six slightly different models (Horn & Staker, 2011).

As BL continues to increase this mode of learning and instruction is being segmented to take on slightly differing methods and characteristics. Horn and Staker (2011) categorized BL using the following six models: face-to-face driver, rotation, flex, online lab, self-blended and online driver. Some of these models mirror those identified by Christensen et al. For example, the rotation and flex models are defined the same way in both studies. Others, though, have dissimilar descriptions.

The face-to-face driver uses F2F instruction but specifically designates online learning as needed by students for remediation (Horn & Staker, 2011). The online lab model emphasizes the location of online learning as occurring in a campus lab. In the self-blend model students engage in remote learning online only as an enhancement to traditional courses provided at their base schools. The last model described by Horn and Staker (2011) is an online driver model where students spend the majority of their time learning online but have the option for F2F support as needed. As seen by the varying models and applications, the rapid growth and popularity of BL has increased its value as a K12 instructional model.

Operational Aspects of Blended Learning and Its Value

Older, traditional means of instruction are no longer at the forefront and "the hybrid solution of blended-learning schools will likely be the dominant model of schooling in the United States in the future" (Christensen et al., 2013, p. 25). The BL model of instruction exemplifies a multifaceted method of instruction that extends beyond the definitive blending of traditional instruction and technology-based instruction. In BL, the technology-based aspect is

sometimes seen as the disruptive innovation (Basham et al., 2013; Bergdahl & Bond, 2021; Boboc, 2018; Graham et al., 2019; Henrie et al., 2015; LaFrance & Beck, 2014).

According to Christensen et al. (2013), merging new technology (disruptive innovation) with old (sustaining innovation) is the basis for the theory of hybrids or in an educational context, the BL model. Christensen et al. (2013) also predicts that BL will eventually replace the F2F model of instruction as the primary method of teaching. While teachers are well versed in providing instruction through established means, employing BL places a demand on them to develop or sharpen their technology-based or digital literacy skills.

As the nation and the world shifted to BL due to the pandemic, teacher performance revealed their lack of technology-based skills and competencies to deliver such instruction (Aditya, 2021; Azukas, 2019; Graham et al., 2019; Pulham et al., 2018; Short et al., 2021). Educational leaders quickly realized the need to provide training and support for teachers using technology. An et al. (2021) explored how teacher experiences could be used to prepare teachers for online learning. According to Frazier and Palmer (2015) preparing teachers for online instruction in both the K12 and higher education arenas is the dominant factor contributing to student learning. As the need for teacher preparation became increasingly evident (Basham et al., 2013), teacher preparation programs were being designed to focus on online and blended instruction. With the emergence of more such programs, teachers experienced an increased readiness to teach in an online or BL environment (Wong & Estudillo, 2021). While BL initially had a focus on teaching readiness, aspects of it also had a significant impact on student learning as well.

Employing the BL model gave students an opportunity to manage the how, when, and where of their learning as they chose the place, time, pace, and path of their learning (Arnesen et

al., 2019; Basham et al., 2013; Christensen et al., 2013; Ehsanifard et al., 2020; Enyedy, 2014; Graham et al., 2019; Harrell & Wendt, 2019). As teachers and students understood the development of the active learning that was taking place, other benefits of the BL environment on student learning began to emerge. Some of the notable benefits of BL included increased student outcomes, improved student engagement, academic achievement, and overall performance (Boboc, 2018; Bryson et al., 2015; Ciftci, 2020; Fazal & Bryant, 2019; Francom et al., 2021; Hall & Trespalacios, 2019; Wayer et al., 2015).

Christensen et al., (2013) identified three other benefits of the BL model: incorporating personalized instruction and learning, providing accessibility and equity for all students, and being a more cost-effective system. Beyond those, another profound impact of BL was found to be the level of student-content engagement. Numerous studies show that delivering instruction via BL promoted student-content engagement (An et al., 2021; Bergdahl & Bond, 2021; Cakir & Delialioglu, 2009; Carver, 2016; Chiu, 2021; Henrie et al., 2015; Jain et al., 2013). Implementing BL not only positively affected students in core courses such as math, science and English, but gave the same effect for CTE courses.

While the operational aspects and benefits of BL are evident as this mode of teaching and learning gains stability in the K12 sector, a critically important aspect involves the use of technology. Because the make-up of BL is indeed a blend of traditional methods of instruction with the technological aspects, it is important to examine the use of technology as a primary part of the blend.

Uses, Barriers, and Benefits of Technology in BL Environments

Technology usage plays a significant role in teaching and learning (Rahman et al., 2015; Tang & Chaw, 2016). The term “blended”, in defining BL, is often associated with the

technology aspect of BL that is used to facilitate student learning (Yang et al., 2021). Without some form of technology use, one cannot truly deem BL as authentic. According to Tang and Chaw (2016) BL with the aid of digital technology has become front and center in the field of education.

The rapid development of digital technology used in the BL setting has had a profound impact on both teachers and students in all sectors of education (Yang et al., 2021). Rasheed et al. (2020) asserted that the adoption "and use of technology for instruction is the backbone of the online component of blended learning" (p. 195). In consistency with other literature, Rahman et al. (2015) found that the use of technology within a BL model can help teachers to implement teaching and learning in an efficacious manner. An understanding of how to effectively use technology in the BL setting is one of the first steps a teacher should embark upon.

Teachers need a comprehensive understanding of the BL environment prior to designing and teaching their courses (Wong & Estudillo, 2021). It is important that teachers in the K12 setting develop their technological skills by first perceiving the use and role of technology in BL teaching as an essential component for successful instruction (Edannur & Marie, 2017; Aditya, 2021). The findings of the study conducted by Edannur and Marie (2017) showed that the effective use of technology by teachers begins with examining their experiences with BL technology.

According to Kormos and Julio (2020) the expectation for teachers was that they be fully equipped with the skills to effectively use technology while differentiating instruction for their students. Short et al. (2021) confirmed that educators must know how to combine F2F and online in order to acquire the skills and competencies required to develop effective blended teaching practices. As noted by Luo et al. (2017), in 2015 government policy provided directives in

support of preparing both students and instructors with technology-based tools to use in the K12 environment. While teachers' use of technology in the BL setting is crucial, at the same time, it is equally important for students to have a certain level of competence and proficiency in the use of technology, particularly in the BL setting (Rasheed et al., 2020). Tang and Chaw's (2016) study showed that teachers needed to first understand the digital literacy abilities of their students before immersion in the BL environment.

Yang et al. (2021) noted the growing awareness of academic diversity seen in K12 learners related to technological concepts and models that demonstrated a prevalent need for the development of practices designed to meet the needs of all learners. In today's BL classrooms it is vital for students to have some level of digital literacy. The most basic level of digital literacy for K12 students begins with possessing the foundational skills required to utilize technology (Tang & Chaw, 2016). Moving beyond basic technology usage to knowing how to manage information, practice online etiquette, think critically and master ideas is also a part of the digital literacy that students need to develop (Tang & Chaw, 2016).

In the BL environment, technology is the primary way that K12 students access learning materials, therefore increasing the levels of competency and proficiency with technology use is essential for the BL student (Rasheed et al., 2020). The findings of the study conducted by Rasheed et al. (2020) revealed that students are willing to use technology in their courses; however, the issue is found in the learners' ability to use technology proficiently and effectively. Additionally, other barriers have been identified in the literature that impacts technology use in the BL classroom.

Blended learning requires culturally suitable technologies, instructional and learning materials for both students and teachers (Yilmaz & Malone, 2020). When issues with technology

use begins to emerge then barriers are erected for teachers and are even more pronounced for middle and high school students. The role of digital education is critical to providing students with equitable access and opportunities that may not have been realized in a traditional setting (Boboc, 2016). The Association for Career and Technical Education (2020) reported concerns with technology integration with BL that included accessibility, equity and technology issues such as bandwidth.

Dziuban et al. (2018) also cited equal access as a potential barrier to students but even more so for students of marginalized populations. Accessibility to technology for students has consistently been noted in the literature as a salient challenge (Aditya, 2021; Dindar et al., 2021; Edannur & Marie, 2021; Huh & Reigeluth, 2017; Kormos & Julio, 2020; Naidoo & Singh-Pillay, 2020; Shin, 2021). According to Carver (2016) accessibility was the most identified barrier to K12 technology and Dziuban et al. (2018) noted a concern with BL in that blends are not always balanced based upon how courses are designed.

Other challenges or barriers that were identified included learning new technologies, geographical locations impacting internet accessibility, technological issues (i.e., bandwidth), and insufficient infrastructure to accommodate technology needs (An et al., 2021; Arnesen et al., 2019; Enyedy, 2014; Luo et al., 2017; Luo & Murray, 2018; Rasheed et al., 2020; Shamir-Inbal & Blau, 2021). Challenges to the use of technology in BL is not exclusive to student's experiences but teachers have also dealt with obstacles.

In a study conducted by Kormos and Julio (2020) findings revealed multiple challenges faced by teachers working in urban settings. Kormos and Julio (2020) mentioned the impact of geographical locations in the use of technology as teachers in urban areas experienced lower technology usage rates than teachers in suburban and rural areas. In another study conducted by

Yilmaz and Malone (2020) challenges were revealed in the number of technological issues experienced by preservice teachers. One pronounced barrier for teachers was identified as a lack of training on the various technologies.

Teachers believed that technology training and access was needed to successfully implement BL in their classrooms (An et al., 2021). Edannur and Marie (2017) also believed that teacher training was essential to effectively utilize new technologies for integration in course design. Additionally, in the research conducted by Carver (2016) teachers identified several barriers to the effective use of technology in the K12 setting such as teacher knowledge and skill sets, instructional time schedules, and technology availability. While legitimate obstacles to technology use in the BL classrooms have been identified, benefits specific to students have also been noted in the literature.

Technology-based tools can be used to enhance BL courses. Koivula (2020) stated "interactive images, videos, and virtual tours can support online learning by providing an alternative to text-based communications" (p. 1). The use of technology tools can provide an enriching experience for high school students through differentiated instruction. As noted by Brodersen and Melluzzo (2017) personalized learning alternatives can be used to address students' diverse learning styles. Students are afforded the opportunity to master content due to the flexibility available through the use of technology in BL courses. As stated by Dziuban et al. (2018), using online technologies has the potential to increase access to non-traditional and marginalized student populations through the use of educational resources and experiences.

The use of educational technologies may remove barriers associated with the traditional classroom such as outdated texts, limited opportunities for writing and damaged or defective non-digital resources (Kormos & Julio, 2020). Other common benefits recorded in the literature

included allowing for student voice and choice, personalization, increased student motivation, achievement, participation and engagement (Arnesen et al., 2019; Edannur & Marie, 2017; Luo et al., 2017; Rahman et al., 2015; Yang et al., 2021). Although research has identified barriers and benefits to the use of technology in the BL setting, these areas are contingent upon how the teachers experienced BL and the best way to implement this method of instruction effectively and successfully into their K12 classrooms.

Teacher Experiences with BL

The validity of teacher experiences regarding BL was not just newly introduced as a result of the COVID-19 pandemic. The BL models of instruction surfaced in a few of the K12 academic institutions decades prior to the onset of the pandemic (Picciano & Seaman, 2007). According to Archambault et al. (2014) concerns about teacher quality and online preparedness in the delivery of online and BL instruction emerged pre-pandemic. As these instructional models have continued to experience exponential growth, concerns about teacher expectations and readiness have also increased.

When K12 teachers first entered into the BL teaching and learning environment, teacher's experiences with this model ranged from supports, to the benefits, to the challenges of employing the BL model of instruction. While the transition to the BL model happened rather swiftly, some teachers believed they were ready to transition to the BL environment. As noted by Aditya (2021), teacher experiences indicated a belief that teachers were ready for the transition to digital learning. In other situations, teachers who recognized the need for support in this endeavor, participated in BL courses designed to inform their instruction (Arsenen et al., 2019; Ashraf et al., 2021; Edannur & Marie, 2017; Elsayary, 2021; Pardede, 2019; Yilmaz & Malone, 2020). This acknowledgement and experience with needed support partly resulted from the idea

that BL was not a temporary change. Teachers believed they would revisit more BL in the future (An et al., 2021).

K12 teachers also held beliefs about the use of the BL model in their classrooms, specifically noting the benefits, challenges, and effectiveness with certain disciplines. The perceived and noted benefits of using BL included: improvement in student learning, increased student engagement, motivation and participation, easy accessibility to course materials, student flexibility and satisfaction, increased student outcomes, promoting personalization, autonomy through student choice, leveraging devices for content delivery and internet access (Ashraf et al, 2021; Carver, 2016; Kuo et al., 2014; Liao et al., 2021; Luo & Murray, 2018; Naidoo & Singh-Pillay, 2020; Pardede, 2019). Edannur and Marie (2017) noted that teacher experiences revealed the belief that the integration of technology in instruction provided more benefits in BL than in the F2F model. On the other hand, with certain content areas more emphasis is placed on the value of F2F instruction while still acknowledging the overall benefit of the BL model.

Teacher experiences with BL in specific disciplines revealed the belief that these courses were positively impacted as a result of employing the BL model. For example, while enjoying the benefits of online learning in an English as a foreign language (EFL) course, experiences with F2F learning was still viewed as a valuable method of instruction and in this study, F2F methods were deemed of more value (Pardede, 2019). Albeit, the F2F aspect represented only a part of the BL model, EFL instructors saw the benefit of BL for learning and overall, for EFL teachers (Pardede, 2019).

In STEM courses, teachers deemed BL to be critically important to education based upon the positive results witnessed in student outcomes and how their own teaching practices were strengthened (Elsayary, 2021). STEM teachers noted how the technology aspect of BL helped

students in locating evidence to develop strong arguments (Elsayary, 2021). Lastly, the implementation of the BL model in math courses is perceived to be beneficial to students (Fazal & Bryant, 2019). In the same vein of teacher experiences regarding the benefits of BL, there are also concerns and challenges with using this model of instruction.

K12 teachers have expressed concern over student's ability to self-regulate, self-direct, and self-motivate their learning (Huh & Reigeluth, 2017; Luo & Murray, 2018). Concerns regarding student behavior has caused teachers to believe that boundaries need to be established in managing the BL classroom relating to potential student behavior issues (Luo & Murray, 2018). Other challenges by teachers, focused more on the technology component of BL.

Teachers felt that equipment availability, inadequate facilities and infrastructure, in addition to limited accessibility to digital resources and materials, could severely inhibit the effectiveness of using the BL model in their classrooms (Carver, 2016; Jerry & Yunus, 2021). The anticipated challenges centered on technology were not only from a student perspective, but teachers shared concerns about the inability to effectively blend technology resources into course design, learning to use the technology, and the overall implementation of BL (Kormos & Julio, 2020; Liao et al., 2021; Luo et al., 2017; Luo & Murray, 2018; Naidoo & Singh-Pillay, 2020; Napier, 2011).

A wealth of existing literature on the subject of BL has served to establish a knowledgebase for further research into this current and relevant topic. The literature revealed the lack of research regarding the use of the BL model in the K12 sector. An overall understanding of the blended teaching and learning model further informs this study by examining teacher experiences of the BL environment which also served as the primary focus

from an analytical perspective. It is, therefore, crucial to first establish a solid working definition from the plethora of definitions provided in the literature describing BL.

Watson and Kennedy (2014) provided a comprehensive explanation, which in part, identifies the blend as being partially online and partially in-person learning. This description in its entirety served as the foundation on which this study was built. Moving beyond simply defining the term to a more in-depth understanding of more substantial aspects of BL, particularly related to the K12 setting is another significant component in conducting a thorough analysis of this instructional method. As noted by Bryson et al. (2015) there are salient characteristics of BL that are notable such as maximizing instructional time for teachers while personalizing instruction to meet the unique needs of all students. A full systematic examination of BL is required in order to appropriately situate and connect the experiences of K12 teachers to this very specific and intentional mode of instruction.

Student-Content Engagement

Definitions of Student-Content Engagement and Types of Engagement

When defining student-content engagement, studies utilize varying approaches extracting this particular type of engagement from the broader category of student engagement. According to Martin & Bolliger (2018) the terms interaction and engagement are sometimes used interchangeably in literature but this study will use the term engagement. Moore (1989) makes the distinction of student-content engagement from the other two types identified, as one that serves as a foundational pillar of all learning.

While the topic of student engagement is extremely broad in nature, the idea of three forms or types of student engagement was initially introduced by Moore (1989) as an interaction framework comprised of student-content, student-instructor, and student-student interactions.

The student-instructor type of engagement involves the interaction between the student and the instructor responsible for preparing the course materials. This type of interaction is cited by Moore (1989) as one that motivates students in maintaining an interest in the course content. In student-student interaction students interact with each other either individually or as a group. The student-content interaction occurs between the student and the course content which can appear in multiple formats. Of the three types of engagement, Moore (1989) deemed this the first level of interaction and refers to it as "the defining characteristic of education" (p. 2). Castro and George (2021) concur with this assigned ranking of importance by labeling student-content engagement as foundational to the educational process.

Several studies have placed the student-content engagement at the forefront when examining the types of engagement. In research conducted by Borup et al., (2013) student surveys revealed that students viewed all three types of engagement as motivational promoting educational pursuits; however, students deemed student-instructor and student-content engagement significantly higher. Student-content engagement has been identified as the critical point where learning actually takes place (Gutierrez, 2021; Powell & Leary, 2021; Prouty & Werth, 2015; Xiao, 2017). Abdul et al. (2022) found that students believed that having freedom of choice based upon student interest, as well as the various approaches to content validate the strength of student-content engagement. With the growing ubiquity and focus on student-content engagement, it is imperative that teachers develop and utilize strategies promoting this engagement particularly in the BL setting.

Strategies to Promote Student-Content Engagement in BL

There are multiple ways to promote student-content engagement using the BL model of instruction. Due to the need to improve student engagement overall, there have been substantial

changes to the BL format (Youngers, 2014). Henrie et al. (2015) posited that student-content engagement can occur through technology-mediated experiences such as in online or BL courses. Student-content engagement in the BL setting is also largely driven by student motivation and flexibility. Chiu (2021) believed that student motivation at different levels could increase student-content engagement. According to Chiu (2021) the online learning environment provided students with the flexibility to choose a learning strategy that would promote personal engagement with course content. Other aspects of student engagement are more directly associated with teaching and instruction.

As noted by Jain et al. (2013) teachers have an important role in promoting student-content engagement as they enable collaboration within the learning environment. In a study conducted by Harris et al., (2020) teachers identified the following six categories of strategies to promote student-content engagement: 1) build relationships, 2) create a safe classroom environment through differentiation, 3) use technological tools to facilitate interaction and monitor progress, 4) make learning fun and relevant, 5) draw on school-wide pedagogical frameworks and teaching strategies, and 6) encourage self-regulation.

Of the six categories, at least four speak to how students can engage with the content. As teachers differentiate to develop a safe classroom environment, adjusting the content is a necessary initiative to ensure that conditions are conducive to learning for all students. Teachers should also consider the technology tools used to enhance instruction while strengthening student-content engagement. When teachers are intentional in their choice of learning materials and content this is a way to increase student-content engagement by sparking student interest (Harris et al., 2020; Kurt et al., 2022). Lastly, as teachers use school-wide pedagogical

frameworks that typically include how content is presented in the adoption of specific lesson structures, student-content engagement is often impacted (Harris et al., 2020).

In the research initiated by Kurt et al. (2022) three categories of teacher strategies promoting student-content engagement were identified and analyzed. The first category was instructional strategies where teachers designed and incorporated engaging activities into the content to foster increased student engagement with content. Teachers also employed managerial strategies to ensure and monitor student-content engagement. Affective strategies represented the emotional support that students needed to continue to effectively engage with course materials in a consistent manner. Students were not the only beneficiates of these powerful strategies but teachers also improved in their practices.

As teachers promoted student-content engagement it helped to increase teacher self-efficacy. Dindar et al. (2021) observed an increase in teacher self-efficacy through evidence of increased students' engagement with content, classroom management, and instructional strategies. Another critically important factor to consider when examining strategies that promote student-content engagement in the BL environment is the use of technology.

The type of platform used to deliver instruction remotely or in a virtual environment can have a profound impact on student-content engagement. Jain et al. (2013) suggested the learning management system (LMS) used by a school system for BL determines levels of student-content engagement. According to Bergdahl and Bond (2021) engagement in a LMS and effective use of digital technologies is critical for the BL environment. While engagement with content is the primary goal for students, using an appropriate LMS can be key as choosing a less robust system to use in the BL setting can reap the opposite effect and cause learners to disengage.

Bergdahl and Bond (2021) noted that the success of school systems using the BL model is highly contingent upon the right mixture of the LMS in addition to supporting digital technologies. As a matter of fact, digital tools used by teachers can promote levels of disengagement (e.g. use of projector to place content onto a whiteboard, where the teacher may have to turn their backs to students) (Bergdahl & Bond, 2021).

Some of the more specific digital technologies to be used effectively in the BL environment include information communication technologies otherwise known as ICT. Dziuban et al. (2018) discussed the used of ICT in the BL setting. In some instances, this type of technology has been established as the standard for BL teachers in managing their classrooms (Bergdahl & Bond, 2021). Another prevalent type of tool that proved effective in the BL setting was online digital tools that could be used for collaboration. Brodersen and Melluzzo (2017) also reference the effectiveness of using adaptive technologies in BL programs. The ways in which digital technologies are incorporated into the BL environment to promote student-content engagement often factors into teacher perceptions of its overall effectiveness in the goal of increasing student-content engagement.

Teacher Experiences with Student-Content Engagement

Literature specifically focused on what teachers believe about student-content engagement is scarce. The few articles that were located for this study showed how beliefs that K12 teachers hold regarding the most salient influences on student-content engagement vary and revealed mixed experiences (Borup, 2016). One view that surfaced was regarding teacher self-efficacy or a teacher's belief in their ability to influence student-content engagement which served as a central focus in the BL environment. This concept of self-efficacy in addition to a solid knowledgebase was also noted by Borup (2016) where teachers assumed the responsibility

for ensuring that student-content engagement was encouraged in order to succeed in the BL environment.

Another teacher experience spoke to the teacher's ability to build relationships with students as a means of promoting student-content engagement (Bergdahl & Bond, 2021; Dindar et al., 2021; Louwrens & Hartnett, 2015). Teachers believed that demonstrating genuine concern and building relationships could positively impact student performance through engagement with content while also increasing student confidence (Louwrens & Hartnett, 2015).

The growth in student confidence also resulted as students were given the power of choice and control. This is evident in the findings of a study conducted by Huh and Reigeluth (2017) which revealed that when learner-centered instruction is initiated, giving learners control of their learning, student-content engagement is positively impacted. Similar results were shown in Louwren and Hartnett's (2015) research where teachers expressed a belief that the use of web 2.0 tools that were used outside the confines of the LMS gave students more control of their learning yielding higher levels of online or content-related engagement.

Lastly, increases in student-content engagement has been connected to the feedback students received from their teachers (Louwren & Hartnett, 2015). Borup (2016) cited the used of the Internet as a tool that significantly increased feedback from teachers that, in turn, promoted student-content engagement. Feedback from teachers has been deemed as a highly effective strategy used in the BL setting (Geiger & Dawson, 2020; Kumi-Yeboah, 2018; Luo et al., 2017).

Some researchers have found ways to categorize the strategies that have been employed to promote effective student-content engagement especially in the BL setting. Students have been positively impacted by the deployment of the identified strategies but teachers have also

reaped benefits. While effective practices are yet being realized, there are still experiences with potential barriers such as accessibility and the overall effectiveness of certain practices. At the other end of the spectrum resides teacher experiences with student-content engagement as an aspect that leaves much room for further exploration. As a result of varying experiences, it is important for research to continue in order to create and develop strong pedagogical practices and strategies that prove effective for all constituents.

Pedagogical Practices and Effective Strategies in BL

Pedagogical Strategies and Digital Technology Management in BL

In the BL setting, pedagogy may look slightly different from what is typically seen in the traditional F2F setting. There are several types of pedagogical strategies that can be effectively implemented within the BL environment. One type is personalization. According to Fazal and Bryant (2019) sometimes BL is mentioned interchangeably as personalized learning. Bryson et al. (2015) acknowledged the intentional shifts in pedagogy that are needed to personalize learning in the BL environment. While, personalization is considered an effective pedagogical strategy in blended teaching and learning, the power of its effectiveness is in the ways learning becomes individualized for students. Dziuban et al. (2018) acknowledged the individualization and personalization that the BL model offers. According to Bryson et al. (2015) BL allows teachers to reach all students personalizing the instruction to meet student's needs at differing levels.

The personalization of instruction and management of digital technology using the BL model also positively impacts student-content engagement. Kocour (2019) lists BL as a strategy to increase student-content engagement through the use of differentiated instruction and personalization. This level of personalized instruction does not only benefit students but teachers

can also experience gains when they engage in training and professional development that is differentiated based upon their needs. As noted by Hall and Trespalacios (2019) the personalization of student learning through the use of technology should be matched by providing personalized professional development for teachers. In addition to personalization there are other types of pedagogical strategies and digital technology that is managed just as effectively in the BL environment.

Some additional strategies used by teachers include virtual meetings conducted via Zoom, providing immediate feedback on school assignments, using intentionally selected external digital tools to support learning, and granting students access to various resources (Geiger & Dawson, 2020). Once again, these strategies extend well beyond traditional core subjects and classrooms. For example, CTE teachers in particular can now introduce emerging technologies into their pedagogical practices further equipping students through simulations and real-world experiences (Castelo, 2020). In the study conducted by Mulqueeny et al. (2015) findings revealed that pedagogical strategies that fully engaged students deepening their learning resulted in improved learning outcomes. While these pedagogical strategies used in a BL setting can make a significant impact, teachers that instruct in a BL setting have had to exercise flexibility and make paradigm shifts to expand pedagogical practices and technology-based skills.

One particular area of flexibility noted by Oliver and Stallings (2014) is the implementation of a student-centered pedagogy where teachers have to be intentional in their preparation to strategically design course activities and assignments. For teachers to be successful in the execution of the BL model they need to prepare to use new technology tools and adjust their pedagogical practices (Oliver & Stallings, 2014). Lastly, according to Oliver and

Stallings (2014), from a pedagogical perspective, modes and resources should be appropriately blended to assist the learner in making the distinction between multiple types of content and concepts.

Teacher Experiences with Educational Technology, Accessibility, and Effectiveness in BL

Teachers believed that a need exists for digital devices and accessibility for students in order for BL to be effective. Christensen et al. (2013) identified accessibility as one of three value propositions of the BL model. In one study, teachers believed that technology training and access was needed for both K12 teachers and students (An et al., 2021). However, despite teacher experiences regarding needs, barriers continued to exist and were realized, posing challenges to the effective use of technology as well as accessibility issues.

Teacher experiences revealed several barriers to the effective use of technology in the K12 setting, which included: technology availability, teacher knowledge and skill set, instructional time schedules, and curricular concerns (Carver, 2016). Jerry and Yunus (2021) confirm that barriers do exists for teachers and students in the form of limited resources, accessibility, and technology. According to Carver (2016) the most identified barrier to K12 technology usage is accessibility to technology and the greatest benefit was increased student engagement overall. Chiu (2021) also identified a significant challenge as inaccessibility to resources and technology devices. For K12 teachers, the overarching factor was the availability of equipment as this had a profound impact on the potential integration of technology into classroom instruction (Carver, 2016).

K12 teacher experiences regarding technology accessibility and usage play a crucial role in the effectiveness of implementing a BL model and it is typically up to school leadership to build teacher confidence by supporting the valid concerns and need for resources. One of the key roles in successfully integrating technology in the classroom is to make attempts to understand

teachers' experiences and make improvements regarding the use of technology (Edannur & Marie, 2017).

To appropriately address teacher concerns regarding accessibility, the issue needs to be addressed from the onset. Geiger and Dawson (2020) noted the ability to address accessibility issues early on by working with their technology divisions to provide access to Internet services. As school leaders and districts assess resources to implement BL it is imperative to ensure accessibility and technology for all relevant stakeholders with a particular focus on specific demographic groups that may experience an even deeper challenge in this area.

Teacher Experiences with Professional Development and Training Support

With the abrupt shift to the BL model of instruction, teachers were among some of the first to recognize the need for training to teach their courses using this method. Teachers believed that in order to prepare and equip them to possess the technical tools and digital competencies required to effectively implement BL, well designed professional development and training was needed (Elsayary, 2021; Huh & Reigeluth, 2017; Kormos & Julio, 2020; Naidoo & Singh-Pillay, 2020; Pourreau & Lokey-Vega, 2020). Studies revealed that teachers in many instances, took the initiative to share their need for training on providing instruction in a BL setting. According to Kuo et al. (2014) teachers felt that training and workshops on BL should be provided. In a study conducted by Naidoo and Singh-Pillay (2020) the need for PD was identified by teachers regarding BL. Pourreau and Lokey-Vega (2020) noted more specifically in a case study, that teachers expressed a need for training based on standards related to technology-based positions within the K12 online teaching and learning environment.

As teacher needs continued to emerge, educational leaders started to design training courses and professional development programs that addressed this overarching need. Teachers expressed the specific challenge of deficiencies in the technology-based skills that would be

required to fully engage with students. Puhala (2018) reported that teachers believed they needed support through PD in implementing digital resources into their classroom structures. Some teachers were also impacted based upon the geographic locations of their schools.

For example, a study conducted by Kormos and Julio (2020) found that teachers working in urban areas with low socioeconomic populations tended to face accessibility issues in addition to low morale due to lack of support from educational leaders regarding integration. The same study revealed that teachers employed in more rural and suburban areas had better accessibility and support as did their students (Kormos & Julio, 2020). Teachers believed that understanding discrepancies based upon geographic location could inform the PD to personalize teacher support offered while also speaking to the design of the PD supporting technology use in the classroom (Kormos & Julio, 2020). As a result of these disparities, teachers reported low self-efficacy in areas where the challenges tended to be greater (Kormos & Julio, 2020). Not all teachers' experiences dealt with the challenges or had negative connotations; others spoke of the benefits and value of PD in a BL environment.

In a study conducted by Elsayary (2021), teachers reported seeing the positives and the benefits attached to PD designed to support BL. For example, teachers noted their beliefs in the power of the BL approach and benefits to significantly increase student learning and improve teaching practices (Ashraf et al., 2021; Bryson et al., 2015; Edannur & Marie, 2017; Elsayary, 2021; Kundu et al., 2021; Napier et al., 2011; Pardede, 2019; Yilmaz & Malone, 2020). Teachers also reported that the use of technology not only supported students with critical thinking activities but was a significant component in the development of the digital competencies being gained by the students (Elsayary, 2021). The study conducted by Shin (2021) showed similar results as teachers believed the PD program was of great value and effectively prepared them to

teach in a BL environment with a specific focus on personalized learning. According to the findings shared by Shin (2021), teachers learned more about personalization of instruction and were more confident about the use of BL in their own classrooms to promote personalization with their students. Overall, studies indicated that teachers deemed effective PD as beneficial to them and their students.

Theoretical Framework

The theoretical framework that was used for this study is the complex adaptive blended learning systems also referred to as the CABLS framework (Wang et al., 2015). This framework is rooted in the general systems theory, which was initially introduced by biologist, Ludwig von Bertalanffy's (1972) in the 1920s and is founded upon theoretical biology which affirms that the most basic characteristics of living things are dependent on its organization.

Examining the components of living things shows how these systems and processes work and function together cohesively rather than functioning in seclusion which allows for the establishment of laws governing biological systems. Bertalanffy's research furthered the concepts of open systems that remained in a steady state representing complexities which served as part of an active yet non-linear system (Drack, 2015). Waddington (1977) also addressed this concept as he described a system of external elements that traversed an internal process producing new outcomes.

Expansion of this concept beyond biology to a more generalized theory could be applied to any system. Essentially, the general systems theory was an extension of "the Aristotelian dictum of the whole being more than its parts" (Bertalanffy, 1972, p. 410). General systems theory was further developed and could apply, for example, to the field of sociology where

individuals act as agents of change that impact future interactions when forming a sociocultural system (Buckley, 1968, 2008).

Examining general systems theory through a sociocultural lens, Buckley (1968, 2008) developed the complex adaptive system by extracting from the homeostatic (balance of open elements) of the earlier general systems theory. A primary characteristic of the complex adaptive system as it relates to the general systems theory is its ability to sustain the openness of structure within pre-existing boundaries.

The interactions that occur among the parts of a system may create change in the parts themselves. These interactions that occur both externally and internally, in turn, cause adaptable changes to the environment that cause the emergence of complex patterns within the systems without focusing on any one dominant element (Buckley 1968, 2008). The concept of various components that are adaptable, showing continual shifting, and without the primary focus on one prevailing element are concepts readily adaptable to the BL model of instruction.

The principles supporting the complex adaptive system have been updated and applied to BL. Using these initial concepts that were applicable to the sciences and math, CABLS is considered to be a general open, yet complex adaptive, system that is suitable to describing the complexities associated with the BL model (Wang et al., 2015). The study conducted by Wang et al. (2015) involved research that examined "what constitutes blended learning and how different components of blended learning work together over time to achieve an integrated whole" (p. 380). The BL model can be seen as a complex model when used with teaching and learning because of integrating F2F instruction with technology that can require multiple types of devices (Wang et al., 2015). The various frameworks and concepts that support the theory and the framework being used for this study are depicted in Figure 1.

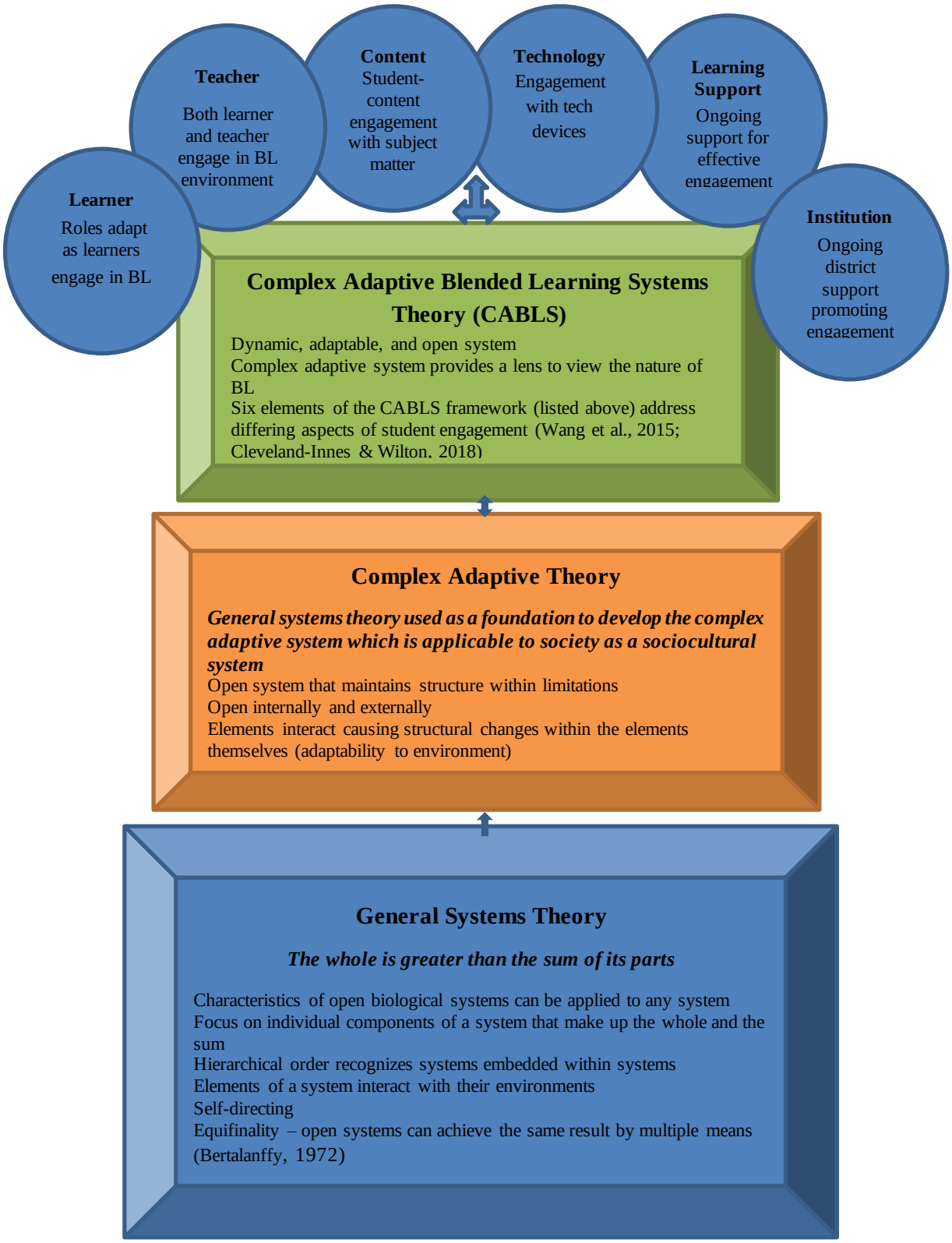

Figure 1

General Systems, Complex Adaptive Systems, and CABLS

According to Wang et al. (2015) many empirical studies tend to focus on specific aspects of BL interventions, when there is much more to be explored. While research continues to redefine BL, there is still a gap that needs to address how the elements of BL work together as individual parts for the ultimate good of the whole (Wang et al., 2015). This idea appears to align with and is congruent to the general systems theory, which states that the components of a complex system presents as a newly emerging system because the whole is larger than the sum of its parts (Clark, 2014). Wang et al. (2015) have used general systems theory with the BL model to develop the CABLS theoretical framework. Within this framework, BL is divided into six subsystems that work in a vigorous yet non-linear fashion (Table 3; Wang et al., 2015).

Table 3

Subsystems and Functions of Blended Learning

Subsystem	Function
Learner	Initial engagement or new engagement in the system determines the learner's role
Teacher	Role of teacher requires adaptation to BL pedagogies while developing and engaging with students and other subsystems
Content	The curriculum and instructional materials used to engage learners with the goal of mastery of content
Technology	Engagement with technology of the BL setting in new and innovative ways to work with content
Learner Support	Continuing support for learners in the BL environment that may include scaffolding to handle challenging content and assignments
Institution	"Blended learning requires technological infrastructure and digital janitors" (Cleveland-Innes & Wilton, 2018, p. 40)

Summary

There is a growing body of literature investigating blended teaching and learning strategies. Gaining an understanding of salient blended teaching and learning strategies is a prominent aspect that informs this research when analyzing teacher experiences illustrating the need for the development of new studies focused on this portion of BL. First, the concept of student-content engagement is key as this is a crucial phase of student learning. As noted by Ehsanifard et al. (2020) "instruction through blended learning tends to optimize both interaction and engagement" (p.253). Chui (2021) expressed a similar view stating that to increase student-content engagement, teachers needed to design instruction skillfully and intentionally.

Next, pedagogical strategies along with digital technology management informs the teacher experiences facet of the study in the implementation of the BL model. This component addresses strategies designed to support the technological portion of the blend. It is imperative to this study to demonstrate the relationship between pedagogical strategies and the desired student outcomes contingent upon differentiation. Kundu et al. (2012) identified pedagogical goals based on the aspect of personalization for BL. Technology-based resources are needed to assist and support learners in the BL environment. According to Oliver and Stallings (2014) from a pedagogical perspective, modes and resources should be appropriately blended to assist the learner in making the distinction between multiple types of content and concepts. In order to successfully integrate technology and BL strategies, understanding teacher experiences with strategies using integration is required (Edannur & Marie, 2017). Teacher experiences centered around BL strategies served as a pillar for this study with the intention of causing potential advancements and improvements in the blended teaching and learning setting.

CHAPTER 3: METHODS

The COVID-19 pandemic in 2020 caused a major upset to the K12 educational world. Teachers accustomed to traditional methods of instruction have continued to struggle with implementing BL as an instructional modality (König et al, 2020). As BL is now considered the norm, it is believed to promote student-content engagement on multiple levels. However, the challenge of incorporating the BL model in the K12 classroom is based primarily on the fact that the F2F method of instruction has been used for centuries. To address this challenge, this research focuses on using BL in the K12 arena and explores effective strategies for its use with attention given to student-content engagement.

This study served the purpose of investigating K12 teacher experiences with facilitating student-content engagement in BL settings. The three research questions that guided this study were:

1. What are K12 teachers experiences with facilitating student-content engagement in blended learning environments?
2. What strategies and practices do K12 teachers use to promote student-content engagement in blended learning environments?
3. What are K12 teacher perceptions of the teaching and learning practices used within their school districts for blended learning?

This chapter describes the methods used to collect and analyze relevant data. The research design and rationale supporting the design choice are discussed. A detailed description of the participants is given, as well as the means used to collect and analyze data.

Methodology and Epistemology

Qualitative research can be conducted by choosing to employ one of several research designs. According to Merriam (2002), the goal of qualitative research is to thoroughly examine the lived experiences of individuals through a descriptive lens in order to understand those experiences while considering specific times and contexts.

For this study a single case study design with the participants serving as the unit of analysis, was used within the qualitative methodology because this design allowed broader exploration of teachers at multiple sites within two school districts simultaneously. This single case study is bounded within the confines of BL specific to the K12 sector in alignment with Flyvberg's (2011) observation that cases require boundaries defining the context and the case itself.

The researcher examined a general overview of K12 teachers experiences in the BL setting with attention to student-content engagement. According to Yin (2009) a single case study is the appropriate method to use when the focus of the study involves a current phenomenon by which the researcher has minimal control and the event occurs within a real-life situation. A single case study design was used because it allowed the researcher to investigate participants within two school districts with different types of public schools in each district that used the BL model in some form at multiple grade levels. The case represented in this study included the general experiences of eleven K12 teachers. Electing to study the situational aspects of BL pertaining to student-content engagement and teacher experiences with BL is a salient characteristic of a single case study design that the researcher found appealing and useful when considering an appropriate methodology.

Research Design

This study used a single case study design intended to investigate teachers' experiences with BL in two public school districts, while examining and identifying the pedagogical practices and strategies that were employed. The primary (and preferred) method addressed the research questions by considering the phenomenon from a real-life perspective (Yin, 2009). The choice of this design emerged as a result of the research questions developed which sought "to understand how educators facilitate the understanding and capability of learners" (Stake, 2006, p. 3) in the BL environment.

This design is one in which a single case examined the general experiences of participants described based upon the same phenomenon occurring within their shared stories (Stake, 2006; Yin, 2017). Creswell (2013) also agreed that employing a single case study design is a way to investigate real-life systems that are confined over a period of time in order to collect extensive and detailed data for thorough analysis. Stake (2006) found that a single case study emerges as the result of a particular case of interest that is presented in a way that encourages expanding the study to a collection of cases if applicable.

In this study, the system considered was the BL environment (Merriam, 2009). This design best lent itself to using a group of schools located in two different districts with the teachers within those sites serving as a single case but permitted the researcher to work toward understanding the participant's experiences individually as applicable to the topic (Stake, 2006). As an educator, the researcher's perspective regarding the topic included baseline levels of relativity and subjectivity embedded within the constructivist epistemology of this study (Charmaz, 2014). This aligns with Charmaz's (2014) belief that acknowledged the researcher as one who assesses their knowledge of subjectivity and involvement as construction and

interpretation of the data unfolds. It was therefore this researcher's hope to assume the active position "as the author of a reconstruction of experience and meaning" (Mills et al., 2006, p. 26). In order to present a strong research design that represents congruence with the researcher's beliefs, the single case study approach based on a specific phenomenon or condition to be studied was the method employed in this instance (Stake, 2006).

This study utilized the descriptive perspective of a case as K12 teacher experiences and stories were shared and investigated. Using this approach ruled out other methodologies that could support the topic and indicated a specific and bounded system, program, or event that may or may not be isolated while examining the case in connection to its context (Yin, 2013). The overall goal of using a single case study design was to discover the frequency of findings (Baxter & Jack, 2008; Yin, 2009). Using the overarching topic of BL, the goals of considering one distinct case examining the generalized experiences of K12 teachers regarding the facilitation of student-content engagement within the BL setting was explored

Theoretical Framework

An appropriate theoretical framework relevant to the topic is relatively new and specifically designed to support the BL instructional modality. The neoteric framework referred to as CABLS was derived from the grounded theory approach (Wang et al., 2015).

CABLS is a lens through which to explore BL and its impact on student-content engagement when applied using the six identified elements in support the methods used in this study. The framework was applied to this study inductively by using the elements identified from the pre-existing CABLS theory. The six subsystems included are: learner, teacher, content, technology, learning support, and institutional support. These six facets were used to create the

interview protocol and survey instruments and guide the data analysis. The questions posed by the instruments were categorized using the framework elements as a guide.

Once data had been collected, analysis was done using CABLS. For example, for the element of institutional support, participant responses were examined in terms of emerging patterns that revealed how institutions/districts provide support to BL classroom activities and initiatives. The information contributed to how the data were viewed and interpreted by the researcher. Individual, semi-structured interviews discussed the research questions of this study as each component of CABLS was addressed. The research questions were designed to engage K12 teachers in an open-ended dialogue about student-content engagement in their BL classrooms directly related to the CABLS framework.

A complex adaptive system is an open system where the identified elements are structured yet interact relative to one another while maintaining the ability to adapt independently. This is the foundational principle undergirding the structure of the CABLS framework. The six subsystems housed within the CABLS framework are autonomous yet are interrelated as they impact various aspects of student engagement related to the BL environment. The CABLS framework offered structure for data analysis while also shaping the data.

The BL model of teaching and learning, with its integration of technology-mediated and F2F learning, has made BL a complex method representing various aspects of education (Wang et al., 2015). While research continues to redefine BL, there remains a gap in the literature concerning how the aspects of BL work together to benefit students (Wang et al., 2015). Conceptually, BL appears to align with general systems theory developed by von Bertalanffy, who stated that the components of a complex system present as a newly emerged system because the whole is greater than the sum of its parts (Clark, 2014).

Researcher's Role and Positionality

My role as researcher was to conduct the study with minimal assistance from others, develop a survey, design a recruitment plan, and collect and analyze data using appropriate instrumentation and a basic qualitative method. In the initial phase of data collection, participants were selected to partake in individual semi-structured interviews. A transcription service was used to transcribe conversations between study participants and me. I further analyzed responses and made comparisons that will be documented in the findings. At that point, I asked colleagues to review and discuss the findings to minimize the risks of biases, predispositions, assumptions, and power imbalances. I also noted key points in the interviews as well as the limitations and implications of the study.

I identify as a Black woman and a first-generation, middle-class doctoral student. I grew up in a single-parent home in the Bronx, New York. Due to my love of learning, my mother intuitively knew I was going to be a teacher. After high school I attended college, aspiring to become a teacher. My first teaching experience in a K12 classroom was through Junior Achievement, which is when I fell in love with teaching and continued my teaching career in CTE.

My interest in student-content engagement within the BL environment stems from my passion and experiences as an educator. I have explored ways to incorporate instructional technology into my courses and this study allowed me to further explore this topic while also gaining a better understanding of strategies designed to promote student-content engagement.

Working in this field could pose a potential challenge requiring me to maintain an unbiased outlook free of assumptions to avoid misinterpreting the data. Maintaining high quality

data is key to having fair, accurate, and ethical practices when interpreting participants' responses, particularly regarding student-content engagement practices used in their classrooms.

As a former CTE teacher, bias could have caused me to favor CTE teachers as experts in using BL. Conversely, I needed to avoid assumptions and preconceived ideas regarding teachers of non-CTE disciplines use of BL inadequately in their classrooms. As a former CTE teacher, I can identify with the blended design of CTE courses. In either situation, I must remember that there are multiple ways BL could potentially be implemented, including innovations that have yet to be discovered.

Ethical Considerations

Protecting human participants is a critical aspect of any research. White (2020) noted the ethical implications that can surface as researchers put measures in place to protect participants. For this study, specific strategies were implemented to minimize potential risks such as inaccurate recording of data, breach of confidentiality, researcher outlooks, biases, assumptions, and power imbalances. To begin the process of mitigating potential risks to participants, the researcher began with informed consent forms. White (2020) wrote that the informed consent process is comprised of three elements: basic information, volunteer information, and comprehension.

The IRB of the University provided an editable template. I developed informed consent forms to cover the interviews and online surveys. The consent forms informed interviewees that their identities were protected by pseudonyms. School districts and specific schools were not identified to provide further anonymity.

To minimize inaccuracies in recording and documenting data, member-checking and bracketing were employed. Data was continuously reviewed for alignment to the research

questions and purpose of the study. Selected colleagues were asked to review the findings. The final step in this process was obtaining IRB approval.

Research Site and Participants

To follow the recommended sample size for qualitative research, 11 participants were interviewed. Charmaz (2014) considered a small sample size as one that allows for collecting rich data through in-depth interviewing. The selection process was purposive and used theoretical sampling. According to Charmaz (2014), theoretical sampling begins as a strategy to construct ideas based on the data. The targeted group of participants was a culturally diverse group of individuals from two K12 districts that included specialized schools such as charter and online schools. K12 teachers were selected as participants in order to provide multiple perspectives and experiences.

Sites

The setting for a research project is a critical piece that could potentially influence interpreting the data. It was essential for the researcher to begin searching for an appropriate site by becoming familiar with the community and then identifying a potential setting while surveying the community (Acrury & Quandt, 1999). *Editage Insights* (2020) described the research setting as a crucial element in the research process that should be explained in detail.

The field setting that was used for this study included two K12 school districts comprised of public elementary, middle and high schools, and online schools in addition to charter schools at several urban and rural locations in the northwestern region and Piedmont triad region of a southern state. I chose these settings to diversify the participant pool and gather rich data.

In this study, the primary investigator conducted a descriptive single case study of teachers from two vaguely different K12 school districts located within the same southern state

in the U.S. Upon IRB approval from both the university and the administrative leadership of the school districts three school districts provided contact information for potential participants in their districts that engaged in BL within their classrooms. Emails were then crafted and sent to the potential participants in all three districts. Of the three districts only two districts had potential participants that responded to the recruitment email inviting them to be a part of this study. Additional follow up emails were sent to the third district and due to non-responsiveness the remaining two districts that did respond were selected to participate in the study.

The two districts selected for this study are modest in size. The case participants were employed in these two districts that will be referenced as District C and District D. The schools within the districts targeted for this study represent middle schools, high schools, and a K12 online school (See Table 4 for a profile of each district).

District C Description

District C is a modest-sized school district with 28 schools inclusive of 6 high schools, 6 middle schools, one K-12 online school and the remaining are elementary schools serving over 15,000 students (see Table 4). There are a little over 2000 employees with less than half of the personnel being teachers. Approximately 98.3% of the teachers in District C have 3 or more years of teaching experience.

The specific schools targeted for the study were the online K12 school serving all grade levels in an established BL environment and a traditional high school. The district is considered to be a one-to-one district meaning that all students have computer devices that they get to take home on a daily basis. The participants represented the content areas of science, math, and CTE. The data was collected from participants using semi-structured interviews and all interviews were conducted virtually using the Zoom platform.

District D Description

As a fairly sizeable district, District D, includes 36 schools comprised of 9 high schools (one of them being a combination school with middle and high school students), 7 middle schools, 18 elementary schools, one early college and one K-12 school all serving over 17,000 students (See Table 4). District D also employs over 2000 individuals with over 1100 being teachers and 96.1% have 3 or more years of teaching experience. For this study, the targeted schools were 3 traditional high schools and 2 traditional middle schools. This district is also considered to be a one-to-one district.

The participants represented the content areas of math, science, social studies, CTE, and English. The data for this district was collected from participants also using semi-structured interviews. Most of the interviews for this district were conducted virtually using a Zoom platform while one interview was an in-person interview that took place in the classroom space of the participant and recorded using an embedded software on the researcher's computer device.

Table 4

District Profiles

District	Number of Schools	Number of employees	Number of teachers	Size of Student Population	Percentage of teachers with 3+ years of experience
District C	28	2000+	900+	15,494	98.3%
District D	36	2000+	1150	17,894	96.1%

An inductive analysis approach was used by the researcher to analyze participant experiences individually. The researcher also made notations and wrote memos throughout the process. Brief descriptions of the case participants are included and participant responses are aligned with the research questions and the elements of the CABLS theoretical framework.

Single Case Study Overview

For this single case study, the goal of the researcher regarding the selection of the participants was to recruit and collect data from 10-12 participants representative of a diverse population of teachers within the two school districts. The researcher also wanted to ensure that a variety of types of schools would be denoted in this study and the table below shows the three types of schools and the grade levels for each school providing the participants. In this section the researcher shared additional information about the two districts and the schools used as the sites for each district (see Table 5).

Table 5

School Profiles

District	School Name	School Type	Number of Teachers	Size of Student Population
District C	A School	Online Virtual Academy	72	1186
	B School	Traditional HS	~75	1300
District D	C School	Traditional MS	40	552
	D School	Traditional MS	40	630
	E School	Traditional HS	~65	873
	F School	Traditional HS	65	977
	G School	Traditional HS	41	731

The two districts used for this study received IRB approval from the school districts as well as the required IRB approval from the university. In addition, the district IRB approvals were provided to school site administrators as requested. Emails with the informed consent forms attached were sent to administrators to obtain a list of potential participants for recruitment.

From District C five participants who met the selection criteria responded to the invitational email. Potential participants were two males and three females who taught either middle school or high school students online or in a traditional school setting with the exception of two teachers. One teacher teaches both middle and high school math and the other teacher teaches math in a traditional high school setting and online. One of the male participants that initially expressed an interest no longer responded to email reminders and inquiries and was not included in the participant pool that was used for the study. For District D there were 8 potential participants who met the selection criteria. Six of those participants were female and two of them were male. One of the female participants declined the interview due to personal issues and obligations. The final participant pool included 11 teachers.

The participants represented a culturally diverse group of both African American and Caucasian males and females. The years of teaching experience ranged from 6 years to 28 years in the classroom. Some of the participants taught multiple courses and others have taught the same content courses for a number of years. Two of the participants also had experience teaching in a community college setting while two others had a license in school administration. All participants were assigned pseudonyms to protect their identities and professional background information on each participant can be viewed in Table 6 below.

Overview of Participants – District C

In this section the researcher provides a brief demographic seen in Table 6 and professional profile seen in Table 7 describing each participant. The description provides a succinct glimpse of each participant's professional background including educational degree attainment.

Amber – Online High and Middle School Math

Amber is in a unique situation as she teaches both middle and high school math in the online setting. She holds a bachelor's degree and has taught 6th, 7th and 8th grade Math I. She has also taught Math I to high school 9th grade students. Amber is one of a very few number of online math teachers in the state. She has been teaching for 3 years for the online school but has a total of 15 years teaching experience. Amber employs BL as her students attend class both online with some in-person component requiring students to come to the building. Her students also have specialized computers that allow interaction through use of a touchscreen.

Table 6

Participant Demographics (n=11)

Pseudonym	Gender	Race/Ethnicity	Role
Amber	Female	White/Non-Hispanic	Math Teacher
Ashley	Female	White/Non-Hispanic	Math Teacher
Barbara	Female	White/Non-Hispanic	Science Teacher
Brad	Male	White/Non-Hispanic	CTE Teacher
Dawn	Female	White/Non-Hispanic	Science Teacher
Haley	Female	White/Non-Hispanic	English Teacher
Kathy	Female	White/Non-Hispanic	CTE Teacher
Megan	Female	White/Non-Hispanic	English/Social Studies Teacher
Mitchell	Male	White/Non-Hispanic	Social Studies Teacher
Paige	Female	White/Non-Hispanic	Career Development Coordinator/CTE Teacher
Storm	Male	Black/Non-Hispanic	Science Teacher

Storm – Online Middle School Science

Storm has been teaching for a total of 22 years but has been teaching science in the online setting for 3 years. He holds a master's degree in school administration and served as an administrator for a 2-year stint. Storm has taught 6th, 7th , and 8th grade science for the last 3-4 years and uses BL to engage students with his content through online instruction, both synchronously and asynchronously with some in-person class meetings. He was also one of the first teachers to begin implementing AI in his course structure.

Ashley – Online and Traditional High School Math

Ashley is an anomaly in that she teaches math in both the online and traditional high school settings. She has taught in the traditional high school for 16 years and in the online school for 4 years. She has a total of 24 years of teaching experience. Ashley uses BL by employing a combination of traditional F2F instruction with online instruction. She also records videos using a flipped classroom model of BL. Ashely holds a master's degree and has taught the following courses: Math I, Math II, Math III, Math IV, ACT Prep, and yearlong math. Ashley also serves as an adjunct teaching in a community college.

Paige – Online High School Career Development Coordinator and Teacher

As a CTE Career Development Coordinator, Paige also teaches business courses. She has served in her current role for 8 years and has been working at the online school for 3 years. Paige has 18 years of classroom experience. She hold a master's degree in instructional technology with an add-on license in school administration. Her content area is business and technology. Paige has taught the following courses in the last 3-4 years: Business Law, Career Management, Microsoft Word and Microsoft Excel. As a CTE teacher, Paige uses BL by incorporating some instruction in a F2F environment while also utilizing an online platform to engage her students in

her content. Paige makes sure her students use digital devices to effectively and actively engage with her content.

Overview of Participants – District D

Megan – Middle School English Language Arts and Social Studies Teacher

Megan has 19 years of teaching experience and 16 years serving at this particular school. She holds a bachelor's degree and her content areas are English Language Arts (ELA) and Social Studies. She has taught 7th grade ELA for the past 4 years and she has spent 2 years teaching Social Studies. Megan teaches in a traditional middle school and BL looks a little different in her classes as she instructs students primarily in a F2F environment. She uses technology on a daily basis and requires her students to engage in her content using technology mediated devices as well. It is important to Megan for her students to engage digitally on a daily basis while in-person as a part of her BL environment.

Dawn – Middle School Math and Science Teacher

Dawn holds a bachelor's degree in math and science. She has taught for a total of 11 years and she has taught in her current school for 2 years. Although she is licensed in math and science, she currently only teaches science. In the past 3-4 years Dawn has taught 5th grade math and science, 7th grade science and 8th grade science. Dawn took a 4-year break from teaching but because of her previous experience when she returned to the classroom she began to serve as a mentor for new teachers. She integrates technology into her lessons on a consistent basis to engage students with her content. Dawn also uses online platforms to engage her students in the BL environment.

Barbara – Middle School Science Teacher

Barbara holds a bachelor's degree in elementary education and K-12. She has been teaching in her current position for 5 years but has a total of 14 years of teaching experience. Barbara has previous experience teaching elementary school students but currently teaches middle school science. She goes beyond the typical use of Chromebook computers to engage her students in the BL environment as she also provides her students with iPads and uses the digital speech feature of the student's devices to engage them with content on a level that works for the student. Barbara employs the flipped classroom model as another type of BL used in her classroom.

Brad – High School CTE – Agriculture Education Teacher

Brad has a total of 23 years of teaching experience but has taught in his present position for 1 ½ years. He was a former social studies and science teacher for high school. Brad also taught technology courses for middle school. He holds a master's degree. While Brad's classes are primarily F2F he promotes BL by using unique types of technology such as virtual reality providing his students with an immersion experience using technology while in-person.

Kathy – High School CTE – Family and Consumer Sciences Teacher

Kathy holds a master's degree in teaching. She has a total of 6 years of teaching experience and has spent 6 years in her current position at her current school. She has taught Food & Nutrition I and II and Food and Science Technology. Kathy uses BL by having her students to interact in the online environment while also using traditional strategies such as group work which is accomplished as students are in-person.

Mitchell – High School Social Studies Teacher

Mitchell has 28 years of teaching experience in his current position. His highest degree is a master's degree in American History. In the past 3-4 years he has taught; Civics, US History, Advanced Placement (AP) US History, Honors Psychology and standard Psychology. Mitchell uses BL as he blends in-person strategies with technology used by both himself and the students.

Haley – High School English Teacher

Haley hold a master's degree and she has a total of 22 years of teaching experience. She has taught in her present position for 14 years. Haley has taught English II Honors, AP Language and Composition, and Yearbook. She also has 2 years of experience teaching in a community college setting. Haley incorporates online collaboration with in-person skills such as writing to employ BL that engages her students with her content.

Participant Selection

Determining an appropriate sample size in qualitative research can be challenging. Merriam and Tisdell (2016) listed factors that contributed to these challenges such as the research questions, data collection, and resources supporting the research. The sample size also affected the potential for data saturation.

Sample size related to data saturation is an aspect of qualitative research that lacked detailed guidelines. Fusch and Ness (2015) wrote that data saturation is not often discussed because it is difficult to define. This study followed the advice of Lincoln and Guba (1985; cited in Merriam & Tisdell, 2016) which encouraged investigators to sample "until a point of saturation or redundancy is reached" (p. 101). This was evident when responses to interview questions were repeated. The sample size for this study was deemed appropriate based on the research questions.

Table 7

Participant's Professional Background Profile

Name	Subject Taught	School Type	District	Yrs. of Teaching	Highest Degree	Notes
Barbara	Science	MS	D	14	Bachelor's	
Paige	CTE	Online – HS	C	18	Master's	Career Dev. Coord. but teaches business Admin. license
Megan	English and Soc. Studies	MS	D	19	Bachelor's	
Dawn	Math/Sci.	MS	D	11	Bachelor's	
Amber	Math	Online – MS and HS	C	15	Bachelor's	Teaches both MS and HS math
Kathy	CTE	HS	D	6	Master's	
Brad	CTE	HS	D	23	Master's	Taught science, SS and technology
Storm	Science	Online - MS	C	22	Master's	Served 2 years as administrator
Mitchell	Soc. Studies	HS	D	28	Master's	Taught Special Ed. 4-5 years and community college for 2 years
Ashley	Math	HS	C	14	Bachelor's	Teaches in a traditional high school and online. Also teaches community college
Haley	English II	HS	D	22	Master's	Taught yearbook and community college for two years.

Conversing with up to four educators from two different sites representing the same content area, participants gave similar perspectives, but with minimal differences to provide richness to the data. Fusch and Ness (2015) considered collecting data using interviews a straightforward way to achieve data saturation as the researcher reviewed and analyzed transcripts. By reviewing teacher responses to the interview questions, I was readily able to see when saturation was reached by hearing repeated responses.

Teachers were purposively selected for participation by completing the informed consent form and the online survey to determine eligibility based on meeting the following criteria for demographic and descriptive purposes:

- Identify as a man or a woman
- A minimum of four years of teaching experience
- Teach in a core content area or CTE

Collecting demographic data provided context for data analysis and ensured a diverse pool of participants. The number of years a teacher has taught is important in order to gain various perspectives from teachers with varying skill levels about strategies used to gauge student-content engagement in the classroom before, during and after the COVID-19 pandemic. Snoeyink and Ertmer (2002) found that veteran teachers considered themselves novices concerning technology integration in the classroom and desired to move towards computer-competence. On the other hand, novice teachers tended to adapt quickly to technology integration that is often at the heart of BL.

Once teachers completed the informed consent forms, links to the demographic surveys were sent via email. The overall plan for recruitment was to write an emailed letter of invitation.

The recruitment letter had an introduction and a detailed description of the project. The letter also explained how their contact information was obtained through school administrators.

I addressed the informed consent process needed to proceed and plan for the interviews. For invitees that did not respond, a second letter was sent to gauge their interest in participating. For those who agreed to participate, a follow-up letter included a timeline of next steps and signing consent forms, along with a reminder that they were not obligated to participate. The letter included my contact information for further questions.

Data Collection

Data for this study were collected from a group of participants from multiple K12 schools within two districts. Before beginning the study, participants received consent forms by email in order to explain this part of the process and addressed the most common questions.

After the consent form was signed, participants were asked to complete a brief survey to collect demographic data. If the criterion on the survey was met, they were considered a participant. The demographic data that determined eligibility was the number of years a teacher had been teaching. The requirement was at least four years. This is so participants had a level of classroom experience that allowed them to address the questions based on the transition from the onset of the COVID pandemic to the present.

Demographic data were also used to bring context to the data analysis by identifying the number of males and females in the study. Participants were contacted via email to schedule interviews using a scheduling spreadsheet for virtual and in-person interviews. After scheduling the interviews, a *Zoom* invite was sent for virtual interviews as an official invite, and in-person meetings received a calendar reminder. Once interviewees were scheduled, individual semi-structured interviews were arranged and guided by a detailed interview protocol.

The teachers provided data by answering in-depth, open-ended questions via semi-structured interviews based on the topics identified in Table 8 below. As participants chose either in-person or virtual interviews, the interview format was determined by participant preference. The questions and their structure were previously developed for a pilot study.

The pilot study provided a strong foundation and realistic expectations for the full study while valuable lessons were learned. For example, some of the interview questions were restructured to reduce redundancy. Also, while I desired responses to be authentic and candid, I also wanted to respect each participant's time and reduced the number of questions.

Each interviewee identified professional background information such as the public-school unit or district in which they were employed. All interview questions were in a format that easily lent itself to further probing questions to deepen the engagement allowing participants to expand their answers. For example, a sample question used in the interview was, "What strategies do you use to engage students in a BL environment?"

Instrumentation

For this study, I used an interview protocol designed with in-depth, semi-structured, and open-ended questions aligned with the CABLS theoretical framework as my primary data collection instrument to address the research questions. Additional questions are included in the interview protocol as a means of probing to initiate even more in-depth conversation and to bring clarity. This method was in accord with and confirmed the recommendations made by Stake (2006) and Yin (2009). I also employed a brief online survey as suggested by Yin (2009), using *Survey Monkey* to collect demographic data. The demographic data were important to gauge the number of years a teacher has taught so that teachers could speak to teaching practices before, during and after COVID. Both methods have often been used in case study designs.

Table 8

RQ Alignment with Collection Instruments, Analysis Process, and CABLS

Research Question	CABLS Element	Data Source	Analysis Process
RQ1. What are the experiences of K12 teachers when facilitating student-content engagement in the blended learning environment?	The Learner The Learning Support	Semi-structured interviews	Descriptive Descriptive Diagnostics
RQ2. What kinds of strategies and practices do K12 teachers use to promote student-content engagement in blended learning?	The Content The Tech	Semi-structured interviews Survey	Descriptive Prescriptive
RQ3. What are K12 teacher perceptions of teaching and learning practices promoting student-content engagement used within their school districts for blended learning?	The Teacher The Institution Support	Semi-structured interviews Survey	Descriptive

Table 9 below gives a brief outline of the alignment of the research questions to the interview protocol and survey, as well as showing the data analysis process through the lens of CABLS. This study was grounded in a single case and used interviews and surveys that are typically associated with single case designs. Yin (2009) wrote that one of the most important ways to gather essential data from a case is by interviewing. The in-depth interview used in this study allowed conversations where not only facts were addressed but participants could also share opinions (Yin, 2009). The replication of information sought through the survey and interview protocol instruments confirmed the reliability of the collected data as similar results emerged (Yin, 2009).

Of equal importance was the external validity of this study, evidenced in the replication rationale often associated with case studies (Yin, 2009). The global impact of the COVID pandemic on K12 education illustrated the generalizability of its effects well beyond the districts

selected for this single case study and demonstrated the external validity as schools worldwide turned to BL.

Table 9

Case Study Procedures (Yin, 2009)

Test	Procedure	Use in the Research
Construct validity	Chain of evidence is established Key participants to review draft of findings	Data collection
Internal validity	Match emerging patterns Build explanations Provide explanation of conflicting data	Chapter 4 Findings Data analysis
External validity	Use rationale for replication Protocol (replication)	Research design
Reliability		Data collection

Demographic Data Collection

The online survey included four questions requesting participants' demographic data (gender, race, ethnicity and years teaching) to provide descriptive data ensuring a culturally diverse pool of participants. Teachers with less than four years of experience were considered beginning teachers that are provisionally licensed and still being trained. They were not able to provide in-depth experience associated with teachers who taught before, during, and after the COVID pandemic.

Semi-structured Interviews

The interview protocol instrument used the lens of the theoretical framework, CABLS. The instrument identified the type of study being conducted followed by the research questions. Immediately following the research questions and introduction to the protocol, each participant

was asked to provide some background information and then questions were grouped based on the six elements that make up the CABLS framework (Wang et al., 2015).

The instrument began with section A, a short survey designed to collect background information about interviewees, considering the professional experience of the participants. Section B had three questions which focused on the learner and technology. Section C asked participants to share information about content and pedagogical practices. Teaching and learning practices that addressed any innovative teaching strategies implemented by the participants was the focus of the questions in section D. The final section, E, covered learning supports and institutional supports that participants have experienced.

As the interviews concluded, participants could make additional comments. In addition to the questions asked during the interview, the researcher also asked probing and clarifying questions to ensure understanding of what participants shared.

Pilot Study

The goal of the semi-structured interview is to gather rich data based on a participant's feelings and experiences. Trigueros (2017) found that in-depth interviews provide flexibility and a platform for participants to freely express themselves. For example, a pilot study is an excellent way for novice researchers to find the most appropriate instrument(s) for a study. A pilot study can also expose any hidden positions or biases of the researcher in accord with Chenail's (2011) assertion about pilot studies.

A pilot study has been helpful in deciding which instrumentation is best suited for this study and as a result, incorporating surveys was deemed most appropriate for this study. *Survey Monkey* was used to create the surveys. This survey was considered a questionnaire that was used as a means of collecting demographic data for the second step in recruiting participants.

(The first step was reading and signing the consent form.) The transcription and coding process incorporated the identified data collection instruments. These steps were completed before beginning the data analysis process.

Validity and Reliability

In order to ensure the quality and authenticity of this research, the research questions were clearly defined and served as a foundation for the protocol instrument. Table 9 above shows the single case study techniques used to address validity and reliability in alignment with what has been reported by Yin (2009).

Data Analysis

Conducting data analysis for a single case study is distinct from doing an analysis for other research designs in that it relies on potentially larger data sets. The researcher therefore has to analyze the individual case(s) involved. The data analysis plan for this study incorporated one of the five identified techniques specific to case studies and multiple case studies (Yin, 2009). Yin (2009) noted that conducting data analysis explicitly related to using a single case study design is a challenge for researchers. However, there are techniques that can be used with appropriate analytic tools as a beginning strategy to analyze the data.

Yin (2003, 2009) gave five techniques for case study analysis: pattern matching (connecting data to propositions), explanation development, time-series analysis, logic models, and cross-case synthesis. The data for this single case study was analyzed by first looking for patterns that matched and making connections within the case (Stake, 1995). As overlap surfaced within the identified patterns, these results led to a stronger level of internal validity (Yin, 2009).

As the data were being collected the researcher noted the emergence of patterns that were specific to grade levels that were taught and in some instances, patterns developed based on the

types of schools that were represented. For example, the middle school teachers noted how tech savvy their students were with technology use while the high school teachers felt that their students were limited in their ability to use technology.

Data were collected using a semi-structured interview protocol that posed questions aligned to the CABLS theoretical framework and that would address the research questions. Data obtained from the interviews were transcribed using a transcription service called *Rev*. The researcher used this service to produce detailed transcriptions that captured salient features of the conversations such as voice inflection (Bailey, 2008). The next step in the analysis process was coding using a combination of NVivo and manual coding. Initially I began to key information into the NVivo platform to develop the initial codes but found this method a bit daunting given the vast amount of data that was collected, compared to conducting the coding using manual methods based upon transcripts. I continued to use the manual coding process by creating a large spreadsheet to key in all data using color-coding to distinguish categories, themes and subthemes. After coding the transcripts, categories were re-examined to establish patterns and relationships that would lead to additional themes. I created an initial spreadsheet with all pertinent participant information linking participant's identifying information to their responses.

I read the digital transcripts highlighting key words and phrases while making notes and engaging in the memo-taking process to analyze responses closely in determining meaning from participant responses. Interview transcripts were treated as individual contributions. I began the coding process by using open coding followed by putting codes into categories. The categories were then aligned with one of the six elements of the CABLS framework. After the categories had been established the researcher reviewed and continued analysis by looking for the emergence of relevant themes. As the major themes were revealed the researcher continued

analysis by extracting subthemes from the major themes continuing to align the themes and subthemes with the research questions as well as the CABLS framework.

The CABLS theoretical framework guided the data analysis process and provided the structure as each of the six elements was addressed during the analysis. The analysis initially employed a deductive approach using the six subsystems of the CABLS framework as primary codes. Once the subsystems were documented an inductive process was used to develop additional new codes resulting from the subsystems of the theoretical framework to help provide detailed explanations relevant to each question. Teachers' perceptions that appeared key to explaining CABLS framework and their experiences in facilitating student to content engagement were identified. The data went through the iterative process of coding, sorting, and sifting as themes continued to surface leading to robust results (Chowdhury, 2014).

Data Quality

To establish quality data, one intensive method of collecting data was used to triangulate the data which was the collection of data from multiple sources. Nightingale (2020) identified three purposes for triangulating data: improve validity, give readers an in-depth look at the identified research problem, and probe for other ways to understand the research problem. This study used triangulation to enhance validity and overall data quality.

Establishing Trustworthiness of Qualitative Data

Establishing trustworthiness for this study was critical. In taking a constructivist stance, the researcher expected to become immersed in the lived experiences of the participants (Williams & Morrow, 2009). For qualitative research, trustworthiness has four components: credibility (standard procedures), dependability (reliability), confirmability (consistency), and transferability (external validity) (Gunawan, 2015). Connelly (2016) defined credibility as the

measures the researcher takes to ensure that standard procedures were followed, such as peer-debriefing and member-checking.

For this study to have credibility, member-checking was done by requesting feedback from participants to ensure accuracy (Connelly, 2016). Copies of transcripts were provided to participants requesting for them to make notes as they reviewed the transcripts for accuracy and validate what was recorded. The researcher kept a notebook for reflective journaling throughout the data analysis process to further enhance the credibility and validity of the data. Journaling also allowed the investigator to make changes and adjustments as needed. Other aspects of establishing trustworthiness were dependability, confirmability, and transferability.

Dependability involves the stability of conditions related to the study over time (Connelly, 2016). Connelly (2016) described confirmability as being present when the findings were repeated. Lastly, transferability addresses the level of generalization of findings to other settings (Connelly, 2016).

Each element was essential to establishing and bolstering trustworthiness. As such, this qualitative case study had many of the procedural elements found in other studies such as the grounded theory approach (Connelly, 2016). Tables were used to present data as a means of enhancing trustworthiness. Cloutier and Ravasi (2021) argued in favor of using tables for this purpose, so readers can engage the research process. This research used reflective journaling, member-checking and iterative questioning of participants (Connelly, 2016).

Summary

This chapter has provided an in-depth description of the methods that were used in the study. The methodology used a qualitative approach and single case study design.

Constructivism was the epistemological position. The researcher described the role and position that was taken, which also revealed a connection to the topic.

Each step was included so as to explain the plan to recruit participants as well as how data was collected from them. While a number of instruments and tools used in qualitative research were possible, this chapter specified the instruments and tools selected, along with a justification for their use. Data analysis procedures and a way to ensure data quality were addressed in the remainder of the chapter. The techniques described in this chapter gave the findings presented next.

CHAPTER 4: DISCUSSION

This chapter describes the results obtained from the qualitative findings from the analysis of interviews with 11 K12 teachers that examined their experiences with student-content engagement within the BL environment. Participants represented traditional high schools and an online school within in two K12 school districts. In organizing the codes from the interview, eight major themes and 20 subthemes emerged during that analysis of data of teacher experiences within BL settings.

A case description is reported first starting with brief descriptions of the school districts (see Table 10). Immediately following is a case study overview inclusive of brief participant descriptions comprised of demographic data and professional profiles (see Table 2). The final section of this chapter includes an in-depth discussion of the findings that incorporates research question (RQ) alignment as well as demonstrating alignment to and through the lens of the CABLS theoretical framework.

Findings

In this section, the RQs along with the relevant themes, subthemes and frequencies of mention by participants will be noted and discussed. Alignment with the CABLS theoretical framework will also be considered (Table 10). As findings are noted according to the research questions and the framework what has also been revealed is that teachers expressed differing interpretations of blended learning. For the online teachers, even though most of their courses were taught online there was an element of in-person class work requiring students to report to the building. For others such as the traditional middle and high school teachers, the blend often included traditional F2F instruction coupled with some form or use of technology whether that

included Chromebook computers used by students or interactive white boards used by both teachers and students.

Table 10

Alignment of Research Questions to Theoretical Framework's Themes, Subthemes and Frequencies (n=11)

Research Question	CABLS Subsystem	Themes, Subthemes, and (p/f)
RQ1	The Learner	Experiences with Learners Demographics – Race and Gender (11/55), Academic Ability (11/55), Digital Literacy Skills (11/45), Access to Technology (10/24)
	The Learner Support	Experiences with Support in Using BL Environments – Instructional Routines (11/20), Design of Lessons (11/21), Autonomy (11/8)
RQ2	The Content	Perceptual Strategies and Practices with Content and PLC Support – New Strategies or Status Quo? (11/50), Experiences with PLCs (10/16), PLC Challenges and Overcoming Barriers to Content (11/71), PLC Opportunities and Maximizing Opportunities (11/86)
	The Technology	Using Technology – The Power of One-to-One (11/24), Successful Technology-based Strategies Used in BL (11/69) Pros and Cons of Technology – Barriers to Using Technology (11/49), Benefits of Technology (11/52)
RQ3	The Teacher	COVID: The Impetus Behind K12 BL – COVID Impact on Teaching and Learning (11/32), Pedagogical Practices and Strategies – Old and New (11/57), Improvements to Teaching and Learning (11/32)
	The Institution	How The Institution Provides Support – District and Institutional Support (11/84), Accessibility to Technology for Teachers (11/32)

**Note: (p/f) is p=participant representation; f=frequency references of data saturation across transcripts*

Research Question One

What are K12 teachers experiences with facilitating student-content engagement in blended learning environments?

The first area of investigation for this study was to gain an understanding of how K12 teachers facilitate student-content engagement within the BL setting. The facilitation of BL in traditional schools presents differently than what is seen in the online school. Participants from traditional settings incorporated technology at some level in their seated courses or provided instruction using digital means, while online teachers spent approximately 80% of their time providing instruction either synchronously or asynchronously online. Students in the online school were also required to attend the in-person portion of their classes as this was the expectation and requirement for attending the online school. This aspect also was used to define the 'blend' of the courses.

In addressing this first research question, it is important to begin with identifying teachers' perceptions of the learners to establish their ability to utilize and interact with the technology aspect of the BL environment. Examining students' demographic data provided a snapshot of possible trends that could show how K12 teachers facilitated student engagement within their BL classrooms and its impact on their academic performance (Bernhardt, 1998; Ghaleb et al., 2021). Research question one aligns with the CABLS theoretical framework subsystem entitled *The Learner* and *The Learner Support.* For this element, participant responses revealed two prominent themes that showed student's ability to engage with content: learners' demographics, digital literacy skills, and teacher's experiences of facilitation of student interaction through learning support.

Experience with Learners' Demographics

Participants shared information about students that included race, gender, academic learning levels, and socioeconomic status. All participants shared the demographic makeup of their student populations with some minor yet significant differences. The data revealed the emergence of patterns that seem to be associated with the types of courses that are represented across districts and with the technology used at different grade levels. The student's ability to interact with and use technology in the participant's classes whether taught online, in-person, or a combination of both was also briefly discussed to evaluate the student's ability to potentially engage with content.

Race and Gender

When asked about demographics most participants (n=11), in terms of race, report teaching a predominantly white student population. The exception to this demographic was seen with the CTE teachers who shared an entirely different makeup for their courses. For example, Paige, who teaches a business law course, notes "I have diverse students … I've got a lot of Hispanic students in our community..." The other CTE teachers give a similar claim as they speak in terms of having mixed populations. For example, Kathy said "we have a lot of mixed demographics in my classes." Similarly, Brad has only one class that is predominantly white with only four Hispanics but continues to share that his other classes "have a mixed population of Hispanic, black and white" students. This is an interesting dynamic that shows that more students of color were enrolled into the elective CTE courses.

Participants varied when they shared the gender representation in their courses. For example, both Mitchell and Haley provide similar data revealing that their student populations include "60-65% females," while Kathy and Megan report having a heavier male presence in

their classes. These findings are not indicative of any specific patterns regarding gender representation.

Academic Ability

When looking at how K12 teachers facilitate student interaction in the BL setting it is critically important to consider the student's academic learning levels. The demographic of academic learning levels could potentially speak to the types of support that K12 students may need in order to successfully engage with the content in the BL setting. For example, Ashley who shared about the academic abilities of her students stated, "we have several EC students, 504" and "ELL students." All of the types of students mentioned by Ashley are characterized by some level of cognitive ability. Students that are labeled as EC means these students are considered exceptional students. Students that are considered 504 students are those referenced by a section of the Rehabilitation Act of 1973 and this prohibits those students from being discriminated against based upon a handicap or disability. Students classified as ELL are English Language Learners that have limited proficiency in the English language.

Ashley conveyed that she teaches a range of students in terms of academic ability from those needing extra support to those that are considered academically gifted. According to the participants, a student that falls in one of the categories could need supports to engage with the content, like a read aloud, extra time to complete assignments or technology that will translate into another language. Although not all participants provided the academic ability levels of their students, the general makeup of K12 classes at any grade level is inclusive of varying academic levels and abilities.

Digital Literacy Skills

As noted by participants, typically, teacher experiences include the expectation that K12 students enrolled in online or BL courses come into those classes with, at minimum, a basic knowledge of digital literacy but according to the findings this is not always the case. As indicated when Haley shared, "most of them are not very adept at technology." Students need the basic levels of digital literacy in order to successfully engage with content. The online school in District C was designed as a BL school with students being online and also having an in-person component.

All (n=11) of the teachers reported a modest spectrum of digital literacy that was linked, in some cases, to student's grade levels and how much technology they were previously exposed to. There is also a pattern that surfaced showing similarities with the technology skills found in the teachers' perceptions of middle school students as opposed to what the findings showed regarding the perceptions of high school teachers. For example, Amber, observed and shared "my 6th graders struggle more than my 7th graders. My 7th graders struggle more that my 8th graders..." This response indicates that as students' progress to the upper grade levels they have been exposed to a little more technology and the struggle seems to decrease with academic promotion. However, Amber does conclude that the "6th graders struggle the most, and our 7th and 8th graders are usually pretty good."

This observation could indicate a lack of exposure in elementary school prior to going to another grade level and a new school setting or could be indicative of other factors that equate maturity levels with digital literacy levels. Paige, who also teaches online to 9th grade students, noted that she has seen some of her students also "struggle with the online environment." This

data seems to be replicated as a correlation between the age or grade levels of students that have an impact on their levels of digital literacy whether direct or indirect.

When considering the responses from participants in the traditional schools of District D, the interpretations and experiences are different. For example, both Mitchell and Haley report very similar responses limiting their student's digital literacy skills to the use of social media and cell phone devices. Mitchell said "most of my students are pretty technology capable. They are equipped to use social media, cell phones. They're good at using and manipulating computers." In a very similar response, Haley, who teaches a different course, stated that "most of them are not very adept in technology other than how to use their phone and social media." These results seem to point to discrepancies as students are promoted from one grade level to the next such as 6th grade being the lowest middle school grade and 9th grade being the lowest high school grade with regards to the expectations at the middle and high school levels.

The observations of middle school teachers showed their belief that their students leaned more towards high levels of digital literacy. Megan who teaches 7th and 8th graders primarily, asserts "I think they are pretty well versed in technology, maybe not always using it in the best way or the way we want them to, but they are very tech savvy." Dawn, who also teaches 7th and 8th grade students, confirms that "most days they're pretty tech savvy."

Access to Technology

The question of accessibility to technology was addressed from the perspective of what students have access to. All participants shared that they are one-to-one districts meaning that all students referenced in this study have Chromebook devices that they get to take home. Some students also have access to specialized devices to meet special needs that will aid them as they

engage with course content. For example, Barbara shared that "some of the ESL students have access to iPads for translation apps."

Participants from the online school, due to the nature of their courses, provide additional levels of accessibility as having access to the online courses is critical to student success. Storm shared that students who may "have trouble accessing the internet, they're given a hotspot." This is the measure taken by this particular school to ensure that students don't run into any issues when logging into their classes from any location. Another type of specialized technology that students have access to is virtual reality (VR). Brad stated that his students "actually have a VR welder" that is specific to his content area. Using this type of device allows students to experience the content in a fully immersive way thereby promoting maximum student interaction via the use of technology.

Teacher Experiences Facilitating Student-Content Engagement Through Learning Support

An important phase of student-content engagement is being able to identify the facilitators of the technology that is an integral part of the BL environment. A deeper dive into technology use in the BL classroom revealed teachers' experiences in identifying who the facilitators of technology are in the form of individuals as well as initiatives for support. The general thread with many of the participants revealed that those who help implement and support the different types of technology that are considered a part of the BL fabric come with multiple titles and responsibilities that include supporting BL in some capacity. Participants shared how instructional coaches topped the lists as the primary supports and facilitators of technology. Further probing also revealed that other teachers were viewed as facilitators that continuously shared information. Storm shared, "we have people that are instructional coaches that also specialize in technology."

As with their middle school counterparts, both Paige and Ashley highlighted different facilitators. The facilitators that were listed were media coordinators and other designated individuals that teachers can go to for help. Paige noted, "our media coordinators are essential. They are the point of contact for every student in making sure that their Chromebooks are working. If they need a loaner, they provide that." Ashley also mentioned the use of professional development (PD) designed to facilitate technology that would potentially promote student-content engagement.

The facilitators of technology that were mentioned by the middle school teachers also identified specific individuals designated as such. Megan listed the media coordinator and said, "our instructional coach is another good facilitator." From a slightly different perspective, Barbara mentioned facilitation from the district level as having an individual that "has done PDs showing us stuff that we can put into our flipped classrooms." This individual also sends out "a newsletter every Tuesday with tech updates."

When considering an initiative or an activity as the facilitator of technology as opposed to an individual, PD was referenced a few times. Haley recalled how the district requires "tech PD a few times a year." This PD is designed to assists teachers in the implementation of new technology-based platforms and programs. Kathy made a similar observation as she stated, "they really ramped up their PD for technology stuff." Lastly, Brad emerged as the only participant in this case to imply that he, himself, serves as the technology facilitator in his classroom knowing how to best engage his students with his content.

Participants shared their narratives of how they develop their lessons and what a typical day in their classrooms looks like with the focus on how their lessons are designed to support the learner. The learning support is the fifth subsystem in the CABLS theoretical framework. This

subsystem looks at how the teacher designs lessons that will help the learner take responsibility for their own learning through academic support and technical support which can also be described as active learning (Wang et al., 2015). For this theme, participants were asked to share their experiences with lesson planning, instructional routines, and lesson design allowing readers to get a glimpse of the pattern of instruction designed to foster academic and technical support for student learning.

Instructional Routines

Participant responses for this section showed what a typical day in their classrooms looked like. When asked about what would be observed in a typical classroom setting all participants expounded upon how they conducted their classes from start to finish. Participants conversed about the routines used on a daily basis and how they often start with an activity requiring the use of technology. Five of the participants begin routines with some sort of class starter activity directly related to the content of their course. One participant, Amber, actually engaged her students with something other than her math content as she shared,

> So, a typical day students join my Google Meets. How do I use it to get my kids engaged? Maybe not doing math…we do a question of the day every day when we start class…kids will email me their question of the day.

Other participants use the starting activity as a way to engage students in the content through the use of technology such as Megan who stated,

> …so I always start with a class starter, which just means there's a slide up on the Promethean board that does two things that tells them what they need to have out on their desk to be ready for class to start.

The remaining three participants described very similar starter activities that are designed to get students attention as soon as they are seated and ready for class.

Some of the participants seem to move into a problem-solving mode as they progress through their routines or require students to engage in some type of analysis. For example, Ashley provided a description of this part of her routine explaining,

> Today we did error analysis and they had to write a sentence…they had to look at a problem and determine what was wrong and they had to solve it correctly, and then they had to write what was the mistake.

Along the same lines, Haley used "textual analysis" as an anchor for her English course as she said, it "supports everything because they don't understand it like they should." Haley then transitioned into modeling followed by other technology-based activities such as the use of YouTube videos and using the Promethean board. These types of activities clearly confirmed that the academic and technical support that served as components of learning supports are implemented in these BL settings.

As the description of instructional routines continued to be shared, most participants explained how they would engage students in a brief review of what was taught the previous day to check for comprehension. Others would provide learning support through engaging students in whole class and small group discussions of the content or in an activity that required active engagement from their students limiting down time. Once these varying activities have been completed teachers then move into teaching the actual content for the day and begin to integrate the use of more technology. Storm, for example, at this phase with his online students, said he then transitioned "into teaching content." He also incorporated technology through the use of "Google to do a poll" and he also used "AI to write questions." When his students are in-person

he teaches, “them content basically like it is in the classroom.” For students that can’t attend in-person he “also either records or put something in an alternate assignment online for them.”

While technology serves as an important aspect of the “blend” participants incorporate more traditional kinds of activities throughout the lessons and instructional routines. Several participants still utilize providing notes and also having their students take notes as instruction is taking place. For instance, Dawn supports learning by giving “notes occasionally” and she said, “I try to do a hands-on lab once a week.” Megan leads her students into a mini-lesson and then breaks “into stations” where different groups have different tasks. Lastly, the teachers shared how their students engage in “independent work” where the teachers simply serve as a guide. The routines employed by the middle school teachers not only support learning but encourage students to become more active learners by “doing something on their own,” and becoming more engaged with content.

Design of Lessons

When the researcher asked participants about whether lessons were pre-designed, most of the participants in the online school as well as the traditional schools, expressed the freedom to design their own lessons to promote student-content engagement within their content areas. Several participants from the traditional schools, particularly CTE teachers worked from pre-designed lessons that were provided by the state; however, they would take the pre-designed lessons and make changes so that the lessons would be implemented with the intentionality of promoting student-content engagement with content. For example, When Paige, the CTE teacher, was asked the same question she stated, “they can be pre-designed by the state, but I’ve rewritten” them. The ‘they’ that this participant is referencing is the state education department.

Participants in both districts shared a mix with some teachers creating their own lessons while others worked from pre-designed lessons. The type of content areas seemed to dictate whether teachers worked with pre-designed lessons or were able to design their own from start to finish. This finding showed a significant pattern as it highlighted that pre-designed lessons were provided for all CTE teachers in this study, while core content area teachers and most online teachers had the autonomy to design their own lessons. All CTE teachers re-wrote or redesigned the curriculum/content provided to them by the state. Brad disclosed, "they give us the curriculum…but teach it however you want." Kathy confirmed this as she explained, "a lot of them are pre-designed. They'll give you stuff through the state again, but I find myself replacing and redesigning them still doing the same content just in a totally different way."

Autonomy

Most teachers for the online school spoke candidly and proudly about the autonomy they had and the support to design their own lessons in such a way to best suit their student populations. Amber explained "we have full autonomy to do what we want to do and what's going to best serve our students." Participants expressed that having this level of autonomy provided an opportunity for them to differentiate their lessons and essentially "do what we want to based on what we think is best," as noted by Storm who gave his perspective as a science teacher. Others who have this same autonomy but teach courses that are reading or math courses online have the ability to design their lessons with a level of freedom because these content areas tend to be a little more "astringent" according to Storm. As a matter of fact, reading and math teachers are given "pacing guides" according to Storm, by their district leadership that they are expected to follow, demonstrating how their freedom is accompanied by standards that have been established by the district.

This same level of autonomy was also witnessed by some of the teachers in the traditional school settings. Some of the participants in this setting also liked the idea of designing their own lessons as a good fit for their student populations so for these participants, lesson designs could potentially vary from one class to the next with the intent of strengthening the students' engagement with the content. For example, Barbara spoke about how she designed her own lessons and had the freedom to "tailor it to however we need it to be tailored, whatever's going to fit our students the best." Participants also shared how having the ability to design their lessons would prompt them to conduct research as lessons are planned out because they are "trying to find other activities that don't necessarily fit the box of the everyday classroom," as mentioned by Dawn.

One of the key benefits of autonomy for most of the participants was being able to try new strategies to strengthen student-content engagement in an uninhibited fashion. Another noted benefit was the liberty to design lessons based upon a student's academic abilities. Megan shared that as she teaches her classes using the same standards across the board, "it's going to look very different depending on the class." In the world of K12 this level of differentiation that is driven by the academic abilities in the classrooms is referred to as modifications. Students that may require additional support are able to receive this as teachers modify lessons to level the playing field, so to speak. This is a motivation for participants who really want to see their students succeed. Megan affirms this as she posits, "it's just a matter of what works best for that class and what their needs are."

Research Question Two

What strategies and practices do K12 teachers use to promote student-content engagement in blended learning environments?

Identifying innovative strategies and practices used by K12 teachers to engage students in the BL content was the next area of investigation that the researcher wanted to address. The focus on content aligns with the subsystem in the CABLS framework, which looks at the content in terms of encouraging constant interaction through use of multiple means such as individualized learning and problem-solving (Wang et al., 2015). It is of critical importance to ensure that the learning occurs through engagement with content in a way that exhibits collaboration, differentiation, and individualization to ensure maximum interaction with course content (Wang et al., 2015). Participants tended to respond with stories and examples of how they incorporated what they deemed to be innovative strategies into their content areas.

The researcher discussed the participant's course content from the perspective of professional learning communities (PLCs) and the support they provide. The participants shared their perspectives of their PLCs and their interaction or the lack thereof in the implementation of new strategies and practices. Participants considered the challenges of content and making changes within groups of professionals that may or may not share in the exact same content areas but approaching the discussion in term of practices and strategies employed to promote student engagement with the content. Barriers were identified that addressed working on content within the PLCs and how to overcome those barriers was discussed. Equally, participants were asked to identify opportunities and ways to maximize those opportunities for this part of the interview conversation. The data revealed in this section ranged from strong PLC interaction in collaboration to little interaction and support from the assigned PLC that was based on

commonalities other than shared content. The theme that emerged included perceptual innovative strategies and practices with content and PLC support.

Perceptual New Strategies and Practices with Content and PLC Support

Participants shared their stories and experiences with implementing what they defined as new strategies and practices used for content within the BL classrooms. While varying responses surfaced throughout the interview process, it became evident that the ideas on what could be considered new were viewed from differing perspectives and experiences within the participants PLCs. What several participants described were not necessarily original or new in a more general sense but was expressed as something new on a more personal level through the shared narratives of the participants.

New Strategies or Status Quo?

Responses regarding the use of new strategies and practices yielded a vast variety of what participants deemed as new. All participants referenced technology use in some capacity as a newer strategy used to engage students in the content. Some responses were a mixture of interesting, fairly new, and not-so-new strategies such as Storm's answers when he shared

> I've been trying to write more songs, even if they're crazy songs, the Cavalier songs tell more stories to engage kids. I do think students like stories. I mean it's age old and it's not new. I am starting to implement AI in the classroom a little bit…it allows me to write questions quicker to get more feedback from the kids.

As this teacher acknowledged his first strategy and practice as not necessarily innovative, he followed up with a new practice incorporating the newest kind of technology which can be considered innovative when employed in the K12 classroom.

Two participants referenced the use of the LMS platform and the programs that can be integrated as an innovative strategy turned best practice and this has occurred since K12 started affording students the opportunity to work remotely. Mitchell explained, "…since we are using Canvas and all my information is on Canvas, I spend less time during planning, copying material." Additionally, teachers like Mitchell went beyond simply identifying the regular use of an LMS but also suggested the use of devices such as a Promethean board as a new practice that "allows…more time to be engaged and less time having to prep enormous amounts" of class work.

As technology was front and center including devices as shared in the narratives of the participants, they also noted strategies used to place interactive activities within a technology-based platform as a newly adopted best practice. Giving students digital access to activities that would have previously required pencil and paper is now considered by some as an innovation. For instance, Amber shared that when she transitioned from traditional F2F to the BL environment she "had to move to, okay, let's put this in a Google Doc and hyperlink things so they have to be interactive within the activity themselves."

Another strategy turned practice identified by some of the participants was recording of their lessons and weekly outlines using video. This strategy was recognized as particularly useful for students with attendance issues removing the barrier of accessibility to the content. Ashley described her experience when she shared,

> I made a video each week, which just kind of outlined what I was going over that week. They have it in written form, but…I'm trying to do more to get a little more personal with them. And so, each week I would make a video.

The experience of Ashley, who teaches high school math, was similar to the narrative shared by middle school teacher, Barbara who expressed,

> I think the biggest thing would be recording my lessons…but I think that was definitely something that just really was beneficial and something I had never thought of…it doesn't scare me to sit down in my classroom now and prerecord my lesson. And leave it for them.

Participants shared that many of these strategies and practices were developed as a result of the pandemic where there were no choices in how instruction would be delivered for K12 teachers. The remaining stories that were shared all highlighted strategies and practices that were not necessarily new or innovative but rather represented the status quo and adding the technology piece for many of the participants was a new aspect for them when delivering content in the BL setting. Strategies like using collaborative group work or providing individualized instruction that can now be accomplished using some type of computer-mediated method is deemed as a new strategy or practice simply because the mode of delivery shifted from the more manual sit-and-get to now employing technology for delivery of content.

Experiences with PLCs

In the K12 sector of education the role of the PLCs is to share strategies, practices and resources with other teachers to strengthen student-content engagement. According to participants, teachers can be grouped into PLCs according to content, grade level, or some other common area. Participants shared different narratives as to the effectiveness of their PLCs when it came to providing support and offering strategies and resources designed to enhance student-content engagement while also promoting positive student outcomes. Several of the participants were involved with multiple PLCs. Ashley, for example, shared "we have different ones. We

have our math PLCs, but we also have digital technology PLCs." She further expressed that her math PLC was not necessarily beneficial because it was not grouped based upon the specific math courses taught but in a more general sense. She states,

> …everybody has their own kind of class they teach. You might have three math III teachers. And so, you've got a couple teaching math one, you've got a couple teaching math III…we've got a lot of strong opinions in our department, and so they don't necessarily see eye to eye.

She sees this as a big challenge and believes that if the PLCs were grouped differently this could prove beneficial to the teachers.

Another participant shared his similar story of being a part of multiple PLCs but benefiting more from one than the other. Storm was also involved in multiple PLCs and he shared about his science PLC that "we talk about content, but probably the most rewarding one is actually the four of us that are online." He was referencing that his second PLC is one that consisted of the online teachers, which was the commonality in this PLC.

As participants continued sharing their experiences with their PLCs some positives were revealed from teachers who are part of one PLC or serve in a leadership role over PLCs. In the content area of social studies, the PLCs tend to focus more on basic skills to engage students with content as opposed to technology. Mitchell, who also serves as department head, conveyed,

> …one of the things my teachers are telling me is that sometimes there's too much technology. They feel like they're pushed to do too much technology and not enough back to rote basic skills such as writing or essays…sometimes technology makes it real easy to gain data…The good part about it is technology now allows for a lot more instant data for our PLCs…but are you really getting a good measure of what the kids learn?

This narrative spirals back to one of the roles of the PLC in considering student outcomes, with the last question posed by Mitchell. This participant also noted what he believes the PLC needs to do in order to truly engage students in the BL environment when he stated, "we have to blend what I call old school versus new school. I mean, the old school was, everything was on paper and pencil. You wrote everything out. We have to be able to combine the two."

Another notable story was shared by Paige who addressed connecting with online teachers through a PLC to engage in collaboration. She shared,

> …let's say that I collaborate instead with CTE teachers, I collaborate with other online teachers and the best way to spice things up for the course and make student engagement better…I'm very lucky to work with people who are focused on student success…

Other participants such as Amber and Haley expressed the struggles, they have connecting with PLCs that are beneficial to them and they find themselves resorting to making connections with online teachers who share in the same content.

Another aspect of the PLC role is providing resources for teachers to use specifically for their content. Two participants spoke to this part of their PLCs. Brad commended his CTE PLC for providing and sharing resources as he states, "…I'm going to give us a plug for that, because we're really good about sharing resources." Similarly, Megan also talked briefly about "the plethora of resources" that her PLC shares and has access to. Overall, all participants shared the pros and cons of their experiences with PLCs and their interpretation of support provided through those PLCs.

PLC Challenges and Overcoming Barriers to Content

When participants were asked about challenges that they faced in their PLCs as it pertained to changes in content, the responses represented a range of issues. For the online

middle school teacher, Amber, she initially stated that she did not have a content area PLC because she was one of a very few middle school online math teachers in the state. She shared, "we are kind of leading the charge in the state for an online program." Amber stated, "the challenges that I run into is math is just a whole different beast in itself." While she shared respect for other content areas, she believed that another aspect of the challenge for math is that "you have to stay engaged. . . you have to write things down. . . you have to show your work."

Storm, on the other hand, who is fortunate to work with two PLCs feels that the PLC he enjoys the most is also the one that has the challenge of location and proximity with regards to meeting. He shared on behalf of the group, "well, we're hoping they put us in the same place and that would really help." His primary PLC meets online and while they have the autonomy to meet their students' needs when it comes to content, he feels "just being more efficient about what we do really can overcome that challenge."

When the researcher further probed as to how the identified barriers and challenges could be overcome the results yielded responses specific to what each participant cited as a challenge. For example, Amber believed that her district's willingness and ability to provide her with resources to better engage students with her content was a salient factor. She shared, "a lot of things that I feel like have helped, one, our district getting us the Chromebooks that we needed, the touchscreen Chromebooks, because students are able to write on those Chromebooks."

The ability to get along well was cited as a challenge for some of the participants as they attempted to work with their PLCs. Ashley is a part of a math PLC and a digital technology PLC. The most prominent issue that she cited with the math PLC has to do with the group coming together in agreement regarding matters of content. She said, "I would say that would be the biggest hang-up is not everybody agrees on what they think is the best way to do it." With this

challenge in mind, Ashley believes to overcome the barriers "you just have to be willing to share and to compromise, when it comes to resources used to develop good math content for students. She did seem to circle back around and stated, "for the most part, after everybody thinks about it and realized what everybody's trying to do, what's best for the students, we kind of come to a consensus."

The traditional middle school teachers are all a part of PLCs in some capacity. Barbara is involved in a grade level PLC and a content area PLC. The issue she mentioned is at the state level when it comes to building content. She informed the researcher that her PLC was asked by the state, to teach a whole unit on rocks and minerals. None of that was in our textbooks. So, everything that we do for that has to be, we've either found stuff, done our own research, created our own stuff online, things like that. So that can be kind of challenging.

She shared that the state is the entity responsible for providing the textbooks, but they don't appear to be very useful when delivering information that can be used to develop content. As a result of this challenge, Barbara selected a unique way to try to overcome the barriers and address the challenges by joining a curriculum pacing committee. She disclosed, "that's part of the reason I signed up for that, because I want to be able to ask the questions." Another reason she chose to sit on this committee was "to kind of see what is the county's process when looking at this [content]."

The findings showed a slight mixture of narratives for the high school teachers when looking at involvement in PLCs. Haley is considered a singleton, meaning she is the only English honors teacher in her school or district but she does try to connect with the teachers that are a part of the standard English PLC. Despite her efforts there is still a bit of a disconnect when she tries to contribute to conversations about content. Haley disclosed, "this year I've gone to the

PLC and we've met, but a lot of times, when I speak, they don't. We're very different in how we deliver content." This is a little disheartening for Haley, but she has found a way to connect with others who do teach her same content as she shared, "I've joined an online group because we don't have a PLC here for AP." She has tried to address that challenge by trying to connect in sharing her resources. She expressed, "it's open, as far as I'm concerned, they know anything I've got they can have."

Brad reported that he is not only a part of a PLC but one that he describes as being "really good." As far as content, his PLC "met this summer as a PLC to come up with questions and ideas, how we approach the curriculum." While he showed a positive excitement about his PLC, he also identified "the biggest issues coming from the state level." He feels that the state has not been supportive in helping with the content of the curriculum as he shared, "that's been our biggest deal, trying to figure out questions and how we need to teach this stuff." Brad feels that one way to address this would be "if we can get feedback from the state faster." He also believes that the state has the responsibility to provide "more understanding of exactly what" they "want from us, there's not a clear understanding of exactly what anybody wants from the state level."

Kathy, who did not specifically mention her PLC agreed with Brad's assessment of state support. She stated, "challenges are…in the stuff that they give you from the state, they give you a lot of the basic stuff that you can use, but there's a lot of it that is not very tech-friendly." Kathy further divulges, "I think that they haven't updated our particular content area since the pandemic, so I'm hoping that when they update it, they'll include more tech stuff." She also agreed with Brad in wanting the state to take the initiative as she lamented, "I wish they would reach out to more teachers and ask us what we would like and see if maybe we have some things that we can contribute to the state curriculum."

PLC Opportunities and Maximizing Opportunities with Content

Just as participants from both districts identified challenges and barriers pertaining to content, they were also asked to identify opportunities to engage students in their content through PLCs with the exception of one participant. Amber praised her PLC for their openness to changes as she shared, "my teammates are receptive. They're open to change." She continued to reiterate how well they worked together when she responded, "we just work very well together and the people above us and our directors and facilitators and things trust us to make those decisions." Amber also expressed a way to maximize the opportunities her team has in making decisions about content that works well for students. Some of her suggestions included, "time extending Google Meets and being able to meet with all of our grade levels for an hour. And then also meeting with small groups in the afternoon."

Storm's assessment of the opportunities for his PLC was comparable to that of Amber as he shared that it is "freeing to be able to make so many decisions on our own and quickly by just talking to four people making a discussion." He also added the advantage of connecting with others weekly regarding content as he stated:

…we do that weekly and sometimes twice a week if we need to. So, it's really been that cross-content PLC that because we're just four teachers and we are pretty much the whole school, we can really make changes a lot quicker and react to what the students need a lot quicker.

The researcher discovered that Storm not only offered a way to maximize opportunities but offered a suggestion that could potentially give students a voice in their learning. He said, "we could probably maximize it a little bit more if we actually brought the students in a little bit more." He continued, "I'm thinking about having maybe student representatives," as he posits that this would allow the teachers to receive feedback from students.

Other participants focused on the opportunities they identified for the students. Barbara believed that the opportunity she sees is related to students engaging in her content as a result of having one-to-one devices. She said, "I think with having one-to-one access, with kids having Chromebooks…I do a lot more project-based kind of assessments and learning." She feels that she maximizes this opportunity as she tried "to balance it" by being "heavy-handed in research and maybe writing a couple of paragraphs about something or creating a Google slideshow."

Megan echoes the perceptions of her colleagues as she said that "the positive is that we do have more technology than ever, and the kids are more tech savvy than ever before." She believes the best way to maximize this opportunity is to give students "more opportunities to create technology." Megan makes an interesting observation as she exposes a thought process. I think some people think, oh, if they're using their Chromebooks, we're using technology, and yeah you are. But are they actually using it in a way that's engaging them in the content, or is it just so that you didn't have to make copies.

The findings also revealed current work that is being done, in some instances, to maximize opportunities. Brad proudly disclosed an initiative that is currently underway as he stated, "they've actually started developing a website. Teachers are starting to put resources in for each one." He further expounds that,

> if the state would come up with a way to put more resources into a, you know, a Google Drive somewhere and share it with all the teachers or on a database…our network wouldn't just be our county PLC, it would be a statewide PLC.

Mitchell's perspective is focused more on the learning curve of the teacher who is still fairly new to using technology to design content. He stated, "I think the opportunities are there. I think the biggest thing for older teachers like me is the learning curve for us that we have to go

through." To maximize this opportunity Mitchell asserts that older teachers need to "be open to look at new materials, not being afraid of the new material and so forth." In contrast, he also holds that the newer teachers "have been trained to use technology almost too much, and so they have to be worked in the opposite direction to say it's okay if they write you a paragraph."

Using Technology

Participants shared their experiences regarding the use of technology as a required element in the BL environment. The emergence of technology in the educational setting has presented intricacies that have yet to be fully understood. As an essential component of BL this topic also serves as the 4th subsystem in the CABLS theoretical framework. For this theme participants shared extensive narratives and stories about their experiences with technology in the BL classroom. Without technology there is no BL because the technology aspect is a major component of the blend.

In this section, the participants shared the power of one-to-one and successful technology-based strategies used in the BL classroom. Participants discussed the types of technology that are accessible to teachers to promote student-content engagement in their classes. Additionally, participants were asked to share specific strategies that have been implemented successfully. The data revealed in this section demonstrates the versatility of the technology-mediated devices used by students and teachers.

The Power of One-to-One

The participants in this single case study are part of school districts that are referred to as one-to-one districts which means that every student is assigned a Google Chromebook computer device that they get to take home on a daily basis and this is considered to be a very positive aspect for the districts. The findings revealed that for the online school this is the expectation and

represents the technology culture as this school is designed to educate students digitally with some level of in-person learning. Storm informed the researcher that "we are a one-to-one school district, so everybody has a Chromebook." As an online school this institution was created for BL from its inception so students have been one-to-one for a number of years. Paige attests that "our students have had Chromebooks in their hands for four or five years." Initially, for the traditional schools they were not considered a one-to-one district because students only had access to computer devices while on school campuses but that has recently changed as a result of the pandemic.

Barbara shared "we've been one-to-one since the pandemic." As a matter of fact, all other participants confirmed that the district went one-to-one with Chromebooks for every student since the pandemic and they have continued with this practice. As this is a more recent transition for traditional schools, the findings revealed that some teachers are beginning to accept the one-to-one concept as being beneficial to students and strengthening their own instructional practices. This was seen when Mitchell shared that being one-to-one has caused his students to be "very good at being able to decipher information from those kinds of platforms" as opposed to using the traditional "written forms of material." Mitchell also expressed that he loves "the idea of every child having one-to-one access."

As teachers become more versed in the use of technology in their classrooms, they are also being encouraged to utilize it more as witnessed with Dawn. She provided a good example of this as she shared "I try to integrate something in technology every day." The daily use of devices in the K-12 classrooms has clearly indicated that there is power in being a one-to-one school district using some form of technology to engage students with content on a consistent basis while removing the barrier of inaccessibility.

Successful Technology-based Strategies Used in The BL Classroom

When the researcher inquired about strategies used to promote the use of technology in the BL classroom and asked participants to identify the most successful strategies, the data revealed the use of strategies introduced as a result of the pandemic as well as the resurgence of older familiar strategies all used to promote BL. In the online or virtual setting, hard copy textbooks are considered to be an antiquated tool to use in BL courses, unless they are formatted as digital resources. Amber provided a great example of this as she shared that the district purchased the online version of the Pearson textbook that is used in her classes. She said the online textbook "is extremely interactive with the students. It's great. That's where being able to write on their interactive textbook is huge for me."

Amber also uses technology-based programs such as KAMI which is designed specifically for math content allowing "students to interact" with their teacher (KAMI is a digital annotation and markup tool). District C is considered a Google district so she also employs several platforms associated with Google such as Google Meets (a virtual meeting space) and Google Jamboard. In describing one of her strategies Amber stated,

> I do whole class instruction at the beginning of my meets, and it's usually about 10 to 15 minutes, but its direct instruction teaching hardcore. And then we do, I pull different groups and we go into breakout rooms within Google Meets and work with different groups of students, and then we come back whole group and wrap things up.

As for one of Amber's most successful strategies, she cites preview tutoring as "a great strategy." She attested that this particular strategy has helped her students tremendously when she "pulls small groups and we preview what we're going to be learning later in the week."

Ashley, who teaches the same content said, she doesn't have textbooks for her traditional students and she doesn't mention the use of digital textbooks with her online students. However, she does incorporate the use of technology as a strategy with both groups of students. For her traditional students she said, "I make copies for them as guided notes. We do group work. Sometimes I give them a variation of paper and digital things." For her online students she does a kind of flipped classroom model as she shared that she made videos. Ashley stated,

> basically, the videos are taking the notes that I provide to them, and I'm going over the notes. It's like they're in the classroom with me except I'm just talking to a camera, and that way they can watch it and they can print their notes out and they can add stuff and follow along.

Ashley identified one of her successful strategies as online self-checking activities. She admits, "I like using digital self-checking resources." Students being online and able to check their work as they go has proven to be an effective and successful strategy for her.

The use of technology as a key component of BL seems to be a common thread for some participants and this is no different for Storm. He engages his students in "live meetings about an hour a day per grade level. And within that we're using Google." Storm provided a general statement about his use of "different programs" without really listing what he has specifically used. As for his most successful strategy, he referenced the use of Google Meets but his primary goal is a strategy that fosters connections with his students. Storm believes the key to keeping students engaged is to build relationships as he affirms "relationship is huge when it comes to keeping the students engaged."

Results showed that participants have also used strategies that were effective for their student populations. Some of the strategies identified are not necessarily 'new' but for the

teachers who have employed them, they are considered new. Megan, for instance, uses gamification as a strategy. She shared,

> I try to, if I can make something look like a game, even if it's a worksheet…it is worksheet, but turning it into a competition really helps keep them engaged and keeps them on task because there's something at stake.

Other, more familiar strategies employed by Megan include stations, collaborative learning, and using the jigsaw strategy where larger topics are broken down into "smaller, more manageable pieces." She identified her most successful strategy as stations, where each student is assigned a job. This strategy helps her hold students accountable for those group behaviors and for their learning."

Kathy and Brad both teach CTE courses where hands-on learning is a primary component of instruction. Ironically, both teachers have found creative ways to engage their students through the use of technology. A successful strategy for Brad was using the VR welder. He proclaimed that the welder "was one of the best things that I've used." While the findings revealed the use of technology in these classrooms is growing, it was also unveiled that these teachers noted the safety aspects of the technology they are using, especially Brad. Using a VR welder versus an actual welding machine is a much safer choice for his students from which they can still learn.

Both Haley and Mitchell have textbooks available to use for their more traditional courses, but they choose to integrate technology either through digital textbooks or use of online resources. Both participants rely on the Canvas platform and use the LMS exclusively. In Mitchell's content area of social studies, he also reverts back to the use of Cornell notes and folded notes as a more familiar strategy. Haley is more involved with technology in her core

subject of English and she incorporates technology tools such as Google Docs, Google Forms, and Padlet as strategies that she has successfully implemented.

The Pros and Cons of Technology

Throughout the entire interview process, participants would vacillate back and forth between noting the positive aspects of using technology as well as citing the barriers or obstacles. There were some barriers that were identified by participants revealing differing perceptions of what the barriers actually are. Participants also mentioned some of the benefits of technology use in their courses.

Barriers of Technology Use

Participants shared their experiences and perceptions in identifying barriers of technology use specific to their students. This is another area where responses yielded differences in what participants deemed an obstacle of some sort for their students. One area that was not only listed as a barrier but also shared as a point of concern was student accessibility to internet connections from home. For those teachers working in the online school this concern was mitigated as Paige shared, "…we have hotspots available for checkout, so I think our district has done a phenomenal job of making sure that every student has access to the same resources."

In other instances, for those that are working in the traditional school setting this remains an obstacle as Brad explains,

> Just when the internet goes out, you know… going all the way back to COVID, our biggest issue then were students that didn't have internet connection. You know, still in this county, we have several students that, you know they don't have reliable internet connection. You know, they may have it, but they can't really afford it.

Another barrier to technology that was cited by Mitchell dealt more with the content placed on the websites that are accessed by his students for his content. He spoke about the importance of vetting sites accessed through technology as he shared,

> The biggest barrier is making sure your content, one, is neutral. Making sure that the platform is not, especially in civics, a platform that is not trying to propagandize, persuade or invoke a doctrine or a theory…I have to vet it, I have to make sure I know what it is and be sure that it is, one, adhering to our standards and our goals and it's appropriate for classroom setting.

While Mitchell's students have access to technology and devices, his primary concern was around what students could potentially be exposed to on websites that he used to engage students in his content.

From a slightly different perspective, other identified obstacles included familiarity with platforms, support from home in taking care of technology and student privacy. Amber stated,

> Barriers as far as technology, just becoming familiar with Canvas…I think that was a huge barrier…And until they realize that it's a tool, and if they want to be successful, then they've got to learn how to use that tool.

This concern was also shared by Haley in response to another question when she stated, "they're not super great with using Google correctly," which is important as she is in a Google district. Participants believed that if students are not able to engage in digital content due to a lack of technical knowledge of the LMS it could slow down the pacing of their courses.

Another barrier that reflected on student support in the home was with regards to maintaining the upkeep of devices ensuring that devices are ready to use for class. For example, Dawn mentioned

> I would say the barrier is the support at home, like charging their Chromebook. A lot of the kids come to school and they either don't have the charge or don't have their Chromebook or they forgot to charge it the night before.

This finding seemed to resonate with other middle school teachers regarding the charging and even the upkeep of devices. Barbara attempted to circumvent this issue as she stated, "I will ask my kids if they know they are going to forget to charge it at home to just leave it here and charge it overnight."

In Storm's narrative he identified the protection of student privacy in the online environment. He explained,

> Actually, the biggest barrier this year has actually been student privacy, and when I'm saying that, is from the end of our county, it's becoming more and more important to protect students' information out there. So, they are making vendors sign up to make sure they won't use their information in an incorrect way or in an inappropriate way.

In essence these findings reveal differing aspects of barriers that have been identified as hindering student engagement with technology as opposed to focusing on barriers that speak more to limiting the use of technology in the BL setting.

Benefits of Technology

As participants shared their success stories with the use of technology in their courses, they also acknowledged how benefits were reaped that either had a direct or indirect impact on student-content engagement. One notable response came from Megan who shared that in addition to using technology in a positive way "the other positive is that it allows me to give them more immediate feedback." She particularly likes the benefits of using gamification or

using a software program that can be used for competitions because she believes it "kind of bolsters that engagement."

Mitchell echoes a similar sentiment as his colleague, as he stated, "I am a big believer in competition." One of the benefits that he mentioned associated with technology in a more direct fashion is the use of the technology itself to promote student interaction with the content. For example, Mitchell explained,

> So, I'll usually get the kids up and we might draw on the whiteboard or on the Promethean board, or I may send one group to the Promethean board, one group to one of my whiteboards, and we're trying to draw stuff.

Teachers have expressed more of a benefit to themselves as the instructors and to the students as the learners, in using the devices that will lend themselves to increased student interaction.

Participants reflected on the use of self-made videos of their class lessons as beneficial, particularly for students that may need to see a replay of what was previously taught. Barbara provided a strong example of this as she shared how her and her teammate record their lessons "using the Zoom or our document cameras and we'll still post those lessons in Google classroom. So, kids who are absent…have access to whatever it is we did that day." She then goes on to share, "that's why recording the classes at certain times is really beneficial because if a kid doesn't understand, they can go home and watch it again."

Teachers seemed to continue to identify either specific types of technology devices or technology-based platforms and structures that they currently use as a result of seeing the benefits and positive impact experienced with student engagement. Dawn shared her story of how she once used a class website that was not "user-friendly." She has since revamped the site and reported,

> So now I use an interactive website. So, I actually post my notes on the website every day so that the kids that are absent, I think that's probably where it helps more with the engagements. The kids who aren't actually hearing the instruction, they get the instruction even though they're not here.

A common benefit repeated from participant responses was the ability to record lessons that could potentially benefit struggling students as well as those that may have attendance issues. Participants seemed to see the use of a Zoom platform to record lessons as something they will continue to practice because of the immediate benefits of connecting students to the content, virtually.

Research Question Three

What are K12 teacher perceptions of the teaching and learning practices used within their school districts for blended learning?

To address the last research question, the inquiries unveiled teacher perceptions of teaching and learning specific to BL occurring within their school districts. This question supports the next important element of the CABLS framework which focuses on how the role of the teacher develops in the BL setting to foster engagement with content and technology. Under this subsystem one theme emerged from the findings which was COVID the impetus behind K12 BL.

The researcher recorded the participants experiences and shared narratives of the teaching and learning practices they have observed within the BL environment. Participants shared their perceptions within the scope of their individual schools and/or the district. Pedagogical practices and successful strategies representing both old as well as new are discussed. The data revealed the emergence of patterns that seem to span across grade levels and instructional models.

COVID: The Impetus Behind K12 BL

The onset of the COVID pandemic proved to be a game-changer for K12 teachers, and for many the use of technology in conjunction with and as a part of BL was introduced as a result of this worldwide crisis. Participants were asked to share their perspectives on teaching and learning in their schools and/or districts. The results yielded several prominent yet mixed responses ranging from a love of technology to a blatant rejection of the use of technology in their classes with other factors mentioned within that range.

COVID's Impact on Teaching and Learning

When participants were asked about teaching and learning practices used to facilitate student interaction in the BL setting within their schools and/or districts, the results were telling. Amber and Storm immediately noted the opposition to online or BL modalities of instruction as a result of the pandemic. Amber disclosed that when "we went to remote learning during the pandemic, there was a lot of pushback from teachers." This aversion to BL and incorporating online instruction through the use of technology was not well received because it was an abrupt interruption to teaching and learning in the traditional sense.

Both Amber and Storm expressed in total agreement that "teachers were not ready" for this sudden shift from the norm. While Amber asserted that teachers were frustrated and discouraged, they still had to keep their students' learning as a priority. She admitted that teachers now produced "better students because their teachers were kind of pushed to meet those technology needs."

Despite the opposition, participants still acknowledged the expectation post COVID. The district mandated the use of Google Meets and Canvas platforms for online instruction both synchronously and asynchronously. Storm stated that "beyond COVID, teachers still needed to

have things online for absent students" and that his district as many others have continued with remote learning. He also shared that there may be an increase in the online and BL modalities of instruction. The beliefs expressed here also speak to where teachers perceive the BL is going futuristically. Storm felt that "we need to get used to it as a society". He sees BL and technology as a tool but he also expressed that "it's invaluable to bring them (the students) in person and see people face to face as we learn how to build relationships and learn how to talk to people and do those things."

Paige affirmed her acceptance of BL as she stated that it is a "fantastic tool that we are able to use for our students." Ashley also embraced BL and even though she shared that some of her colleagues don't like to use technology, she believed that in her school and district that "some teachers have come around" and "for the most part enjoy it."

Participants in this district all shared that they are seeing improvements in teaching and learning practices in their district due to changes and supports at the district level. For example, Amber attributed this improvement to support from the district leaders. She felt that the practices they have employed now help them to meet the needs of students better when they "leave the in-person setting and come to us online…That transition is so much smoother now than it was three years ago." Storm believed that the improvement is related to improved practices such as extending the time for "our Google Meets." He also mentioned social emotional training as a practice employed to improve teaching and learning. Paige thinks that the teachers' willingness to adapt to change now is the reason for the improvement and Ashley felt that "most teachers put a little more thought into it now." Participants have clearly expressed how time has worked in their favor in terms of acceptance and development of better practices that improve teaching and learning overall.

Middle school teachers, Barbara and Megan both expressed their observations of mixed practices. Where some teachers have "tried to revamp the way" they do things; however, for some they have "reverted back" to their old methods of teaching. On the other hand, high school teachers like Brad and Mitchell believe that BL instruction needs to be a good fit for the teacher. Mitchell revealed the elements of instruction that an educator loses when he goes to online or engages in BL instruction such as the absence of "body language that goes into learning." He expressed his ultimate acceptance of using technology in new ways in his course and how he developed digital activities for his students. It is important to several of the participants to recognize technology as a tool and to rebuild relationships with students that can sometimes be lost in a virtual environment.

One participant in this district, Haley, offered a very different yet interesting perspective as she shared that she could address teaching and learning practices based on student perceptions and feedback that students have shared with her. Her students shared that "the Promethean board is used as a projector more often than anything else." According to Haley, other students stated that "they don't open their Chromebooks at all except for one or two class periods. And some of them will say that some of their teachers hate technology." This finding not only diminishes the effectiveness of BL but is a disservice to students who want to engage in the content using technology.

Pedagogical Practices and Strategies – Old and New

The results regarding pedagogical practices and strategies demonstrated that when using the term 'pedagogy' the association is often with practices seen in the traditional F2F setting, but as the researcher listened to online teachers share their experiences, the reality is that pedagogy may look different for online instruction as opposed to traditional instruction. For example,

Amber shared that pedagogy or a best practice in the virtual setting could be students being required to have their cameras on. Amber shared, "the very first year that we started, Google Meets were optional and they could keep their cameras off. That's no longer an option anymore. Students have to cut their cameras on." She admits that this requirement is not necessarily a research-based practice, but it is an online practice for students that could potentially help with engagement.

For Ashley and Paige, the pedagogical practices they employed encompass some older and more familiar practices that have been utilized in traditional settings such as reviewing course content and standards in addition to using the Marzano's Taxonomy to gauge students' cognitive levels. When the researcher posed this question, Ashley responded "we've looked at the standards together. We kind of work on pacing guides together." Here she uses the plural tense as she refers to her PLC. Paige mentioned how she is "definitely looking at Marzano's …the higher-level thinking, higher level strategies."

Storm addressed this question from a more personal perspective as he stated, "in my specific content area, when we are in person, I try to be hands-on." His perceptions of pedagogy in his classroom included looking for opportunities "to actually get hands-on inquiry-based" activities for the online portion of his BL classroom. Another commonly used pedagogical practice employed in the traditional setting is differentiated instruction. Storm shared how his practice translates when using technology.

> I also try to make sure that I'm differentiating as much as possible, that I'm using simulations as much as possible so that even though we don't get the hands-on experience as much as I would like, they still get pseudo inquiry-based learning when they're out there.

He also focused on building vocabulary skills that promote his student's knowledge of the academic language.

As participants began to dive deeper into sharing pedagogical strategies that they've implemented since the pandemic, the findings revealed the same trends of some new and not-so-new ways that teachers foster interaction with their content. Some of the more recent pedagogical strategies used in Paige's classes included the use of several technology-based programs such as Canva, Google, and Screencastify. Paige used Canvas as her LMS and likes being able to use other outside resources that can be embedded and are compatible with the LMS. She claimed that "being able to use Canva, being able to attach Google files…that's a streamlined process for students to have everything in their Google Drive."

Megan assigns her students a job in an effort to promote accountability. Her pedagogical practice may also mean letting students "know ahead of time what the expectation is or what they should be able to do by the end of the assignment." She views this practice as a way to foster "that sense of accountability when it comes to engagement with the content." Megan was the first to mention her "attempts at the flipped classroom that was not happening before the pandemic." What she found in trying this strategy using technology was that it did not work well for her and resulted in her going back to a more familiar strategy such as using stations. She stated:

> I think stations came out of an attempt to try to fill in some gaps that were created by the pandemic and being remote for so long, but then I really just started to see the value in being able to work with those small groups regularly.

In essence, Megan tried a model of BL that did not work well for her class and as a result, she reverted back to a strategy that was a comfortable method that she was familiar with and saw value in.

The findings show that some practices adhere to or support the type of content being taught as seen in Kathy's Food and Nutrition classes where her students "do a lot of hands-on things." Of the seven participants interviewed in the traditional schools, Mitchell was the only teacher that mentioned the use of technology in his arsenal of pedagogical practices. He said, "what technology does, especially in our content area, which used to be very lecture heavy, allows us to break it down to have smaller chunks to differentiate and use it in that manner." He also shared how he now uses his Promethean board to do smaller activities like setting a timer and he believes using the technology is a positive shift as he stated, "it allows us, I think, more time to be engaged and less time having to prep enormous amounts." Implementing these new pedagogical strategies has shifted Mitchell's role as he acknowledges "I wasn't teaching, but I was the facilitator."

Echoing the sentiments of her colleagues, Haley has also expressed how she now uses technology in her classes. She uses "AP choice boards that are all digital" and she proudly states how she now has "a digital syllabus" that she provides to students online. Haley has taken her tech savviness a step further as she now provides "a digital handbook" for parents. This handbook includes tabs and seems to be user-friendly as she described that parents can "click on each tab and it takes them where they need to go." She is pro-technology and has found a useful way to take it beyond her classroom to include other stakeholder groups.

Improvements to Teaching and Learning

During the interview process, participants were asked to share regarding improvements that they may or may not see in the teaching and learning practices witnessed in their districts. The thought around improvement varies for most of the participants. Barbara and Megan believe that there has been substantial improvement across the district. Megan expressed that administrators "have done a good job with aligning our school improvement goals with" performance indicators to assess overall school progress. Barbara has seen improvements on a school-based level as evidenced by school growth as she shared "kids were growing by leaps and bounds" and she credits this with blending technology with writing and other strategies that seem to be good for students.

For high school teachers the responses varied with Mitchell stating that "I do feel it's improving, and I think what's happening is I think COVID was a wakeup call." He also believed the districts initiative for more collaboration between teachers also served as a factor for improvement in teaching and learning. Brad believed that it is difficult to gauge improvement as a whole because it depends "on the teacher." Lastly, Kathy spoke to improvement through the lens of the lessons that were learned. She believed that improvements are happening because teachers learned that connection with students is a major factor in predicting a "good outcome for learning."

How the Institution Provides Support

The researcher discussed the support for BL provided by the institution or district in this section. Participants reflected on ways in which their school districts have supported them in the endeavor to implement and promote the BL modality of instruction with its strategies in the traditional and online classrooms. This question aligns with the final subsystem in the CABLS

framework, which is the institution. Participants shared their experiences with school and/or district level support of BL. The narratives show how K12 teachers perceive restrictions as well as support in their BL classrooms as dictated by their school. Participants shared how training, instructional materials, and classroom tools are typically provided as the overarching entity of the institution signs off with a stamp of approval.

District/Institution Support for BL

Participants representing District C all praised their district for the support that they have received in multiple ways. Amber cites protected time given by the district when she reports, "within our program, our directors do a good job of giving us time built into the month, the week, which is our time, our protected time for us to meet and to get together…" She also mentioned that PD is offered as an additional support. Storm commends the district for providing the needed resources as he claimed, "our district had really been good at giving us tools to support us and also educating the rest of the school district about what we do." He continued as he mentioned the support the institution provided for students as he shared, "they also make sure our internet is running when our kids have problems, they're responsive to the kids and making sure their one-to-one devices work…" Both Paige and Ashley speak in total agreement with their colleagues when Paige said, "...we have a lot of support from our district office" and Ashley echoes, "they are very supportive."

As seen with District C, participants in District D praised the support experienced in their institution. Kathy emphasized, "we've had a lot of good training on blended learning and ways to go from classroom to online and seamlessly kind of blend those two together." Mitchell in concert with Kathy spoke of the training when he shared, "we have tech training, we have staff development that goes with that training." He also listed some of the technology that has been

purchased for teachers when he said, “we are encouraged to use Chromebooks” and “every class has a Promethean board… we all have our own laptops.”

Brad shared his experience with having his needs met when he needed resources for his classroom. He has pointed out that, “...anytime I asked for something, they, whether it was for blended learning, regular learning, anything like that, they gave it to us.”

Accessibility of Technology for Teachers

Another means of support provided by both districts is seen in how much access teachers have to multiple types of technology devices and programs. As accessibility for the teachers was also briefly discussed, participants shared how they have access to whatever they need to teach their courses successfully. Megan said, “we now have the Promethean boards, which actually adds another element of technology that students can actually put their hands on.”

Promethean boards are interactive whiteboards that can be used by students and teachers to create and engage students in classroom activities and assignments. Teachers like Mitchell listed resources such as websites and “good technology platforms” as another form of technology that he has access to. In both districts the LMS platform is Canvas. The last type of technology-based resource identified by participants was the use of digital textbooks which are utilized by both teachers and students.

Summary

In this chapter the findings were presented based on the CABLS Framework and address the following three research questions:

- What are K12 teachers experiences with facilitating student-content engagement in blended learning environments?

- What strategies and practices do K12 teachers use to promote student-content engagement in blended learning environments?
- What are K12 teacher perceptions of the teaching and learning practices used within their school districts for blended learning?

Participants provided data that demonstrated how they effectively facilitated student interaction in the BL classroom using technology on a regular and consistent basis. Specifically, teachers discussed at length the many various pedagogical practices and innovative strategies that they have adopted as a result of the COVID pandemic. Participants also shared the observations of teaching and learning practices within their respective districts. In the subsequent chapter the researcher discusses the study comprehensively reviewing the characteristics of the participants, providing an explanation of how the themes were extracted and their relation to the CABLS theoretical framework and providing a study overview. In the next chapter, the results of this study will be discussed in reference to previous literature and with implications for the future.

CHAPTER 5: DISCUSSION

The onset of the COVID-19 pandemic had a profound impact on educational systems across the globe (Aditya, 2021). Over 168 million students were affected as schools were closed across the world (UNICEF, 2021). As the educational world experienced the effects of having to make an immediate shift, teaching and learning was also impacted in a life-changing and significant way (Dvir & Schatz-Oppenheimer, 2020). Teachers were expected to make abrupt changes to now teach all of their courses using online or blended learning modalities of instruction with only a brief introduction to online teaching (Konig et al., 2020). While this shift proved difficult for many educators across academic sectors, it was a particularly tough challenge for K12 teachers who were expected to teach using a blended model that combined traditional F2F instruction with online instruction simultaneously (Milheim, 2006). As this transition began to manifest, teacher attitudes ranged from disparage over the new and difficult technology challenges to viewing this change as an opportunity to employ innovations as a part of their instructional practices (Francom et al., 2021).

The purpose of this qualitative case study was to investigate K12 teachers' experiences facilitating student-content engagement in blended learning (BL) environments. The research was guided by three research questions given in previous chapters.

This chapter includes a summary of the findings from the data that was shared in the preceding chapter. A discussion of the theoretical framework and literature relative to the descriptive analysis of the data addressing the research questions is being presented here as well. The limitations identified in this study and the implications for a deeper understanding of the importance of the study as well as the relevance of the findings relative to the emergent practices has also been provided. The chapter closes by acknowledging opportunities for future research.

Discussion

The theoretical framework, CABLS, as well as the academic literature provided a lens by which the research questions have been addressed. CABLS also informed the research by providing a basis for descriptive analysis of the participant's experiences and shared stories. In making appropriate application of the CABLS framework, further analysis of the results discussed in Chapter 4 uncovered several significant areas directly aligned to the research questions.

In this section, the researcher discusses the experiences of K12 teachers when facilitating student-content engagement in the BL setting. These experiences are discussed in alignment with the corresponding subsystems that make up the CABLS framework. This discussion also highlights how the themes and subthemes emerged as a result of addressing the research questions through the purview of the framework.

Research Question One

What are K12 teachers experiences with facilitating student-content engagement in blended learning environments?

The term "blended learning" has multiple definitions that are not recorded using the same exact verbiage in the literature. As seen in the findings of this study and in agreement with Kassner (2013), most educational practitioners described BL as a blend of F2F instruction with online elements of instruction incorporating some form of technology use. It is critical to first be able to apply a plausible definition to BL before addressing student-content engagement in this setting. In addition to laying aside the subjectivity of the term and determining what BL really is, it should also be noted that there are several models of BL as identified by Christensen et al. (2013).

As teachers shared their experiences of how student-content engagement is facilitated in the BL environment, they started with a basic description of who their learners were which served as the first prominent theme. The subsystem entitled *Learner* is the central component of the CABLS framework but is impacted by the remaining five subsystems (Cleveland-Innes & Wilton, 2018). Providing this demographic data aligned with the first subsystem of the CABLS framework which offered context for the identities of the learners associated with the types of courses that were represented in this study. The learner's identities continued to evolve in the BL setting as they transitioned from being passive to more active learners (Wang et al., 2015).

Teachers' experiences with facilitation of student-content engagement were impacted by the learners' demographics and their digital literacy skills. Tang and Chaw (2016) confirm that determining a student's digital literacy levels should be a deciding factor in how easily a student can learn to use technology. Learners were described primarily in terms of race and gender, which emerged as a subtheme, and the next major focus or subtheme was on the learner's academic ability. Other less prominent descriptive information included students' socioeconomic status and social class. Several of these factors are indicative of the types of supports that students may need to successfully adapt, engage, and interact with the other subsystems of the CABLS framework as confirmed in the study conducted by Wang et al. (2015). These demographics also directly influenced how teachers experience facilitation of student engagement in their individual courses when considering potential demographic trends that could speak to a student's transition from passive to active learning.

The findings clearly showed a pattern in the responses about the levels of student-content engagement that could be associated with the types of courses that students are enrolled in. This finding is confirmed by Applied Educational Systems, Inc. (2022) which posits how the use of

good technology in course content has the potential to improve the students' understanding of that content. The core subjects of math, science, English, and social studies are courses that are graduation requirements in the K12 sector. Students in these courses usually engage with content as a means of ensuring they meet the graduation requirements in following a two- or four-year college track (North Carolina Department of Public Instruction, 2022). The teachers that taught core subjects noted a heavier presence of Caucasian students rather than describing a student population illustrating high levels of cultural diversity. Participants that taught the CTE courses, which are designed with the same goal of preparing students for college entry but also have a heavier focus on careers, reported having a more diverse population of students both ethnically and racially.

Students enrolled in CTE courses engage with content as a means of learning a skillset that will open a door for jobs and careers in a specific field and as seen in the findings these are often students of color. Research corroborates this observation by showing that CTE courses tend to be more culturally diverse (Rehm, 2008; Leu & Arbeit, 2020). The CTE teachers in this study teach courses such as agricultural mechanics, foods and nutrition, and business law which are considered to be a part of career clusters where students are taught life skills leading to careers and gainful employment (Leu & Arbeit, 2020; Loera et al., 2013). As alluded to by some participants, CTE students engage with their content as they are motivated by an interest in courses that prepare them for careers beyond and in some cases instead of post-secondary education. This point aligns with Castelo's (2020) assessment that industry leaders see the technology component of BL as a major benefit as students become more tech savvy and able to acquire the skills needed for many high-end jobs and careers.

Student's academic abilities was another key factor in determining how student-content engagement is facilitated in BL. Participant experiences showed that many teachers had to adjust their practices while employing additional support from those identified as instructional coaches and media coordinators to meet the needs of students with lower levels of academic abilities. To support these students, it was sometimes necessary to enlist the aid of translation devices that translate linguistically, as just one of many examples. BL has been deemed as an instrumental tool in the facilitation of helping students to develop stronger language skills and sub skills (Ehsanifard et al., 2020).

The second compelling theme aligned with the learner was identified as teacher experiences with learner digital literacy. Tang and Chaw (2016) verified the importance of digital literacy as they posit that the efficient use of technology is contingent upon a certain digital literacy level. Upon identifying and describing the learners referenced in this study, most participants shared their experiences with facilitation for student-content engagement, which emerged as a subtheme based on discussion responses, directly related to digital literacy levels.

Determining a student's prior knowledge with digital literacy is a salient consideration in how facilitation is initiated. This aligns with Chiu's (2021) findings where teachers believed that digital literacy is a required component for technology use in the BL environment. Individuals that served in supportive technology-based roles were the key players in designing and providing PD opportunities to instruct educators in the use of instructional technology in their BL classrooms that would address the varying digital literacy levels. As participants assessed their students' digital literacy, this provided a foundation for how facilitation would be initiated to promote student-content engagement.

The last recurring topic for the learner that emerged as a subtheme based upon frequency was that of accessibility to technology for the learner. Participants unanimously discussed the advantages for students having Chromebook computer devices assigned to them for usage throughout the entire school year. This endeavor provided one of the most critical aspects of the blend needed to substantiate BL and promote student-content engagement. Harrell and Wendt (2019) confirmed and explained that positive student outcomes are associated with students having accessibility to the required devices used in BL.

As participants continued to share their stories and experiences, the second overarching theme spoke more directly to the research question in the discussion of facilitation with student-content engagement through learning support. This portion of the conversation aligned with the CABLS subsystem labeled the Learning Support. As noted by Cleveland-Innes and Wilton (2018), the learning support has to be designed and implemented in such a way as to support learners as they work towards mastery of the content.

Learning support is a student-centered approach inclusive of both academic and technical support designed to give the student control over their learning making them active learners (Wang et al., 2015). This part of the framework was supported through the subthemes that surfaced as participants focused on their instructional routines, the design of their lessons and the autonomy some of them expressed in making instructional choices in the best interest of their students, fostering student-content engagement.

All participants shared their instructional routines by providing the researcher with a glimpse into their daily practices. While all participants gave detailed descriptions of how technology was included at multiple points within the class period, only a few mentioned how they employ differentiation to meet the diverse needs represented in their classrooms. As a part

of their routines, several teachers for both, traditional and online schools, now see the benefits of what has been called the flipped classroom. Koivula (2020) affirms that the flipped classroom can be designed to benefit and support student-centered learning by using interactive multimedia. McKinstry (2012) echoed the positive impact of using the flipped classroom model to promote student-content engagement within the F2F aspect of the BL classroom. They now record lessons for students that are absent or for struggling students that may need to review aspects of daily lessons for comprehension. The flipped classroom is a means of using designed instructional and learning materials such as video, as a substitute for traditional in-person F2F instruction (Kostaris et al., 2017). Instructional routines are founded upon teaching content from a curriculum that has been designed by the teacher or provided by the state and revised by the teacher according to responses.

Participants shared information about the design of their lessons and the freedom associated with this whether directly or indirectly. Enyedy (2014) conveyed that when teachers have the freedom to personalize instruction through tailored content this is a viable way to meet the needs of each student. This subtheme of lesson design revealed some patterns that appeared to be content-specific. Teachers of core subjects in the traditional schools as well as the online schools all had the freedom to design their own lessons. Participants seemed to express excitement in this autonomy (another subtheme), as they were able to build in activities and assignments to promote student-content engagement in their courses. Conversely, CTE teachers shared their experiences with how their curriculum was provided by the state whether taught online or in a traditional setting.

They all mentioned how they would take the curriculum and revise or rewrite it to engage their students in BL and to meet the diverse needs of their students as a means of supporting all

learners in an equitable manner. According to McKinstry (2012), if CTE teachers are going to effectively facilitate student-content engagement in their BL classrooms then the BL element has to be included as an essential piece embedded within their curriculum.

Research Question Two

What strategies and practices do K12 teachers use to promote student-content engagement in blended learning environments?

The robust discussion that ensued about strategies and practices used with content proved to yield a plethora of responses that participants seemed eager to share. The one pronounced theme that resulted from the responses to one of the interview questions was perceptual innovative strategies and practices used with content and PLC support. This focal point aligned with the CABLS subsystem entitled The Content.

As duly noted by Wang et al. (2015),

> The content that learners are engaged with in BL has never been as rich and engaging as it is today as a result of constantly interacting with, and often determined by, the learner, the teacher, the technology, the learning support, and the institution (p. 383).

Teachers shared extensively about strategies and practices that they perceived as innovative and then transitioned to talking about their PLCs, highlighting everything from challenges to opportunities. The frequency and depth of the data produced was a primary factor in extracting four subthemes.

The conversations around innovative strategies implied and brought into question how the teachers defined innovation, that may have required the researcher sharing the types of innovation such as disruptive innovation or sustaining innovation as described by Christensen et al. (2021). As participants described strategies they were using to engage students with their

content, some of them mentioned that the strategies referenced were not necessarily new, such as virtual group work, but were new to them as teachers trying something different with their students and something they deemed beneficial to their students. Kumi-Yeboah and Smith (2018) corroborated the benefits of innovation as they reported some of the benefits of K-12 BL environments include teachers gaining strong pedagogical strategies using innovative concepts, presenting a strong learning environment for students, and students receiving more immediate feedback regarding their performance.

The pandemic was cited as the culprit behind teachers trying strategies and employing practices promoting the student-content engagement that have existed in other educational sectors but presented as new to K12 teachers. Smith and Soricone (2021) acknowledged that the COVID-19 pandemic brought challenges particularly for CTE courses; however, innovations began to quickly emerge. As teachers shared the use of an LMS and software programs like The Google Suite to post assignments and foster student collaboration promoting student-content engagement, this presented as more of a disruptive innovation which merges new technology with old technology (Christensen et al., 2021). One participant presented a prime example of this in using an LMS platform (old) to implement AI (new) into his course content.

Other opportunities to implement innovative strategies can be found within the professional groups referred to as PLCs that are designed to be instrumental in helping to develop innovative strategies and practices that engage students with content. Bryson et al. (2015) affirms the importance of PLCs in providing opportunities for teachers in BL classrooms to acquire support and observe experienced BL teachers while also participating in functional and strong PLCs as mandated and supported by educational leadership. In this study PLCs were described and discussed in detail as to their role in creating engaging content. Participants

displayed different attitudes across the board showing inconsistencies particularly in the traditional settings. The next primary focus aligned with the framework is the technology.

To successfully engage with content or any aspect of BL, technology is a requirement. This portion of the conversation showed some unanimously common areas across the board. The CABLS framework includes a subsystem referred to as *The Technology*. This is the one subsystem that is required to be utilized by both the teacher and the learner in order to successfully create and engage with content in the BL setting (Cleveland-Innes & Wilton, 2018). The use of technology is the broad and obvious theme aligned with the framework and serving as a foundation for the research question.

The subthemes of the power of one-to-one and successful technology-based strategies used in BL were the prevalent subthemes that were mentioned by all participants. When asked about technology all eleven participants stated that their school districts were one-to-one and this set the stage for the BL classrooms that were initiated as a result of the pandemic and that have continued well beyond. Luo and Murray (2018) confirmed a benefit of students using Chromebook computers to engage with content as having a positive impact on teachers who have students that use one-to-one devices in their K-12 classrooms. While new strategies were discussed earlier, participants now focused on those strategies that they deemed successful and continue to use in their practices.

As with other components of education, there were pros and cons identified as barriers and benefits to technology use. The barriers that were cited differed according to the teacher's experiences with some barriers being tangible and focused more on the actual devices while others were more conceptual in nature regarding data privacy issues. Benefits were mentioned that demonstrated support of student-content engagement that was not previously witnessed prior

to the introduction of technology in the K12 classrooms. Carver (2016), identified similar information in his study as he stated, the most identified barrier to K12 technology usage is accessibility to technology and the greatest perceived benefit was increased student engagement.

Research Question Three

What are K12 teacher's perceptions of the teaching and learning practices used within their school districts for blended learning?

Now that BL has found its place within the culture of the K12 sector, it is important to look at practices that will not only sustain it as an instructional modality but will also strengthen it through continued support. Within that culture is the role of the teacher, which is just as critical as the learner. The role of the teacher as well as the concept of teaching and learning is supported and viewed through the lens of the CABLS framework subsystem entitled The Teacher. The role of the teacher in the BL environment has been one that has been reinvented and engages in a cycle of continuous co-evolution to adapt to the other subsystems of the framework (Cleveland-Innes & Wilton, 2018; Wang et al, 2015). As this role transforms to fit into the BL culture the pedagogical practices will also need to be modified for appropriateness in this fairly new environment (Cleveland-Innes & Wilton, 2018). The success of BL programs is heavily dependent upon the teachers' ability to engage with new educational and pedagogical practices as well as receiving relevant PD to support these initiatives (Schecter et al., 2017).

Only one major theme developed as participants engaged in discussion about teachers within their districts, which was COVID the impetus behind K12 BL. The literature confirms the thought process of COVID causing the emergence of BL in the K12 sector. For example, Elsayary (2021) makes a similar claim in stating that the development of BL in K12 education was a direct result of the COVID-19 lockdown. From this theme the subthemes of pedagogical

practices and strategies – old/new and teaching and learning practices, surfaced. The onset of the COVID-19 pandemic brought on a major challenge for educators at multiple levels but K12 educators were more deeply impacted as they were mandated to combine in-person and online teaching modalities simultaneously (Short et al., 2021; Varela & Desiderio, 2021).

The participants in this study often referred to the pandemic as the culprit and turning point for their practices and this thought was corroborated by Jerry and Yunus (2021) in concluding that the COVID-19 pandemic caused the restructuring of instructional practices. Unless the courses were initially designed to include a technology component, like some CTE courses, it was not considered a normal part of their pedagogical practices and strategies. While some teachers did not readily embrace the integration of technology into their pedagogy, others were a little more open. The mixed emotions centered on technology use for student-content engagement was also noted in the findings of Kormos & Julio (2020) as they mentioned varying teacher attitudes that were impacted by the use of educational technologies. In this study, those who were initially a little reluctant, started to note the benefit of including technology as pedagogy for increased student-content engagement in their courses in addition to pedagogical practices and strategies that were used pre-pandemic.

For participants who saw the shift to new pedagogy as dictated by BL as a new opportunity to increase differentiation, this was a more welcome change. Arnesen et al. (2019) spoke to the relationship of differentiation to BL by deeming differentiation as a part of the BL fabric. According to the discussion, the reasoning or logic behind this acceptance was that the participants would still be able to employ older practices and strategies such as hands-on activities that promote student-content engagement in addition to incorporating the use of technology to address the various learning styles of their students. At the end of the

conversations all participants were able to recognize benefits for themselves as the practitioners and their students in using a blend of old and new pedagogical practices and strategies.

While these particular teachers now accepted BL classrooms and spoke of their BL courses in a positive way, they also shared with the researcher how this is not what they have seen within their districts. In alignment with findings from Jerry and Yunus (2021) teacher's acceptance of blended learning is often contingent on the impact of technology and its influence on teaching practices. As the discussion shifted to reflect and share experiences about what they were seeing in a general sense with teaching and learning in their districts the tone of the conversations changed. There was a sense of concern and agitation as they identified teachers, albeit smaller in number, who displayed a disdain for technology and as a result have reverted back to older more familiar and comfortable teaching methods.

However, to the dismay of this small group of opposing teachers, K12 districts have opted to continue with BL in the classrooms as it has made a substantial difference in the levels of academic achievement based on student-content engagement as reported by the participants. Bryson et al. (2015) posits that BL not only promotes growth in student engagement but also produces better student outcomes. As these positives are being realized in the school districts of this study, these results justify the push and support of the institution in the increase of BL classrooms throughout the districts. This point leads to the final topic of discussion, which looks at the district as an institution as the final subsystem of the CABLS framework.

In order for BL to be fully implemented the institution as the impetus must provide the infrastructure required to develop a strong BL program (Cleveland-Innes & Wilton, 2018; Wang et al., 2015). The dominant theme that materialized as a result of the frequency of participant responses was how the institution provides support, with the subthemes of district/institutional

support and accessibility to technology for teachers. Participants unanimously agreed that their districts are supportive of BL which is evident by the fiscal support in providing multiple types of technologies and programs to equip BL classrooms. Districts and institutions also provide the necessary training and PD to equip teachers with the knowledge and skills for implementation. Frazier & Palmer (2015) concur as their findings revealed a need specifically for K-12 teachers to receive the training and support needed in preparation for instruction in the BL environment. Lastly, teachers have a plethora technologies and tools accessible to them as a result of the investments made by the districts. This support appears to be an ongoing endeavor as districts now move into newer technologies such as AI, as reported by participants.

Limitations of the Research

There were several limitations observed in this study that are being acknowledged. First, the study was limited due to the involvement of using only two school districts even though I potentially had access to additional sites. In my current role as a CTE Administrator I have access to multiple school districts throughout the state based upon my connection with colleagues. Time constraints and the difficulties of obtaining IRB approval in other school districts caused the researcher to intentionally keep the study contained within two school districts.

The second limitation noted was in the fact that due to the nature of the focus of this study the research could have been conducted on a much larger scale. The geographic location could have been extended into other regions of the state or even other states to produce a much larger study that could have proven to be a good fit for a quantitative or mixed methods study that included a much larger pool of participants. The study could have also been expanded to include other content areas such as world language courses.

The third limitation was that the number of participants that were selected for this study could have also been expanded to include other teachers representing other grade levels. In the state where this study was conducted there are successful BL programs that have been implemented in elementary schools covering grades K-5.

The fourth limitation noted was in the process used to select participants. While I am familiar with some of the CTE teachers, I have to rely on school administrations as the gatekeepers to provide references to teachers covering all content areas included in this study. This opens the potential risks of the administrators showing a bias in the teachers that are referred to participate in this study. During the recruitment process there were additional recommendations of teachers that would have been good participants; however, the researcher chose to keep the number of participants manageable.

Implications for Professional Practice

This study was designed to address a gap in the literature focused on BL specifically in the K12 setting and the findings of this study revealed implications regarding professional practice. There were several implications that evolved from this study that demonstrated the potential benefits of promoting student-content engagement within the BL setting. The implications included; (a) diversifying ways to facilitate student-content engagement in BL environments; (b) selecting strategies and practices that can be employed across content areas to promote student-content engagement; (c) restructuring of PLCs to create engaging activities, assignments and projects promoting cross-curricular integration; (d) increased PD to strengthen teaching and learning across school districts; and (e) integrate BL strategies into teacher education programs.

First, throughout the entirety of this study, participants referenced multiple ways in which student-content engagement was facilitated in their BL classrooms. Some K12 teachers relied on facilitation that was implemented through individuals while others believed that training and PD was just as effective. Rather than K12 teachers using one means to facilitate student-content engagement within their classrooms it could prove beneficial to tap into multiple resources such as trainings, media coordinators, instructional coaches, workshops, seminars and exploring new technology-based devices as a means of diversifying technology facilitation in their BL environments.

Second, a focus on strategies and practices that K12 teachers have successfully employed across different content areas could potentially strengthen student-content engagement. Many of the strategies and practices proved to be beneficial for K12 teachers and could be shared across content areas as opposed to teachers using successful practices in isolation. Building a repository of strategies and practices that are generalized in nature and applicable to any K12 area could not only strengthen student-content engagement but could also invoke increases in student outcomes and performance benefiting students, teachers, and school leaders.

The third noted implication that could potentially prove beneficial to educational stakeholders and cause the overall advancement of the school culture would be in the restructuring of PLCs. Research into PLCs and how they are designed to function could also benefit district leaders, administrators, teachers and ultimately students. Providing guidelines or structure on what PLCs should look like provides a starting point for school districts to revisit their current concepts of PLCs according to the findings in this study.

Currently, PLCs across districts tend to be a bit disjointed showing no real unity or cohesiveness. The development of a template providing an example of the ideal PLC that works

successfully regardless of its composition focused content, grade level, etc. could prove beneficial to all educational stakeholders. This study illustrated how important it is for PLCs to establish the ultimate and common goal of creating engaging content employing ideas that promote strong inter-curricular or cross-curricular projects strengthening student-content engagement.

Next, is the necessity of promoting student-content engagement in the BL setting through continued and increased teacher support through PD designed specifically to build teaching and learning skills across school districts. Developing training to assist teachers in the implementation of the use of instructional technology is another key factor that could provide lasting value. This is also an area where differentiation would be profitable as all teachers do not have the same levels of knowledge and expertise and therefore do not need the same levels of support.

The final implication is integration of BL strategies into teacher education programs in post-secondary institutions. Teacher education programs typically provide training and support in pedagogical practices and teaching strategies to aid and support beginning teachers in the K12 sector. Integration of strategies and practices specific to the BL environment could promote the use of BL strategies for new teachers moving forward. This element of teaching has the potential of moving BL to the forefront in the minds of educational leaders who recognize the direction K12 education is moving towards with regards to BL. The more this instructional modality is discussed and used within K12 classrooms, the more intentional administrators and educational leaders can be about observations that focus on the effective use of BL in the classroom.

Recommendations for Future Research

As the gap in literature focused on student-content engagement in BL settings is slowly decreasing, there still remains a significant deficit when considering the K12 sector (Ashraf et al., 2021; DiPietro et al., 2008; Harrell & Wendt, 2019; Hesse, 2017; Kassner, 2013; Mulqueeny et al., 2015; Short et al.,2021). Promoting further research in this area could have a profound impact on teaching and learning practices within school districts and promote overall student learning outcomes and student achievement.

As noted in the implications of this study, for effective BL throughout school districts, teaching and learning must be addressed. As the advantages and benefits of using proven effective strategies promoting student-content engagement in BL classrooms are highlighted, a healthy learning climate and overall culture could begin to develop. One recommendation that could initiate solid teaching and learning practices would be the implementation of using an evaluative instrument for K12 teachers in BL classrooms. As it currently stands, the districts that were represented in this study have no instruments in place to quantify the effectiveness of strategies and practices used in BL environments. Modifying the current evaluative tool used to assess teacher performance to include and reflect the effective strategies used in BL classrooms could not only prove beneficial for all K12 educational constituents but would mandate accountability for all teachers engaged in BL environments.

Another possible area worth consideration for further research addressed the implication focused on the facilitation of student-content engagement. Throughout the entirety of this study, participants referenced a few ways in which student-content engagement was facilitated in their BL classrooms. Some K12 teachers relied on facilitation that was implemented through individuals while others believed that training and PD was just as effective. Rather than K12

teachers using one means only to facilitate student-content engagement within their classrooms, it could prove beneficial to conduct research that would identify additional resources. These would include digital trainings that are differentiated based on teacher needs, technology facilitators, technology conferences focused on newly emerging technology programs, partnering with higher education departments focused on instructional technologies, workshops, seminars, and exploring new devices as a means of diversifying technology facilitation in their BL environments. The role of the technology facilitator is specifically designed to provide support and training for the use of instructional technology in K12 classrooms, but these roles at one point were being eliminated and now are slowly re-emerging as the need increases with the use of BL.

Exploring other ways to facilitate student-content engagement using other technology could not only benefit all educational stakeholders but could garner additional funding for possible BL program expansion that could also potentially create new and supportive partnerships between K12 education, higher education departments, and technology-based industry partners.

Summary

The findings of this study revealed prominent themes and subthemes that surfaced by means of inductive analysis. Participants shared their stories and experiences of student-content engagement within the BL environment and their responses were provided in alignment with the research questions through the lens of the CABLS theoretical framework. Semi-structured individualized interviews were conducted and questions were crafted to allow participants to expound upon their experiences providing the rich descriptive data embedded within the constructivism epistemology.

All participants shared the demographic composition of their classes. While the majority described a higher number of White students, the participants reporting more of a mix were those teaching CTE courses. Gender representation for participants in their classes were vastly different with no real correlation to the courses. The additional demographics of economic statuses and academic abilities ranged was from the high end to the low end with no significant weightiness at either extreme. The demographic factor that served as a potential indicator was that of a student's socioeconomic status which could play a role in the student's ability to have internet access from home.

Student's digital literacy skills ranged from those who are tech savvy to those who tend to struggle with technology. This range was linked to salient factors identified such as unfamiliarity with the LMS or computer programs that were used. The differences between middle and high school observations also appear to be clearly seen and relative to students' prior knowledge and experiences with technology-mediated devices before moving to another grade level.

The teaching and learning practices witnessed in the districts (with the exception of the online teachers) exposed teachers' attitudes as an initial aversion to online and BL instruction; however, post the pandemic many have now embraced the digital world and incorporate digital activities. Participants seemed to elude to the fact that some teachers still have a strong dislike for technology and as a result have completely reverted back to the sit-and-get means of instruction; however, this small group of laggard's pales in comparison to those who have grown to accept BL and are consistently combining technology with other instructional methods to produce engaging lessons that do promote deeper engagement within their content areas.

When the subject of technology was addressed, it was immediately noted that both districts are considered one-to-one school districts where every student receives a computer device to take home and use throughout the school year. This translates into accessibility of technology devices for all students and teachers. District leaders ensured that teachers were provided with multiple technology devices to promote the BL environment. This accessibility to technology would seem to be an advantage in promoting student-content engagement; however, for some, technology usage is not the priority.

Although for most, technology use is now the norm, this is not the case for everyone. Some K12 educators have reverted back to some of the traditional means of providing instruction. Teachers, particularly CTE teachers, felt that much learning happened as a result of students being engaged with hands-on activities where they learn by doing. These teachers do still incorporate some technology-based elements of BL in their courses successfully resulting in more positive student outcomes. For instance, the mandated use of an LMS to post assignments and instruct students that may be absent is growing in popularity. As more teachers attempt to integrate different forms of technology via assignments and activities, some concerns regarding what students are able to engage with still looms in the shadows.

Students having limited Wi-Fi access or internet connection from home was cited as a barrier multiple times. The online school was able to overcome this barrier by providing students with hotspots. Despite the resolution for this issue, other concerns still surfaced. For example, teachers, cited other differing obstacles to technology usage such as student privacy and maintenance and care of technology devices causing limited availability for student use.

To help facilitate technology use, individuals as well as support systems were identified. Instructional coaches and media coordinators were referenced as individuals that not only

facilitated the use of technology, but also served as primary points of contact to service, troubleshoot, and maintain the technology issues as they arose. A structure used to facilitate technology across cases included PD designed to support instructional technology use. Using multiple technology tools, digital textbooks, and notebooks in the design of lessons and instructional routines is helping to promote and foster that student-content engagement that is a priority for most educators.

When asked to share about the pedagogical practices and strategies used in classrooms there were commonalities across the board. There were anticipated practices that were exclusive to the online setting while other practices used in the traditional setting seemed to be appropriate for certain age groups. Older more familiar practices were also still in use such as group work, hands-on activities, and practices specific to using certain types of technology such as Promethean boards. Examination of the pedagogical practices and strategies exemplified across districts segued into a focus on the object of pedagogy, which is the content.

Collaboration with the design and implementation of content was often cited, whether by PLC or a group of professionals that teachers have connected with. While connection with a PLC seems to be a requirement for teachers some are connected to multiple PLCs that range from grade level to common content areas. There seemed to be a sincere desire to enhance engaging content through PLC interaction or use resources provided through these groups that could potentially strengthen content. As discussions continued key challenges such as conflicts within the groups and opportunities to work collaboratively across content areas designed for the BL setting emerged. The challenges and conflicts as well and the collaborative efforts are handled by initiatives from the district. Overall, districts and institutions have proven to provide multiple

layers of support and interventions to ensure that the BL environments continue to thrive and grow.

Conclusion

Blended learning has been in existence in the K12 setting for only a short span of time. Because of this instructional modality's ability to take student engagement to new levels and heights it is not predicted to die out as some educational trends and fads do…it is here to stay. Now that students have been introduced to a fairly new way of learning that moves them from passive to active learners, this cannot be taken away from them. This study sought to examine student-content engagement in the BL setting specific to students in the K12 sector as a contribution to closing a gap in this area of scholarly knowledge. The findings of this study may contribute to the development of best practices, guidelines and resources to enhance student engagement, improve learning outcomes, and foster a culture of continuous improvement in blended learning environments. Future studies can build on this knowledge to ensue examining other facets of BL within the K12 environment that promotes exponential growth is this area of education.

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APPENDIX A: BASIC QUALITATIVE SINGLE CASE STUDY INTERVIEW PROTOCOL

Research Questions

RQ1. What are the experiences of K12 teachers facilitating student-content engagement in the blended learning setting?

RQ2. What kinds of strategies and practices do K12 teachers use to promote student content engagement in blended learning?

RQ3. What are K12 teacher perceptions of the teaching and learning practices promoting student-content engagement for blended learning?

K12 Teacher Interview Protocol Form

Public School Units (PSU):

_____

Interviewee (Title and Name):

_____

Interviewer: _____

Survey Sections Used:

_____ A: Interviewee Professional Background

_____ B: Student-Content Engagement and Technology (learners & technology)

_____ C: Departmental Professional Learning Community and Content Areas (content)

_____ D: Teaching and Learning - Face-to-face (F2F) and Blended learning (BL) (teaching)

_____ E: Resources, Strategies, and Practices (learner supports) & (district support)

Student-Content Interaction/Engagement in F2F and BL settings Interviews

Introductory Protocol

To facilitate my note-taking, I would like to record our conversations using the Zoom platform or for in-person an audio recorder on my cellular device today. Please sign the release form. For your information, only researcher(s) on this project will be privy to the recording which will be eventually destroyed after they are transcribed. In addition, you must sign a form devised to meet our human subject requirements. Essentially, this document states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) I do not intend to inflict any harm. Thank you for your agreeing to participate.

I have planned this interview to last no longer than one hour and 20 minutes. During this time, I have several questions that I would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning.

Introduction

You have been selected to speak with me today because you have been identified as someone who has a great deal to share about student-content engagement strategies you have used prior to the pandemic, during and post-pandemic. My research project as a whole focuses on K-12 teacher perceptions of student-content engagement strategies used in a BL setting.

My study does not aim to evaluate your techniques or experiences. Rather, I am trying to learn more about student-content engagement strategies, and hopefully learn about which strategies were successful and worked to facilitate student-content engagement in a BL environment.

Potential Risks

The only potential risks for this study could be psychological. If the participants do not currently have access to the technology or equipment that would further enhance their BL courses this could cause low levels of emotional distress. The data will be analyzed after the interviews have been completed and your responses will have no potential negative effects on your profession. Additionally, as a measure to protect participants, I want to ensure that teachers are comfortable with the interview prior to our discussion. The participants all have some level of technology but

I still want to ensure that they are comfortable talking about technology and other resources required to effectively implement BL instructional modalities in their courses and if not, they may decline the interview.

A. Interviewee Background

What is your PSU or school district? _____

How long have you been teaching _____ in your present position? _____ at this school?

Additional background information on interviewee:
What is your highest degree? _____
What is your content area? _____
1. Briefly describe your role (different courses you have taught in the past 3-4 years) as it relates to student engagement.

B. Student-Content Engagement Strategies (learners & technology)
1. Describe the demographic makeup and technology knowledge base of the learner population in your courses and how they engage in the BL environment.
2. How accessible is technology in your content area to teach in the BL environment?
Probes: What are the barriers to using the technology for the BL setting to facilitate student-content engagement?
Who/what are the facilitators (initiators/people i.e. district, teachers, etc.) to using the technology for the BL setting to facilitate student-content engagement?
3. What specific strategies/resources do you use (i.e., technology, textbooks, etc.) in the BL courses to facilitate students-content engagement?
Probe: Can you identify any strategies that were more successfully implemented than others?

Can you give an example?

C. Department Professional Learning Communities (PLCs) and Content Area (content)
1. Is your PLC based upon content area and what are some of the major challenges your department PLC faces in attempting to make changes that will promote student-content engagement practices? What are the major opportunities?

Probes: How can barriers be overcome? How can opportunities be maximized?

2. What pedagogical practices are initiated by you or your PLC to help promote student-content engagement in your specific content area regarding the BL setting?

D. Teaching and Learning – F2F and BL

1. What do you think of the teaching and learning practices related to BL in your school and/or district?

Are teaching and learning practices improving in your school and/or district.

Probe: Explain why or why not? (criteria, evidence)

2. What specific new and innovative teaching strategies and practices have you implemented in your specific classes?

E. Resources, Strategies, and Practices (learner supports) (PSU Support)

1. Describe what a typical lesson looks like in your classroom and your best practices.

Probe: Are your lessons pre-designed or are you able to design and develop your own lessons to incorporate strategies designed to better support students and their levels of engagement with your content?

2. What kind of support does your district provide to promote the use of BL in your classroom?

Post Interview Comments and/or Observations:

APPENDIX B: K-12 TEACHER PERCEPTIONS: DEMOGRAPHIC SURVEY

This survey is designed to collect demographic information from research participants.

Top of Form

Question Title

1. ***Gender: How do you identify?***

Man

Woman

Question Title

2. ***What is your ethnicity?***

Hispanic

Non-Hispanic

Question Title

** 3.* ***What is your race?***

White

Black/African American

American Indian/Alaskan Native

Asian

Native Hawaiian/Other Pacific Islander

Two or more races

Question Title

4. ***How many years have you been teaching in your subject area?***

Done

Bottom of Form

APPENDIX C: CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Department of Educational Leadership
9201 University City Boulevard, Charlotte, NC 28223-0001
t/704-687-8858 f/704-687-1629 https://edld.uncc.edu/

Title of the Project: *K-12 Teachers' Perceptions of Effective Strategies for Student-content Engagement in the Blended Learning Environment*

Principal Investigator: Karen Ingram, Ed.D. Student, UNCC

Faculty Advisor: Ayesha Sadaf, PhD, UNCC

You are invited to participate in a research study. Participation in this research study is voluntary. The information provided is to help you decide whether or not to participate. If you have any questions, please ask.

Important Information You Need to Know

Key Information:

- This project is research and participation in this study is completely voluntary
- Purpose: To allow K-12 teachers to explain their perceptions of effective practices used to facilitate student-content engagement in the BL setting.
- Duration: If you choose to participate it will require approximately 1 hour and 20 minutes of your time.
- Research procedures: This study will begin with participants engaging in completion of this Consent Form and then returning this form to the researcher. Once the Consent Form has been received the potential participant will also be asked to complete an online demographic survey. Upon completion of the survey, an in-person individual interview or a virtual individual interview via the Zoom platform will be scheduled. Participants may elect to interview in-person or via Zoom based upon convenience and participant preference.

- Follow-up: Upon completion of the interview member-checking will be used which means that participants will be allowed to review transcripts to ensure accuracy of the data.
- Risks: The only potential risks for participants could be psychological due to lack of resources such as technology or equipment.
- Benefits to participants could include: increased support from educational leadership, gaining additional financial support to increase required technological devices, and an increase in classroom strategies that could improve instructional practices.
- There will be no alternative procedures or courses of treatment for this study.

Please read this form and ask any questions you may have before you decide whether to participate in this research study.

Why are we doing this study?

The purpose of this research study is twofold. The first purpose is to explore K-12 teachers' perceptions of the impact of student-content engagement within the blended learning (BL) environment. The second purpose is to examine and compare the pedagogical practices and strategies employed by K-12 teachers to facilitate student-content engagement in BL settings.

Why are you being asked to be in this research study.

You are being asked to be in this study because you have completed and signed the Consent Form and you meet the eligibility criteria of the demographic data being requested indicating that you have taught in the K-12 sector for a minimum of 2 or more years in order to provide a range and various levels of experience with BL in the classroom.

What will happen if I take part in this study?

If you choose to participate, you will engage in either an in-person or virtual interview. For the virtual interview participants will receive an invitation from the researcher to come to a virtual Zoom conference room to complete an interview with the researcher. If you choose to participate in an in-person interview, the researcher will contact the participant via email to schedule a time to meet in person to conduct the interview. Interviews will be recorded. For the virtual interviews there will be video and audio recordings and for the in-person only audio will be recorded. Once the interviews have been transcribed all video and audio recordings will be deleted.

Your time commitment will be about 1 hour and 20 minutes which will include the participant answering professional background survey questions prior to the actual interview questions. The interview questions will seek your perceptions of the following areas included in the BL setting: learning & technology, content, teaching, learner supports and district support. Follow up procedures will include member-checking where participants will receive and email with the attached transcripts or via a phone call to discuss and ensure accuracy of the collected data and to validate the data.

What benefits might I experience?

There is no direct benefit to teachers that come from participating but sharing results could potentially benefit participants individually.

What risks might I experience?

The only potential risks for this study could be psychological. If the participants do not currently have access to the technology or equipment that would further enhance their BL courses this could cause low levels of emotional distress. The data will be analyzed after the interviews have been completed and your responses will have no potential negative effects on your profession. Additionally, as a measure to protect participants, I want to ensure that teachers are comfortable with the interview prior to our discussion. The participants all have some level of technology but I still want to ensure that they are comfortable talking about technology and other resources required to effectively implement BL instructional modalities in their courses and if not, they may decline the interview.

How will my information be protected?

The information you provide will be stored using the university secured storage repository and protected in this electronic format. Personal identifiers such as email or name will not be linked to data provided or interview responses. The audio recordings will be deleted once transcription is complete. The virtual interviews will be video recorded as well but the video will be deleted immediately following the interviews. Pseudonyms will be used to rest findings. The school district, school, or state will not be identified in the findings.

How will my information be used after the study is over?

After this study is complete, study data may be shared with other researchers for use in other studies without asking for your consent again or as may be needed as part of publishing our results. The data we share will NOT include information that could identify you.

Will I receive an incentive for taking part in this study?

You will not receive an incentive to participate in this study as school districts do not permit K-12 teachers to participate in research for gifts.

What are my rights if I take part in this study?

It is up to you to decide to be in this research study. Participating in this study is voluntary. Even if you decide to be part of the study now, you may change your mind and stop at any time. You do not have to answer any questions you do not want to answer.

Who can answer my questions about this study and my rights as a participant?

If you have further questions or concerns about your rights as a participant in this study, contact the Office of Research Protections and Integrity at (704) 687-1871 or uncc-irb@charlotte.edu. If you have questions concerning the study, contact the principal investigator, Karen Ingram at (910) 916-0059 or by email at Kingra20@charlotte.edu or Dr. Ayesha Sadaf at (765) 702-5955 or by email at asadaf@charlotte.edu.

Consent to Participate

By printing and signing your name on this Consent Form, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. You will receive a copy of this document for your records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I understand what the study is about and my questions so far have been answered. I agree to take part in this study.

_____	_____
Participant Printed Name	Date
_____	_____
Participant Signature	Date
_____	_____
Principal Investigator Signature	Date