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TEACHERS' PERCEPTIONS OF LEADERSHIP SUPPORT FOR THE IMPLEMENTATION OF A LEARNING MANAGEMENT SYSTEM IN URBAN MIDDLE SCHOOLS

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By

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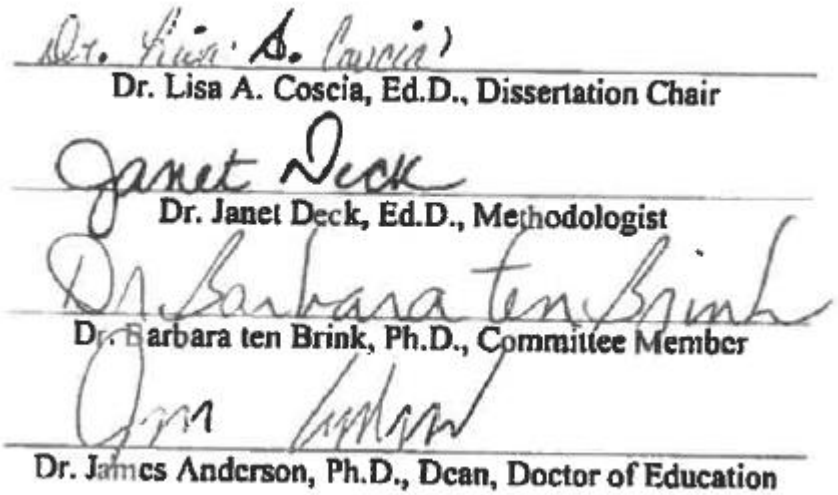

DEDICATION

"I can do all things through Christ who strengthens me" (Philippians 4:13, New King James Version). I thought of this verse often as I toiled through the dissertation process. Only God could provide me with the strength and determination required to complete the arduous task of researching and writing a dissertation.

I dedicate this dissertation to my husband, Allen, who encouraged me to pursue my doctoral degree. Throughout the long journey, he continually provided me with "quiet-time" by taking our four children on various excursions. Thank you for being my best friend. I love you dearly.

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ABSTRACT

This qualitative multi-site case study examined teachers' perceptions of leadership support for their implementation of a learning management system (LMS) to facilitate blended learning in urban middle schools. Understanding teachers' perceptions of leadership actions to encourage the implementation of new innovations will allow leaders to provide materials, resources, and support to effectively increase the incorporation of blended learning in classrooms. Qualitative data were collected through interview sessions with 10 middle school educators who taught at two dichotomous schools. The data was triangulated with artifacts and the research literature to provide an in-depth depiction of the perceptions and experiences of teachers who have used an LMS in classroom instruction. Findings showed that strong organizational infrastructures are needed for teachers to adopt an LMS for instruction. Additional findings included the need for ongoing and consistent coaching support for successful LMS implementation. The study also showed that teachers' perceived administrators who incorporated the components of systems thinking as supportive instructional leaders. The case study findings revealed a need for additional research in the fields of systems thinking educational leadership, instructional coaching, and community responsiveness.

Keywords: blended learning, e-learning, experiential learning theory, instructional leader, learning management system, personalized learning, systems thinking, technology-enhanced learning

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I. INTRODUCTION

As school district personnel begin to design a framework for implementing learning management systems as platforms for blended learning, leaders need to evaluate organizational preparedness regarding infrastructure and teacher readiness for pedagogical change. Leadership decisions about the execution of new initiatives directly influence teacher actions and, consequently, student achievement (Magana & Marzano, 2014; Waters & Marzano, 2006). Understanding teachers' perceptions of leadership support for their use of a learning management system (LMS) to facilitate blended learning will allow leaders to effectively provide materials, resources, and support to ensure system-wide integration of online platforms.

This dissertation is a report on a case study of teachers' perceptions of leadership support regarding the implementation of an LMS as a means to transform pedagogical practices with blended learning strategies. The study is based primarily on interviews with middle school teachers in an urban school district who have implemented the district's prescribed LMS as a delivery platform for blended learning. This chapter is organized into eight subsections. The subsections include the background of the study, the problem statement, the significance of the study, the theoretical framework, the research methodology, the study's limitations, the key terms and definitions, and a summary of the study.

Background of the Study

The introduction of new technologies and multimodal forms of learning and communicating necessitates pedagogical and institutional adaptations to satisfy the evolving educational needs of 21st-century students (Loh, Wong, Quazi, & Kingshott, 2016). To accommodate the learning styles of "digital natives" and to prepare them to compete in a global economy, 95% of colleges and universities in the United States implement curriculum in a blended learning format using a learning management system (Alenezi, 2018; Hilliard, 2015). Reports in the literature show that blended learning increases student academic achievement, motivation, and confidence (Akgunduz & Akinoglu, 2017; Fassbender & Lucier, 2014; Magana & Marzano, 2014). Even after decades of research showing successful student outcomes due to technology-enhanced pedagogy and the use of computer learning systems in higher education, blended learning and learning management system (LMS) integration is not yet pervasive in K-12 education (Akgunduz & Akinoglu, 2017; Alijani, Kwun, & Yu, 2014).

Blended learning is the integration of face-to-face teaching, e-learning tools, and technology-mediated instruction which changes the activities, curriculum, and interpersonal relationships in the learning environment (Boone, 2015; Loh et al., 2016; Wang, Han, & Yang, 2015). Blended learning is "a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path and/or pace" (Staker & Horn, 2012, p. 3). Traditional teaching methods such as whole group, face-to-face, and "low tech" learning do not offer students opportunities to research and solve problems in a global and interactive environment nor do they appeal to tech-savvy learners (Akgunduz & Akinoglu, 2017; Bingham, 2017; Trinder, 2015). LMSs provide a platform to utilize communication technologies and bridge face-to-face learning with online

learning. Communication technologies, such as email, social media, discussion boards, and webinars, are familiar to students and allow multiple participatory outlets, collaborative forums, and connections to real-world scenarios in which students can connect and attach meaning (Trinder, 2015). Likewise, access to multiple search engines and websites on the internet provides immediate and varied avenues for knowledge retrieval.

The basis for the concept that learners need to create connections with new information is rooted in experiential learning theory and the principle of interaction espoused by John Dewey (1944). The principle of interaction suggests that students need to interact with new knowledge in meaningful ways. Also, to make sense of new content, students need to build on previous knowledge and talk about new knowledge in a participatory environment (Bransford, Brown, & Cocking, 2000; Dewey, 1944; Magana, 2017; Marzano, 2004; Sousa, 2011; Vygotsky, 1978). Technology-enhanced pedagogy provides avenues for interactive learning. Teachers who use blended learning create environments that promote active participation, collaboration, and inquiry. Students use technology to engage in problem-solving tasks, discuss new content, and reflect on their thought processes (Magana & Marzano, 2014). Moreover, teachers who employ course or learning management systems can provide immediate feedback, which increases learning performance and strengthens the metacognitive skills of students (Alenezi, 2018; Magana, 2017; Sousa, 2011).

Originating in the late 1950s and early 1960s, e-learning tools such as computer-assisted instruction (CAI) and computer-assisted learning (CAL) were developed to facilitate problem-solving in fields such as mathematics, engineering, physics, statistics, and business (Aparicio, Bacao, & Oliveira, 2016). In 1966, LMSs emerged, which shifted the e-learning focus to student-teacher interaction and student progress through the management of task

accomplishments (Aparicio et al., 2016). In the late 1990s, course management system (CMS) software was created to monitor student performance (Lochner, Conrad, & Graham, 2015; McGill & Klobas, 2009; Moses, Ali, & Krauss, 2014). CMSs like Blackboard and Moodle allow instructors to place course materials online, track student performance, store student submissions, and monitor student communication (Watson & Watson, 2007). CMSs and LMSs have similar capabilities. However, the systemic natures of LMSs have evolved since the 1960s and now have more functionality than a CMS (Watson & Watson, 2007). The LMS acts as the infrastructure that unites corresponding technologies; CMSs are characterized as being part of the LMS (Watson & Watson, 2007). LMSs are web-based learning technologies that support blended learning and act as a delivery mechanism to facilitate organization, collaboration, and transparency throughout the entire education system (Basak & Govender, 2015; Wang et al., 2015).

Historically, LMSs were described as "the framework that handles all aspects of the learning process" (Watson & Watson, 2007, p. 28). LMSs were first known as integrated learning systems (ILS) which acted as a management and tracking system of personalized instruction (Bailey, 1992; Becker, 1993; Brush, Armstrong, Barbrow, & Ulintz, 1999; Szabo, 2002; Watson & Watson; 2007). ILSs are still used today with adaptive software programs such as iStation and iReady, which use diagnostic tests to individualize and personalize student learning experiences. The LMS was designed to provide the infrastructure to deliver instructional content, assess and track learning goals, collect and present data to individual learners and the organization, and manage course registration and administration (Gilhooly, 2001; Szabo, 2002; Watson & Watson, 2007). Today, LMSs such as Canvas, Blackboard, and Brightspace provide highly accessible learning environments for students and allow instructors

to deliver content, monitor and assess student work, and promote shared interactions among students and teachers (Lochner et al., 2015). LMSs, regardless of platform, provide a systematic infrastructure to support blended and e-learning (Lochner et al., 2015). Systemically, LMSs "centralize…processes and create a sense of uniformity" (Alenezi, 2018, p. 2) within organizations. LMSs are increasingly used in institutions such as colleges and universities that have strong infrastructures. Currently, more than 96% of universities in the United Kingdom have adopted an LMS, and all but 5% of U.S. universities use an LMS to manage and supplement traditional classroom systems (Alenezi, 2018).

LMSs are constantly evolving, but their main function remains the same: to connect students with the "learning contents in a standardized manner through software and programs specifically developed for student learning" (Alenezi, 2018, p. 1). LMSs act as an extension of the classroom which benefits both students and teachers by creating connections among class participants. The LMS provides a platform for online discussions and the sharing of materials to facilitate individual and collaborative learning (Adzharuddin & Ling, 2013; Alenezi, 2018; Alghamdi & Bayaga, 2016). Reports from the literature indicate that students prefer learning environments that incorporate technology into the instruction (Akgunduz & Akinoglu, 2017; Fassbender & Lucier, 2014; Alenezi, 2018; Alijani et al., 2014; Loh et al., 2016; Magana & Marzano, 2014; Schmid & Hegelheimer, 2014; Trinder, 2015; Vickrey, Golick, & Stains, 2018; Wengreen, Dimmick, & Israelsen, 2015). Instructors benefit from technology use because they can interact with students inside and outside of the classroom using online forums and monitor student performance to give specific and timely feedback (Alenezi, 2018). Institutions also benefit because learning and communication tools are streamlined within one system which provides continuity, interconnectedness, and interoperability across the organization. As a result,

the heightened use of technology-enhanced learning at the college and university level has begun to influence "the way that K-12 programs are thinking about how to prepare kids for success in college" (Staker et al., 2011, p. 3). School districts are cognizant of the benefits of technology-enhanced learning, yet classroom implementation is progressing at a slower pace than the growth of personal technologies (Varier et al., 2017).

Problem Statement

The purpose of this qualitative study was to provide an understanding of teachers' perceptions of leadership support for their implementation of a learning management system as a delivery platform for blended learning in urban middle school classrooms. According to Marzano (2004), the pedagogical approach of blended learning increases student engagement and achievement. LMSs provide the infrastructure to facilitate blended learning throughout the school system, yet public school systems are slow to adopt such platforms (Akgunduz & Akinoglu, 2017; Alenezi, 2018; Aparicio et al., 2016; Magana & Marzano, 2014; Waters & Marzano, 2006).

This study examined teachers' perceptions of the types of support provided by instructional leaders and the impact support had on teachers' implementation of a learning management system. The findings from this study may help inform educational leaders as to the most effective strategies for the system-wide implementation of an LMS as a platform for blended learning in educational organizations.

Significance of the Study

Research conducted by Akgunduz and Akinoglu (2017) found that students who participated in a blended learning classroom achieved higher rates of academic success compared to those who only attended a traditional face-to-face classroom. Although the research indicates

that technology-enhanced instruction results in higher levels of academic success for students, the implementation of blended learning is progressing at a slow rate in K-12 education (Varier et al., 2017). Likewise, colleges and universities use LMSs as a systemic framework to integrate face-to-face and online instruction, yet primary education is slow to adopt this delivery system (Alenezi, 2018; Aparicio et al., 2016). Research on this topic adds to the growing literature regarding systemic use of LMSs in K-12 public education. The results of the study enumerate strategies to effectively support and encourage teacher use of an LMS as a platform for implementing blended learning as a pedagogical method. Moreover, the results from this study may inform the decisions of district and school leaders regarding technology integration and LMS implementation.

Theoretical Framework

The theoretical lens from which a study is approached guides the research study and provides a procedural strategy for data collection and analysis (Creswell, 2009). Teacher perceptions of leadership support for incorporating technology-enhanced learning methods, including the implementation of an LMS to meet the changing needs of students, were explored through the theoretical lens of experiential learning. Ertmer and Ottenbreit-Leftwich (2009) have identified school culture as a key factor in technology integration and leadership as the driving force for cultural change. The conceptual framework of systems thinking was used to identify the attributes and actions of effective change agents in implementing systemic change. Systemic change management in education requires leaders who can guide the community in creating a shared vision of the new educational system and encouraging stakeholders to take ownership of that vision, thereby changing the culture of the system (Senge, 2006).

The pervasiveness of technology in society requires education systems to adapt to the changes technology perpetuates. No longer is learning confined to a brick and mortar structure. The advent of the Internet has shifted learning from an analog environment to a digital space. Students now have the ability to research information using Web 2.0 tools such as Google and YouTube. Consequently, learning experiences take place in any location and at any time of the day, changing "what is meant by knowledge in school and in life outside it" (Kroksmark, 2016, p. 48). Dewey (1938) suggested that the outcome of an experience

> sets a problem to the educator. It is his business to arrange for the kind of experiences which, while they do not repel the student, but rather engage his activities are, nevertheless, more than immediately enjoyable since they promote having desirable future experiences. (p. 27)

Students' changing experiences with learning require education providers to include "alternative modes of delivery, such as technology-enhanced e-learning" (Loh et al., 2016, p. 129) to create enjoyable and relevant learning experiences. However, according to Banathy (1991), education is responding to societal changes at a slow pace and typically addresses problems through incremental steps rather than systemic change. Systems theorists posit that changing one part of the system impacts the entire system (Banathy, 1991; Miller & Miller, 1995; Senge, 2006; Von Bertalanaffy, 1968). Therefore, an understanding of how all the parts are interrelated is required for the fundamental change to take root in the system. Technology-enhanced learning and the implementation of an LMS in education change the entire educational system and impacts all of the stakeholders. As such, for positive transformations of learning to occur, educational organizations must change both the mindset of individuals and the culture or system in which they work (Fullan, 2006).

Overview of Methodology

Methodology

A non-experimental design, including a multisite, instrumental case study, was used to examine teachers' perceptions of leadership support for their implementation of a learning management system as a delivery platform for blended learning. Purposeful maximal sampling showed different perspectives regarding the issue (Creswell, 2013). Quantitative and qualitative instruments were used to gather data related to three research questions.

Quantitative data were collected from Instructure Learning Analytics in the Canvas LMS used by a large urban school district in the southwest region of the United States for the 2018-2019 school year. The learning analytic reports showcased the number of teachers actively using the LMS for instructional purposes as both an information and communication platform and as a means of delivering course content. Course analytic reports were also analyzed to determine the type and extent of LMS use by research participants. Data from the reports were used to form interview questions for the case study.

An interview protocol was developed and approved by the school district. Interview participants were chosen using purposeful maximal sampling which allowed for varying perspectives about the use of the LMS (Creswell, 2013). The interviews were recorded, annotated, and transcribed. Interviewees validated the transcriptions. Follow-up interviews were held for clarification purposes. Responses from follow-up interviews were transcribed, validated, coded, and analyzed for themes. Relevant information about the three evaluation questions was imported into a concept map for further evaluation.

Research Design

Participants of the study included middle school teachers employed in a large urban public school district located in the southwestern region of the United States. Middle school consists of grades 6-8. Participants taught general education subjects such as math, English language arts (ELA), social studies, and science to students in grades 6-8. Fine arts, foreign language, special education, athletics, and career and technical education (CTE) teachers were also eligible to participate in the study. Participants were selected for individual interviews based on two levels of LMS use determined by analytic reports: (1) consistent use of the LMS as a platform for course delivery and communication and (2) emerging use of the LMS or use as a repository.

Interview participants were chosen from two schools located in the two main regions of the school district delineated as the eastern and western areas of the district. Individual interviews were conducted with educators from the demographically diverse schools to capture the perceptions of teachers servicing different student populations. The geographic location corresponds to the economic and demographic statistics of the population as revealed by the demographic breakdown of two dichotomous schools in the district. Generally, students in the western region represent a population categorized as 5%-31% economically disadvantaged and 24%-50% minority. Conversely, students in the eastern region represent 73%-96% economically disadvantaged and 84%-99% minority.

Research Questions

This study was structured to address three main questions:

1. What are the factors that affect teachers and the successful adoption and implementation of an LMS in teaching and learning?

2. How do middle school teachers perceive support from district and school leaders for the use of an LMS as a platform for implementing blended learning?
3. What are enablers and barriers teachers have encountered in implementing an LMS in classroom instruction?

Data Collection

Quantitative data were collected from Learning Analytics (LA) in the Canvas LMS used by the school district for the 2018-2019 school year. LA applications identify factors that are associated with student learning and course completion (Norris, 2011). LA reports were disaggregated according to the frequency in which teachers and students accessed online materials, completed assessments, and performed online exercises and activities. Collected data included the number of teachers actively using the LMS for instructional purposes as both an information and communication platform and a means of delivering course content.

Interview participants were selected based on Canvas Instructure Analytics data and represented the dichotomous nature of the district. Prospective participants were contacted by letter sent via district email (Appendix A). Participants were notified of the volunteer nature of the study and confidentiality of interview transcriptions. Participants who consented to be interviewed were contacted by email to arrange the location, date, and time of face-to-face interview sessions. Interview sessions lasted approximately 30 minutes and were audio recorded. Follow-up interviews were scheduled with participants who needed to clarify responses. Interview recordings were transcribed and annotated, and participants reviewed and validated the transcriptions. Validated interviews were coded and analyzed for themes. Relevant information about the three evaluation questions was imported into a concept map for

further evaluation. Interview transcriptions, notes, and data will be kept in a password-protected database accessible only by the researcher and then deleted after five years.

Limitations

Limitations are possible weaknesses or problems in research that are recognized by the researcher (Creswell, 2012). One of the limitations of this study was that participation involved only teachers in one public school district in the southwestern region of the United States. Another limitation was that the population included only middle school teachers selected based on analytic reports and the geographic location of the schools where they taught. The selection process was a limitation because it excluded teachers of other grades and schools within the district.

A third limitation was the duration of the study which was one school year. Data collection and interviews were conducted during the spring of the same school year. However, limiting the study to one school year allowed for follow-up interviews with the same participants instead of facing the possibility of losing contact due to staff changes that occur between school years.

Definition of Key Terms

The following terms were used in this study.

Blended Learning

Blended learning is curriculum and instructional design in which a student learns in part through online delivery and face-to-face instruction, with some element of student control over time, place, path, and pace (Staker & Horn, 2012). Blended learning integrates e-learning tools, and technology-enhanced instruction which changes the activities, curriculum, and interpersonal relationships in the learning environment (Boone, 2015; Loh et al., 2016; Wang et al., 2015).

E-learning

E-leaning is the use of online tools designed to help or enhance student learning (Loh et al., 2016).

Experiential Learning Theory

Experiential learning theory is learning where acting and knowing are contiguous, take place all the time, and are "a continuous reorganization and reconstruction of experience" (Easterby-Smith, Araujo, & Burgoyne, 2001; Dewey, 1938; Dewey, 1944).

Instructional Leader

Instructional leadership encompasses "school vision and mission, education programs and the management of teaching, professional competencies, climate of learning, [and] industry-wide competencies" **(**Özdemir, Sezgin, & Kiliç, 2015, p. 378). In this study, instructional leaders include district and school administrators (superintendent, directors, principals, and assistant principals), instructional coaches, curriculum coaches, and technology coaches.

Learning Management System (LMS)

An LMS is computer software that provides a platform for online discussions and the sharing of materials to facilitate individual and collaborative learning (Adzharuddin & Ling, 2013; Alenezi, 2018; Alghamdi & Bayaga, 2016). LMSs connect students with the "learning contents in a standardized manner through software and programs specifically developed for student learning" (Alenezi, 2018, p. 1) and act as an extension of the classroom.

Personalized Learning

Personalized learning is instruction and assessment that "is tailored to students' learning preferences, connects to students' interests, and allows for voice and choice" (Rubin & Sanford, 2018, p. 69).

Systems Thinking Theory

Systems thinking theory is the study of how parts of a system affect the dynamics of the system as a whole. The components of organizations improve efficiency by understanding, adapting to, and learning within the system and from the system (Senge, Scharmer, & Winslow, 2013).

Technology-enhanced Learning

Technology-enhanced learning is all pedagogical approaches in which technology is used to support, augment, modify, or redefine the teaching and learning process (Dror, 2010; Puentedura, 2013).

Summary

Blended learning as an instructional method results in high levels of motivation and academic success for students (Magana & Marzano, 2014; Varier et al., 2017). As a learning tool to facilitate blended learning, learning management systems "provide the medium through which students can improve their knowledge… as a result of the active and collaborative support from teachers" (Jackson, 2017, p. 185). However, K-12 education has been slow to adopt the LMS delivery platform (Alenezi, 2018; Aparicio et al., 2016).

Administrative support is a leading factor for teachers' implementation of new programs and initiatives. According to Youngs, Kwak, and Pogodzinski (2015), teaching experiences are strongly affected by administrative decisions, policies, and leadership practices. Moreover, the actions of top administrators directly correlate to student increases in achievement (Waters & Marzano, 2006). When leaders provide professional development and support, teachers are more

likely to incorporate new instructional methods, thereby impacting the educational system and the experiences of learners (Schrum & Levin, 2013).

This study examined how teachers perceive leadership support for their implementation of a learning management system as a platform for blended learning in classroom instruction. The qualitative, instrumental case study research method utilized a purposeful sample of middle school teachers in an urban school district. Data collection included learning analytic reports, documents provided by the teachers, and individual interviews. Triangulation of the data aligned the study findings to relevant research on experiential learning and systemic change, and teachers' perceptions of leadership support for the use of an LMS. Study results may inform instructional leaders as to the best strategies for implementing an LMS within educational organizations as a tool for shifting pedagogy to a blended learning approach.

II. REVIEW OF LITERATURE

The examination of classroom teachers and their perceptions of leadership support can be explored from various approaches. This research examined the perceptions of teachers in the process of implementing pedagogical change through the lens of experiential learning theory and the conceptual framework of systems thinking. The introduction of new technologies and multimodal forms of learning and communication changes the learning experiences of students and teaching practices of educators. As a result, educational organizations must reevaluate instructional design to accommodate a technological society. Shifting learning strategies changes the function of the entire organizational system, necessitating pedagogical and institutional adaptations (Banathy, 1991; Lim, 2002).

Schools function as living, open systems that exchange energy and information across departments and with relevant stakeholders, which helps the system maintain structure (Cleveland, 1994). Blended learning has made learning more complex as it changes the role of components in the learning system such as students, teachers, content, peers, objectives, time, and place (Wang et al., 2015). A learning management system (LMS) provides a platform for interconnection between the elements of blended learning and helps facilitate organization, collaboration, and transparency throughout the entire system. Instructional leaders and teachers that effectively utilize an LMS enhance interconnectedness and interoperability, which

influences student learning and organizational performance. Successful integration of technology into the teaching and learning environment requires a high level of participation from the instructor and entails ongoing training and administrative support. Supportive instructional leaders create a collaborative school culture that allows teachers to take risks and improve their performance (Haynes & Maddock, 2014). Moreover, leadership support significantly impacts both educator success and student achievement (Badia, Meneses, & Sigales, 2013; Waters & Marzano, 2006; Waxman, Boriack, Lee, & MacNeil, 2013).

The review of the literature analyzes experiential learning theory as it relates to blended learning and systems thinking regarding teachers' implementation of a learning management system to meet the learning needs of students. Peer-reviewed research studies and journal articles within the last five years were used for analysis as were additional texts and older research studies that provide background for the current literature. This review supports the research questions and the chosen methodology with documentation from researchers in the field of education, systems thinking, and educational technology. The literature examines the relationship between learning theory and blended learning; teachers' and students' perceptions of blended and technology-enhanced learning; the use of learning management systems in education; systems thinking and strategic leadership practices; and teachers' perceptions of leadership support.

Experiential Learning Theory and Blended Learning

Dewey (1944) theorized education is most effective with a balanced approach to learning where teachers, students, and content have equal importance. Dewey (1938) was an American pragmatist philosopher and the founding voice of student-centered experiential learning (Jenlink, 2004; Tarrant & Thiele, 2015). He suggested that children learn best when they interact with

their environments and are actively involved with the school curriculum. The theory of experiential and interactive learning emphasizes that the process of learning "is embedded in social practice, which means that learning involves changes in both social practice and individuals engaged in continuous reorganization and reconstruction of their experience" (Easterly-Smith et al., 2001, p. 85). Although learning takes place in social situations, individuals learn by linking their previous experiences and knowledge to present content (Dewey, 1944 as cited in Wheeler, 2016). As a consequence, learning results in growth and happens when a person reflects on actions from experiences and the resulting consequences of those experiences. Dewey (1938) posited that genuine knowledge and understanding could only be achieved through doing, and the outcome of active experience and reflection culminates in cognition when it has meaning. The "learning by doing" philosophy is still referenced in the current literature and is regarded as a best practice in education (DuFour, DuFour, Eaker, & Many, 2010). The method follows the learning stream of acting-to-knowing in that reflective experiences grow from situations where a person is confronted with a problem and must stop and think about solutions (Easterly-Smith et al., 2001). The experiential learning approach, in which students develop critical methods of thought, is the foundation of other similar approaches such as problem-based learning, inquiry-based learning, and transformative learning (Chew, 2015).

Twenty-first-century learning has changed from information gathering to knowledge formation due to the proliferation of mobile devices and easy access to the Internet. Kroksmark (2016) suggested "it is not only the content of knowledge that is affected, altered and valued in a new way but also how learning itself takes place; how we choose and organize knowledge for ourselves" (p. 36). Due to the Internet, students experience immediacy and social presence and have greater options concerning information sources and methods of communicating. The

interactivity of technology has created a marked division between old and new learning experiences (Lievrouw & Livingstone, 2006; Saljo, 2010). Today, learning is not confined to physical classrooms or the time constraints of the school day. The accessibility of information through social media, blog posts, online news outlets, and search engines changes the time, place, and pace of learning. What students think and know is a consequence of their lived experiences, and they live in a digitized world. Different ways of thinking emerge as students attempt to synthesize the copious amount of information the Internet contains, thereby changing the nature of knowledge and the learning experiences of children (Kroksmark, 2016).

Technology has shifted pedagogy from analog instruction using presentations and lectures to collaborative and inquiry-based lessons where teachers become facilitators or supervisors of the learning experience. In a qualitative research study of five schools in Sweden integrating technology, Kroksmark (2016) aimed to understand "how teachers change their teaching and how pupils change their learning as a consequence of working in One-to-One environments in schools" (p. 35) where every student has a digital device. The study explored the change in pedagogical strategies in primary and lower secondary schools, the change in strategies for student learning, and the change in perspectives of knowledge and learning regarding one-to-one. Kroksmark based the study on the theoretical framework of experiential philosophy to examine the everyday experiences of students and teachers using technology. Data were collected through focus interviews with 18 preschool teachers and 56 primary school teachers using open-ended questions. The interviews were audio recorded, transcribed, sorted into categories of descriptions, and interpreted in a phenomenological mode focusing on similarities and differences. The results of the study showed that teachers had to shift their focus from planning for teaching to planning for learning where teachers' activities decreased and the

pupils' activities increased. Teachers changed pedagogical strategies from whole class instruction to focus on personalization with consideration of individual student needs. Teachers transformed instruction by determining their pupils' perspectives, including understanding students' preconditions for learning, how they view educational knowledge, and how to help students focus on the content and process of learning. Learning processes changed from analog to cooperative activities using digital communication tools with the creation of knowledge taking priority over the reproduction of information. Teachers realized they needed to improve their digital competencies to understand the way students gain knowledge using technology because approaching problems with analog solutions no longer worked. Ultimately, one-to-one instruction, in which every student has access to a computer or device, shifted from traditional teaching and learning to blended learning using different strategies and methods. The study revealed that, in one-to-one environments, the teacher must accommodate for the different ways that students learn and that "teaching must be adapted to these conditions in precisely the same way as the Internet adapts itself to the pupils' differences… [because] learning is always a consequence of having experienced what is to be learned in varying ways" (p. 50). Kroksmark determined that new learning theories should be developed that meet the demands made by one-to-one and that reflect each pupil's mode of learning in the digital environment.

Blended learning is curriculum and instructional design in which a student learns in part through online delivery and face-to-face instruction, with some element of student control over time, place, path, and pace (Staker et al., 2011). Blended learning integrates e-learning tools and technology-enhanced instruction which change the activities, curriculum, and interpersonal relationships in the learning environment (Boone, 2015; Loh et al., 2016; Wang et al., 2015). Moreover, blended learning gives students the ability to take responsibility for and ownership of

their learning. Student learning and engagement increase when students are dynamically involved in their learning and when learning materials are challenging and interesting (Dewey, 1938; Dror, 2010; Newmann, 1996; Vygotsky, 1978). The literature reveals extensive use of blended learning in higher education and limited use at the middle school level (Akgunduz & Akinoglu, 2017).

According to Staker and Horn (2012), there are four models of blended learning: rotation, flex, self-blend, and enriched virtual as illustrated in Figure 2.1.

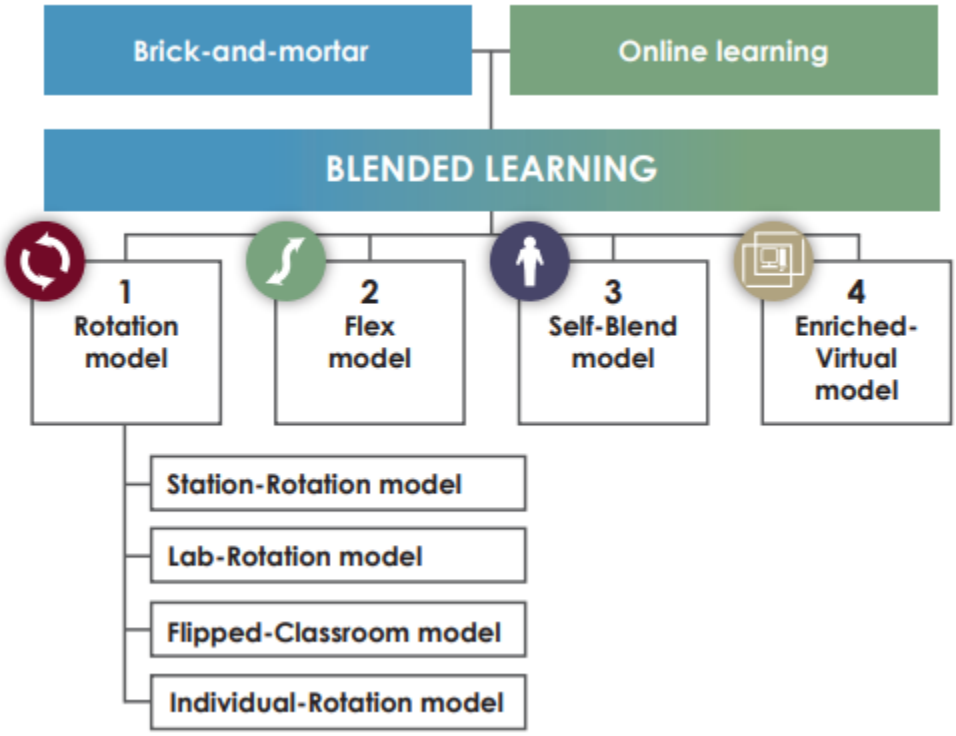

Figure 2.1. Blended learning taxonomy

The diagram depicts a taxonomy scheme for the implementation of blended learning in existing education programs that are preparing to integrate technology in instruction and learning. From "Classifying K-12 Blended Learning," by H. Staker and M. Horn, 2012, p. 2. Copyright 2012 by the Innosight Institute.

The rotation model is characterized as a fixed schedule where students rotate between online and face-to-face learning modalities such as small group, full-class, or individual tutoring. This model has four sub-models including station rotation, lab rotation, flipped classroom, and individual rotation (Staker & Horn, 2012). The station rotation model includes stations in the classroom with at least one incorporating technology, lab rotation denotes online learning in a computer lab, flipped classroom provides face-to-face instruction at school with separate online learning at a different time and place, and individual rotation is where students use individually customized schedules to rotate between stations with various learning modalities (Staker & Horn, 2012). The flex model is a program in which content is delivered primarily through online courses on campus, but students can receive one-on-one instructional support with the teacher of record if needed. The self-blend model (i.e. a la carte model) allows students to choose to take one or more courses entirely online in place of a traditional course and can opt to participate off campus. The enriched virtual model is a whole-school model where all students divide their time between learning remotely and attending classes on the campus (Staker & Horn, 2012).

Blended models personalize instruction to individual learners and can meet the needs of both advanced and struggling students (Alijani et al., 2014; Dror, 2010). Students can move through the content at their own pace and independent of their peers. Blended learning also offers opportunities for teachers to provide extra support to students who are struggling. Technology-enhanced instruction "incorporates asynchronous learning channels, which often provides scholars with more relevance in their understanding and learning content in a given course" (Alijani et al., 2014, p. 131). Blended learning transforms the learning environment by providing opportunities to engage learners with technology and online tools designed to help or enhance student learning (Loh et al., 2016). Experiential and interactive learning is immersed in

blended learning as instruction is learner-centered. Activities focus on the interests of students and are reflective of their experiences and prior knowledge. Instruction is also knowledge-centered and community-centered with a focus on depth rather than breadth of knowledge and activities that promote collaboration and construction of knowledge (Bransford et al., 2000 as cited in Alijani et al., 2014).

In an attempt to understand the thought processes, relevant factors, and benefits of implementing blended learning in K-12 education, Alijani et al. (2014) conducted a multiple case study of ten charter schools that serve minority, high needs students. The general demographic make-up of the schools was 90% or more African American students, 90% or more students qualify for free or reduced-price lunch, and 10% or more receive special education services. The study used multiple sources of data including teacher surveys, observations, and documents. Data were collected over one academic semester during the spring of 2013 and included 130 completed teacher surveys; three observations of blended learning in math, English, and reading programs; and a review of case studies conducted by other researchers on the same schools. The results of the study revealed that Caucasian teachers had a higher level of comfort using technology in their classrooms than teachers of other races. Data also indicated that implementing blended learning would be beneficial to students' mode of learning and teachers' facilitation of instruction. However, the study showed that "having a precise vision, mission, and purpose are crucial in implementing a blended model that produces improvement" (Alijani et al., 2014, p. 139). The researchers suggested that school leaders ensure that proper steps are taken to successfully make the transition from traditional instruction to blended learning models including assessing financial feasibility, maintaining a strong technological infrastructure, and providing teachers ongoing professional development. The researchers recommended that

further research should examine the differences between the various blended learning models and student demographics to determine which model could work best with different populations.

Perceptions of Blended Learning

To meet the needs of today's students, educators must reflect on their experiences as traditional instructors and modify their pedagogy to ensure that students enjoy the learning environment and can connect to the content in meaningful ways (Dang, Zhang, Ravindran, & Osmonbekov, 2016; Dewey, 1938; Sousa, 2011). Students and teachers bring their experiences from both outside and inside the classroom to the learning environment including their experiences using technology (Alijani et al., 2014; Dewey, 1944). Although students may be proficient users of personal technologies outside of school, they may not know how to control their learning in a semi-autonomous blended learning environment or have the skills necessary for academic purposes (Alijani et al., 2014; Bingham, 2017; Ratliff, 2009; Vickrey et al., 2018). Likewise, teachers may not always have technological knowledge or an understanding of "how to structure their classrooms to facilitate learner autonomy" (Bingham, 2017, p. 525). Regardless of skill level, teachers recognize that having the right technological tools and an opportunity to become comfortable with hardware and software is crucial "in closing the digital divide not only for them but for the students who have under-utilized technology" (Alijani et al., 2014, p. 134).

A primary influencing factor on student learning is instructor characteristics (Dang et al., 2016). A study conducted by Sun et al. (2008) found a correlation between teachers' attitudes toward technology and learners' satisfaction of instruction. Teacher attitudes were also found to directly impact how much technology is integrated into the classroom (Alijani et al., 2014; Varier et al., 2017). Another study found that "instructor characteristics could significantly

influence students' acceptance of the blended learning environment since they need to better motivate and guide students in this learner-centric environment" (Ahmed, 2010, as cited in Dang et al., 2016, p. 121). The integration of e-learning tools in blended learning classrooms shifts instruction from teacher-centered to learner-centered. Teachers who innovate their instruction with technology offer students access to personalized learning, flexibility over time and space, more opportunities for collaboration, access to various resources, and improved communication and support (Vickrey et al., 2018).

Teachers' Positive Perceptions of Blended Learning

Several studies have recorded positive teacher perceptions regarding technology integration and blended learning (Alijani et al., 2014; Dahlstrom, 2015; Fassbender & Lucier, 2014; Schmid & Hegelheimer, 2014; Varier et al., 2017; Vickrey et al., 2018). An instructional practices survey conducted by Dahlstrom (2015 as cited in Vickrey et al., 2018), found that teachers "generally have positive attitudes toward technology and are interested in incorporating more of them into learning environments" (p. 65). Likewise, a study completed by Alijani et al. (2014) showed that 48% of teacher respondents believed blended learning was more effective than traditional teaching and 94% thought blended learning could increase student achievement. In a study about the use of one-to-one technologies in classrooms, teachers noted that their pedagogy shifted from teacher-centered to facilitation of student learning and "perceived the potential for long-term positive teaching and learning outcomes" (Varier et al., 2017, p. 976).

A study of teachers' technological, pedagogical and content knowledge (TPACK) conducted by Vickrey et al. (2018) found that teachers appreciated the "potential pedagogical affordances of technologies to allow students to interact with content and each other in authentic ways" (p. 71). TPACK is a conceptual framework that describes the base knowledge instructors

need to effectively integrate technology into instruction (Mishra & Koehler, 2006). The researchers applied the TPACK framework to 53 research studies to gain an understanding of how technology is integrated into various courses. The researchers found that teachers who integrated technology were able to give more one-on-one attention to students and assign technological resources that provided individualized help such as adaptive software programs and video tutorials. However, the study revealed that the learning differences of students contribute to technology-enhanced learning and that instructors' understanding of pedagogy, including learning theory and content, is essential to the successful integration of technology.

Fassbender (2014) conducted action research on blended learning and discovered that teacher-created videos allowed students to immediately feel comfortable with lessons because they were able to listen to the voice of someone they know. Students were able to learn asynchronously and view and review material at their own pace until they reached mastery. As a result, students had control over their learning, promoting student agency by giving students voice and choice in how they learn (Fassbender & Lucier, 2014; Fulton, 2012). Fulton (2012) found that teacher-made videos were successful in engaging students because "students like having the voice behind the lesson belong to someone with whom they have a personal relationship" (p. 22). Likewise, Wang et al. (2015) reviewed 87 research articles regarding technology integration and confirmed that "short and concise pre-recorded video lectures allow students to learn content in greater depth and at their own pace outside the classroom" (p. 387). The "flipped model" allowed students more time in class to work collaboratively resulting in improved communication, problem-solving skills, and interpersonal relationships. Additionally, teachers appreciated online communication and announcement tools as a means of sending reminders, setting future goals, and recognizing students' successes (Fulton, 2012). Teachers

were also able to provide immediate and effective feedback using formative assessments, thereby increasing student achievement (Fassbender & Lucier, 2014; Varier et al., 2017). A study of technology-enhanced language classrooms reported that teachers thought online assessment tools helped them understand pupils' learning and the effectiveness of their instructional design. Teachers also saw the "potential for the technology to achieve greater variety of pedagogical goals" (Schmid & Hegelheimer, 2014, p. 328).

Teachers' Negative Perceptions of Blended Learning

According to Bingham (2017), teachers who have experienced more traditional schooling resist "fundamental changes because those changes do not represent what they would consider to be the true purpose and process of schooling" (p. 525). Likewise, teachers' level of motivation to integrate technology linked directly to their teaching experiences and the effects technology has on student learning (Schmid & Hegelheimer, 2014). Teachers' existing knowledge and beliefs about instruction influenced their decisions to integrate technology as did their practical concerns. Practical concerns included classroom management, instructional methods, and feasibility of implementing new ideas. Teachers were also concerned with how students will react to new activities and instructional methods (McKenney, Boschman, Pieters, & Voogt, 2016). Teachers cited the "unpredictability and risks involved in technology use as major reasons for them not planning to use computers for teaching" (Schmid & Hegelheimer, 2014, p. 324).

Implementation experiences affect teacher lesson design and continued technology integration. Bingham (2017) conducted a single institution case study of technology integration in an urban high school serving low income students of color. The purpose of the longitudinal study was to examine the implementation and evolution of blended and personalized learning

models over time. The study took place over the course of three school years from the fall of 2012 to the spring of 2015. Data collection included several rounds of interviews with teachers and administrators; observations of classroom instruction; monthly observations of professional development; one round of student focus groups; and several years' worth of digital documents. Hundreds of documents were gathered and a total of 37 interviews, four focus groups, and 76 observations were conducted. Data were analyzed using codes to organize information into categories. Categories were condensed into themes and findings were identified. Bingham (2017) found that, when teachers experience difficulties managing technology-enhanced learning, they tend to revert to traditional methods such as "low tech" and whole group instruction. During the first year of technology integration, teachers reported feeling overwhelmed with students' poor behavior when using technology. Teachers were also dissatisfied with inadequately designed online curricula and data tools. Teachers experienced difficulty managing technology and implementing curriculum when they used too many learning modalities, instructional supports, and canned digital curriculum. Teachers expressed frustration and felt that "technology became more of a distraction than a platform for learning and autonomy" (Bingham, 2017, p. 533). Implications suggested that substantive changes in organizational practices were needed to successfully implement personalized learning. Bingham (2017) found that "the organizational nature of the school was reactive to the teachers' classroom realities, but also shaped those realities through organizational mandates and priorities" (p. 539). The organizational priorities included incorporating a strong student behavior management system to build culture, instructing students on how to be autonomous learners, choosing digital resources to facilitate personalized learning, phasing in incremental implementation of blended

learning, supporting teachers with pedagogical shifts using technology, and using one digital platform across the system to provide stability and consistency (Bingham, 2017).

Hilliard (2015) determined that educators who experience too many problems with computer software and technology tools will not be excited to try new pedagogical strategies. A study conducted by Trinder (2015) found that teachers will not embrace new technologies unless they perceive the tools as having more advantages over other materials already in use. According to Vikrey et al. (2018), many teachers feel technology integration would enhance their pedagogy but "they need clearer evidence of the effectiveness of technologies for student learning" (p. 66). Teachers are also hesitant to incorporate new technologies because they are concerned with the longevity of new programs and the duration of access to online courses and contracts due to budgetary constraints (Hilliard, 2015). Additional teacher concerns regarding the use of e-learning tools include not feeling comfortable with technology, struggling to manage student teams, and difficulty maintaining students' motivational levels (Loh et al., 2016). Teachers also fear that technology will supplant interpersonal relationships, social learning opportunities, and face-to-face instruction (Fassbender & Lucier, 2014; Loh et al., 2016). However, McKenney et al. (2016) suggested that technology integration increases when teachers' practical concerns are addressed; they are included in the instructional design process; and they are provided with support from content experts.

Students' Perceptions of Blended Learning

Most children have grown up using computers and mobile devices and consider themselves expert technology users, hence earning the nomenclature "digital natives" (Vickrey et al., 2018). Starting at a young age, students have been using technology for social networking, entertainment, communicating, and finding information (Trinder, 2015). Technology is

prevalent in most homes, businesses, and schools, yet instructional methods are not adapting quick enough to "expand on the skills students are developing outside of the classroom" (Alijani et al., 2014, p. 127). Still, learner experiences and beliefs are "considered critical factors influencing choice of learning strategies and tools" (Trinder, 2015, p. 84). Educators mindful of creating learner-centered environments recognize that students should be active contributors over their personalized learning pathways (Peters, Weinburg, Sarma, & Frankoff, 2011; Rubin & Sanford, 2018). Blended learning facilitates personalized learning by giving students some authority of when, where, and how they learn (Wengreen et al., 2015). Blended learning leads to better understanding and comprehension, supports individualized learning, and increases student success (Akgunduz & Akinoglu, 2017).

According to Dahlstrom et al. (2015), students reported a positive outlook regarding technology and preferred blended learning classroom experiences. Likewise, Wang et al. (2015) reported students' positive responses to blended learning were due to an increase in accountability, metacognitive ability, empowerment, and engagement. Students also enjoyed the flexibility of time for completing activities and the personal attention they received from teachers during tutorials or small group rotations (Alijani et al., 2014). A survey conducted by Wengreen et al. (2015) found that 80% of students recommended that courses be taught in a blended format. Data from the survey showed students who were enrolled in blended courses earned higher grades and reported higher levels of satisfaction when compared to those students exclusively taking on-campus or strictly online courses. Students also responded that they preferred the flexibility of blended course design over traditional classes because they had more opportunities to communicate with the instructor and classmates. Results from a case study of blended learning in science education noted that students said lessons were engaging and

motivating, and they were able to retain the information for longer periods of time. Students perceived blended learning instruction as being efficient and supportive. Students also felt that they achieved higher grades because they had more opportunities to practice and prepare for exams (Akgunduz & Akinoglu, 2017).

Loh et al. (2016) conducted a mixed method study to determine the effectiveness of technology-enhanced courses and teaching programs at one Australian university. Data were collected through 31 qualitative interviews and a survey of 231 university students. Purposeful sampling was used to identify individuals who had experience with e-learning. Participants were asked to respond to a series of open-ended questions designed to assess their perceptions of e-learning. Quantitative methods included data collection using a structured questionnaire. Items were measured on a seven-point Likert scale. Students who had completed an online course at the university qualified for participation in the study. The analysis techniques used in this study included summary statistics, factor analysis, and *t*-test. Loh et al. (2016) found that students felt incorporating e-learning tools provided highly flexible learning opportunities including the ability to move at their own pace. Students also felt they achieved better learning outcomes when enrolled in technology-enhanced courses. The findings were confirmed by the mean scores of attitudinal variables as well as the results of exploratory factor analysis. The researchers suggested that the findings have important implications for school administrators including developing online courses with interesting content and assessing the impact of alternative methods of instruction such as blended learning.

Technology-enhanced lessons allow students to achieve deeper understanding and experience authentic language learning scenarios (Schmid & Hegelheimer, 2014). In a study of language programs, Trinder (2015) found that language learners believed they received an

authentic and productive learning experience during blended instruction that incorporated entertainment media such as film, video, and TV shows. Language learners appreciated access to e-learning resources, online news sites, and continuous technical support. Students viewed blended learning favorably because it created a positive emotional space by eliminating feelings of peer pressure, anxiety, and embarrassment because learners could repeatedly review materials at their own pace (Fassbender & Lucier, 2014; Stevens, 2016). Students liked learning independently in the flipped model and then having chances to practice and apply their knowledge during face-to-face activities. Students and teachers alike also valued the ability to build toward mastery and opportunities for immediate, formative feedback (Akgunduz & Akinoglu, 2017; Fassbender & Lucier, 2014; Trinder, 2015; Varier et al., 2017; Vickrey et al., 2018; Wengreen et al., 2015).

Students' Negative Perceptions of Blended Learning

Although scant research exists regarding students' negative perceptions about blended learning, results from a study of student satisfaction showed that instructor characteristics and facilitating conditions were influential in students' perceived levels of accomplishment (Dang et al., 2016). As found by Vickrey et al. (2018), students desired more guidance from teachers on how to use digital tools. Students also expressed a need for more instruction on how to leverage technology to solve problems and collaborate effectively. Loh et al. (2016) found that some students felt there was a lack of collaborative or face-to-face learning opportunities in e-learning environments. Survey results showed perceptions of boredom and isolation resulting from a loss of peer-to-peer interactions. Learners also expressed concerns with limited online resources and e-learning materials. As reported by Dang et al. (2016), to impact students' satisfaction toward

blended learning, "it is important for educators to help [students] build their self-efficacy" (p. 127) and provide continuous support and feedback.

Effects of Blended Learning on Student Achievement

Developing 21st-century learners and lifelong learners who are ready for the global marketplace requires student-centered school environments that incorporate technology-enhanced learning (Groff, 2013, Levin & Schrum, 2013; Varier et al., 2017). However, not all students learn best with technology due to their learning preferences, access to technology, and experiences using digital tools (Trinder, 2015). The diverse needs of students including their level of technological proficiency can create new achievement gaps and pose problems for educators concerned with preparing students for the future (Fassbender & Lucier, 2014). According to Dewey (1938), teachers need to be cognizant of students' capabilities and develop engaging learning experiences that are enjoyable, promote desirable future experiences, and do not alienate students. Therefore, the balanced approach of online and face-to-face instruction is advantageous to students and instructors alike (Hilliard, 2015). Research studies have found that students prefer learning environments that incorporate technology into the instruction (Akgunduz & Akinoglu, 2017; Alenezi, 2018; Alijani et al., 2014; Fassbender & Lucier, 2014; Loh et al., 2016; Magana & Marzano, 2014; Schmid & Hegelheimer, 2014; Trinder, 2015; Vickrey et al., 2018; Wengreen et al., 2015). Participants of blended learning programs and personalized learning see opportunities for increased student autonomy, motivation, and improved individual progress (Hilliard, 2015; Rubin & Sanford, 2018). Students were found to "engage more in all aspects of assessment using online technologies" (Mirriahi, Alonzo, & Fox, 2015, p. 9). Wang et al. (2015) confirmed that using blended curricula allowed students to transform from being passive to active participants in learning. Furthermore, technology-

enhanced learning allows students to take a leadership role in the classroom as they take a more dynamic role in their education (Fassbender & Lucier, 2014). As a result, student metacognition increases leading to better learning outcomes (Kastens & Manduca, 2017).

To increase student achievement, education programs began purchasing computer-assisted instruction (CAI) and integrated learning system (ILS) software starting in the 1950s and 1960s (Aparicio et al., 2016; Bailey, 1992; Becker, 1993; Brush et al., 1999; Watson & Watson, 2007). Since the 1980s, schools have spent millions of dollars on computer software and ILSs to supplement classroom instruction (Bailey, 1992). Today, ILSs function as adaptive software programs that "generate problems, adjust the difficulty and sequence of problems based upon student performance, and provide appropriate and immediate feedback" (Bailey, 1992, p. 4). Instruction is individualized and personalized for each student, and instant data helps teachers target specific areas for growth. Programs such as Achieve 3000, iStation, Imagine Math, iReady, and Dreambox currently offer adaptive programs in reading and math. Results from the literature show that the integration of teacher-led classroom activities with computer-based activities such as ILSs leads to successful student outcomes (Akgunduz & Akinoglu, 2017; Becker, 1993; Brown & Warschauer, 2006; Brush et al., 1999; Fassbender & Lucier, 2014; Magana & Marzano, 2014; Staker et al., 2011; Staker & Horn, 2012; Waters & Marzano, 2006). However, teachers play a crucial role in the effectiveness of ILS integration with regard to student achievement especially when teachers are able to identify and individualize instruction by selecting specific activities for students to complete (Becker, 1993; Brush et al., 1999; Fassbender & Lucier, 2014). According to Fassbender and Lucier (2014), "utilizing specialized assignments breeds confidence in learners as higher rates of individualization correlate to higher rates of achievement" (p. 26). Diagnostic data of students in blended learning classrooms where

face-to-face activities were coordinated with ILS activities showed higher performance on reading and math assessments than students not using ILS software (Bingham, 2017; Brush et al., 1999).

Reports in the literature show that blended learning increases student academic achievement, motivation, and confidence with an effect size of 1.4, or 3 to 4 years' increase in achievement (Akgunduz & Akinoglu, 2017; Fassbender & Lucier, 2014; Magana & Marzano, 2014). The Center for Digital Education (2012 as cited in Hilliard, 2015) reported that the top benefits of blended learning are an increase in student achievement and an increase in student retention. Wengreen et al. (2015) reported that blended courses help students develop self-regulatory skills which are associated with greater levels of academic success. Likewise, Riel and Sparks (2009 as cited in Alijani et al., 2014) reported that achievement levels increased because "students in blended programs may spend more time on their studies than other students" (p. 130). Akgunduz and Akinoglu (2017) conducted a mixed methods study comparing results between student groups who received science instruction using blended learning and those who were taught without technology. The blended learning group showed an increase in academic success and also had higher levels of motivation for learning science.

Traditional instructional practices do not promote student engagement because the teacher directs how and what students will learn instead of facilitating the growth of their creative and critical thinking skills (Hannon, 2012). Hannon (2012) suggested there is a growing disconnect with what engages and motivates students in their lives outside of school and their experiences in school. According to Varier et al. (2017), "engagement occurs when students take responsibility for their learning, feel invested in learning tasks, and see value of school learning in the real world" (p. 968). Blended learning allows students to have some degree of

autonomy and choice over their learning. However, Bingham (2017) cautioned that giving students complete control of their learning can be counterproductive because they may not be able to regulate their learning. A solution is using a system of shared control where teachers select specific activities for certain students according to their learning needs, thereby personalizing learning. Research indicates that shared control and personalized learning increases motivation and achievement (Corbalan, Kester, & van Merrienboer, 2006 as cited in Bingham, 2017). Teachers also found that personalized learning increased students' self-direction, independence, engagement, and that learning extended beyond the classroom (Rubin & Sanford, 2018; Varier et al. 2017). Consequently, blended learning provides students with opportunities for different learning experiences, and positive and engaging experiences create conditions for further educational growth (Dewey, 1938; Magana, 2017; Staker & Horn, 2012).

Learning Management Systems in Education

To prepare students for the future and to compete in a global economy, most developed countries deliver instruction in a blended learning format using a learning management system (Alenezi, 2018; Hilliard, 2015). More than 95% of colleges and universities in the United States and 96% in the United Kingdom use a learning management system (LMS) (Alenezi, 2018). LMSs can be used to support an entire school's teaching and learning programs (Kabassi et al., 2016). However, K-12 education has been slow to implement learning management systems as platforms to facilitate blended learning (Akgunduz & Akinoglu, 2017; Alijani et al., 2014; Kabassi et al., 2016; Lochner et al., 2015). Consequently, unless otherwise noted, the literature pertains to higher education with implications for adoption in lower levels of education.

According to Mirriahi et al. (2015), institutions do not have a consistent approach to blended learning because there is no uniform understanding, definition, or platform. Therefore, inconsistencies exist regarding pedagogical approaches as individuals develop their own interpretations of blended and technology-enhanced learning. Likewise, schools that do not use one digital platform or LMS experience disconnect between their technology integration vision and reality due to inconsistencies in systemic supports (Bingham, 2017; Senge, 2006). These inconsistencies make it difficult for schools to provide evaluative frameworks to inform instructional practices for integrating technology. Alenezi (2018) posited, "in teaching and learning, educational technology goes hand in hand with pedagogy" (p. 1) and having a centralized learning platform in place supports a continuous learning environment (Cisco, 2018).

A learning management system is an e-learning system that focuses on teacher/student interactions, tracking and delivering content to learners, and assessing and reporting learner progress (Alenezi, 2018; Aparicio et al., 2016; Kabassi et al., 2016). LMSs can be open or closed source systems. Open source LMSs are free to download, modify, and distribute (Kabassi et al., 2016). E-learning systems are learning technologies that unite technology and learning and provide an "important communication channel between learners and instructors" (Aparicio et al., 2016, p. 298). Communication also increases with other stakeholders as the LMS becomes a point of access for professional learning communities (PLCs), special clubs, parents, and the school community at large (Backenstoe & Krempasky, 2018). Learning technologies allow for synchronous and asynchronous learning and support a collaborative learning environment in both face-to-face and online instructional formats (Alijani, 2014). Blended and personalized learning with social interaction exemplifies the pragmatic educational theories presented by Dewey (1938) that are crucial for instructional use of learning technologies. LMSs support

blended learning by providing educators, administrators, and schools with an instructional delivery method that alters the time, place, and space of learning (Fassbender & Lucier, 2014; Kabassi et al., 2016).

LMSs do not replace teachers or traditional classroom systems; instead, LMSs make teachers more productive by providing platforms for blended learning and the integration of various pedagogical models, instructional strategies, and digital tools (Alenezi, 2018; Aparicio et al., 2016; Fassbender & Lucier, 2014). LMSs enable teachers to shift from knowledge sources to facilitators of the knowledge acquisition process (Watson & Watson, 2007). Moreover, LMSs are a type of ongoing infrastructure that centralizes organizational processes and increases interconnectedness and interoperability across the institution (Alenezi, 2018; Aslan & Reigeluth, 2016).

Functions and Benefits of Learning Management Systems

The systemic nature of LMSs helps provide a consistent approach to blended learning and technology integration because they offer the functionality required to support blended instruction by managing all aspects of the learning process including learning opportunities for educators (Alenezi, 2018; Aparicio et al., 2016; Lochner et al., 2015; Mirriahi et al., 2015; Wang, 2010; Watson & Watson, 2007). LMSs are widely customizable and can be integrated with third-party software to meet the specific needs of each school (Hetsevich, 2017). Additionally, LMSs enhance interactivity due to the various forms and capabilities of communication and collaborative resources such as email, announcements, discussion forums, remote access conferencing, and video-sharing (Aslan & Reigeluth, 2016). LMSs enable the education experiences of students and teachers to extend beyond the classroom, which is vital

because the success of learning outcomes is dependent on access to and quality of teaching and learning experiences (Dewey, 1938; Lochner et al., 2015; Mirriahi et al., 2015).

LMSs benefit academic institutions, educators, and students (Alghamdi & Bayaga, 2016). An LMS provides schools and teachers with a multitude of benefits such as the ability to seamlessly implement system-wide initiatives, increase efficiency while saving time and money, use automation for course delivery and grading, achieve higher rates of lesson completion, create and store a repository of instructional materials and resources, track student progress, and evaluate teacher compliance with fewer errors (Davis & Surajballi, 2014). The LMS supports a learner-centered environment as it "connects students or learners with the learning contents in a standardized manner through software and programs specifically developed for student learning" (Alenezi, 2018, p. 1). Additionally, students' motivation and achievement are significantly impacted when they can set their own learning goals, track their performance, practice and self-test, and participate in peer reviews (Alenezi, 2018; Aslan & Reigeluth, 2016; Hattie, 2009; Lochner et al., 2015; Mirriahi et al., 2015).

A study of LMS effectiveness on student learning showed that students and teachers both thought the most effective elements of the LMS were the accessibility of course documents and resources and the ability to watch video recordings of lectures at any other time than the scheduled class time (Holmes & Prieto-Rodriguez, 2018). Similarly, in their study, Kabassi et al. (2016) reported that 76% of students liked video lectures for class and workshops and 72% of students found open access to course materials beneficial to their learning. Multiple studies have found that students appreciated the accessibility to self-paced e-learning activities and LMS features that connected them to classmates and their instructors (Adzharuddin & Ling, 2013; Alenezi, 2018; Fassbender & Lucier, 2014; Holmes & Prieto-Rodriguez, 2018; Jackson, 2017;

Lochner et al., 2015). Kabassi et al. (2016) found that 79% of students felt LMS platforms increased collaborative learning and that "students were motivated to spend more time on their homework and they improved their scores" (p. 5). Instructors appreciated being able to create engaging and personalized learning opportunities by integrating multimedia tools and tailoring instruction to increase students' interest and interaction with the content (Holmes & Prieto-Rodriguez, 2018). Moreover, teachers related they were able to provide more one-on-one attention to students and promptly give useful feedback, improving the teacher/student relationship and positively impacting performance (Fassbender & Lucier, 2014).

Barriers to LMS Implementation

Despite the benefits of LMSs in education, there are barriers to successful implementation (Issa, Isaias, & Kommers, 2015). According to Alghamdi and Bayaga (2016), some of the barriers result from infrastructural issues, provision of technical services, instructional design support, and administrative obstacles. Similarly, Basak and Govendor (2015) noted that material and non-material obstacles affect platform implementation. Material obstacles include hardware, software, course content materials, and instructional programs. Non-material obstacles include in-service training, technology integration and design support, appropriate administrative support, technology knowledge and skills, and planning time. Other barriers include teachers' familiarity and use of technology, students' access to technology, and social or cultural norms (Alenezi, 2018; Aslan & Reigeluth, 2016; Badia et al., 2013; Basak & Govender, 2015; Cisco, 2018; Davis & Surajballi, 2014; Holmes & Prieto-Rodriguez, 2018; Kabassi et al., 2016; Lochner et al., 2015; McKenney et al., 2015).

Teacher barriers. Even though schools have invested in an LMS, many educators lack awareness of its functions or perceive using it as a low priority (Davis & Surajballi, 2014;

Lochner et al., 2015). Moreover, while stable organizational structures are essential for technology integration, recognizing teachers' perceptions and concerns regarding innovations like an LMS is crucial to successful adoption and implementation (Badia et al., 2013; Lochner et al., 2015). Multiple studies have indicated that teachers' experiences and beliefs about teaching and learning influence the use of LMSs in the classroom, which supports experiential learning theory (Badia et al. 2013; Dewey, 1938; Ertmer, 2005; McKenney et al., 2015; Ramirez, Canedo, & Clemente, 2012). To ease teachers into the use of technology in the classroom, Ertmer (2005) recommended that teachers should use technology professionally as they do privately, thereby drawing from their personal experiences. Badia et al. (2013) suggested that teachers' attitudes are shaped by cultural values and the relevance society places on the use of digital tools and platforms. These external pressures included "the demands of educational authority and the expectations of other teachers [who have] the belief that a good teacher should use technology when teaching their classes" (Badia et al., 2013, pp. 790-791).

According to Mirriahi et al. (2015), teachers' confidence and skills using technology and online platforms are low, which compromises technology integration in teaching and successful student learning. Likewise, Backenstoe and Krempasky (2018) posited "teachers need to use the LMS and feel comfortable implementing it in their classrooms, or it will not have the impact it should on students" (p. 3). Basak and Govendor (2015) reported that the main factors inhibiting teachers' adoption and implementation of LMS platforms were "lack of teachers' confidence, lack of teachers' competence, resistance to change and negative attitudes, lack of time, lack of effective training, lack of accessibility, lack of technical support, difficulty integrating [technology] instruction in classrooms, [and] observability and trialability" (p. 436). Therefore, leaders must address teacher concerns and provide specialized support at the individual level

before and during the implementation process (Lochner et al., 2015). Supporting teachers in their use of an LMS is important because "much of the decision-making about how the technology used is often the responsibility of the individual teacher" (Lochner et al., 2015, p. 65).

As reported in the literature, the main barrier for educators in implementing an LMS is the time and management that an LMS requires (Badia et al., 2013; Lochner et al., 2015). Teachers are also concerned with having access to appropriate resources for integration and time to incorporate an LMS into instruction. A study of teachers' use of an LMS conducted by Jackson (2017) determined that teachers lack opportunities for learning and practicing instructional design using the platform. The purpose of the study was to explore the effectiveness of an LMS in impacting the outcomes of teaching and learning at one college. The researcher triangulated data using a mixture of qualitative methods to increase validity "in order to unearth feelings about the wider impact of technology enhanced learning on teaching and learning" (Jackson, 2017, p. 193). Participants in the study included a mixture of teachers who were either novice or proficient users of the college's LMS. Teachers took part in observational focused group interviews. The use of identified themes allowed teachers to express their views in using the LMS to improve teaching and learning and explore their effective use of the platform in enhancing students' outcomes. Random selections of students were also chosen to participate in diagnostic assessments to explore their feelings and perceptions about the use of an LMS in their learning. The researcher actively participated with students during lessons where technology was consistently used by teachers and students. Student use of the LMS was randomly assessed as a way of uncovering their needs in improving learning opportunities. Interviews and assessments were analyzed and data were grouped into categories based on the

predetermined themes. The identified theme regarding frequency of LMS usage by teachers revealed inconsistent use by instructors in curriculum areas such as math, science, government, and politics. Teachers expressed concerns over the lack of support from administrators regarding allocated time for collaborative professional development. Teachers also revealed frustration over lack of time and insufficient understanding of using technology to support differentiated teaching and learning. According to Jackson (2017), "allocation of dedicated time and continuous application of skills learned are the only way in which teachers gain mastery of the technology" (p. 184). The findings indicated that leaders need to appoint technology specialists to support teachers in their use of LMS platforms and allow teachers time to share good practices with colleagues and generate ideas to support differentiated instruction.

Student barriers. More and more, technology is being integrated into traditionally delivered classes, especially at the college level (Ratliff, 2009). Instructors incorporate technology because "students require more than lecture to become engaged in the learning process" (Ratliff, 2009, p. 699). Kabassi et al. (2016) noted that students appeared more stimulated when they attended a course using an LMS. Unfortunately, many college undergraduates struggle with computer classes and classes that use an LMS or other applications. A study conducted by Ratliff (2009) found that 48% of participating college freshman required remedial technology courses because they lacked the necessary computer knowledge and skills needed to participate in technology-rich learning environments. Likewise, the study conducted by Jackson (2017) found that the majority of students enrolled at the college represented in the study were not familiar with the LMS platform which negatively impacted their ability to collaborate or communicate with teachers and peers. Although most students are familiar with personal technologies, they lack the computer knowledge required for academic purposes

because there are differences between academic use and social networking (Alijani et al., 2014; Jackson, 2017; Mirriahi et al., 2015; Ratliff, 2009; Trinder, 2015; Vickrey et al., 2018).

Alenezi (2018) identified the top student barriers to adopting an LMS as student attitudes toward new technology, level of support from the instructors and the school, training on the use of an LMS, and access to computers at the school. Alenezi surveyed three universities that had varying levels of LMS infrastructure to identify the various barriers that hindered LMS adoption. Data collection involved the online administration of 150 questionnaires to students in the three universities. The main section of the questionnaire used a 4-point Likert scale to indicate their use, attitudes, and barriers towards LMS platforms. The questionnaire also had open-ended questions so participants could use their own words in the responses. Data analysis revealed that students generally had a positive attitude toward using an LMS (90%) but the lack of training and support by the university resulted in low motivation (66%). Students participating in the study stated that instructors lacked the time and knowledge to guide students on how to use an LMS. Students also commented that teachers' instructional design of LMS modules was inadequate and inconsistencies in module design among instructors were frustrating. Poor internet connectivity, infrastructure failure, and blocked websites were also found to be barriers to LMS use by students. Strategies to overcome LMS barriers include training students on how to use the platform for educational purposes, providing technical support to troubleshoot accessibility issues, and ensuring that the school's infrastructure allows constant Internet and networking capabilities.

A similar study of blended learning and LMS use by Kabassi et al. (2016) found inconsistent access to Wifi as a barrier and reported that 26% of students did not have access to the Internet at home. To gain access, students noted "the importance of mobile devices as a

supplementary tool in their learning activities" (Kabassi et al., 2016, p. 5). Students in the study expressed that other barriers to LMS use were instructor related, namely, inconsistencies with module design among instructors, poor communication skills, poor materials and lesson design, and not creating personalized learning opportunities congruent with students' level of experience. Difficulty finding materials within the LMS is also a source of frustration for students (Holmes & Prieto-Rodriguez, 2018; Jackson, 2017; Kabassi et al., 2016). The research conducted by Alenezi (2018) showed that centralizing school processes created a sense of uniformity among courses thereby mitigating student barriers to LMS use.

According to Jackson (2017), when LMS technology is used well by teachers, it has aided students to "increase their level of confidence and independence as the wide range of resources provided creates an opportunity for students to challenge their knowledge, not only in preparing for examinations, but also for the wider world of work" (pp. 185-186). However, for students to experience the benefits of technology-enhanced instruction using an LMS, they must be familiar with the platform and other digital tools (Jackson, 2017; Mirriahi et al., 2015). Ratliff (2009) suggested to prepare students for college, career, and life, schools "should no longer limit their focus to the traditional three R's of readiness - reading, writing, and arithmetic - but should take into consideration the technology readiness levels of their students as well" (p. 702). Educators cannot assume that students are proficient with technology tools and should provide strong support for students' development of digital literacy skills (Mirriahi et al., 2015). Studies in the literature recommended that schools identify students' technical abilities and provide training, resources, induction and/or remediation to familiarize students with the tools and functions of LMS platforms so they have the experience necessary to participate in technology-enhanced classes (Jackson, 2017; Mirriahi et al., 2015; Ratliff, 2009).

Systems Thinking in Education

According to Wang et al. (2015), blended learning consists of "intertwined disjointed parts, all trying to connect…because each element, in isolation, only offers part of its landscape without interconnection" (p. 381). Likewise, Menchaca, Bischoff, and Dara-Abrams (2003) suggested that "technology-enabled educational approaches are generally implemented in a piecemeal, disjointed, incremental way, rather than as part of an overall system design" (p. 2). Schools that integrate technology utilizing an LMS provide the interconnectedness needed to support blended learning, manage curriculum design, enable stability within the organization, and increase overall school improvement (Alenezi, 2018; Levin & Schrum, 2013; Menchaca et al., 2003). The North American Council for Online Learning (NACOL) attributed the selection of an appropriate online infrastructure to the successful implementation of blended learning (Watson, 2008). Although there are limited studies regarding blended learning and LMS use in middle schools, the literature has indicated that student motivation and academic success increase when used in higher education (Akgunduz & Akinoglu, 2017; Bingham, 2017; Jackson, 2017; Webster, 2016; Varier et al., 2017). LMS platforms enable organization, collaboration, and transparency throughout the entire system (Cleveland, 1994; Fassbender & Lucier, 2014; Hilliard, 2015). In addition, using one platform ensures that all students achieve the 21st-century learning goals that will prepare them for the global workplace (Alenezi, 2018; Davis, Dent, & Wharff, 2015; Fassbender & Lucier, 2014; Hilliard, 2015; Webster, 2016).

The institutional implementation of an LMS involves substantive change which requires strategic leadership, systemic planning, and structure within the organizational infrastructure (Bingham, 2017; Fassbender & Lucier, 2014; Staker & Horn, 2012). However, how schools are organized and how students are taught are challenging to change due to influencing factors such

as school vision, cultural norms, societal expectations, leadership styles, teacher experiences, and environmental constraints (Alijani et al., 2014; Bingham, 2017; Tyack & Cuban, 1995). A qualitative review of 30 schools found that schools had difficulty implementing technology-enhanced programs due to the misalignment of new school practices with teacher, student, and parent expectations (Bingham et al., 2016 as cited in Bingham, 2017; Varier et al., 2017). According to the National School Boards Foundation (2002 as cited in Menchaca et al., 2003), integrating technology "is as much about change and support for the change as it is about technology" (p. 3). Therefore, schools must pay attention to the systemic context and cultural-historical antecedents of initiatives prior to implementing change (Bingham, 2017). LMSs create structures that focus on community-building and a culture of learning that allows "administrators and teachers to frame new educational practices and structural reform" (Bingham, 2017, p. 543) which improves school effectiveness. An LMS is both learner-focused and organization-focused and helps manage the entire system's logistics, learning activities, and other competencies (Oakes, 2002 as cited in Watson & Watson, 2007). Furthermore, implementing one digital platform or LMS that is aligned with organizational priorities is instrumental in developing consistent systems in schools (Bingham, 2017).

A common theme within the literature on the topic of effective LMS implementation is the need for a systems approach because incorporating an LMS diverges from traditional cause and effect operational methods (Pafford, 2018). A review of 15 empirical studies by Davis et al. (2015) supported the application of systems thinking approaches in improving organizational performance. Systems thinking involves looking at cause and effect relationships, analyzing feedback loops, and reflecting on the assumptions and beliefs about systems (Tarrant & Thiele, 2015). Feedback loops provide data to help leaders coordinate activities and keep the system

near its desired state of operating as a whole rather than in segments (Kastens & Manduca, 2017). Systems thinking "provides a productive lens for design, implementation, and evaluation of large scale educational innovations" (Kastens & Manduca, 2017, p. 227). Systems thinking is a conceptual framework for understanding interdependency and change and "requires leaders to see the whole school as a complex organization with many interdependent components" (Thornton, Peltier, & Perreault, 2004, p. 222). Interdependency emphasizes the whole organization, not individual parts, events, or behaviors (Davis et al., 2015; Senge, 2006). The connection between the components of educational institutions, society, and adaptive sensitivity to the environment is rooted in the pragmatic views of John Dewey (1944). Additionally, Dewey's influential views on interdependence provide a theoretical foundation to the development of systems thinking in education, especially the role of stakeholders as agents of change (Tarrant & Thiele, 2015).

Complex Adaptive Systems

Understanding systems thinking is essential because schools function as complex adaptive systems (CAS) – living, dynamic, open systems that exchange energy and information across departments and with relevant stakeholders which help the system maintain structure (Cleveland, 1994; Wang et al., 2015). According to Dewey (1938), adaptation pertains to changing circumstances and the knowledge that is gained through active participation, lifelong learning, and creative collaboration. As a pragmatic philosopher, Dewey (1944 as cited in Rooney, 1993) believed that "humanly motivated change is possible, that such change matters, and that philosophy has an important role to play in effecting such change" (p. 18). Dewey held that meaning is constructed and reconstructed through action, thinking, criticism, and diverse types of communication (Jenlink, 2004). According to Jenlink (2004), pragmatism attempts to

mitigate barriers that cause incongruent relationships, thereby promoting interconnectedness in systems. In complex systems, stakeholders must take responsibility for reconstructing meaning with participatory involvement using "clear and continuous communication and collaborative experimental problem-solving" (Tarrant & Thiele, 2015, p. 59). When individuals contribute to the design of the new educational system and all design ideas are considered, stakeholder acceptance increases and implementation is realized because the design is unique to their community (Banathy, 1991; Jenlink, 2004).

The diverse and interdependent parts of complex adaptive systems interact in nonlinear ways and share a common goal or perspective and can adapt to the environment when needed (Davis et al., 2015). The premise of CAS theory is the concept of the edge of chaos and is explained as follows:

> Complex systems have all somehow acquired the ability to bring order and chaos into a special kind of balance. This balance point —often called *the edge of chaos* is [where] the components of a system never quite lock into place, and yet never quite dissolve into turbulence, either…The edge of chaos is where new ideas and innovative genotypes are forever nibbling away at the edges of the status quo, and where even the most entrenched old guard will eventually be overthrown. (Waldrop, 1992, p. 12)

This concept of the edge of chaos provides an understanding of CAS and the ability to maintain a balance between stability and turmoil or vision and reality (Senge, 2006; Wang et al., 2015). Chaos or unpredictability in the system may generate conflict but can ultimately lead to positive changes in the operations, structures, goals, and program designs of the organization (Bingham, 2017; Schneider & Somers, 2006). Through chaos, complex adaptive systems "have the ability to self-organize, adapt to, and evolve with their environment" (Wang et al., 2015, p. 382). When

organizations strategize as CASs, they quickly develop solutions that are effective and adaptive (Greer-Frazier, 2014).

Systems thinking in education is not just about pedagogical theory and practice; it focuses on the interconnectedness and interdependency of elements, events, and relationships within the system and is a useful tool for initiating organizational change (Davis et al., 2015; Thornton et al., 2004). Branch (1999) considered the act of learning to be complex and identified eight subsystems in learning systems: students, content, media, teachers, peers, time, goal, and context. Wang et al. (2015) used the work of Branch and other research regarding blended learning to develop the Complex Adaptive Blended Learning System (CABLS) depicted in Figure 2.2.

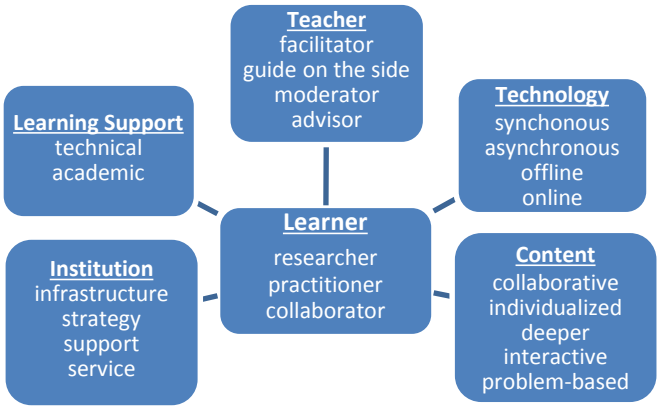

Figure 2.2. The Framework of Complex Adaptive Blended Learning Systems (CABLS) The diagram shows the six subsystems and their relationships: the learner, the teacher, the technology, the content, the learning support, and the institution. The subsystems and their interior subsystems interact with one another to form a system of blended learning. Adapted from "Revisiting the Blended Learning literature: Using a Complex Adaptive Systems Framework," by Y. Wang, X. Han, and J. Yang, 2015, *Journal of Educational Technology & Society, 18*, p. 383. Copyright 2015 by the Creative Commons.

Systems thinking focuses on continuous progress within and between the subsystems and "assumes that schools can improve student achievement regardless of external circumstances" (Thornton et al., 2004, p. 226) such as socioeconomic status, social conditions, and family structures. Ultimately, systems thinking "enables educators to make decisions related to improvement of student achievement and understand the impact of each decision on the organization" (Thornton et al., 2004, p. 222).

The introduction of new technologies and multimodal forms of learning and communicating changes the dynamics of teaching and learning and necessitates pedagogical and institutional adaptations (Wang et al., 2015). Introducing new technologies and switching from analog to digital learning environments creates chaos by reorienting students and teachers to different strategies, methods, and materials (Kroksmark, 2016). Technology changes the learning experiences for all involved and is the primary tension-generator in learning organizations (Greer-Frazier, 2014; Kowch, 2013). An empirical review of case studies by Wang et al. (2015) showed that institutions that implement new technologies undergo a "dynamic, adaptive process of emergence, adoption, and establishment or obsolescence [and] the self-organizing process of the systems eventually retains those technologies that best facilitate blended learning" (p. 384). Consequently, when technology is adopted without a comprehensive behavior management plan, strong cybersecurity program, or alignment to curriculum and educational goals, schools risk implementation failure which disadvantages students (Alijani et al., 2014; Webster, 2016). Moreover, institutions must arrange for network infrastructure and campus servers to provide reliable service to faculty and students (Hilliard, 2015).

According to Alijani et al. (2014), implementing technology-enhanced and blended learning instruction "is considered second order change due to the fact that doing so warrants

profound change in the area of pedagogy, approach to teaching, learning, and curriculum" (p. 128). However, Thornton et al. (2004) warned that quickly implementing new programs can cause fear of failure, confusion, and rejection and suggested careful planning and slow implementation with a pilot group of well-trained teachers. Also, providing opportunities for teachers to experience small wins increases excitement and commitment to the change process (Boone, 2015). Change is difficult and does not happen immediately, but "slow processes acting across long time spans can accrue monumental impacts" (Kastens & Manduca, 2017, p 228). As such, instructional leaders must be aware of the relationships and interdependencies within the organization to ensure the success of new initiatives (Pafford, 2018). Understanding dynamic complexity requires the ability to see significant interrelationships and patterns of change and acknowledge that effective systemic improvements take time (Senge, 2006; Thornton et al., 2004). Hence, it falls to school leadership to create systems to build a school culture where relationship and community building are at the core of the change process.

Shared Vision

Successful organizations incorporate systems thinking through a "shift of mind" (Senge, 2006, p. 73). Changing the mindset of the system is powerful, and an inspiring vision can attract early adopters and innovators to the new design (Kastens & Manduca, 2017). According to Banathy (1991), in education, there is

> a lack of realization of the wholly outdated "design" of the current educational system and the ever-widening gap between rapidly changing societal developments and the persisting (basically unchanged) nature of education. It is still the prevailing "mindset" that hinders and blocks such realization. (p. 9)

For stakeholders (teachers, administrators, students, parents, community) to change their mindset and embrace initiatives that benefit the whole organization, administrators and staff must first determine their personal vision which will then lead to the creation of common objectives and a shared vision (Bingham, 2017; Senge, 2006). Vision establishes a long-term and overarching goal and has a "core ideology and an envisioned future" (Hoskisson et al., 2016, p. 517). Vision facilitates new ways of thinking, learning, and acting (Senge, 2006).

According to Kroksmark (2016), strategic thinking and acting are prerequisites for learning. Likewise, Dewey (1944) suggested that acting on new knowledge and having a common language are essential to thinking, personal growth, and social or organizational change. Dewey postulated that learning involves changes in both social practice and individuals' reconstruction of their experiences, and begins by having a purpose or end in view. Therefore, leaders must set the example by modeling personal mastery and addressing personal vision to establish a shared vision (Senge, 2006). Personal mastery for leaders includes the continuous pursuit of evidence-informed leadership practices, training, and education (Fullan, 2006). A study conducted by Webster (2016) found that leaders' assumptions about technology integration influenced their approaches to technology decision making. As such, leaders need a well-developed understanding of technology-enhanced learning to make purposeful and informed decisions before implementation. Furthermore, leaders need the knowledge and understanding of how the parts of the educational system are interrelated to affect systemic change (Banathy, 1991; Boone, 2015). When people see a connection between their vision and the fundamental purpose of the organization, they begin to understand the rationale for working in new ways (DuFour et al., 2010). It is incumbent upon leaders to value personal mastery and the growth of

vision. After teachers understand their particular visions and what drives them, they will then "see [their] own picture of the organization at its best" (Senge, 2006, p. 198).

Menchaca et al. (2003) suggested that "the change process begins with the development of a vision and with advocacy by the organization's leaders" (p. 3). Administrators can build a strong technology culture based on shared vision (Levin & Schrum, 2013). For vision to be realized, the values and goals that drive the daily workings of the organization must first be clarified (DuFour et al., 2010). According to Kastens and Manduca (2017), the vision needs to be substantial enough to be inspiring and aligned with earlier goals, so stakeholders feel it is achievable. Organizational members also need to have a clear understanding of the organization's mission, purpose, and the new system design, including how technology will be used (Jenlink, 2004; Weisbord, 1976). A study of one-to-one technology integration in K-12 schools found that "school districts' strategic goals for transforming learning environments accelerate the adoption of 1:1 and examining technology options" (Johnson et al., 2015 as cited in Varier et al., 2017, p. 985). Systemic LMS implementation happens with consistent adherence to priorities and practices across the school that aligns to the shared vision (Bingham, 2017).

Shared vision creates a mutual language and identity and a "sense of commonality that permeates the organization and gives coherence to diverse activities" (Senge, 2006, p. 192). According to Senge (2006), shared vision provides stakeholders with "the focus and energy for learning" (p. 192), a larger purpose to commit to, and the impetus for overcoming differences in order to work together. Likewise, a case study by Taylor and Newton (2013) revealed that "strategic institutional change will only happen if there is a shared vision and energy that touches all parts of an organization" (p. 59). Shared vision aids teachers to work toward the same goal and dialogue about creative tension or the disparity between vision and reality because "vision

provides a sense of direction and a basis for assessing both the current reality of the school and potential strategies…to improve that reality" (DuFour et al., 2010, p. 31). Consequently, schools need the flexibility to adjust or change strategies and structures when reality does not meet the vision (Bingham, 2017).

When teacher teams understand the purpose of the organization, they develop more in-depth knowledge, higher self-efficacy, and a stronger sense of ownership in results (DuFour et al., 2010). However, systemic priorities must be shared and agreed upon by teachers and other stakeholders to be effective (Bingham, 2017). In due course, individuals feel valued and an inherent desire to realize the vision increases, resulting in firm commitments in teacher teams. Developing a shared vision is an essential first step toward facilitating and expediting the adoption of new initiatives and must be a primary focus of the daily work of leaders (Alijani et al., 2014; Rubin & Sanford, 2018; Senge, 2006). According to Kastens and Manduca (2017), system-wide changes "must be endorsed, adopted, or rewarded by others in the institution if they are to transition from research into practice" (p. 221). Campus-wide systems that are aligned with a precise mission, vision, and purpose connect interdependent stakeholders to a common goal which leads to increases in student achievement and produces improvement throughout the institution (Alijani et al., 2014; Davis et al., 2015; Jenkins, 2007).

Strategic Leadership

Leadership practices establish how organizations adapt to change (Hoskisson et al., 2016). Successful change at the organizational level necessitates an understanding of how individuals and groups function and adjust to change (Kotter, 2012). Moreover, leaders need an understanding of leadership theories "to respond to changes within and around education systems" (Kowch, 2013, p. 31). The interaction between individuals, groups, and the

organization as a whole are complex (Burke, 2018). Therefore, strategic plans must include components such as sharing the new corporate vision, opening the flow of information, recognizing existing and emerging culture, and addressing resistance from individuals and groups. The importance of leadership in facilitating change cannot be overstated. Effective change relies on the strength of leadership and how said leaders facilitate the change process because, without strong leadership, the intended change will not occur (Burke, 2018; Edgelow, 2012).

The support of school leadership teams in conjunction with information technology leaders "must work together for the benefit of quality resources, instruction, and higher student achievement" (Hilliard, 2015, p. 181). Leadership teams must ensure that technical support is readily available to help teachers gain access to technology for their learning as well as their students (Akgunduz & Akinoglu, 2017; Hilliard, 2015). Problems with infrastructure such as inconsistencies with module design, difficulties with online activities, or losing access to the internet frustrate individuals and slow the implementation process (Akgunduz & Akinoglu, 2017; Alenezi, 2018). Also, leaders need to share actionable information across the system in a timely manner so each subsystem can respond to responsibilities, challenges, and opportunities (Kastens & Manduca, 2017). Sound leadership practices are vital to the success of any organization because leaders are responsible for ensuring a stable infrastructure exists and for "allocating the scarce resources to the opportunities that the organization faces" (Galbraith, 2014, p. 40). Principals who prioritize, support, and model the use of technology and an LMS as part of their school's administrative and instructional practice are perceived by staff to be innovative and effective leaders (Bingham, 2017; Waxman et al., 2013).

Strategic leadership encompasses a myriad of skills required to manage and move organizations in positive directions such as fostering shared beliefs, establishing standard operating procedures, protecting teachers from issues that negatively impact their time, understanding pedagogy and assessment, and establishing open networks of communication and data sharing (Pafford, 2018; Thornton et al., 2004). Leadership is viewed in terms of individual traits, leader behavior, interaction patterns, role relationships, follower perceptions, influence over followers, influence on task goals, and influence on organizational culture (Alas, Tafel, & Tuulik, 2007). Amagoh (2009) suggested, "the key elements that contribute to a successful leadership experience include changing mindsets, a global focus, personnel development and improved business and leadership skills" (p. 990). Leaders of CAS should avoid individual biases, not give into limited knowledge, use the collaborative intelligence of the group, and empower people to overcome assumptions and biases (Geer-Frazier, 2014). According to Hoskisson et al. (2016), "strategic leaders are responsible for ensuring that appropriate strategies are both formulated and successfully implemented" (p. 519). Implementation of new programs and initiatives requires leaders to analyze feedback loops and collect information from stakeholders, assess needs and wishes, integrate new knowledge into strategic decisions, manage external stakeholders, and form inter-organizational relationships (Hoskisson et al., 2016). Perhaps the most essential leadership skill is the ability to influence employees, so the "mission, vision, purpose, long-term goals, and values" (Hoskisson et al., 2016, p. 522) are realized.

Strong infrastructures and leadership practices establish how organizations adapt to change and are influential factors on how technology is used throughout the organization (Badia et al., 2013). Implementing an LMS is important because it positively impacts students, teachers, and schools by providing an interconnected infrastructure and innovative means to

deliver instruction. New technologies are the most crucial resource leading to transformative innovation in learning organizations and are "critical to learner well-being in the new century" (Kowch, 2013, p. 30). Implementation involves developing structures, systems, and programs, and it is the responsibility of leaders to "encourage and promote innovation" (Hoskisson et al., 2016, p. 517). According to Thornton et al. (2004), "systems thinking seeks to ensure principals are competent leaders who possess the necessary skills to develop effective programs to improve student achievement and teaching practices" (p. 225). Successful implementation of an LMS requires leaders who emphasize structure and alignment to school vision, accountability for student outcomes, and teacher professionalism, including quality instructional practices (Bingham, 2017; Fullan, 2006). However, Huang (2001) argued that professionalism is not just about compliance and that enforcement of agreed-upon goals has a positive impact on teacher performance.

Transactional Leadership

To increase professionalism within the system, school leaders may choose to use elements of transactional leadership to reward employees for accomplishing established objectives and reaching set goals or productivity levels. Transactional leadership refers to the achievement of maximal employee motivation due to organizationally sponsored reward systems (Pearce & Sims, 2002). The transactional system has a framework of a principal or employer who contracts an employee to perform work and then holds the employee accountable for that work. The principal ensures that the employee performs the job well, so goals are achieved (Yu & To, 2011). Ouchi (1979) suggested that a behavior-based framework or system is best used when the behavior of the employee is observable and measurable. Snell (1992) explained that incentives such as performance-based rewards are used to increase and improve performance.

However, Levac (2009) classified performance measurement as a poor control because it may not measure what the principal specifically desires. As a result, transactional leadership may lead to low levels of organizational citizenship behaviors (OCB) among employees (Ali & Waqar, 2013). However, according to Ali and Waqar (2013), OCB levels are essential in education because "teachers with high OCB have more value as compared to others because the quality of academic institutions is dependent on them" (p. 300). In addition, students' academic achievement correlates to teachers' OCB levels (Khalid et al., 2010). Research conducted by Ali and Waqar (2013) showed that "employees value organizational rewards and believe that [when] their leaders administer rewards contingent on performance, they engage in citizenship behavior as a means of obtaining rewards" (p. 308). Likewise, Levac (2009) found that the best framework for increasing professionalism and performance is "the mix of extrinsic financial rewards and intrinsic professional and personal job satisfaction" (p. 38).

Distributed Leadership

Complex adaptive systems are decentralized and team-based with a distributed power structure (Geer-Frazier, 2014). However, leaders hold the central position in the organizational model to coordinate functions between the other organizational components (Davis et al., 2015). Although the central position enables leaders to review and address areas of concern within the system, adaptive leadership uses a "bottom-up" non-linear approach rather than a top-down approach (Burke, 2018; Davis et al., 2015; Weisbord, 1976). The bottom-up approach to leadership exemplifies distributed leadership as administrators set goals for the school, encourage professional development, and continuously work toward school improvement (Petersen, 2014). A team-oriented and engaged staff is established by building trust, assigning responsibilities, and promoting collaboration (Bird et al., 2012). The distributed responsibilities

of frequent communication, shared decision making, and collaboration in working groups "are components of critical importance in the successful systemic change process" (Menchaca et al., 2003, p. 4).

Systems thinking allows leaders to respond to "organizational complexities and move leadership from a traditional bureaucratic model to a more adaptive model" (Davis et al., 2015, p. 333) as seen in distributed leadership practices. Administrators should strive to build a culture that prioritizes distributed responsibilities, collaboration, and community involvement. As tasks are assigned to different teams and individuals, the administrator's role shifts from one of direction to one of support (Boone, 2015). According to Bajer (2009), leaders must "attempt to develop leadership cultures where everyone in an organization is actively working together to create changes and add value" (p. 38). Teachers who are involved in leadership and decision-making practices positively affect technology integration (Levin & Schrum, 2013). Additionally, teachers perceive effective administrators as those who affirm their teachers, collaborate with staff, and practice distributed leadership (Markow, Macia, & Lee, 2013). Furthermore, distributed leadership within the systems thinking approach forces leaders to assess the social system as a whole and then train employees to accomplish the objectives that will advance the entire organization (Pafford, 2018; Petersen, 2014).

Transformational Leadership

Strategic leaders, whether in business or education, are responsible for ensuring employee engagement and job satisfaction and are tasked with molding the organizational culture (Fullan, 2006; Hoskisson et al., 2016). In education, "leadership not only matters: it is second only to teaching among school related factors in its impact on student learning" (Leithwood et al., 2004, p. 1). The type of leadership style education leaders use is crucial to

building a positive organizational culture that can break down barriers, promote trust, and empower employees (Hoskisson et al., 2016; Thornton et al., 2004). Strategic leaders exemplify the traits of transformational leaders in that "transformational leadership entails motivating followers to do more than is expected, to continuously enrich their capabilities, and to place the organization's interests above their own" (Zheng & Peterson, 2011 as cited in Hoskisson et al., 2016, p. 501).

The dimensions of transformational leadership are charismatic leadership, individualized consideration, inspirational motivation, idealized influence, and intellectual stimulation (Ali & Waqar, 2013). Also, Organ and Ryan (1995) found that transformational leadership behavior has significant positive correlations with altruism, courtesy, conscientiousness, sportsmanship, and civic virtue. According to Thrash (2012), transformational leadership elevates both the leader and the follower. Leaders who practice transformational leadership form relationships with their subordinates and are morally uplifting, which leads to positive effects on the performance of the institution (Thrash, 2012). Effelsberg, Solga, and Gurt (2013) concluded that transformational leadership enhances pro-organizational follower behavior. As a result, healthy leader-follower relationships lead to positive effects on the performance of the institution.

According to Hoy and Miskel (2005 as cited in Ali & Waqar, 2013), "transformational leaders build trust which leads to increased levels of organizational citizenship behavior" (OCB) (p. 299). Moreover, workgroups with transformational leaders are more likely to openly communicate with one another because of cultivated trust (Zheng & Peterson, 2011). Therefore, team performance is optimized due to positive leader-follower relationships. Conversely, the lack of interpersonal relationships between leaders and followers can result in dissatisfied and unengaged employees (Flaherty, 2015). However, leaders who practice transformational

leadership can "motivate followers to do more than is expected, to continuously enrich their capabilities, and to place the organization's interests above their own" (Zheng & Peterson, 2011 as cited in Hoskisson et al., 2016, p. 501). Likewise, Ali and Waqar (2013) found that teachers who work under transformational leaders show higher levels of OCB, including sportsmanship, conscientiousness, and courtesy.

Many schools practice transformational leadership as a means to bring about systematic change because it is an inter-organizational and interpersonal approach (Pafford, 2018; Thrash, 2012). Administrators transform the culture of the school and the attitudes of teachers toward technology when they are involved in the daily operations of the school and model institutional technology integration (Anthony & Patravanich, 2014; Fullan, 2006; Waxman et al., 2013). For successful implementation of technology and LMSs to take place, school leaders must be "users, supporters, and planners of technology" (Richardson, Flora, & Bathon, 2013, p. 157). Transformational leaders who focus on infrastructure, educational effectiveness, and faculty professional growth are perceived by teachers as innovators, problem solvers, and mentors (Lowrey, 2014). Likewise, a study conducted by Hauserman and Stick (2013) found that staff were motivated by transformational leaders who had a strong vision, collaborated with teachers, and encouraged professional growth.

Servant Leadership

Strategic leaders exhibit servant leadership traits as servant leadership focuses on the needs of employees, which, in turn, increases employee job performance, satisfaction, loyalty, and behavior (Taylor, 2002). Worth (2017) suggested that servant leadership practices can anchor change in organizational culture. Likewise, Parris and Peachey (2013) concluded that servant leadership encourages a "helping culture that can result in greater individual and

organizational effectiveness" (p. 378). According to Coetzer, Bussin, and Geldenhuys (2017), on a team or group level, servant leadership is positively correlated to group organizational change behavior, group identification, service culture, and procedural justice climate. Additionally, at the organizational level, servant leadership is positively related to multi-level, stakeholder satisfaction. Although diverse leadership styles are practiced in various institutional settings, servant leadership is different in that a servant leader meets the needs of other people first.

Servant leadership emphasizes service to others and equipping people who "can build a better tomorrow" (Parris & Peachey, 2013, p. 378). According to Robert Greenleaf (1977 as cited in McKenzie, 2012), the goal of servant leadership is to create an "ethical and caring organizational culture" (p. 116) and encourage interdependence and cooperation. Hoskisson et al. (2016) found that human capital and organizational culture are vital to achieving organizational success, and strategic leaders are responsible for ensuring that both are firmly in place. Cultural change succeeds only when leaders actively support and empower employees (Hoskisson et al., 2016; Kotter, 2012). A positive culture can be cultivated by an administrator who is a servant leader because there is "a strong association between servant leadership and job satisfaction" (McKenzie, 2012, p. 113).

Servant leadership also includes a moral component and acts in the best interest of the follower (Walumbwa, Hartnell, & Oke, 2010). Hoskisson et al. (2016) suggested, "to properly influence employee's behavior, ethical practices must…be an integral part of an organization's culture (p. 519). Employees follow the example set by instructional leaders. Therefore, the leader's values and ethical practices will reinforce a value-based culture in the organization. Burke (2018) suggested that change leaders are self-aware and have high levels of emotional

intelligence. Demonstrated emotional intelligence in leaders creates a positive work environment and can lead to employee ownership (Taylor, 2002). Servant leaders understand how emotions work in others and can regulate their own emotions to create an environment of self-awareness and encourage employee growth (McKenzie, 2012). Self-awareness is achieved through self-reflection, which requires confidence, humility, and vulnerability. Leader self-knowledge and self-efficacy allow leaders to reflect on their practice and adapt to the needs of followers. Leaders can yield positive results by being willing to accept constructive feedback and being open to dialogue with employees and stakeholders (DuFour et al., 2010). Leaders need to understand how they are perceived which can be accomplished by "comparing that feedback with their conception of themselves" (Caldwell, 2009, p. 402). Instructional leaders who attune themselves to the feedback of others can improve the work environment, build trust, and increase job satisfaction (Walumbwa et al., 2010). Although both transformational and servant leadership are similar, there is a fundamental difference:

> While transformational leaders share and align their followers' interests, servant leaders put the interest of their followers before their [own interests]…transformational leadership may be more relevant in a dynamic, changing environment; servant leadership may be applicable in a stable environment. (Burch, Swails, & Mills, 2015, p. 400)

Both transformational and servant leadership stress the importance of administrators developing relationships with faculty members. Ultimately, employees who perceive leaders as supportive tend to perform extra duties above their regular roles (Uen, Chien, & Yen, 2009).

Instructional Coach Support

Permanent and pervasive change requires a strategic approach from leaders at all levels of the institution (Jackson, 2017; Kastens & Manduca, 2017). Burke (2018) theorized that first-

order change starts within a subsystem, a segment of the chain that leads to an organization's success. Subsystems can learn from and mentor each other to accelerate the change process. The procedures, templates, information flow, and feedback elements designed by the subsystem can be replicated by parallel subsystems "without greatly increasing the burden on the infrastructure or leaders" (Kastens & Manduca, 2017, p. 222). Instructional coaches and academic deans are the first-level instructional leaders of content teams on campuses, and each team acts as a subsystem within the school. Coaches and deans have direct access to individual teachers and content teams, an understanding of the work environment, and the ability to share vital district information with teams (Edgelow, 2012). Moreover, instructional leaders interact with educators individually and can investigate teachers' concerns regarding innovation adoptions from their viewpoints (Lochner et al., 2015). Addressing the concerns and attitudes that teachers have about technology "are fundamental elements in the educational change process and may affect how technology is ultimately implemented" (Lochner et al., 2015, p. 65). Furthermore, when teachers have a technologically proficient mentor or coach with which to collaborate they are more likely to implement technology-enhanced instruction (Brown & Warschauer, 2006; Jackson, 2017; Schmid & Hegelheimer, 2014).

Instructional leaders are responsible for advancing the initiatives set forth by the district as explained by the campus principal and for facilitating and maintaining a supportive environment by creating and upholding shared vision among teachers (Sugar & Slagter van Tryon, 2014). The systems thinking literature shows that increased communication, integration of services, and aligning support and resources greatly help schools achieve organizational goals (Ayers, 2002; Davis et al., 2015; Jenkins, 2007; Levin et al., 2010; Wang et al., 2015). According to Edgelow (2012), communication is what makes the change process work because

the flow of information affects strategy, changes, and the transition from old systems to new. Open lines of communication help members build intergroup relationships based on trust because false assumptions are diminished (Senge, 2006). Davis et al. (2015) suggested the key to seamless implementation and successful change is effective communication, which happens when educators share ideas and issues across the system. Leaders often expect information to move throughout the organization naturally. However, the flow of information does not always occur, and vital material is not conveyed throughout the system. Administrators need to meet regularly with coaches to share strategy, change-related information, and school/district expectations. According to Lochner et al. (2015), teachers want a clear understanding of what the expectations are regarding technology integration in the classroom. It is essential for coaches to have face-to-face access to employees and teams to relay change communication and expectations. Additionally, administrators and coaches can use digital tools in the LMS to bridge the gap between subsystems by communicating system-wide educational initiatives and distributing timely updates that have an important impact on the organization (Davis & Surajballi, 2014; Kastens & Manduca, 2017). Coaches should also encourage transparency among team members to eliminate misunderstandings and support a relational framework of interpersonal and intergroup processes. Coaches can foster positive intergroup interactions by recognizing socio-cultural aspects of groups and creating a psychologically safe environment to help work through conflict, share feelings, and feel comfortable taking risks (Burke, 2018). Positive intergroup processes can lead to powerful problem-solving sessions, which may create beneficial learning opportunities and yield new innovations for the organization (Sreekeessoon, 2010).

Instructional leaders are responsible for developing cohesive teams through team-building exercises. Hanson and Moir (2008) contended that through collaboration, inquiry, assessment, and communities of practice instructional coaches will continue to develop new knowledge, values, and habits of mind in teachers. A mindset of continuous growth toward mastery empowers the entire organization "to realize their collective efficacy potential" (Cisco, 2018, p. 15). It is vital that coaches and deans be equipped with leadership knowledge and skills because they help set organizational direction, create alignment, and nurture commitment in groups of people (McCauley & Douglas, 2004). Instructional leaders can also cultivate organizational alignment and cohesive teams by training, modeling, and structuring how digital tools will be used, including the LMS.

Holmes and Prieto-Rodriguez (2018) conducted a mixed methods study in 2013 to examine student and staff perceptions of various LMS features and the effectiveness of LMS components in their courses. Surveys were completed by 46 teachers and 470 students at a College of Education. Staff and students were asked to rate the effectiveness of various components of the LMS using a 4-point Likert scale. Two focus groups were conducted with four students in each group. Groups were mixed in terms of degree level and gender. Staff members were invited to participate in post survey interviews. The focus groups and interviews were audio recorded and transcribed. Transcriptions were thematically coded in relation to student and staff perspectives on the functionality, interactivity, and accessibility of the LMS. The analysis of the staff and student response mean scores demonstrated that the most effective element of the LMS was the ability to access course documents to support learning. An independent samples *t*-test indicated a significant difference in staff and students in relation to perceived effectiveness of LMS tools providing accessibility to resources. Results revealed that

students valued teacher-created video lectures as being more effective learning tools for supporting learning than did staff. Both staff and students felt online discussion forums were a less effective learning tool. Teachers and students expressed appreciation for the accessibility that the LMS afforded but felt some form of uniformity or standardization of LMS course sites and module designs would be beneficial. Implications for organizations include carefully considering how LMS tools will be used to complement or supplement teaching and learning strategies and ensuring that staff and students have a comprehensive understanding of how to utilize the tools in the platform.

Teachers' use of technology in the classroom is influenced by the expectations of other teachers and by external requirements such as school and district requirements for technology and LMS use (Badia et al., 2013; Lochner et al., 2015). Teachers are also influenced by performance incentives and when they are recognized and rewarded for incorporating the LMS into pedagogy to improve teaching (Jackson, 2017). The ability of the coach or dean to influence change depends on their ability to motivate individuals and the entire group. Burke (2018) suggested, "changing how supervisors treat subordinates…will affect work climate and subordinate motivation, which then may lead to greater individual and group performance" (p. 125). Therefore, it is crucial that coaches, deans, and other first-level leaders "have the opportunity to learn more about human motivation, the consequences of certain kinds of rewards and punishments, and effective ways of providing feedback on worker performance" (Burke, 2018, p. 125).

The passage of pedagogical knowledge from a content or instructional specialist helps teachers build confidence in their practice. Instructional leaders need to be knowledgeable about digital learning tools and act as systems thinkers to strategically promote and support institution-

wide technology solutions because the type of support teachers receive is indicative of how an LMS and technology-enhanced practices will be implemented (Cauthen, 2019; Lochner et al., 2015). Support should be given promptly to help teachers overcome their various levels of concern about integrating technology into their curriculum (Lochner et al., 2015). Instructional coaches can extend technology knowledge, materials, and processes to the entire organization by building and mentoring "a cadre of faculty who could lead community-wide efforts for adoption" (Kastens & Manduca, 2017, p. 221).

Technology Coach Support

Teachers face challenges when implementing digital tools, including LMSs and often revert to traditional methods of instruction when supportive infrastructure is missing in schools (Alenezi, 2018; Fassbender & Lucier, 2014). Implementation barriers include inadequate teacher training and support, blocked websites, slow or dropped Internet connections, software issues that disrupt teaching, poor instructional design guidance for teachers, and a lack of high-quality technical support staff (Alenezi, 2018). Basak and Govender (2015) found that poor administrator support, lack of access to computers, unreliable equipment, lack of technical support, and lack of highly qualified LMS/technology coordinators are also barriers to technology and LMS implementation. To support teachers, Menchaca et al. (2003) recommended that schools have "robust technology infrastructure capable of supporting new learner-centered educational methods" (p. 5).

An essential component of school infrastructure includes providing technology design support with technology coaches because teachers' main obstacle to technology and LMS integration is the lack of technical and educational training (Basak & Govender, 2015).

Appointment of technology "champions" or experts within departments and curriculum areas "makes it easier for good practices to be shared in a coordinated manner" (Jackson, 2017, p. 187) and ultimately leads to an improvement in PLCs and in meeting the needs of teachers. Likewise, McKenney et al. (2016) found that content knowledge played a significant role in technology-enhanced lesson design. Schmid and Hegelheimer (2014) discovered that teachers were more willing to implement technology-enriched instruction when paired with a technologically proficient mentor. Teachers are more likely to integrate digital tools when districts provide experienced technical support personnel to solve problems and assist with software and hardware concerns (Hilliard, 2015). Additionally, Holmes and Prieto-Rodriguez (2018) suggested that timely support be available for troubleshooting hardware and network issues to develop an effective LMS experience.

Thornton et al. (2004) suggested that "well-designed implementations provide training, feedback, designed adjustments, and individualized support for teachers" (p. 225). Jackson (2017) recommended that schools provide technology support to increase teachers' rates of LMS implementation and improve cohesiveness across the system. Lowther et al. (2008) found that full-time, campus-level technology coaches significantly increased teachers' technology skills, confidence, and implementation of new digital tools. To explore the idea of providing technology support to PreK-12 public schools, Sugar and Slagter van Tryon (2014) developed and distributed an electronic survey to 184 in-service teachers who worked in schools in the southeastern region of the United States. The survey contained questions about seven themes/features of a technology coach including: collaboration, discussion, learning, news, profile, sharing, and technology. Sixty teachers participated in the study and rated the themes from very valuable to not valuable using a 5-point Likert scale. Mean data indicated that

teachers preferred a learning community facilitated by a technology coach so their technology integration needs could be met. Teachers perceived an increase in their knowledge and skills when they collaborated with their school's technology coach. Participants in the study felt that having access to a technology coach who had an understanding of the curriculum from various departments would be able to share more cross-curricular resources and model technology strategies, to "enhance the development of interdisciplinary lessons" (Sugar & Slagter van Tryon, 2014, p. 59). Respondents valued the sharing of resources and strategies that can be used simultaneously by other curriculum areas. Teachers perceived collaboration as a valuable resource and a way to discuss technology integration and co-design technology-enhanced lessons. Study results also showed that teachers valued professional development and remaining current with new instructional technologies. Implications for technology coaches (live and virtual) included focusing support around sharing, collaborating, and professional learning.

Collaborative Team Culture

A central task of strategic leaders is shaping the organizational culture so that stakeholders facilitate change. Kotter (2012) suggested "only leadership can motivate the actions needed to alter behavior in any significant way. Only leadership can get change to stick by anchoring it in the very culture of an organization" (p. 33). Sinek (2011) submitted that the only variable that leaders can control is the conditions inside the organization and must establish a deep sense of trust and cooperation with their employees. According to Menchaca et al. (2003), "change is successfully implemented in a culture of innovation, collaboration and coordination where all participants in the system are involved in the change effort" (p. 3). The environment needs to be right to inspire people to do great things, which begins with leadership practices (Sinek, 2011). Leaders who serve and care for their employees establish a positive and

safe environment because they sacrifice for their staff (Sinek, 2011). In turn, employees have a high level of achievement motivation and job satisfaction (Lee, 2010). According to Rutledge, Cohen-Vogel, and Roberts (2015), a focus on community-building and a culture of learning improve school effectiveness (as cited in Bingham, 2017). Furthermore, Haynes and Maddock (2014) posited that "all teachers perform better in schools with supportive leadership and a collaborative culture" (p. 11).

Organizational and Team Learning

By definition, institutions of learning should be an example of how successful organizations learn and grow to improve performance (Hoskisson et al., 2016). Organizational learning refers to learning that occurs in groups where people learn collectively through sharing among team members, thereby improving performance in the workplace because cognitive diversity and collective intelligence are more powerful than individual intelligence (Sreekeessoon, 2010). Sreekeessoon (2010) stated that "teams play a fundamental role in supporting organizational learning as a driver of organizational change" (p. 2). Team learning is the method by which change is initiated, and change is what allows the organization to adapt to the environment and remain competitive. According to Sreekeessoon (2010), "investing in change initiatives without a focus on team learning is likely to be a waste of resources" (p. 10). Team learning helps set goals, establishes roles and responsibilities, determines workgroup norms, and develops interpersonal relationships (Burke, 2018). Senge (2006) stated, "team learning is vital because teams, not individuals, are the fundamental learning unit in modern organizations" (p. 10). Pafford (2018) posited that innovation succeeds when people with differing perspectives and opinions collaborate. Burke (2018) concluded that "a smoothly operating group of people in a workgroup can be highly beneficial to the overall organization

change effort" (p. 117). When individuals and teams are committed, they make the success of the organization a priority and "move the goal of development beyond individual outcomes to collective outcomes" (Hickman, 2016).

Cultural changes only succeed when the organization's leaders actively support those changes (Hoskisson et al., 2016). When administrators and instructional leaders do not establish empowering environments, learning is isolated, knowledge remains with the individual, and the potential of people remains stagnant. Senge (2006) stated, "organizations learn only through individuals who learn" (p. 129). A school culture of collaborative learning is vital because "individual learning does not guarantee organizational learning" (Senge, 2006, p. 129). A study conducted by Perez-Mateo and Guitert (2012) found increased learning performance and learning outcomes of individuals participating in cooperative or group learning activities. Learning does not occur in a vacuum; it requires knowledge of tools and processes acquired through collaboration, investigation, research, and trial and error (Perman, 2008). Collaborative learning enhances the ability to create based on shared understanding and commitments people have made to long-term priorities (DuFour et al., 2010). Collaboration allows "a body of knowledge that can be accessed by community members and used for their own purposes" (Miles et al., 2010, as cited in Hickman, 2016, p. 611) and to advance organization initiatives.

Organizational outcomes increase when leaders model systems, respond to stakeholder feedback, and participate in training workshops (Gregory & Midgley, 2000). According to Davis et al. (2015), leaders can improve organizational performance and foster change by "engaging and enacting the adaptive and participatory practices of discovery, framing, and action" (p. 335). Systemic discovery practices include garnering stakeholder buy-in through various information gathering methods such as surveys, community meetings, and social media. Prior to

implementing new technologies, schools and districts should have conversations regarding how digital tools might serve teaching and learning because stakeholders determine how they will be used (Cho & Littenburg-Tobias, 2016). Leaders also need to address the concerns of teachers regarding innovations like the LMS to realize successful adoption because "implementation of an innovation is accomplished at the individual level (Lochner et al., 2015, p. 63). Framing or mapping encompasses identifying interconnections in the system, clarifying meaning, and charting patterns over time by analyzing data. Framing also includes drawing boundaries of the system to allow for a focused design (Kastens & Manduca, 2017). Action refers to the systemic approach used for implementation, including engaging stakeholders, collaborating, coordinating, and aligning subsystems as seen in Figure 2.3.

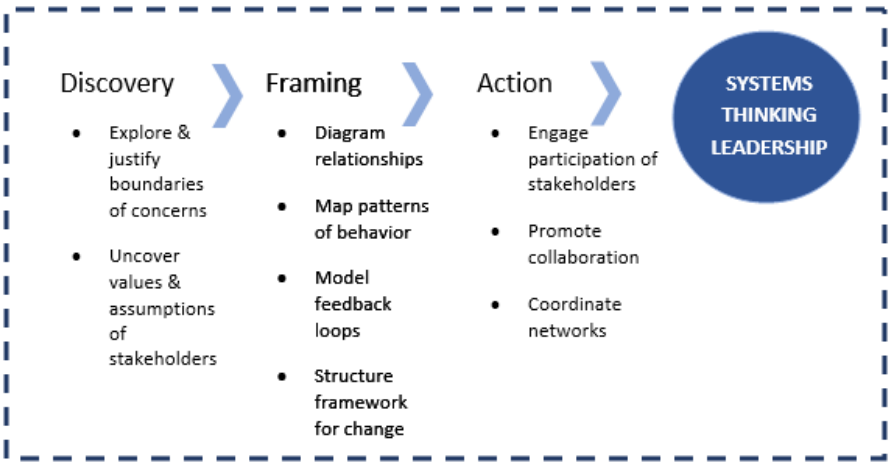

Figure 2.3. A conceptual model of systems thinking leadership

The figure illustrates how systems thinking leaders can enhance organizational performance by using the three processes of discovery, framing, and action to meet the challenges of complex education environments. Adapted from "A Conceptual Model of Systems Thinking Leadership in Community Colleges," by A. P. Davis, E. B. Dent, and D. M. Wharff, 2015, *Systemic Practice and Action Research, 28*, p. 347. Copyright 2015 by Springer Science and Business Media.

Additionally, cognitive and reflective practices such as understanding creative tension or the gap between vision and reality and practicing transparency help produce energy for change (Davis et al., 2015; Senge, 2006). Cognitive practices allow for continuous assessment and can be implemented and practiced in team meetings through honest discussions using data from observations and assessment results because "data-based decision making is a high-leverage leadership approach that can facilitate systemic change and can improve student achievement" (Thornton et al., 2004, p. 223).

Technology is beneficial to team learning because it eradicates the barriers that exist in education to make collaboration more straightforward and more accessible (Cisco, 2018). A review of the literature shows that the development of digital, collaborative networks among teachers contributes to deepened professionalization which leads to increased use of technology-enhanced learning strategies (Dexter, Seashore, & Anderson, 2002; Kozma, 2003; Kroksmark, 2014; Lochner et al., 2015; Means, Penuel, & Padilla, 2001). Physical and virtual professional development allows faculty to stay connected in collaborative environments through online, blended, and distance learning (Cisco, 2018). When teachers discuss technology integration ideas and concerns with colleagues, they gain confidence and feel empowered to continue using technology because they feel they have more support beyond their school (Sugar & Slagter van Tryon, 2014). Lochner et al. (2015) suggested that some teachers may need additional time to collaborate, observe, and share digital activities to increase their understanding of how to effectively integrate an LMS and other innovations into their instruction. Ultimately, teachers gain vital knowledge and skills through collaboration and the sharing of expertise (Jackson, 2017).

According to Hoskisson et al. (2016), "cultures with a tendency toward innovativeness encourage employees to think beyond existing knowledge, technologies, and parameters in efforts to find creative ways to add value" (p. 515). Likewise, leaders need to think of creative ways to give teachers more time and opportunities to collaborate with learning communities (Lochner et al., 2015). Digital or virtual professional communities expand learning beyond the confines of four walls and allow teachers to establish an online presence to remain current with new instructional technologies (Sugar & Slagter van Tryon, 2014). LMSs provide the platform for supporting "the development of a collaborative team by providing a 'place' to 'convene' and share ideas, plus [provides] a visible artifact depicting shared progress" (Kastens & Manduca, 2017, p. 223). Holmes and Prieto-Rodriguez (2018) found evidence that the online LMS environment leads to growth and critical thinking skills for teachers because they develop a better understanding of the platform and have increased accessibility and interactivity to materials and peers. The study conducted by Sugar and Slagter van Tryon (2014) revealed that sharing digital resources, including modular lessons, was the most valuable aspect of participating in an online community because teachers would not have to "reinvent the wheel" (p. 59). Teachers also appreciated sharing online resources, instructional materials, and upcoming professional development opportunities as well as helping each other troubleshoot technology integration problems.

According to Cisco (2018), "an intelligent digital campus allows for the connection of people, process, things, and data" (p. 17). Continuous, evidence-based learning is valuable as it leads to improved teacher practice and student outcomes (Davis et al., 2015). The professional learning communities (PLC) model recommends that student data should be reviewed and discussed at every meeting, so teachers have a clear understanding of reality (DuFour et al.,

2010; Senge, 2006). Data helps teacher teams dissect curriculum and collaboratively develop lessons to meet student needs. Much like data reveals weaknesses in the curriculum, failure sheds light on unsuccessful strategies and should be viewed as learning opportunities (Senge, 2006). Growing from failure requires individuals and teams to be committed to the truth, find the root cause of problems in the system, identify high yield improvements, and align feedback with learning goals (DuFour et al., 2010; Jackson, 2017; Senge, 2006; Thornton et al., 2004). Collective problem-solving builds capacity, collaboration, and empowerment among colleagues in individual schools and throughout the district (Fullan, 2006; Taylor, 2002). Moreover, leaders such as school administrators and instructional coaches need to use the strategies and structures of a systems approach and review data to hold teachers accountable for reaching predetermined goals (DuFour et al., 2010). Developing a skills assessment instrument with criteria and standards can support teachers and staff in their progression of learning by informing needs-based resources and professional development (Mirriahi et al., 2015).

Professional Development

Research shows that technology-enhanced learning increases student motivation, engagement, self-directed learning, metacognitive skills, and interaction with teachers (Alenezi, 2018; Cisco, 2018; Zucker, 2005; Kroksmark, 2016). When teachers implement new technologies in ways that transform learning environments, education becomes more relevant to students, and students develop knowledge-creation skills and competencies (Cisco, 2018; Fullan, 2006). Student achievement improves when teachers' knowledge and skills correspond to both the topic being taught and the instructional methodology (Darling-Hammond, 2004). Torrisi-Steele and Drew (2013 as cited in Mirriahi et al., 2015) found that low technological pedagogical content knowledge (TPACK) compromises appropriate technology integration and limits the

facilitation of effective student learning. Therefore, teachers need experience and continuous professional development opportunities to craft new pedagogical knowledge to accommodate new ways of thinking and learning using technology (Fullan, 2006; Cisco, 2018). Dedicated professional development regarding the LMS can help address shortcomings in skills and confidence, which typically prevent some teachers from using the platform (Jackson, 2017). Moreover, the frequent use of technology helps teachers overcome their lack of knowledge and fear of using digital tools (Badia et al., 2013; Cisco, 2018). Teachers require time to learn and practice with technology and experience trial and error to gain confidence as digitally responsive educators (Cisco, 2018; Lochner et al., 2015).

Sustainable innovation occurs when schools have supportive instructional leaders, a collaborative culture, a robust infrastructure, and ongoing professional development (Nworie, 2014; Sugar & Slagter van Tryon, 2014). Professional development and teacher preparation are vital factors in the successful adoption of technologies, including an LMS (Waxman et al., 2013). Computers change the learning activities of students and the teaching practices of teachers from analog to digital. As a result, the lived experiences of students and teachers must adapt or "stretch" to accommodate expectations regarding the use of new and innovative learning tools (Dewey, 1938; Kroksmark, 2016). Blended learning and the use of an LMS present different instructional design methods for many educators that may extend past the knowledge and experiences they already possess. According to Kroksmark (2016), teachers experience apprehension and uncertainty about their role and the best use of computers in the classroom because "digitization changes not only the teacher's position but the "pupils' individual way of assimilating, processing, and developing knowledge" (p. 50). Teachers need guidance in the process of self-analysis and on how to connect their personal and professional awareness and

experiences using technology to designing lessons with technology (Dewey, 1938; McKenney et al., 2015; Schmid & Hegelheimer, 2014).

According to Lochner et al. (2015), for an LMS and other technologies to become a long-term part of secondary institutions, teachers need support in overcoming their personal hesitancies and managerial concerns about the LMS and technology innovations. The researchers based their conclusions on a quantitative study of 206 secondary school teachers representing 16 school districts in Arizona. The study examined the concerns of teachers regarding the adoption of an LMS using the Concerns Based Adoption Model (CBAM) as the theoretical framework (Hall, George, & Rutherford, 1979 as cited in Lochner et al., 2015). Subjects were randomly selected to complete an online Stages of Concern Questionnaire (SoCQ) regarding LMS implementation (Hall et al., 1979 as cited in Lochner et al., 2015). The SoCQ instrument "measures a continuum of concerns an individual may develop regarding technology innovation in teaching" (Lochner et al., 2015, p. 66). The questionnaire had 35 statements each representing one of seven stages or levels of concern about the platform. The levels of concern were: awareness, informational, personal, management, consequence, collaboration, and refocusing. The raw score for each stage was the sum of the responses pertaining to the levels and "each stage score ranged from 0 to 35, and the higher the score for a level of concern, the more intense the concerns are at that stage" (Lochner et al., 2015, p. 66). The study's findings revealed teachers' general lack of awareness about the functionality of the LMS, and strong concerns regarding their personal adequacy to implement and manage the platform. Based on the results of the study, the researchers recommended that administrators and other change facilitators provide professional development and support that addresses the primary concerns of teachers because teachers feel motivated to integrate technology when their individual concerns

are immediately addressed (Lochner et al., 2015). Additional support measures included providing incentives for incorporating the LMS, modeling the use of the platform, and scheduling time for teacher teams to create lesson plans that integrate technology.

The system-wide implementation or "institutionalization of an innovation occurs only when the majority of the individuals have resolved their concerns" (Lochner et al., 2015, p. 68). Professional development opportunities designed to address teacher concerns rather than technology skills helps alleviate negative attitudes that inhibit teachers' use of digital tools, including an LMS (Lochner et al., 2015). For teachers to create technology-rich learning activities and materials, they need opportunities "to learn to design in new, unfamiliar situations" (McKenney et al., 2015, p. 183). Attending face-to-face or virtual professional development sessions and designing with other like-minded educators provides a forum for exploration and collaboration regarding technology integration. The study conducted by Lochner et al. (2015) found that providing teachers more time to collaborate and observe other teachers' technology and LMS integration was one of the best ways to support the change process. Leaders need to be persistent yet flexible regarding the time it takes for teachers to work through failures and successes designing and implementing technology-enhanced instruction and be careful not to judge slow or limited progress (Fullan, 2006; Jackson, 2017).

Effectively implementing technology-enhanced learning requires teachers to know the best use of technology in education especially regarding social aspects, online collaboration, and virtual opportunities (Cisco, 2018; Hilliard, 2015; Schweighofer & Ebner, 2015). A comprehensive review of the literature by Vickrey et al. (2018) regarding educator TPACK found that faculty need a better understanding of the meaningful integration of technology in instructional practices. Teachers' attitudes and self-efficacy of TPACK "influence their degree

of willingness to accept technological and pedagogical innovation" (Badia et al., 2013, p. 791). The amount of institutional support can determine the degree of LMS implementation and the success of blended and technology-enhanced learning (Badia et al., 2013). According to Menchaca et al. (2003), "faculty need help integrating online and face-to-face collaborative learning into their instructional practices" (p. 5). A review of 87 case studies by Wang et al. (2015) revealed that institutional support for professional development was instrumental in transforming teachers from "knowledge initiator, class controller, to facilitator, advisor, and promoter of learning" (p. 387). Showcasing positive examples of implementation and providing individual support increases adoption rates (Lochner et al., 2015). Therefore, training of faculty and staff should be part of the commitment of the school, and leadership should commit to continuous professional development regarding new and improved software programs and technologies (Hilliard, 2015).

A survey of K-12 teachers by Alijani et al. (2014) revealed that teachers felt initial training on technological tools was the most critical factor in implementation. However, Schmid and Helgelheimer (2014) found that "non-site-based technology courses have very little impact on teachers' classroom use of computers" (p. 330). Elmore (2004 as cited in Fullan, 2006) emphasized that educators need to learn how to use technology "in the setting in which they work" (p. 4). Sugar and Slagter van Tryon (2014) suggested that ongoing professional development is more effective in supporting teachers' knowledge acquisition and facilitating instructional changes than attending a one-time workshop because "ongoing activities contribute to sustained adoption of knowledge" (pp. 54-55). Therefore, campus-level instructional leaders must develop their digital capabilities to provide continued campus support beyond single technology training courses (Cisco, 2018).

To support teachers' adoption of new technologies, administrators, instructional leaders, and office staff need an understanding of software programs, a working knowledge of technology tools, and a conceptualization of the LMSs systemic functions (Alenezi, 2018; Cauthen, 2019; Cisco, 2018; McKenney et al., 2015). A study conducted by Webster (2016) found that leaders' assumptions about technology integration influenced their approaches to technology decision making. Fullan (2006) found that school leaders build capacity and gain motivation to implement new innovations when they learn with their peers. Leaders need a well-developed understanding of technology-enhanced learning to make purposeful and informed decisions prior to implementation because support includes daily use of technology to create and grow a digital culture (Cisco, 2018). Leaders who use technology and an LMS for administrative and instructional purposes are perceived to be innovative and supportive leaders (Bingham, 2017; Waxman et al., 2013). Moreover, leaders who promote and model structure help to eliminate confusion and provide continuity for students, staff, and the entire organization (Cauthen, 2019). Menchaca et al. (2003) suggested that districts implement training programs for instructional leaders, so they have an understanding of technology practices and a common language to provide consistency and clarity across the system.

Summary

The review of the literature examined the relationship between learning theory and blended learning; teachers' and students' perceptions of blended and technology-enhanced learning; the use of learning management systems in education; systems thinking and strategic leadership practices; and teachers' perceptions of leadership support for their implementation of new innovations, including an LMS. Additional themes emerged in the analysis of the literature pertaining to collaborative team culture, organizational learning, and professional development

opportunities for educators and academic leaders. The literature on experiential learning theory identified the epistemological foundation of knowledge acquisition in individual and social contexts: specifically that individuals learn by linking previous experiences and knowledge to present content (Dewey, 1944 as cited in Wheeler, 2016). A review of research regarding the systems thinking approach demonstrated the interoperability of LMSs in maintaining structure and connectedness between the various components and subsystems of an organization. The institutional implementation of blended learning using an LMS involves substantive change which requires strategic leadership, systemic planning, and structure within the organizational infrastructure (Bingham, 2017; Fassbender & Lucier, 2014; Staker & Horn, 2012). The literature revealed that systems help shape a collaborative school culture which is the core of the change process and leads to both educator and student success utilizing technology (Badia et al., 2013; Waters & Marzano, 2006; Waxman et al., 2013).

Research about strategic leadership uncovered a link between sound leadership practices and organizational success because leaders ensure that a stable infrastructure exists and resources are allocated appropriately (Galbraith, 2014). Leaders facilitate shared vision, establish standard operating procedures, understand pedagogy and assessment, and establish open networks of communication and data sharing among stakeholders (Pafford, 2018; Thornton et al., 2004). Implementation of an LMS provides the infrastructure to communicate system-wide educational initiatives and distribute timely information to the entire organization (Davis & Surajballi, 2014; Kastens & Manduca, 2017). Robust infrastructures and leadership practices establish how organizations adapt to change and are significant factors on how technology is used throughout the organization (Badia et al., 2013). A review of the literature revealed that a blend of various leadership styles was perceived by teachers to be influential in managing change, including

transactional, distributive, transformational, and servant leadership. Leaders can improve organizational performance and foster change by "engaging and enacting the adaptive and participatory practices of discovery, framing, and action" (Davis et al., 2015, p. 335). First-level leaders in education are instructional and technology coaches. The literature showed that full-time, campus-level instructional and technology coaches increased teachers' technology skills, confidence, and implementation of new digital tools, including an LMS. However, the literature indicated that campus-level leaders and coaches must develop their digital capabilities to provide ongoing teacher support for technology integration (Cisco, 2018).

The research literature demonstrated that team learning initiates change, and change allows organizations to adapt to evolving environments. Cooperative or group learning activities increase the learning outcomes of individuals and the performance of organizations (Davis et al., 2015; Perez-Mateo & Guitert, 2012). Team learning helps establish goals, roles, responsibilities, workgroup norms, and interpersonal relationships (Burke, 2018). A review of the literature showed that face-to-face and virtual collaboration and professional development allows faculty to stay connected in cooperative environments through online, blended, and distance learning (Cisco, 2018). The literature also indicated that the design of professional development sessions address teacher concerns about technology integration and bring "awareness of the LMS' affordances for teaching and learning" (Lochner et al., 2015, p. 69).

The existing research about blended learning and the implementation of an LMS reveal a positive correlation between student achievement and organizational performance. However, successful technology integration requires a high level of participation from all stakeholders, especially instructors, and necessitates ongoing training and administrative support. Supportive instructional leaders create a collaborative school culture that allows educators to take risks and

improve their teaching practice (Haynes & Maddock, 2014). Technology integration and LMS implementation initiatives and strategies must be prioritized for sustainable improvements to be realized in educational environments. An understanding of experiential learning theory and systems thinking provides an actionable framework for initiating successful school change.

III. METHODOLOGY

To answer the research questions and address the problem of low LMS implementation in K-12 schools, a qualitative case study methodology was used to examine teachers' perceptions of leadership support for their implementation of an LMS as a delivery platform for blended learning. Leadership support encompasses district and school administrators (superintendent, directors, principals, and assistant principals), instructional coaches, curriculum specialists, campus technology coaches, and district technology coaches. Instructional leadership practices include components of systems thinking design, such as strengthening organizational infrastructures, cultivating shared vision, communicating with stakeholders, building a collaborative culture, modeling desired behaviors, and providing ongoing professional development opportunities (Özdemir, Sezgin, & Kiliç, 2015; Senge, 2006).

Qualitative research assists researchers in accessing the thoughts, perceptions, and emotions of study participants, which "can enable the development of an understanding of the meaning that people ascribe to their experiences" (Sutton & Austin, 2015, p. 226). The objective of this qualitative study was to examine teachers' implementation of an LMS and their perceptions of leadership support. This chapter will describe the research design, participant recruitment, research questions, instrumentation, data collection, and data analysis.

Research Design

A qualitative non-experimental design, including a multisite, instrumental case study, was chosen to examine teachers' perceptions of leadership support for their implementation of an LMS in urban middle schools. The qualitative, case-based research approach was chosen to uncover in-depth responses from participants regarding their use of the Canvas LMS. Case study is a comprehensive investigation of a phenomenon within a real-life context (Stake, 2006; Yin, 2009). More specifically, case study is a "strategy of inquiry in which the researcher explores in depth a program, event, activity, process, or one or more individuals" (Creswell, 2009, p. 13). Stake (2006) described case study as "both a process of inquiry about the case and the product of that inquiry" (p. 8). Yin (2009) recommended the use of case-based research for exploratory purposes of infrequent or rare phenomenon. Likewise, McKeown (1999) suggested that case study research is beneficial when there is little known about the phenomenon such as in this case of low rates of LMS implementation in K-12 education (Akgunduz & Akinoglu, 2017; Alenezi, 2018; Aparicio et al., 2016; Bingham, 2017; Magana & Marzano, 2014; Varier et al., 2017; Waters & Marzano, 2006). The case study approach is appropriate if it leads to new perspectives, insights, or theory (Bonoma, 1985). Furthermore, case study develops a "deeper understanding of complex social or organizational phenomena" (Ragin & Becker, 1992, as cited in Davies, 2015, p. 2).

Participants

Case studies can be investigations of single or multiple cases (Creswell, 2013). In this research study, the multiple cases pertain to two middle schools within a large, urban, public school district. There are 20 middle schools in the district, and each school is comprised of grades 6-8. The district is located in the southwestern region of the United States and has

approximately 82,000 students and 5,700 teachers from diverse backgrounds, as illustrated in Figure 3.1 and Figure 3.2 respectively.

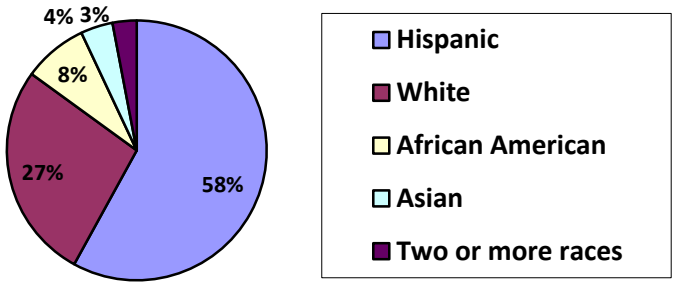

Figure 3.1. School district student demographics

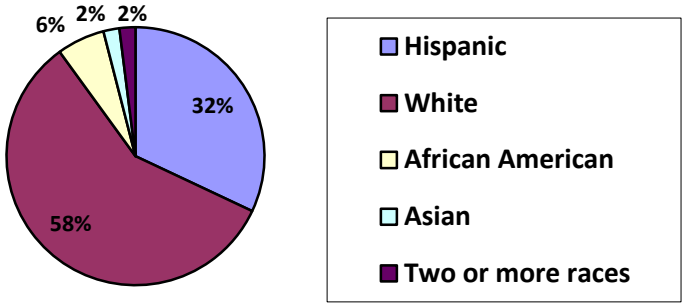

Figure 3.2. School district teacher demographics.

District educators have, on average, 11 years of teaching experience, which is similar to state statistics. On average, 80% of teachers in the district have a Bachelor's degree, and approximately 20% have a Master's degree or higher.

The two sites were chosen based on their regional location in the district. Regions were delineated as eastern and western in relation to their proximity to a major interstate highway. Students in the western region represent a population categorized as 5%-31% economically disadvantaged and 24%-50% minority. Conversely, students in the eastern region represent a population categorized as 73%-96% economically disadvantaged and 84%-99% minority. One school from each region took part in the study to ensure the inclusion of perspectives from

teachers working in schools with diverse populations. Figure 3.3 represents the socio-economic status of the schools from the two regions involved in the study: Site One is from the eastern region, and Site Two is from the western region. Figure 3.4 represents the demographic breakdown of students at each site.

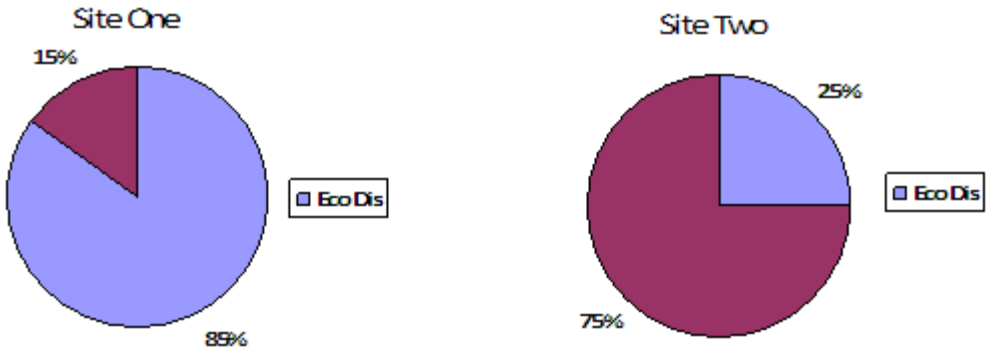

Figure 3.3. Student socio-economic status by site

Site One's student population is 85% economically disadvantaged. Site Two has a student population that is 25% economically disadvantaged. Students classified as economically disadvantaged qualify for free or reduced lunch.

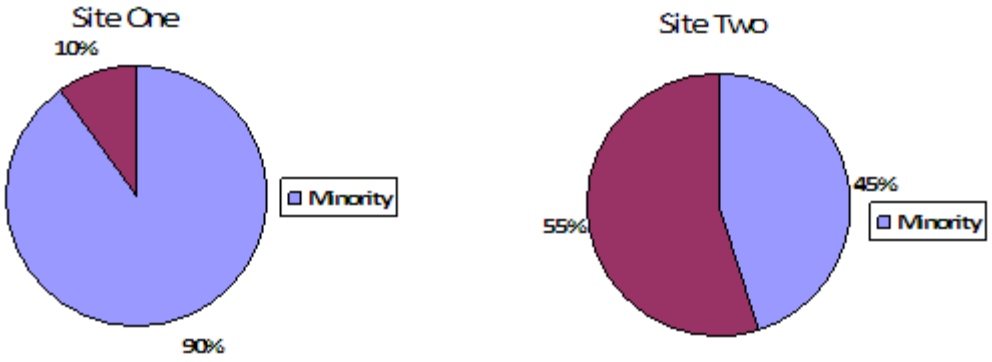

Figure 3.4. Student demographics by site

Site One's student population is 90% minority, and Site Two has a student population that is 45% minority. Minority status includes students who are Hispanic, African American, or two or more races.

According to Stake (2000), case study research is "not a methodological choice but a choice of what is to be studied" (p. 443). The two sites participating in the study are recognized as cases and are bound in the purpose of improving instructional practices with blended learning using an LMS. Furthermore, the two cases exemplified comparable characteristics to other middle schools in the district and shared common conditions for integrating technology, including an LMS, in education. Therefore, the knowledge constructed from this multisite case study can be applied to similar contexts and inform district policies and practices (Stake, 1995).

Sample

Purposeful maximal sampling was selected to garner "diverse variations of individuals or sites" (Creswell, 2013, p. 158). Purposeful sampling elicits different perspectives about the problem and provides an in-depth understanding of the phenomenon under investigation (Palinkas et al., 2013). In phenomenological case research, experts recommend interviewing one to ten individuals (Creswell, 2013; Dukes, 1984; Riemen, 1986; Yin, 2009). Small sample sizes in case studies examine particular instances which lead to transferability to similar contexts (Lincoln & Guba, 1985). Eisner (2017) suggested, "particulars exemplify more than they describe…in the particular is located a general theme" (p. 39). In this research study, the sample size consisted of ten participants: five participants from Site One, and five participants from Site Two. Participants teach general education subjects such as math, English language arts (ELA), social studies, and science to students in grades 6-8. Electives teachers, including fine arts, foreign language, special education, athletics, and career and technical education (CTE) teachers, were also eligible to participate in the study. The requirements for participation in the study were campus location (east or west), school classification (middle school), and documented use of the district's prescribed LMS for classroom instruction.

Teachers were identified as possible candidates using the site-level Learning Analytic reports. The reports showed quantitative data such as course activity, assignment submissions, and participation rates. Course activity showed the number of page views by enrolled students and was accumulated over time, as shown in Figure 3.5.

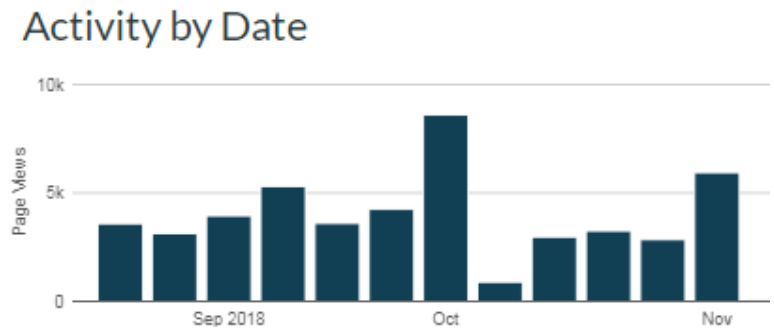

Figure 3.5. Canvas course activity

The image depicts the number of page views from one teacher's course in the Canvas LMS. Page views were automatically tabulated in Canvas based on the number of times course pages and modules were viewed by course participants and were accumulated daily throughout the school year. The data were pulled from the Course Analytics tool on the home page of the course.

According to Creswell (2013), "it is essential that all participants have experience of the phenomenon being studied" (p. 155). There are six grading terms in the school year that extend from August to May. Therefore, teachers with a minimum of 4,000 page views through the end of the 5th grading term qualified for the study because they had a basic level of knowledge and experience using the LMS throughout the school year. Site One had 16 teachers who qualified for the study, which represented 24% of the teaching staff. Site Two had 27 teachers who qualified for the study, which represented 33% of the teaching staff. The intent was to interview

teachers based on two levels of LMS use: consistent use of the LMS as a platform for course delivery and communication, and the emerging use of the LMS or use as a repository.

Teachers who had approximately 10,000 or more page views were sent an invitation to participate letter through email, as seen in Table 1. Site One had nine teachers with 10,000 or more page views and no ELA teachers with page views. Site Two had 19 teachers with 10,000 or more page views, and all academic subject areas were represented. The researcher made an effort to include teachers from a variety of grades and academic subject areas to gain differing perspectives.

Table 1

First Round of Email Invitations to Potential Study Participants

Site One - Round 1			**Site Two - Round 1**		
Academic Area	Page Views	Accepted	Academic Area	Page Views	Accepted
CTE	65,000	Yes	Band	35,000	Yes
Social Studies	17,000	No	ELA	40,000	Yes
Science	10,000	No	Science	11,000	No
Science	10,000	No	Science	88,000	No
CTE	11,000	No	Math	55,000	Yes
AVID	11,000	No	CTE	250,000	No
Social Studies	180,000	Yes	ELA	10,000	No
Math	11,000	Yes	Math	9,000	Yes

Note. CTE is the acronym for Career and Technical Education which includes elective courses such as culinary arts, sewing, woodworking, health sciences, and technology. AVID is the acronym for Advancement Via Individual Determination and is an elective course designed to help average or at-risk students prepare for college.

In an attempt to reach sample saturation, a second round of emails was sent to teachers with no fewer than 4,000 page views as seen in Table 2.

Table 2

Second Round of Email Invitations to Potential Study Participants

Site One - Round 2			**Site Two - Round 2**		
Academic Area	Page Views	Accepted	Academic Area	Page Views	Accepted
AVID	16,000	Yes	Science	135,000	Yes
Math	4,000	No	Social Studies	5,000	No
Math	4,000	No	CTE	130,000	No
Social Studies	4,000	Yes			

Once sample saturation was met and confirmed through participant acceptance emails, interviews were scheduled by email with the individuals. Interview days and times were scheduled at the convenience of the participants. All of the participants chose to be interviewed in their classrooms at each site.

Role of the Researcher, Ethical Assurances, and Bias

According to Sutton and Austin (2015), "the role of the researcher in qualitative research is to attempt to access the thoughts and feelings of study participants" (p. 227). The researcher has a great responsibility to ensure that participants feel comfortable enough to express their thoughts and experiences. Therefore, the researcher must adhere to strict ethical codes and brief the participants about the purpose of the study and how the outcomes will be used to advance research and improve educational policies and practices (Jackson, 2017). Ethical considerations were also checked by the authorizing university's Institutional Review Board (IRB) and the

school district's Department of Research and Evaluation (DRE), and approval to conduct research was obtained prior to data collection. The researcher must also safeguard participants and ensure the confidentiality of their data (Jackson, 2017; Sutton & Austin, 2015). Confidentiality was outlined in the interview consent forms and was discussed with participants at the beginning of each interview. An opportunity for participants to ask clarifying questions was also provided. The researcher took precautions to omit identifying information such as names of participants and their colleagues from transcriptions and other documentation. Furthermore, data were stored in a password-protected digital file only accessible by the researcher.

Bias and subjectivity are unavoidable and should be discussed in a way that is clear to the participants (Sutton & Austin, 2015). A possible bias for the researcher is that the researcher is an instructional coach for the Associate Superintendent of Middle Schools in the same district as the participants. The researcher provided instructional design support for integrating technology to a different campus in the district during the 2018-2019 school year and is knowledgeable about LMS implementation. As such, the researcher may be biased or hold philosophical assumptions about the problem, which could produce "a systematic error in the research findings" (Vogt & Johnson, 2016, p. 36). Although the researcher did not work directly with the two sites in the research study, participants could experience concern regarding the position the researcher holds in the district. This problem is known as "reactivity," and it is the goal of the qualitative researcher to understand it (Walters, 2001). Maxwell (1996 as cited in Walters, 2001) explained that it is crucial that the researcher identify how they influence participant responses and how their influence "affects the inferences that can be drawn from the findings" (p. 60).

Bias may also occur in relation to the teachers who implemented the LMS into math instruction. Math teachers may be overrepresented because the district required all math teachers to complete a math module in Canvas. As a result, response bias may occur because math teachers have more experience using the platform. However, math teachers may not represent the views of the entire population (Creswell, 2013).

Research Questions

An interview protocol with eight open-ended questions was designed and implemented with the intent of collecting information through in-depth interviews. Interviewing is used to "illuminate the experiential knowledge of the participants" (Stake, 1995 as cited in Bingham, 2017, p. 529). The purpose of the interviews was to answer the following research questions:

1. What are the factors that affect teachers and the successful adoption and implementation of an LMS in teaching and learning?
2. How do middle school teachers perceive support from district and school leaders for the use of an LMS as a platform for implementing blended learning?
3. What are enablers and barriers teachers have encountered in implementing an LMS in classroom instruction?

The questions in the interview protocol focused on the central phenomenon of the study: low rates of LMS implementation in K-12 education. Questions were developed around the theoretical framework of experiential learning and the conceptual framework of systems thinking (Appendix B). The first two questions asked teachers for their perceptions about the support they received from school and district leaders for their use of the LMS (Canvas) to facilitate blended learning. The third question asked teachers to describe and evaluate school and district professional development opportunities and the impact training had on their LMS

implementation. Question four asked teachers to explain the systems their school had in place for implementing the LMS. Questions five, six, and seven asked teachers to reflect on the enablers and barriers that affect their implementation of new technologies, including the LMS. Question eight allowed participants to comment openly about their experiences implementing the LMS.

Data Collection

Interviews were the primary data-gathering method. Data collection took place in April and May of the 2018-2019 school year. Collecting data at the end of the school year was necessary so that teachers could share their experiences regarding LMS use and leadership support over the course of one school year. The data collection produced ten interviews and access to multiple online courses and digital documents. The Institutional Review Board of the sponsoring university provided authorization to conduct the study. Likewise, authorization was granted by the school district's Department of Research and Evaluation (DRE) after a review of the research proposal and interview protocol.

Materials and Instrumentation

To conduct interviews with individual teachers, campus principals had first to agree to participate in the research study. An explanation of the study and an attached participation form provided by the district were emailed to principals of campuses in the eastern and western regions of the school district (Appendix C). Two principals (one from each region) agreed to participate in the study. The principal from Site One met with the researcher in person and asked clarifying questions regarding the purpose of the study and length of the interviews. At that time, the Site One principal signed the agreement form. The Site Two principal asked clarifying questions through email regarding participant qualifications and compensation for teachers who

agreed to participate. After replying to the questions using email, the researcher then hand-delivered the agreement form to the principal's administrative assistant. The assistant scanned and emailed the signed form to the researcher and also mailed a hard copy at a later date. Both of the signed forms were scanned by the researcher and emailed to the district's DRE for verification. Approval from the district was granted to review site-level Learning Analytic reports and contact individual teachers to request their participation in the research study.

Potential research subjects were sent an invitation to participate letter via email using district email addresses from the staff directory found on each school's website. Staff directories include each staff member's name, academic subject area, school email, and classroom phone number. Demographic information such as age, race, and length of service was not available to the researcher. Invitation emails contained an introduction and description of the research study (Appendix A). Those teachers who agreed to participate in the study were contacted by email to set a date and time for the interview. Before each interview, an informed consent form with an explanation of the research study and information regarding voluntary participation and procedures for withdrawal was sent by email to each subject for their appraisal (Appendix D).

Procedures

At the time of each interview, the researcher reviewed the information in the informed consent form, explained the interview process, and answered clarifying questions. The researcher also explained personal bias by sharing the researcher's position in the district and addressed assumptions by allowing participants to ask questions about the researcher's role (Merriam, 1988). Each participant signed the consent form and was offered a signed copy to keep for their records. Consent forms included an agreement to provide the researcher with access to the participant's active Canvas course(s) and relevant documentation. Participants

enrolled the researcher as a co-teacher in their course(s) prior to the start of each interview. Co-teacher status allows access to everything in the course, including analytic data. Co-teachers cannot edit or delete anything in the course.

Qualitative data were collected through in-depth interviews using an interview protocol with eight open-ended questions (Appendix B). The interviews were conducted in person and were one-on-one. A handheld Sony IC recorder with an internal microphone, file storage, and USB port was used to record the interviews. The researcher also took notes directly on the interview protocol packet for the duration of each interview session.

Validity and Reliability

Purposeful maximal sampling showed different perspectives regarding the issue (Creswell, 2013). However, according to Creswell (2013), "it is not enough to gain perspectives" (p. 250). Yin (2009) suggested that researchers utilize multiple data sources to increase validity and reliability. Therefore, the methodology included triangulation using multiple sources and methods to provide corroborating evidence. Corroborating evidence from different sources provided validity to the findings (Brown & Dowling, 2001; Creswell, 2013). Validity refers to presenting sound evidence that the data collection instrument matches its proposed use (Creswell, 2013). Thus, the interview protocol was reviewed and approved by an expert in the field of education and a research expert in the school district's Department of Research and Evaluation. Quantitative data from the Instructure Learning Analytic reports provided by the district's Technology Integration Department identified the teachers actively using the LMS and Course Analytics showcased the data in individual teachers' courses. Course Analytics identified how teachers were using the LMS as both an information and communication platform and as a means to deliver course content. Artifacts in the form of

Campus Improvement Plan (CIP) documentation were collected from each site's website. CIP's describe strategies for school improvement in different domains. Triangulation of data from Learning Analytics and Course Analytics in the Canvas LMS, artifacts from each site, coded interview transcripts, and the research literature addressed the research questions and enhanced confidence in the research findings.

Methods to Address Assumptions of Generalizability

According to Walters (2001), "validity that looks at generalization in qualitative research includes issues that need to be examined" (p. 61) such as in cases of infrequent or rare phenomenon (Yin, 2009). The ontological assumption questions the nature of reality as seen through multiple views about the issue (Creswell, 2013). According to Brown et al. (2006), "reality is only in the meaning of the experience of the individual" (p. 122). Creswell (2013) explained that "multiple forms of evidence in themes using actual words of different individuals and presenting different perspectives" provide evidence of multiple realities (p. 20). The theoretical framework of experiential learning posits that experiences are a part of a phase or aspect of an experienced world and are not isolated to a single event (Dewey, 1938). Likewise, Watts (2014) determined that researchers must identify the worldviews of study participants and apply the data to the theoretical framework. Therefore, it was necessary for the researcher to interview several subjects to gain an understanding of various lived experiences regarding the issue. Data were collected through in-depth interviews and were recorded for accuracy, which allowed the researcher to gain varying perspectives about the phenomenon. After the interview process, the researcher reflected on the meaning of statements. Multiple realities and themes emerged based on the compilation of quotes from study participants. As a result, the researcher developed the essence of the experience that represented all of the participants' general views

(Brown et al., 2006).

The phenomenological framework follows a structured plan for collecting and analyzing data as described in the transcendental phenomenological procedural plan (Creswell, 2013). Creswell (2013) explained that this approach is comprised of determining a research problem, identifying a phenomenon to study, specifying the philosophical assumptions, bracketing out researcher experiences, and collecting data from participants by using broad, general questions about the phenomena. Phenomenological research attempts to understand reality by identifying topic-specific data based on the perceptions, emotions, and opinions of study participants to understand the phenomenon (Abawi, 2012; Creswell, 2013; Walters, 2001). As a result, the findings of some qualitative studies may not be generalizable to other populations (Lincoln & Guba, 1985; Walters, 2001). However, Maxwell (1996) stated that internal generalizability is formed through an inductive analysis of the data and the development of a theory within a setting or group. In such cases, conclusions or theories produced from one case may be applied to other cases, not in an attempt to replicate conclusions but to help similar bounded cases address the research problem (Biklen & Bogdan, 1998). Dewey's (1938 as cited in Tarrant & Thiele, 2015) pragmatic philosophy on problem-solving and its relationship to interdependencies in adaptive systems helped frame the research. Philosopher C. F. Delaney (1991) explained Dewey's view regarding the importance of problem-solving in education:

> Education is future-oriented and the future is uncertain; hence, it is paramount to develop those habits of mind that enable us adequately to assess new situations and to formulate strategies for dealing with the problematic dimensions of them…the past is not valued for its own sake but for its role in developing and guiding those critical capacities that will enable us to deal with our ever-changing world effectively and responsibly. (p. 229)

Dewey (1938) believed that problems could be solved by reflecting on past experiences and applying that knowledge to new situations. Consequently, the researcher took a pragmatist view by focusing on the problem being studied, the research questions, the data gathered from participant responses, and the practical implications of study outcomes (Creswell, 2013; Patton, 1980).

Data Analysis

According to Stake (1995), in-depth document analysis and interviewing are two ways to elucidate participants' experiences and provide the context of the case. An examination of artifacts, teachers' Canvas courses, and analysis of course analytic data informed the findings as did the teacher interviews. The purpose of the interviews was to elicit teachers' perspectives regarding leadership support for their implementation of an LMS in urban middle schools. The open-ended questions focused on gaining information about the research questions and teachers' perceptions.

The audio-recorded interviews were uploaded and transcribed using the application programming interface (API) Temi. Temi API is an automatic audio-to-text transcription service and is password protected. Although Temi has advanced speech recognition technology, the transcriptions were not 100% accurate. Therefore, the researcher verified the accuracy of the transcriptions against the audio recordings and edited the transcriptions where appropriate. The researcher also read each edited transcription while listening to the recording to correct any errors and anonymized the transcript so that the participants could not be identified from anything that was said (Sutton & Austin, 2015). The finalized transcriptions were then uploaded to a password-protected digital file and removed from Temi API. The interviewees reviewed

and validated the transcriptions in an attempt to ensure accuracy and validate the contents (Creswell, 2013).

Validated transcriptions were analyzed and coded based on the frequency of specific content occurrence and were then classified (Creswell, 2013). Sutton and Austin (2015) explained, "coding refers to the identification of topics, issues, similarities, and differences that are revealed through the participants' narratives and interpreted by the researcher. This process enables the researcher to begin to understand the world from each participant's perspective" (p. 232). Lincoln and Guba (1985) suggested that the process of interpretation helps researchers make sense of the data or find the broader meaning of the data.

An inductive approach was used to analyze the interview transcripts from each site. The goal of the inductive approach was to examine the data to generate a new theory (Gabriel, 2013). According to Patton (1980), "inductive analysis means that the patterns, themes, and categories of analysis come from the data; they emerge out of the data rather than being imposed on them prior to data collection and analysis" (p. 306). Through the process of inductive analysis using data-driven coding, the researcher identified different perspectives as themes developed in the findings from each data set. Data-driven coding or open coding constructs a coding scheme based on significant categories that surface from reviewing participant responses. Patterns in the data were identified using data-driven coding. Descriptive codes using colored labels were applied directly to the interview statements and phrases in each transcription. Similar codes were gathered, and categories emerged after carefully examining the data and making connections to the interview questions and the literature review. The coding process and thematic analysis were duplicated for each site. The process of transcription, coding, and classifying helped synthesize the information into a manageable set of themes. The codes and

themes that emerged from each site's data were similar. However, the rate of code occurrence differed at each site. A table was created to show quantification of site data. A cross-case analysis was conducted and assertions made to find the overarching meaning of the case (Creswell, 2013). The final phase included representing the data by creating a concept map or diagram of the main themes. The diagram was developed based on the themes and relevant information about the three evaluation questions. The concept map visually organized the major findings from the data.

Research Question 1: What are the factors that affect teachers and the successful adoption and implementation of an LMS in teaching and learning?

The purpose of Question One was to examine the factors that influenced teachers' implementation of technological innovations and the opportunities that the district and individual campuses provided to encourage LMS implementation. Codes that emerged were learning through professional development (campus and district level), time to practice, self-directed learning, knowledge building, and peer/virtual collaboration.

Research Question 2: How do middle school teachers perceive support from district and school leaders for the use of an LMS as a platform for implementing blended learning?

The purpose of this question was to understand teachers' perceptions of the types of support that were offered by campus and district leaders to help them integrate the LMS into their instruction and the actions that leaders took to encourage teachers' use of the LMS. The eight codes that emerged from the interviews were leaderships' modeling of how to use the LMS, creation of a shared technology vision, prioritization of LMS use by administrators, execution of an implementation plan (expectations), accountability for LMS implementation, support provided by district and campus coaches (technology and curriculum), and

communication pertaining to technology integration.

Research Question 3: What are enablers and barriers teachers have encountered in implementing an LMS in classroom instruction?

The purpose of Question Three was to discover what assists or impedes teachers' efforts to implement an LMS for student use in the classroom. Through a retelling of teachers' personal experiences, the following codes were extracted: access to technology, access to digital resources, information processes, teacher attitudes, and student accessibility.

Summary

The research methodology was used to analyze the perceptions of teachers regarding the support they received for their implementation of an LMS to facilitate blended learning. A qualitative instrumental case study was chosen to fully understand the lived experiences of middle school teachers implementing an LMS in classroom instruction. The commonality of the experiences is seen as a phenomenon which can be better understood through the systematic steps of data collection and analysis in the phenomenological research framework (Creswell, 2013). According to Bound (2011), "phenomenology begins with an experience or condition and, through the narration of participants…of a shared condition, investigates the effects and perceptions of that experience" (p. 1). The phenomenological research study culminates in a description that "presents the essence of the phenomenon" (Creswell, 2013, p. 82). Inductive analysis using data-driven coding generated themes related to the research questions and the phenomenon of low LMS implementation in K-12 education. The analysis was conducted through the theoretical lens of experiential learning and the conceptual framework of systems thinking. The outcomes of this study will further the research and identify effective leadership

strategies for supporting teachers as they implement new technologies, including an LMS. The findings of this research study are outlined in Chapter IV.

IV. RESULTS

The objective of this instrumental multi-site case study was to examine teachers' perceptions of leadership support for their implementation of a learning management system (LMS). The researcher analyzed how these perceptions affect teacher use of an LMS to facilitate blended learning in urban middle schools. The pedagogical approach of blended learning increases student engagement and achievement (Marzano, 2004). LMSs provide the infrastructure to facilitate blended learning throughout the school system, yet public school systems have been slow to adopt such platforms (Akgunduz & Akinoglu, 2017; Alenezi, 2018; Aparicio et al., 2016; Magana & Marzano, 2014; Waters & Marzano, 2006). The goal of the study was to inform educational leaders as to the most effective strategies for the system-wide implementation of an LMS as a platform for blended learning in educational organizations. The study was examined through the theoretical lens of experiential learning regarding teachers' knowledge and experiences using the LMS and the systems that leadership utilized to support teachers in their efforts to improve pedagogy using technology. The qualitative approach allowed for an investigation into the phenomenon of low LMS use in K-12 education. The phenomenological approach provided an in-depth view of the perceptions of teachers revealed through a retelling of their lived experiences (Sutton & Austin, 2015). Through careful analysis, the perspectives of teachers led to new insights and a deeper understanding of organization

phenomena regarding the systemic integration of technological innovations (Bonoma, 1985; Davies, 2015).

Methods of Data Collection

The primary data collected were from individual interviews. The instrument used was an interview protocol with eight open-ended questions about teachers' perceptions of the supports they were provided in their implementation of the district's chosen LMS, Canvas. The individual interviews were conducted during the months of April and May during the 2018-2019 school year. Conducting interviews at the conclusion of the school year allowed teachers to reflect on their experiences using the Canvas LMS for the duration of one entire year. All sessions were held on the day, time, and place of the participant's choosing. All of the participants chose to be interviewed in their classrooms at each site. The sessions were audio-taped using a handheld audio recorder with internal storage. Each interview was guided by the same interview protocol with a set of eight semi-structured interview questions (Appendix B). The interview protocol was structured to address three main research questions:

1. What are the factors that affect teachers and the successful adoption and implementation of an LMS in teaching and learning?
2. How do middle school teachers perceive support from district and school leaders for the use of an LMS as a platform for implementing blended learning?
3. What are enablers and barriers teachers have encountered in implementing an LMS in classroom instruction?

The interview protocol guided the direction of the sessions and served to provide a basis for continuity in the collection of data from each school. Each interview recording was transcribed using the Temi API software. Interview transcriptions were validated, coded, and categorized

based on the questions in the interview protocol. A purposeful sample of study participants was obtained from the population of licensed educators teaching various academic and elective courses at two dichotomous middle schools. Interview data were collected from five teachers at each location, totaling a sample of 10 teachers: seven were females with between 5-18 years of teaching experience, and three were males with between 7-9 years of teaching experience. In order to preserve anonymity and confidentiality, each school is represented in this study individually as Site One and Site Two. Each participant is represented with a numerical designation of one through five at each school, such as Participant 2.1 or P2.1.

Data collection also included artifacts and course analytic reports showcasing frequency and type of LMS use for teaching and learning. The researcher reviewed the 2018-2019 Campus Improvement Plan (CIP) and LMS analytic data for each school. LMS course data were also analyzed for each study participant for grading periods 1-5. Grading periods 1-5 occurred from mid-August through the second week of April. There are six grading periods in the school year lasting from August through the end of May. Each grading period includes approximately six weeks. Course analytic data showed that the study participants used different LMS tools for classroom instruction.

The Canvas platform allows teachers to customize the course tile housed in the LMS dashboard. If teachers do not customize the tile, the tile will auto-populate in the platform as a solid color, as shown in Figure 4.1.

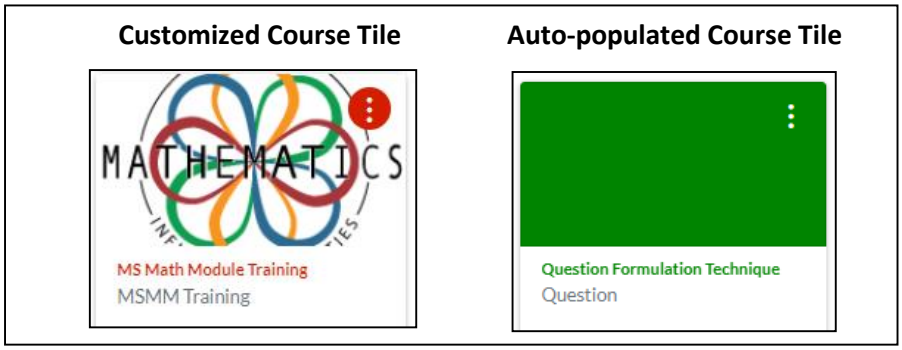

Figure 4.1. Representation of Canvas course tiles

Teachers can design a course tile to represent the content of the Canvas course. The tile helps students locate the course in the LMS dashboard. A preselected color tile will auto-populate if the teacher does not import a customized design or picture. From Instructure Canvas LMS, 2019.

Teachers can design a welcome or home page, which is the first page that students see when they open a digital course. However, teachers must designate the home page to open as the front page, or the platform will automatically open to modules view, as shown in Figure 2.4.

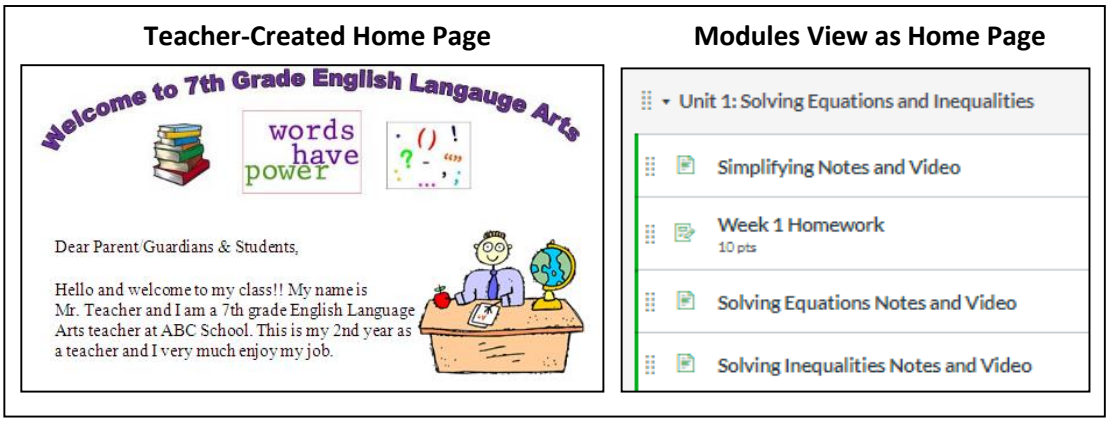

Figure 4.2. Representation of Canvas course home page

Contents of the home page may include a welcome letter, teacher biography, important links, and contact information. If a teacher does not create and designate a home page, the modules view will open instead. From Instructure Canvas LMS, 2019.

Teachers can also create a specialized course syllabus on the platform's syllabus page by inserting text into the HTML content-rich editor, as seen in Figure 4.3. The course summary automatically generates in the course syllabus when teachers add assignments and quizzes. The additional syllabus information must be added by the teacher of the course.

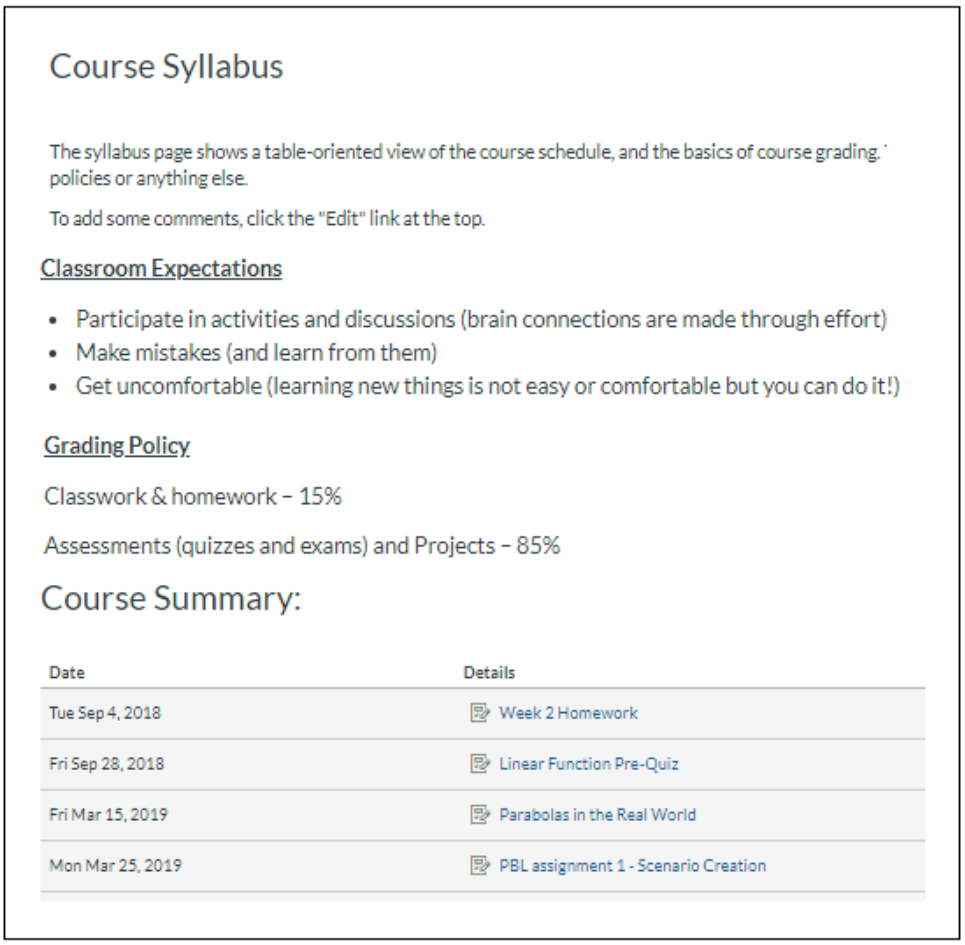

Figure 4.3. Representation of Canvas course syllabus

The course syllabus is an existing page within the LMS platform. The course summary automatically generates when teachers create assignments and quizzes. The Classroom Expectations and Grading Policy were added by the teacher in the HTML content rich editor. From Instructure Canvas LMS, 2019.

This chapter presents the school and general course data as two individual case studies,

one for each school site. The case studies are based on artifacts and analytic data retrieved from the Canvas LMS. The interview question results reflect descriptive data from the participants' own words, perceptions, and experiences. The data were examined and discussed for each site and participant. A summary of the themes that emerged from the data follow the research question results. A cross-case analysis identified common and disparate themes between the two sites. An inductive coding process defined by Patton (1980) resulted in 29 codes and six categories, as shown in the coding hierarchy in Table 3.

Table 3

Coding Hierarchy of Interview Data

Coding Categories	
Category: Learning	**Category: Infrastructure**
Subcategory: Professional Development	**Subcategory: Access**
Code: District PD	Code: Access to Technology
Code: Campus PD	Code: Access to Resources
Subcategory: Independent Learning	**Subcategory: Information**
Code: Self-directed	Code: Communication
Subcategory: Experience	Code: Storage/Retrieval
Code: Building Knowledge	
Code: Time/Practice	
Category: Support	**Category: Culture**
Subcategory: District Coaching	**Subcategory: Collaboration**
Code: Technology Coach	Code: Peer
Code: Curriculum Coach	Code: Virtual
Subcategory: Campus Coaching	**Subcategory: Attitudes**
Code: Technology Coach	Code: Fear
Code: Instructional Coach	Code: Buy-in
Code: IT Support	
Category: Leadership	**Category: Student Impact**
Subcategory: Systems	**Subcategory: Access**
Code: Vision	Code: Access to Technology
Code: Implementation Plan	Code: Access to Content
Subcategory: Strategy	Code: Parent Access
Code: Modeling	**Subcategory: Systems**
Code: Prioritization	Code: Behavior Management
Code: Accountability	Code: Consistency
	Code: Preparedness

Creswell (2013) recommended "winnowing" (p. 184) the data by developing no more than 25-30 codes and five or six categories. Creswell (2013) described themes as "broad units of information that consist of several codes aggregated to form a common idea" (p. 186). The results were examined and discussed as they related to the research questions and the theoretical and conceptual frameworks of experiential learning and systems thinking.

Research Findings

Site One

Case study. Site One is located near a major interstate highway in the eastern region of the school district. During the 2018-1019 school year, the site had approximately 850 students in grades 6-8. Regardless of the school year, Site One's student population is generally 90% minority. Minority status includes students who are Hispanic, African American, or two or more races. Site One typically has approximately 29% or 250 students who are English Language Learners (ELL) and 15% or 130 students who receive special education services. Site One was classified by the district as a low performing school. The school earned a cumulative 67% in all subjects on the state assessments for 2018. As such, Site One's Campus Improvement Plan (CIP) included specific objectives and strategic priorities regarding academics, student behavior, community engagement, and technology integration (specified under the category of college, career, and life).

Regarding technology, the state education agency's strategic priority is to improve low-performing schools. The CIP technology objective was "to improve integration of technology into the classroom environment" (Site One, CIP, 2018-2019). The CIP strategic plan was to "adopt a robust technology integration model for transformational use of technology for teaching and learning" (Site One, CIP, 2018-2019). The CIP did not include a documented technology

integration model. Moreover, Site One did not have a campus community course to support parent and stakeholder engagement. Community courses act as an information and communication platform for students, parents, and other stakeholders invested in the school.

Teacher demographics. Site One employed 67 teachers during the 2018-2019 school year. Sixteen teachers (representing 24% of the teacher population) qualified for this study. Participants qualified because they had achieved 4,000 or more page views in the Canvas LMS, which indicates a minimum level of experience using the platform. Site One study participants included teachers who had between 5-16 years of experience, as shown in Table 4. Three of the participants were female, and two were male; all participants were Caucasian.

Table 4

Site One Teacher Demographics

Gender	Experience	Subject
Female	16 years	AVID
Female	15 years	Math
Male	9 years	CTE
Male	7 years	Social Studies
Female	5 years	Social Studies

Analytic data. All of the active LMS courses at Site One accumulated approximately 370,000 page views during grading periods 1-5. Individual teachers' course data revealed varied duration and type of LMS use by participants, as indicated in Table 5.

Table 5

Course Analytic Data Disaggregated by Participant

Participant	Page Views	Duration	Teacher Home Page	Course Title	Teacher Syllabus	Announcements	Calendar/ Assignments	Discussions	Quizzes
1.1	180K	1-5	X	X	X	5	2	5	12
1.2	4K	5	✓	X	X	X	3	X	X
1.3	11K	1,4,5	✓	X	✓	X	2	2	4
1.4	16K	3,4	X	X	X	X	3	7	1
1.5	65K	1-5	X	X	X	X	50+	X	X

Note: Duration pertains to the grading periods that the participants used the LMS for classroom instruction. X=no, ✓=yes. Numerals signify the number of times each LMS tool was used during grading periods 1-5.

Participant 1.1 used the LMS on a regular basis during grading periods 1-5. Additionally, P1.1 used the most LMS tools and was the only teacher to use the announcement feature to communicate with students. P1.1 designed discussion forums to allow students to answer teacher prompts and respond to peers. P1.1 also used the "Quizzes" feature more than other participants. Quizzes automatically grade student work and can be programmed to reteach material if students perform below expectations. Participant 1.2 used the LMS the least and only for one grading period. However, P1.2 is the only teacher who created a home page to welcome students to the course. Participant 1.3 created both a home page and a syllabus but uploaded them as pdfs into a module instead of including the information on the designated platform pages. Therefore, students did not see a welcome page when they opened the digital course or a teacher-created syllabus on the syllabus page. P1.3 used the LMS at the beginning of the year to introduce students to the course. Mid-year, the course was used interactively by students because the district academic department mandated that all students complete a minimum of one math module during the school year. As a result, students experienced two discussion forums, four quizzes, and two assignments. Participant 1.4 used the LMS as a research tool during a problem-based learning unit for the duration of two grading periods. Documents with research

links were uploaded to modules in the course. P1.4 also used discussion forums as a platform for students to answer questions about their research. Participant 1.5 used the LMS solely as a distribution and submission tool. P1.5 regularly used the LMS with students throughout grading periods 1-5 as a means to distribute assignments and homework. As a result, the course calendar contained several due date reminders because assignments that are given due dates by the teacher auto-populate in the course calendar. Students were also able to submit assignments digitally. None of the participants at Site One customized a course tile in the LMS dashboard.

Site Two

Case study. Site Two is located in the western region of the school district. During the 2018-1019 school year, the site had approximately 1300 students in grades 6-8. Regardless of the school year, Site Two's student population is generally 45% minority. Site Two typically has approximately 10% or 130 students who are English Language Learners (ELL) and 12% or 150 students who receive special education services. Site Two has consistently met state expectations in all subjects and domains. The school earned a cumulative 83% in all subjects on the state assessments for 2018. Site Two's CIP included survey results, specific objectives, and strategic priorities for technology integration. The CIP technology survey results indicated that "Teachers have sufficient training and support to fully utilize the available instructional technology…teachers have sufficient access to instructional technology, including computers, printers, software and Internet access" (Site Two, CIP, 2018-2019). The CIP technology objective was "to improve technology integration into the classroom environment and parental support" (Site Two, CIP, 2018-2019). The CIP strategic plan was to:

> Utilize the Campus Technology Coach to lead and model effective technology design strategies for learning. Increase teacher page views in Canvas and parent utilization in

> Canvas by offering morning training to parents. Increase technology competency by offering training during PD days. (Site Two, CIP, 2018-2019)

Site Two did not have a campus community course to support parent and stakeholder engagement.

Teacher demographics. Site Two employed 81 teachers during the 2018-2019 school year. Twenty-seven teachers (representing 33% of the teacher population) qualified for this study. Participants' qualified because they had achieved 4,000 or more page views in the Canvas LMS, which indicates a minimum level of experience using the platform. Site Two study participants included teachers who had between 4-18 years of experience, as shown in Table 6. Four of the participants were female, and one was male; all participants were Caucasian.

Table 6

Site Two Teacher Demographics

Gender	Experience	Subject
Female	18 years	AVID
Female	14 years	Math
Female	8 years	ELA
Male	7 years	Band
Female	4 years	Science

Analytic data. All of the active LMS courses at Site Two accumulated approximately 1,700,000 page views during grading periods 1-5. Individual teachers' course data revealed similar duration of use but type of LMS use varied by participants as indicated in Table 7.

Table 7

Course Analytic Data Disaggregated by Participant

Participant	Page Views	Duration	Teacher Home Page	Course Tile	Teacher Syllabus	Announcements	Calendar/ Assignments	Discussions	Quizzes
2.1	53K	1-5	X	X	✓	3	11	7	5
2.2	35K	1-4	✓	✓	X	X	17	2	X
2.3	9K	1-5	X	X	✓	60+	14	3	2
2.4	39K	1-5	✓	✓	X	30	30	1	2
2.5	136K	1-5	X	X	X	X	45	7	16

Note: Duration pertains to the grading periods that the participants used the LMS for classroom instruction. X=no, ✓=yes. Numerals signify the number of times each LMS tool was used during grading periods 1-5.

Participants 2.1, 2.3, and 2.4 used the LMS regularly during grading periods 1-5. Additionally, P2.1 and P2.3 used all of the LMS tools but did not create a teacher home page or customize a course tile in the LMS dashboard. Participant 2.4 used every LMS tool except for the syllabus. However, P2.4 designed and designated a home page and customized a course tile. All of the study participants except P2.2 used the "Quizzes" feature with P2.5 using it the most with 16 assigned quizzes. P2.5 was the only teacher who utilized the mastery paths feature in "Quizzes" as an immediate intervention strategy. Teachers can design mastery paths to redirect students to pages in the module that contain the content they need to review as indicated by their assessment performance. Participants 2.4 and 2.5 used the assignment feature the most and had the most calendar postings. The calendar feature allows students to visualize upcoming due dates for assignments and quizzes in all of their course enrollments. A "To Do" list also populates in the right-side toolbar of the dashboard until assignments and quizzes are completed. Of note, Participant 2.3 had the least number of page views, but the most announcements (60+). P2.3 accumulated the page views primarily from implementing the required math module created by the district's math curriculum department. P2.3 consistently used announcements during grading periods 1-5 to communicate with students about upcoming assignments and quizzes.

Announcements are a separate tool from calendar postings and do not auto-populate. Announcements stream across the top of the course home page and are also directly delivered to the recorded email and phone number for the LMS account user. Therefore, students and parents can receive the announcements in personal emails and text messages if they are linked to the LMS. Participant 2.4 frequently used the announcement feature as well with approximately 30 posted announcements.

Research Questions

The interview protocol with eight open-ended interview questions was based on the three central research questions of the study. The questions were approved by the university's Institutional Review Board and the school district's Department of Research and Evaluation to ensure they met the requirements for research involving human subjects. The interview protocol was approved by both of the governing agencies. The questions were formed to be open-ended to solicit detailed responses. The researcher read each question orally and provided participants with a notecard containing individual questions. Notecards were numbered with the corresponding question and were distributed one at a time. The participants responded to the primary questions from the interview protocol and to any additional probing questions that were asked by the researcher. Notecards were collected at the conclusion of each interview.

Research Question 1: What are the factors that affect teachers and the successful adoption and implementation of an LMS in teaching and learning?

District-level professional development. All of the study participants mentioned taking part in district-sponsored professional development (PD). Seven of the ten participants positively perceived PD opportunities provided by the district. Participant 1.1 shared, "over the summer, it was really helpful to go to those summer conferences." Participant 2.2 also

commented about the summer PD opportunities: "I attended the particular course called Canvas for blended learning and the folks there, uh, were able to kind of give me a pretty good crash course on all things Canvas related." Participant 1.2 discussed the value of district PD:

> They showed us like the step by step; this is how you can incorporate all these different things. It was a district one though, and that one I felt was more informative than the campus one. The district one was the most informative, but I loved the way that they broke it down for us. They did a template, and they did a step by step, go here, go there. It was like a no fail - the step by step. I do have to say the last two years PD has been much better as far as what they offer. Um, it's been varied. It's stuff that we can use immediately.

Two participants from Site One were part of a cohort involved in one of the district's credentialing programs. Both participants described the experience as the most influential factor in their implementation of the Canvas LMS. Participant 1.3 stated:

> it trained me, but it also challenged me to, to reach outside my comfort zone. Um, so I learned how to create modules. I learned how to use Canvas. I learned the different models of blended learning. And so I feel like, um, it really helps me learn how to use that as a tool along with other teaching strategies that you currently already have.

Participant 1.4 shared that the structure of the cohort allowed them to "experience [Canvas] in a variety of different ways as a student and really let me figure out how I would want my students to experience Canvas." However, three participants from Site Two negatively perceived other district PD opportunities. Participant 2.1 stated, "it was so much information so, so soon that it did not go from short term memory to long term memory. It wasn't enough practice; it was just like, here's all the information." Participant 2.3 described the PD they attended as "unstructured"

and “I left not feeling like I had things that I could use right away.” Participant 2.5 had similar feelings about district-level PD:

> A lot of that training I honestly didn't find particularly helpful except for like one of them, um, where they actually had us create stuff. Cause like a lot of the trainings that I went to, I went to several that were just like them talking about it, but not actually us teachers having a chance to actually play around, or even having steps.

Participant 2.5 suggested that the district should start providing differentiated training for teachers and recommended that “the district find a way to do that next level training for people who are already pretty familiar with the program because I don't need beginner Canvas.”

Campus-level professional development. Eight of the participants shared their perceptions of campus-level PD. Two participants from Site Two did not recall their campus conducting PD specific to Canvas. Six participants related positive perceptions of campus PD. P1.2 suggested that learning new information about the Canvas LMS during campus PD was valuable:

> I like when we learn something new each time. If it's the same old thing telling me what Canvas is over again or um, showing me the modules, I get a little, a little bored. But if they show me a new feature of it that, that's really cool.

P1.2 explained that campus leadership asked teachers to suggest topics for upcoming professional development days. P1.2 stated, “PDs have been much nicer. They've been something to look forward to for sure.” Participants 2.3 and 2.4 shared that teachers participating in the specialized career credentialing cohorts presented information about Canvas during campus PD days. P2.3 elaborated:

> Our math people, they presented on what they did in their technology cohort. They

> presented what they, um, kind of what they had learned and what they did with the cohort. And they present it not just to math people, but to the, to the whole campus. And then when they were going through the modules, they said, this is how you could use this in your class.

P2.3 also stated that campus-level training occurred "like maybe twice" during the school year. According to P1.3 the campus PD sessions were "a sit and get kind of thing. It's not a create thing." P1.3 elucidated,

> There's been a few PDs I would say on campus - not very long. But it's really just kind of like a whole bunch of information being shot out to all the staff that they go through. Um, I think the downside of that is that it's too much information in too short a time.

Time and practice. A concern for six of the study participants (four from Site One and two from Site Two) was the need for time to learn about the platform and practice building modules. Participant 2.4 professed being "blown away by the opportunity" to use Canvas and saw it as "a really powerful tool" but was "overwhelmed by the time it took to create a lesson." Participant 1.1 stated, "There's not like a whole lot of time, and I'm the team lead, and then there's like other stuff too…and I don't have time to develop my own stuff." Likewise, Participant 1.2 shared that teaching and other obligations impeded the time needed to create modules in Canvas and expressed the need to "play" and have "time to get used to the program and feel comfortable, um, to a point that I know I can do this in an hour." P1.2 suggested that PD leaders provide more time for teachers to create lesson modules during sessions with facilitators "walking around…checking on us." Participant 1.3 shared that campus meetings and PD sessions offered great information but suggested that learning was a product of having "time to build, time to create…to work with your team of teachers." P1.3 concluded, "Not being able

to apply and create makes it a little challenging." Participant 2.1 also felt teachers were not given adequate time to practice in the LMS and suggested to "not shove all the information down all at once. Teach a little, go back and do it for a little bit, teach a bit more, go back and do it a little bit more." Similarly, Participant 2.3 stated as a new LMS user, "I like to walk away and think about things…I need processing time."

Self-directed learning and knowledge building. Self-directed learning was mentioned by participants at each site as an influencing factor for adopting an LMS. Seven participants (three from Site One and four from Site Two) indicated that they independently built knowledge on how to use Canvas. P1.3 told about using "self-help" resources in Canvas to "start building" and independently "trying to figure it out." Likewise, P2.1 said, "I'm learning as I go. That's what I do." Participant 2.5 stated, "It's taken a lot of exploring on my own to kind of figure out some of the things that Canvas can do." Participant 1.4 discussed the tools and resources they used to build modules such as analyzing media tools, copying modules, and searching Google. Participant 1.4 explained:

> There's tons of people all around the country who are like, oh, here's how you do this. So, like I needed to embed a Google Doc. I would just go to Google and say, how do I embed a Google Doc in Canvas? And then there's like a million universities that have help pages for their professors to use that are written very clearly. So I just go to Google to somebody who's already figured it out.

Participant 1.1 also expressed how self-directed learning provided "an element of experience" of what tools to use. Four participants (one form Site One and three from Site Two) discussed completing an online training course called Kung Fu Canvas as a means to build knowledge about the LMS. Participant 2.1 shared their experience of the self-paced, online course:

> I learned a whole lot because you're actually creating as you're going. It's a self-paced online course. It took me like 18 hours. It took me a while because then you had to learn as you go, but I think the online course is a better way to learn because you can do it at your own pace.

A knowledge building component of how LMS use in education impacts teaching and learning is reviewing the research that supports implementation. All of the participants conveyed that they were not shown or do not remember seeing qualitative or quantitative data regarding Canvas integration in schools.

Collaboration. Seven participants discussed peer collaboration, and four mentioned virtual collaboration as influencing factors in their implementation of the LMS. Seven participants shared positive experiences with peer collaboration. P1.3 discussed working in a professional learning community (PLC) with beginning LMS users to navigate a math module in Canvas:

> We problem solved it. We figured out, um, you know, I listened to what their concerns were, what their fears were of using the technology because most of them are not using it at all.

Participant 1.5 described a district professional development experience designed to generate interdepartmental collaboration. P1.5 explained, "They tried to get people within different branches of the department, uh, together to kind of collaborate on how they use Canvas." Participants 2.3 and 2.5 explained how they learned to design in Canvas by collaborating with peers who had more experience using the platform:

> Most of what I've learned is from the other math teachers. They did extra, like a little cohort with technology, and they were building things in Canvas and were expected to

> use technology a certain way. So, um, when I have questions and things I want to ask about Canvas I go to them. (Participant 2.3)

Participant 2.5 elaborated, "Math is definitely using Canvas. And so when I started using it, I would go to her a lot of times for questions, and she's been really helpful to me when I started using it." Participant 2.1 said, "I seek out other people, other teachers. I'm like, 'do you use Canvas? How do you do this?'" Participant 1.2 expressed a desire to collaborate with other teachers in a PLC to "play with the different features and then see how we can use [Canvas]." Three study participants mentioned virtual collaboration. Participant 1.3 explained how the use of the LMS encouraged collaboration in discussion boards and virtual meetings. Participant 2.5 used a Canvas course to share materials and collaborate with other educators who taught the same academic subject. Participant 2.1 expressed a desire for more collaboration in a digital environment: "I like it when people say, hey, I found something new to do, and they will send it out. But I would like to have maybe more teachers share something like, 'I made this module, and this did great.'"

Research Question 2: How do middle school teachers perceive support from district and school leaders for the use of an LMS as a platform for implementing blended learning?

Modeling. Four of the interview participants from Site One and three from Site Two indicated that the administrators at the school modeled how to use the Canvas LMS during staff meetings and professional development days. Participant 2.5 shared their perceptions of administrators' modeling of the LMS: "Um, they've done a few, they try to do some of our uh, like um, meetings like our school meetings via Canvas instead of trying to have us all meet together." Participant 2.3 described that LMS modules were used during campus meetings "to present information so we can see like how it's being, how they're using it to present it."

Participant 2.1 explained that campus meetings were occasionally held online with the information housed in Canvas. P2.1 stated, "I love it, but then we also need to get face-to-face." Participant 1.2 explained how school administrators modeled the use of the LMS:

> To try and get us used to it, all of admin has been putting everything in Canvas. If they were doing a presentation that day, it's in Canvas. If we're doing a staff development, um, we have the modules and here's your schedule today. Um, here's the link to a video or here's the link to the procedures for this day. Um, they definitely have been modeling it quite a bit and I think that modeling has been to try to encourage us to use it. Like, Hey, I can do this too. And the, and it shows their flaws too. They're not perfect at it. They're still learning it as well.

Participant 1.4 shared that the administrators used the LMS to upload and file documents:

> They started having all of our faculty meeting notes in Canvas, which is really nice cause then I don't need paper copies, I don't have to keep track of stuff. You can go back and see it. So they just kind of modeled using Canvas as a way to distribute information.

Technology vision and implementation plan. All of the study participants stated that they did not know if their campus had a technology integration vision or an implementation plan. Participant 1.2 reflected that the school did have a mission statement but could not remember where it was located. After the interview, the participant emailed a picture of the statement which was printed on a t-shirt. Regarding a technology vision, P1.2 said,

> In all honesty, this I'm not so sure about. Like I know we have a campus vision or mission statement, but as far as a Canvas one specifically, I don't know…You would think it would be on the school's webpage.

Likewise, Site Two participants could not articulate knowledge of a technology vision or implementation plan. Participant 2.1 said, "There could be a vision statement and a plan. I'm just not aware of it." Participant 1.3 attributed low LMS implementation to "a lack of expectations." Participant 1.1 explained that the campus principal was "resistant" to create a plan for Canvas integration because the principal "feels like it's challenging to monitor and control." Participant 2.1 stated:

> So, there's no official document that says this is our technology integration vision or this is our implementation plan, and we're going to follow it…and then we're going to progress into the next phase. So there's nothing written down - just use it.

Four of the participants from Site Two stated that at the beginning of the school year, the principal verbally told teachers to incorporate the LMS into their curriculum. Participant 2.3 reflected, "I do remember the principal at the beginning of the year talking about Canvas. So beyond the beginning of the year, I can't recall anything past that." Participant 2.1 mentioned that the minimum expectation was for teachers to create and use a course calendar and begin integrating Canvas into lessons. However, Participant 2.4 indicated that no one checked to see if calendars were created or if teachers were using the LMS but also suggested that the administrators did not prioritize the use of the LMS.

Prioritization. Six out of ten participants attributed prioritization of LMS use to leadership actions. All six perceived that the campus administrators did not prioritize the use of the LMS. Participant 1.1 said, "Canvas is on the bottom of the priority of the school."

Participant 1.3 stated:

> I think, you know, there's definitely a mindset that this is where we're going. I just don't feel like, it's not considered a priority yet. And I don't know if that's just because it's not

like a requirement. And so I think sometimes, unfortunately in education until it becomes a requirement, it's not considered high on the list.

Participant 1.4 reflected similar sentiments:

> There's not really a campus push for it, but, um, I don't think there's a campus push towards another system, so to speak. They're okay with it, but it's not really a part of their top three bullet points of what they want to accomplish, you know, not a priority.

Likewise, Participant 2.5 stated, "The administration doesn't really use Canvas all that much. The administration seems very open to using Canvas, and they want us to use Canvas, but they're not necessarily using it that much. The school really isn't pushing it." Two other participants at Site Two reiterated these perceptions.

Accountability. All of the participants had negative perceptions of leadership's accountability for LMS implementation. Participant 2.1 stated, "This year they want all teachers to integrate Canvas into their lessons, um, but no people are checking it." Participant 1.2 held the same opinion, "There's not really much follow-up…nobody's asking me about it." Participant 1.4 opined, "ideally everybody is using Canvas at some point in their class…but there's not an enforcement piece…it's not mandated." Four participants at Site Two expressed frustration that teachers were still using other platforms. Participant 2.3 expressed frustration that "there's no real accountability" for teachers to use Canvas. P2.3 explained that teachers continued to use other platforms even though "it's been communicated that we are to use Canvas." P2.3 said, "I thought this year was the 100% Canvas commitment…this year it was supposed to be Canvas all the time…so that's kind of frustrating to me." Likewise, P2.1 stated, "this year the principal said it was mandatory" to use Canvas as the digital platform. P2.1 continued, "I don't know if that's being policed or not because I know that there are teachers that

are still using Google classroom and Edmodo and all those other platforms." Participant 2.5 also expressed frustration, "if this is where the district wants to go, then our school needs to say, 'teachers, you need to get on board with this program.'" Participants 2.3 and 2.4 shared that the inconsistencies with platform use by teachers negatively impacted teaching and learning. All ten of the participants also suggested that there were no strategies to monitor teachers' growth using Canvas and no tangible incentives or rewards given by administrators to encourage LMS use.

Regarding monitoring growth, Participant 1.5 explained, "I've never had anyone ask me, 'Why did you do this like that on Canvas' or 'Hey, uh, I noticed your course' I've never had anyone intervene with me like that." Participant 1.2 shared a negative incentive espoused by a leader at Site One:

> The incentive is if we use Canvas enough, then we'll get more Chromebooks. We were told that we didn't get any more Chromebooks or laptops because we weren't using Canvas enough last year. So, I don't know if that's true or not, but that's what we were told.

Participant 2.5 said, "when the school year started, there was no incentive to use it, so I sort of just forgotten everything." Participant 2.1 stated, "There are no heavy campus-wide incentives or strategies put out there." However, Participant 2.3 indicated that at a minimum, the principal "does kudos every week and will mention things that are seen during classroom visits, and sometimes they have to do with technology."

Campus coaching support. Another code related to Question Two regarded the support provided by campus-level coaches. Two participants from Site One mentioned that the campus technology coach was available if teachers needed support, but the coach was also a full-time teacher and had limited time. Participant 1.4 explained:

> The campus tech coach did come over and help me like once or twice, but usually by the time the coach came over I had already figured it out by Googling, but I wanted the coach to double-check it anyways.

Participant 1.5 shared the role of the campus technology coach:

> The campus coach is the first and foremost, uh, the go-to person on our campus for Canvas. Uh, and definitely for the last two years, I believe has asked up front at the beginning of every school year, uh, or has basically made themselves known as the Canvas guru of sorts…has always been someone, uh, throughout the school year if I have a, uh, a question about the ins and outs of Canvas, uh, is very helpful. But is just a teacher who's become quite a guru with Canvas.

Participant 1.1 described the difficulty that instructional coaches had in providing support to the campus, "there's one [coach] for each department, but they're part-time. Everyone is part-time with regular classes." Site Two participants also described instructional coaches as being split between teaching classes and coaching. Furthermore, none of the participants at Site Two mentioned receiving support from campus-level coaches. However, two participants mentioned that the school had a campus technology coach and were instructed to send an email if support was needed. Participant 2.2 shared:

> The only reason I know how to do anything on Canvas is because of my spouse, who is also a teacher - she sat down and figured it all out. I don't feel like I learned very much from anyone on our campus about how to use it.

Participant 2.1 explained, "Our school is not Title I so…we don't have curriculum coaches on campus here, but we do have the ones in district." Four participants relayed that they did not have designated IT/hardware support on campus but were able to submit a service ticket to

request district support. However, Participant 2.4 shared that a volunteer had been coming to the school for 19 years to provide IT support. P2.4 exclaimed, "he is wonderful…he comes three days a week and he takes care of the stuff that needs taken care of with IT things." Three of the five participants at Site One indicated that they did have an IT person on campus that was "able to fix your hardware if you have a breakdown" (Participant 1.2). Participant 1.3 said it was "a blessing" to have a person who could help solve technology issues. Likewise, P1.4 said the IT person was "really responsive…not super trained but will figure it out and if anything, get you help. Just to have somebody to ask and who can find out the answers is really nice."

District coaching support. All but one of the interview participants from Site One discussed the level of support they received from the district technology coach and the curriculum coach assigned to their campus. Participant 1.1 explained the different levels of support provided by the district technology coach (DTC) and the district curriculum coach (DCC):

> I've been working with the district technology coach a bunch because the coach is our school's coach. So, the tech coach has been working with me on integrating Canvas into my classes… [the curriculum coach] haven't done anything on implementation of Canvas but maybe it's because my kids aren't tested.

Participant 1.2 taught a state-tested core subject and perceived support differently than P1.1:

> The technology coach and the curriculum specialist have both helped. The curriculum specialist is with me and is here at least once a week, and then the technology coach just comes when we really need some extra support on the technology.

Participant 1.3 explained that the only face-to-face interaction with curriculum coaches occurred during a training session to review the mandatory math module. P1.3 stated:

> So, their support came in December when the math district mandate came out. And, um, so they were at that training, the curriculum specialists. Um, and so there was like a lot of techie people and just me. It's kind of funny because I was the only one who showed up for it.

However, P1.3 positively perceived support from the DTC:

> The tech coach assigned to our campus was the one that worked with me. The tech coach came in several times because I was really trying to embrace [Canvas], and the coach was definitely available to work through those pieces.

Participant 1.4 made no mention of support from the DCC but positively perceived support from the DTC. P1.4 commented, "The district tech coach assigned to our campus is nice, is really available for questions, and gets back to us really quickly." Four of the five participants at Site Two mentioned the support provided by the DTC, and all had negative perceptions. Three participants suggested that the level of support changed when the DTC retired in December. Participant 2.2 explained that at the beginning of the year the DTC (a different coach from Site One) provided consistent support and held office hours at the campus one day each week, "but the coach retired, so I don't know who the new technology coach is." Participant 2.4 elaborated:

> The district technology design coach used to sort of house on campus…and if you ran into a problem with Canvas you could hold it until Wednesday and then they would come, and we'd work through it together. It was wonderful, and I loved it. Um, she retired in December. Um, but since then there's not a person like regularly housed on campus, and our current person has been very responsive by email. But I hesitate to ask how to do Canvas questions because I need to sit with someone, have them show me how to do it, have them watch me as I do it. And then even then, I may forget what just

> happened. Um, and I hesitate because there are so many clicks that you have to do to make one little thing happen. Um, that I hesitate to write an email to the current tech specialist because I do not want to get an email back with 400 directions or I don't want to get an email back that says, oh, that's in the [Canvas] community. Go search for it there. Because I have gotten that email and I'm like, I already did that. I couldn't find what I was looking for. I'm asking you for help now and you're telling me to go do the thing I just did. So that's, that doesn't feel good. So, um, I really, really miss having someone housed on campus that we can say help and then they can actually help. A physical being, regular support, predictable, predictable support and, and in person.

Participant 2.3 stated, "No one is coming around providing support. As far as people supporting me, like I said, we just kind of support each other within the department." Participant 2.3 also commented that they had not received support on campus from either the DTC or the DCC but had received emails from the curriculum coach sent via the campus department chair.

Research Question 3: What are enablers and barriers teachers have encountered in implementing an LMS in classroom instruction?

Access to technology. Every participant commented that the lack of technology was the primary barrier to LMS implementation. Participant 1.1 was the only study participant with enough computers for every student but explained the challenges faced by other teachers:

> The availability of Chromebooks has been a driver for me. I wouldn't; I don't think I would even use it as much as I do…we don't have one-to-one in the middle school campus. And it really limits a lot of people's ideas of what Canvas can be used for…Um, I'm lucky enough that I have a donors program where I've had, I have a full set of

> Chromebooks for all my students. It's also why I probably use it a lot more because it is essentially one-to-one in my class.

All of the other participants cited that they did not have enough technology for their students. P2.4 opined, "It [Canvas] is going to be really ineffective until we get that one-to-one." Participant 2.1 felt the same:

> I have my own computer cart, so I think that's probably why I use Canvas so much. The ones that do not have carts do not use it. The other two that I plan with, they don't have access to computers at all so everybody having access to technology would be great.

Participant 1.4 explained their apprehension in designing LMS modules:

> I have to think about how it's going to physically be possible given that we're not a one-to-one campus. You know, it's like, okay, I could make this lesson and, but then I got to make sure I also have computer access, and if I like if I don't know for sure that I will be able to get the computers when I need to teach this module, I'm not going to take the few hours it's going to take to set it [Canvas] up… it's just a real big problem to not know for sure if the timing is going to work out if I will have enough technology for the kids.

Additional challenges were that teachers had to share computer carts with other teachers, their computers were taken during testing windows, and the computers were outdated or broken. Participant 1.2 shared the difficulty of finding enough technology for student use:

> So, definitely hindering of Canvas is not having the technology. We're borrowing Chromebooks all the time for each other. If one person is doing a Canvas assignment or something on a computer, it's a mass email going out saying, 'hey, can I use your Chromebooks?' Um, and so we're like, okay, I can't plan anything with the computers this day cause I borrowed out the computers to someone else.

P1.2 also shared how computers were redistributed during testing days:

> If there's testing going on, the IT person's having to come around and collect as many Chromebooks as they possibly can just to make sure there is enough for testing and says, 'do not plan anything on the computer or Canvas or whatnot for these days.'

P2.4 discussed logistical challenges, "at the moment we don't have a way to keep the computers charged. We don't have a way to securely store them. We don't have a way to deliver them easily from one place to the other." Other technology concerns pertained to the reliability of programs and Wi-Fi access. Participant 1.3 stated, "Our iPads don't work as well. They disconnect from the Wi-Fi so easily that it's incredibly frustrating for the students. And I get that. I mean I would be frustrated too." Participant 2.1 also commented, "It's not so much the technology, it's the, uh, the software, the website…it's not enough bandwidth for the program."

Access to digital resources. Nine out of the ten participants commented about access to digital resources. Two participants from Site One had positive perceptions of digital resources. Their comments included phrases such as "Everything is in Canvas now…that's kind of where I just go" (P1.3) and "it is so nice to have the resources where I can go back and see them any time" (P1.4). Four participants from Site Two and three participants from Site One had negative perceptions about the accessibility of materials and resources. Participant 2.3 attempted to use a district-created module and expressed frustration with the functionality:

> I chose to use a card sorting activity, which was pretty cool where the kids could actually grab and drag the cards and sort them. Um, it didn't work on IPADS, it just didn't work. So I unpublished that part, and I used the rest, and it was fine that way, but disappointing. I was disappointed that I couldn't use that part of the module because I thought it was pretty cool.

When asked how participants integrated the digital content from the adopted textbook materials, Participant 1.2 reflected, “Um, we have not used the [digital] textbook. I have not imported any of the textbook stuff into Canvas. I don't know how to embed the adoption materials. I would like to know how to do that.” Participant 2.5 also commented about not using the digital textbook materials, “I've never integrated them before…I'm not even like 100% certain, like where to find the online textbooks…it would be nice for somebody who’s familiar with it to tell me.” Moreover, P2.5 stated that the interactive software programs, websites, and technology tools purchased by the district for teachers to integrate into Canvas “doesn't really function well in Canvas.” Participant 1.2 expressed concern about sharing and accessing materials in a digital environment: “How can we get one teacher to have access to another teacher to have access to our materials that are on here?”

Information processes. Three participants from Site Two and all of the participants from Site One discussed communication and the retrieval of information as either an enabler or a barrier to LMS implementation. Both Site One and Site Two had mixed perceptions. Participant 2.5 did not receive in-person support from a district curriculum coach but did receive information through email. P2.5 said, “so, I just get the like monthly emails or whatever about the content. I don't really pay attention to the emails. I just like to pick and choose what lessons I will do.” Although P2.5 seemingly held a negative perception of communication sent from the district they did describe a positive aspect of the lessons sent through email, “they're exemplary lessons, and that's all a PowerPoint…So, they're basically just utilizing Google drive…So, you just click on it, it goes to there or in Canvas. They work really well together.” Participants 2.3 and 1.3 had positive perceptions of communication and resource retrieval from the math department. P2.3 explained that they received information about math content modules through

email, "[the module] was, um, emailed. Um, I think to our department chair and then she shared it with the math department here." Participant 1.3 explained how the math department stored and distributed content and instructional materials: "The whole department has a Canvas page. So, that's, that's one way to get information out to us." Participant 1.4 discussed shifting perceptions of resource storage and retrieval using Canvas:

> I did not like Canvas at first cause I am a face to face person, but it is so nice to have the resources where I can go back and see them any time. And they stayed there. And it's like, oh, what was that one thing? And I can just go back and find it instead of where did I save it in my files, you know, or I didn't save it or something like that. So, I, I really like it for that. So, there's like ease of use, organizational structure - that's my favorite part honestly...the online.

Participant 1.1 shared that the information and materials in Canvas "never go away" and can be retrieved anytime. Participant 1.3 and 1.4 mentioned that the information provided during staff meetings was distributed and stored in Canvas:

> They started having all of our faculty meeting notes in Canvas, which is really nice cause then I don't need paper copies, I don't have to keep track of stuff. You can go back and see it. So, that just kind of using Canvas as a way to distribute information. (Participant 1.4)

Two participants from Site One also discussed the integration of the district's information systems into Canvas as an influencing factor to LMS implementation. Both P1.4 and P1.5 shared their disappointment after discovering that the grading system was not integrated with Canvas. P1.5 said, "My main concern at that time was whether or not Canvas was going to integrate with the grading system and, um, there was a little bit of a letdown."

Teacher attitudes. Lack of buy-in from teachers was cited by six of the participants as barriers to LMS implementation in instruction. Three of those participants also cited fear of new innovations as a barrier. Four participants from Site Two shared that some teachers did not want to comply with Canvas use. Participant 2.3 said, "Some teachers were reluctant to change to Canvas." Participant 2.1 reflected, "So, we have some that are digging in heels. Like they say, 'I love Google Classroom; I'm not doing Canvas.'" P2.3 elaborated, "I do know that there are teachers here that have not used Canvas. Like, my understanding was that last year it was kind of the last year of using Edmodo… some teachers are still on Edmodo." Participant 2.4 explained that because teachers had already been using websites or platforms such as Google Classroom and Edmodo, they did not want to switch to a new platform:

> They'd been working on it for years in there…they don't want to touch it cause there's so much work there already. Um, and from what I've heard from those teachers is that it's kind of hard to port that stuff into Canvas…so their website or Canvas page says go to Edmodo, go to Google Classroom."

Participant 1.1 concurred with the perceptions of participants from Site Two:

> There is a little bit of cultural hindrance because there are teachers that like to do it the way they'd done it, whether it be on Google Classroom, whether it be having to remake things for Canvas…there is a resistance.

Participant 1.3 perceived the lack of technology as the reason why teachers did not buy-in to using Canvas: "I think technology, and honestly that's probably the one thing that keeps most teachers from jumping in now." Likewise, P2.4 said, "are we gonna really spend this much time teaching kids to log on and use a computer system that we don't have access to 90% of the time because we don't have computers for everybody?" Two participants from Site One expressed

that buy-in was challenging due to the perception that Canvas was not seen as a priority. Participant 1.1 elucidated that teachers felt using Canvas was "just like checking off another box of something to do, and they see it as a requirement rather than a useful innovative tool." Participant 1.3 shared that time, and educator influences were factors for teachers:

> I know everybody is stretched for time and if not everybody's on board with it as a faculty than it's hard I think, to, to give up that much time knowing that more than half of them aren't ever at this point, not jumping in for whatever reason.

Similarly, Participant 1.5 felt, "if all of the campus was using Canvas, I think that would help me in my classroom. If I already was using it and then other teachers begin using it, I think that's going to help me too." Participants 1.1 and 1.3 indicated that teachers were afraid to spend time learning how to use the LMS for fear it would be removed in subsequent years. P1.1 explained that teachers were afraid that "It [Canvas] is just another thing that's going to go away eventually, so it's not as important for a lot of teachers." P1.3 opined

> I honestly think the other fear district-wide though is - yeah, we have it now, when is it gonna leave? You know? This is the next new thing. Okay, so Google Classroom was our big thing. So, now this is the next big thing. Okay, so when is it gonna leave and we're going to have something else? That's the fear of teachers who've been here more than three years. If you have a teacher who's been in the district more three years, that's unfortunately, the feeling.

Participant 2.1 and 2.5 also cited fear as a barrier to LMS implementation. P2.5 stated, "There is a large percentage of the teachers here who are not using Canvas or are not really familiar with it. And they are just like, 'this makes me feel uncomfortable…because it's new and it seems overwhelming." P2.1 also shared that teachers "are not confident about Canvas." P2.1 went on

to say, “it’s all about the people opening up their mindset” and suggested that teachers, “just try it before you ditch it.” Participant 1.1 indicated that teachers are “not getting into it [Canvas] and using it. The more you use Canvas, the better you know about it.”

Student accessibility. The remaining codes that emerged from the interviews pertained to student access to technology and academic content. Participants also discussed topics such as consistency with LMS use, behavior management, and student preparedness. Parent access to Canvas was a concern of participants. Four participants at Site Two shared that students’ access to technology was crucial to LMS implementation. Participant 2.1 explained the importance of student access to technology for LMS use:

> You can only plan such great lessons to be implemented via Canvas or blended learning but if the kids can't get on the computer or don't have a computer or their own devices; it's really hard…so access to technology is an enabler.

Participant 2.4 shared that they were promised new computers “for like the last three years, and we do the best with what we have, you know? But the biggest barrier is because the kids don't have consistent access.” Two participants at Site One also stated that technology was an influencing factor for students’ use of the LMS. Participant 1.1 said, “I have Chromebooks in the classroom for every student. I can put up Canvas and have them on the Chromebooks almost every day, so it really does help a lot.” Participant 1.2 described the process of repairing desktops and hardwiring computers so students could have computer access:

> The greatest enabler I would say is that I took some time to make an official computer lab in my room…I was just kind of making the best of it cause we had so much of these outdated desktops and we don't have that many Chromebooks on campus. I felt like it was just a good choice for, for not only my room but the campus as a whole.

Six participants (four at Site Two and two at Site One) indicated that students accessed Canvas by using their phones. Participant 2.2 explained how phones were utilized in class:

> I create assignments literally so that they can all be completed on a smart device. Um, a student could literally fill out and do everything from a smartphone or tablet. Mostly because these days for people or families who are having to choose between, 'do I get a phone plan for my family or do I go buy a computer?' They're buying the phone plan because that's what they can afford.

Participant 1.5 shared that students are "recognizing the phone as a tool that has to be, it has to be understood in the professional environment that, that you can utilize your phone like a tool." Participant 1.3 also allowed students to use their phones due to a lack of computers:

> The biggest hindrance is the lack of technology; we're not one-to-one…I have like eight Chromebooks. And what we do have can be sparse in its working sometimes. Honestly, most of my kids, when we do [Canvas], I would say more than at least two-thirds of them are actually doing it through their phones versus devices that I provide.

Participant 2.5 explained that phones could be used for assignments that did not require word processing: "most of the time, you know, they can be on their phones and stuff to do these things. Um, but like today they all needed a laptop because they were submitting things online."

Five participants had positive perceptions of students' ability to access and submit content in Canvas. Participant 2.3 said, "it's just nice to be able to just send them messages and have that one place where [content] all goes out and have them, um, you know, submit their assignments on Canvas." Participant 2.1, 2.4, and 1.2 described the Canvas functions that student can access. P2.1 said, "I have the ability to design how I want the kids to do a thing, and

it's all in one place. The calendars there, the announcements are there… that is the great part about it." P2.4 elaborated:

> Kids can just click on the calendar page, and then this long list of all the stuff they need is by date, and then they can click on that, and that takes them to the slide show that we did…so if they missed class, they could get all the notes there.

Participant 1.2 shared how Canvas provided access to the content for absent students. P1.2 said, "Towards the end where kids were starting to drop off a lot in their attendance I was able to say, 'that's fine. It's on Canvas. You can log on it later and do the work'…it's accessible to everyone." Similarly, participants 2.1 and 2.5 explained that content was available to students when substitutes were needed. P2.1 said, "It's super easy to do sub-plans. That's what I liked the most. I cannot be there, and the kids have, there's everything right there in Canvas." Likewise, P2.5 shared, "even if we have a sub in there, [students] can access the information. The sub can have it up in that classroom…and they could just find it on Canvas." Furthermore, P1.2 shared that differentiating for students is possible with Canvas:

> being on Canvas too, from some kids, I got more work out of them that I would have if I'd given them paper and pencil…and, um, then they moved at their own pace, but at a quicker pace than maybe I would've gone at because of the differences in the room with the different levels of kids and that I would just have something on the side in case they finished early and say, 'Here, get started on this' and then I could help the other kids.

Participant 2.2 explained how students were able to self-assess and receive feedback from the teacher by submitting reflections and assessments:

> Student self-assessment has been really useful…the way it works is there'll be an assignment where they have to upload a video of them playing something and then I will

> create a rubric to score them… I'm able to see student's video submissions. I'm able to give them specific feedback. It's a Google form…it's accessible to students.

Another influencing factor that affected student accessibility was the use of the platform by teachers. Four participants expressed that the lack of consistent LMS use by teachers was hindering students' knowledge of how to use the platform. Participant 1.5 expressed the need for more teachers to use the platform for the benefit of student learning:

> If teachers use Canvas and are talking about Canvas, it might only take two classes instead of four classes for students to know how to access their assignments simply because in every single classroom they're getting that tutorial. So it's consistent across the whole school…I see it going better just in every classroom.

Likewise, Participant 2.3 opined, "if every teacher used Canvas, it would be the one-stop place for the students and then it's not a big learning curve [because] they're familiar with it." Participant 2.5 explained the importance of teachers' consistent use of the platform to enhance student learning:

> Not everybody in our grade level is using Canvas. And so it would be really nice…if math and science were both using Canvas so we can easily do like a PBL lesson in Canvas together and, have the kids just go to one place. But like if the English and history department aren't doing that, like we can't work with them in Canvas or try to create something that we can all work together with. Something that could be like cross-disciplinary along with the whole grade level.

Six participants felt that using an LMS would prepare students for future learning. Participant 1.2 expressed the need for PLCs to discuss vertical alignment in lesson planning using technology to prepare students so that "the sixth, seventh, and eighth-graders know what to

expect." Participant 2.3 shared, "If I have sixth graders using it, by the time they get to eighth grade, it shouldn't be hard for them. They should be really comfortable with it." Participant 1.5 extended that sentiment further and stated that students "need as much familiarity with their learning environment as possible…going into high school and college [because] Canvas and blended learning is a very common system." P1.5 continued "if we're going to get them prepared for college and Canvas is a big part of college, I think Canvas should be introduced at least at the middle school level and much more holistically than it is." Participant 2.5 also discussed implications for students' future careers:

> Most of the kids figure it [Canvas] out because they've been holding technology in their hands their entire lives essentially. There's a few who would kind of need a little bit more guidance and stuff like that. I just feel like I'm a facilitator. I'm just kind of guiding them and making sure that they are comfortable in using technology and especially in using technology appropriately…they're gonna have like technology careers - that's what the future is.

Three participants at Site One mentioned behavior management. One participant discussed negative perceptions regarding student behavior issues while using technology, and two participants shared positive perceptions. No participants at Site Two correlated using an LMS with student behavior. Participant 1.2 equated increased student engagement when Canvas was used and described behavior management as "a little nicer because they're having to go around to different things." P1.2 also mentioned students had less destructive behaviors using technology because "they can't destroy it unless they break the computer." P1.2 explained that students tended to rip apart paper copies of activities "even when I put them in plastic sleeve protectors." Participant also shared that students positively responded to completing and

submitting work using Canvas:

> Class in and class out they are turning things in using their phones…and that's a level of self-control that I don't; I don't like to prohibit…I like to give them an opportunity and then when 80% of them can't handle that, well then they have to turn things in on the computer…But if they start out turning things in on the phone, I'm going to let them keep doing that because I see that habit as a big value as far as just overall self-discipline as a student.

Participant 1.3 attributed using Canvas to managing "organized chaos sometimes in my classroom...you know, it's like losing control." P1.3 stated that many teachers did not use Canvas due to "fear of the unknown, losing, losing classroom management… I think there's this fear that you lose control when you go there." P1.3 shared that teachers need to "be okay with chaos sometimes" and recommended for teachers to "set tech norms" and practice digital citizenship with students. P1.3 explained having to remind students frequently what using technology responsibly "looks like… and re remind over and over again."

Parent accessibility to the Canvas LMS was a concern for two participants at Site Two. Participants 2.3 and 2.4 perceived that parents wanted to help their children but had difficulty logging in and understanding how to use the platform. P2.4 stated, "the parents don't understand how to use it so they can't support their kids in using it. And they get as frustrated as the kids do, and then they send us ugly emails, and that's really frustrating." P2.3 suggested that parents were confused and had difficulty with the LMS because some teachers were still using other platforms. P2.3 explained, "Parents are like, 'well why are you on Canvas and some teachers are on Edmodo?' It, it's not as easy for them to get the information." P2.4 indicated that parents were "not familiar with [Canvas]. And at this point in time, there isn't a parent boot camp for

parents to come in and learn." P2.4 recommended having "a resource that parents could go to if they are having trouble getting on Canvas… having a parent Canvas site." A district-created Canvas course or resource was also recommended as a support for parents and other stakeholders.

Themes

After the ten interviews were transcribed and validated, the data analysis spiral, as shown in Figure 4.4, was used to begin the process of analyzing the qualitative data.

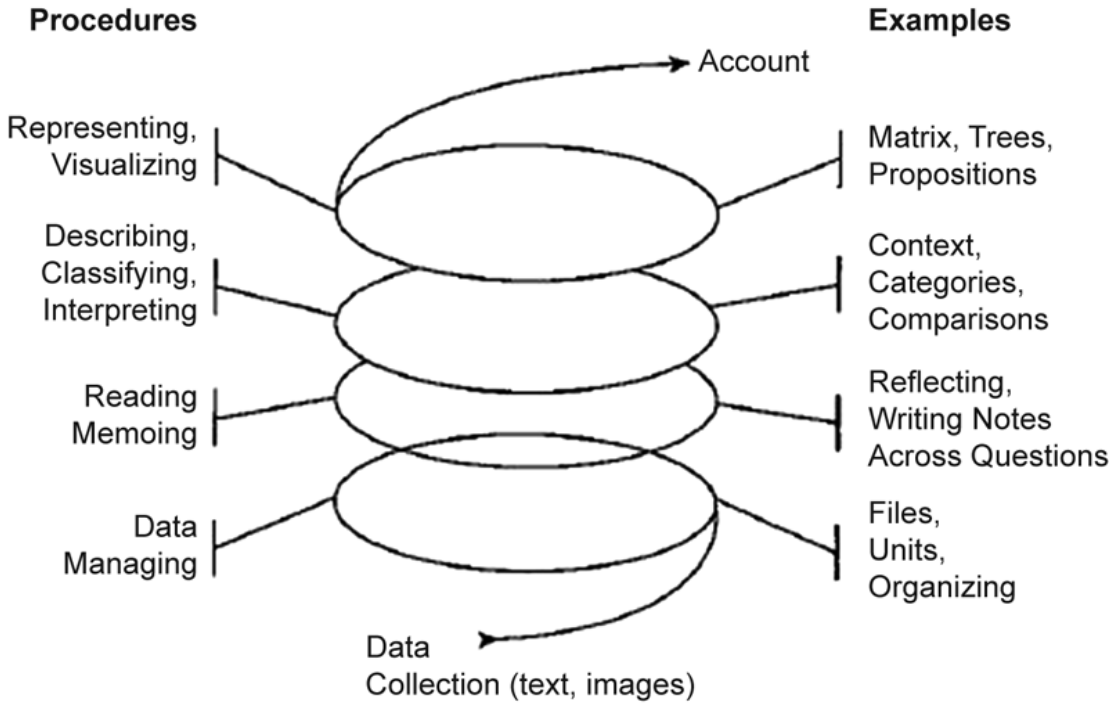

Figure 4.4. The data analysis spiral

The figure shows the process of analyzing data in a continuous analytic circles starting with data of text or images and ending with an account of the data set. From "Qualitative Inquiry and Research Design: Choosing Among Five Approaches," J. W. Creswell, 2013, p. 183. Copyright 2013 by Sage Publications, Inc.

Artifacts (CIPs, Websites), Instructure Analytic Data, and LMS data provided by the district's technology integration department were analyzed to get a sense of each site's objectives and results for LMS implementation during the 2018-2019 school year. Data were organized using spreadsheets and were stored in a digital file. Charts using SmartArt converted the numerical data into visual representations of each site's information. LMS course data were also analyzed for each study participant for grading periods 1-5. Course analytic data were disaggregated for each of the study participants, and a table was created to show how the LMS tools were used for classroom instruction at each site.

Each interview transcription was read several times to immerse the researcher in the details to try and "get a sense of the interview as a whole before breaking it into parts" (Agar, 1980, p. 103, as cited in Creswell, 2013, p. 183). Reading the transcriptions more than once and annotating key concepts helped form organizing ideas about the data. An inductive coding process using data-driven coding (Patton, 1980) generated a coding scheme based on significant and common concepts that surfaced from reviewing participant responses. Color-coded labels using Microsoft's highlighter and font palette helped identify descriptive codes in each transcript. Codes were applied directly to the interview statements and phrases in each transcription, and notes were written in the margins. Similar codes were gathered, and categories emerged after carefully examining the data and making connections to the interview questions. Categories, subcategories, and codes formed a coding hierarchy chart as a means to organize the data. Each transcription was reread to ascertain teachers' negative and positive perceptions regarding the codes in the codification chart, which revealed multiple perspectives about each code and category (Stake, 1995). Rereading the transcriptions also helped to winnow the data to a manageable set of themes (Creswell, 2013). A concept map, as shown in Figure 4.5, helped the

researcher organize and visualize the data with respect to the theoretical and conceptual frameworks. Six themes emerged from the data that were consistent throughout all of the interview transcriptions.

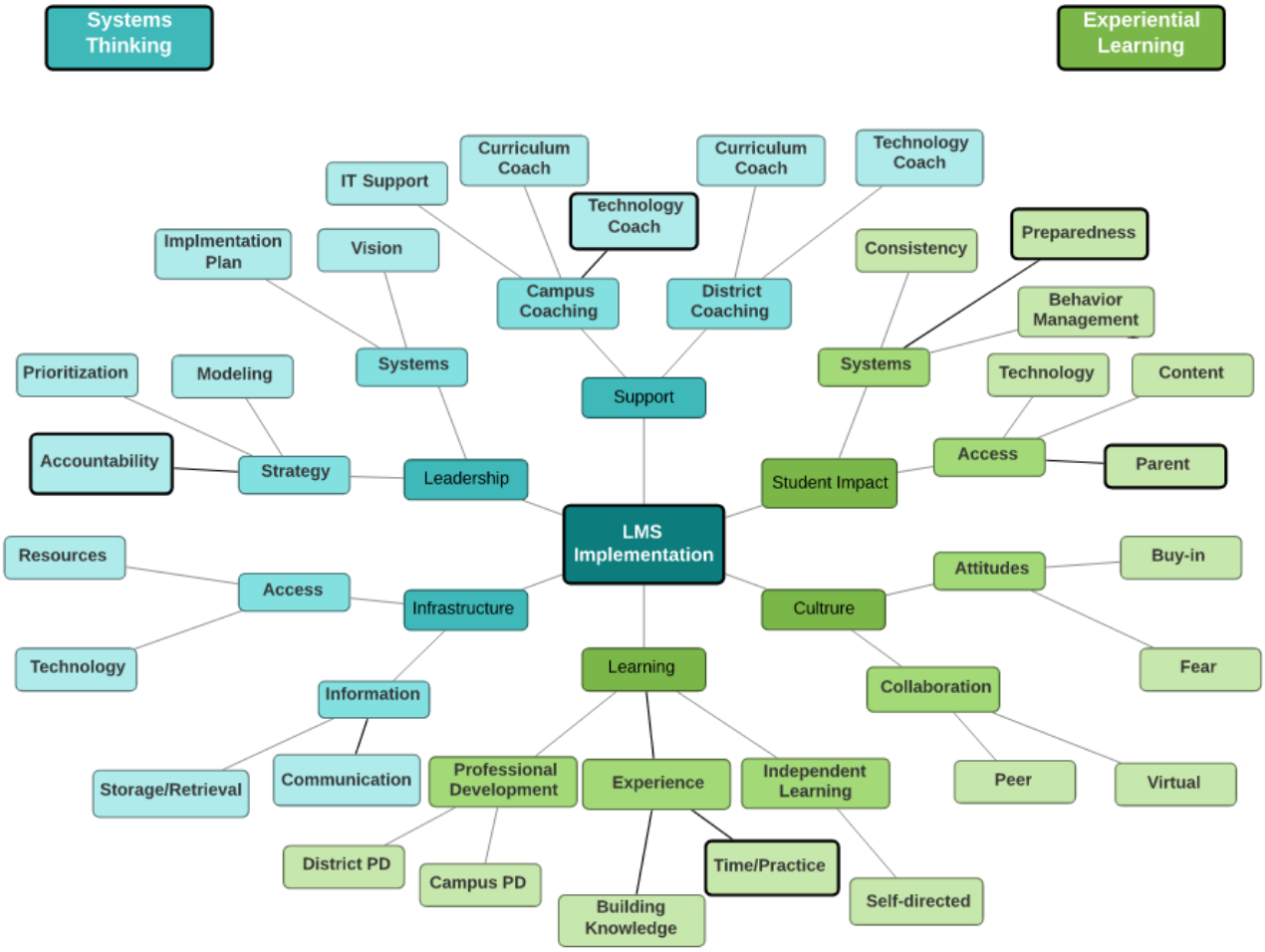

Figure 4.5. Concept map depicting categories, subcategories, and codes

The diagram shows the data categorized according to the theoretical framework of experiential learning and the conceptual framework of systems thinking. The progression of data starts with the 29 codes, gathered into 13 subcategories, and assigned to six main categories or themes, reflecting the central phenomenon of LMS implementation.

The six themes extracted from the data included teachers' perceptions of the learning opportunities provided by the district and respective campuses; the effect of school culture on the success of LMS implementation; the influence of LMS use on students; teachers' perceptions of leadership actions regarding LMS implementation; the level of support provided to teachers by district and campus coaches; and the impact of existing infrastructure on LMS integration in classroom instruction.

Teachers' Perceptions of Learning Opportunities

Seven out of ten participants positively perceived the professional development opportunities provided by the district and mentioned attending summer sessions where foundational information was provided in a "step-by-step" format. However, three participants from Site Two negatively perceived other district PD opportunities describing sessions as "boring," "unstructured," and giving "too much information." One participant suggested that the district provide training for teachers who were ready to move beyond basic exposure to the platform. Another participant advocated that district PDs allow time for teachers to practice creating modules with guidance from technology coaches. Two participants from Site One specifically discussed taking part in a career credentialing program that emphasized the integration of technology. Both participants described the experience as the most influential factor in their implementation of the Canvas LMS because they were required to create lessons using Canvas. One participant stated that "it forced me to design modules." Participants of the cohort were required to record themselves teaching the lesson and then reflect on the experience.

Eight of the ten participants shared their perceptions of campus-level PD while two participants from Site Two did not recall their campus conducting PD specific to Canvas. Six participants had positive perceptions, and two had negative perceptions of campus training

sessions. Participants appreciated being able to suggest campus PD topics and enjoyed learning from other teachers who had experience using the platform. Two participants from Site Two commented that, during campus training, the teachers in the specialized cohorts presented how they used Canvas to engage students. Two participants shared that campus-level PD was "a sit and get kind of thing" and provided "too much information in too short a time."

Participants stated that they needed more time to learn about LMS tools and practice designing modules. Six of the study participants shared that creating lessons in Canvas was time-consuming and were "overwhelmed by the time it took to create a lesson" (Participant 2.4). Four participants suggested that district and campus training structure sessions to provide more time for teachers to create modules and immediately apply new knowledge of LMS tools into their lessons.

Self-directed learning was mentioned by seven participants, and all expressed positive perceptions of independent learning to build knowledge. The participants independently built knowledge on how to use Canvas by accessing "self-help" resources and "exploring" sites like Google for information. Four participants completed a self-paced online training course as a means to build knowledge about the LMS because they were "creating as you go." However, when asked if they were provided data to support the rationale for using an LMS in classroom instruction, 100% of the participants conveyed that they were not shown any data regarding Canvas integration in schools.

Collaborating with other teachers was perceived by seven participants as a positive influencing factor in teaching and learning using a digital platform. Working in a PLC to troubleshoot problems with LMS implementation and sharing concerns about functionality were noted as beneficial. Two participants discussed meeting informally with teachers from the career

cohorts because "they were expected to use technology" (Participant 2.3) and had more experience using the platform for lesson design. Three study participants explained how virtual collaboration in discussion boards and virtual meetings allowed for the sharing of modules and other digital materials.

Eighty percent of study participants perceived communication and the retrieval of information as either an enabler or a barrier to LMS implementation. Forty percent had negative perceptions and cited that information systems such as the grading system were not integrated with Canvas. The other 40% had positive perceptions of communication and resource retrieval. Participants explained that information pertaining to Canvas and academic content was sent through district email or stored in Canvas courses created by curriculum departments. Participants appreciated that content and curriculum materials stored in Canvas "never go away." Two participants (one from each site) positively perceived the information processes used by the district's math department. They explained that information (content and instructional materials) were stored and distributed using Canvas and email.

School Culture and LMS Implementation

The effect of school culture on the success of LMS implementation was discussed by 100% of the participants at Site Two and 40% of the participants at Site One. Collaboration and teacher attitudes were specifically referenced as influencing factors for LMS use. Peer collaboration was mentioned by 80% of Site Two participants and was positively perceived by all. Three Site One participants also discussed peer collaboration as a motivating influence for using Canvas. However, one participant had not experienced peer collaboration but expressed a desire to work with other teachers in a PLC to "see how we can use [Canvas]" (Participant 1.2). Positive responses included the ability to problem solve, work with other departments, and learn

from more experienced teachers (specifically math teachers). Virtual collaboration was mentioned by three participants. Participants positively perceived the ability to conduct virtual meetings, contribute to discussion boards, and share digital materials using Canvas.

Lack of buy-in from teachers and fear of using the LMS were named by six of the ten participants as barriers to LMS implementation in classroom instruction. Buy-in was cited by all six and fear by three of the same participants. Five of the six participants (four from Site Two and one from Site One) shared that teachers did not buy-in to using Canvas because they were already using other platforms even though it was communicated that "this year it was supposed to be Canvas all the time" (P2.3). Two participants also perceived the lack of technology as a significant reason why teachers did not buy-in to using Canvas. Two participants perceived that buy-in was an obstacle due to a lack of prioritization by administrators. Three participants cited fear as a barrier to LMS implementation. Participants shared two levels of fear: (a) teachers feared that the platform would be removed in subsequent years, (b) teachers felt uncomfortable or overwhelmed learning a new innovation.

Influence of LMS Use on Students

A final theme pertained to the influence of LMS implementation on middle school students. Participants suggested that access to technology and academic content affected students' use of the platform and influenced their future learning. Participants also discussed issues with teachers' consistent LMS use, behavior management, and parent access. Six of the ten participants viewed students' consistent access to technology as essential to LMS implementation. Due to a lack of computers for every student, six participants (four at Site Two and two at Site One) indicated that students used their phones as "a tool" to access Canvas.

Fifty percent of the participants had positive perceptions of students' ability to access resources and content in Canvas. Participants shared that students could access announcements, messages, calendars, assignments, and assessments through Canvas at any time. Participants also mentioned that substitute teachers and absent students could access course content in Canvas. Participants noted that they were able to differentiate instruction for students and provide immediate feedback for students completing self-assessments and turning in digital assignments.

Another factor that influenced student learning was inconsistent use of the platform by teachers. Six participants expressed that consistent LMS use by teachers benefited student learning with the ability to create cross-curricular units, project/problem-based lessons, and vertically aligned curriculum. Eight participants viewed LMS usage as a preparatory measure to help reduce the "learning curve" in future classes and in higher education.

Three participants at Site One mentioned behavior management. Participants at Site Two did not discuss behavior management. Two participants noted positive experiences using Canvas, such as a reduction in destructive behaviors, an increase in student engagement, and higher rates of assignment completion. One participant felt that using Canvas resulted in "organized chaos" and required frequent reminders to the students to behave responsibly.

Parent accessibility to the LMS was a concern for two participants at Site Two but was not mentioned at Site One. The CIP technology objective for Site Two was "to improve technology integration into the classroom environment and parental support" (Site Two, CIP, 2018-2019). The CIP strategic plan was to "Increase… parent utilization in Canvas by offering morning training to parents." (Site Two, CIP, 2018-2019). Participants perceived that parents were frustrated due to inconsistent LMS use by teachers and a lack of information on how to

access the platform. A parent "boot camp" and parent Canvas course were recommended as ways to train and inform parents on how to use the platform. Instructure Learning Analytics in Canvas showed that Site Two did not have a campus community course to support parent and stakeholder engagement.

Teachers' Perceptions of Leadership Actions

Leaderships' strategies of modeling, prioritization, and accountability were cited by participants as influencing factors for LMS implementation. Likewise, the systems design components of creating a shared vision and an implementation plan were also perceived as influencing factors. Seven interview participants indicated that administrators modeled how to use the LMS during staff meetings and professional development days. Participants shared that pertinent information, documents, and presentations were imported and stored in Canvas. Canvas was also used to hold "online staff meetings" at Site Two instead of having everyone meet face-to-face. Participants perceived modeling as a strategy used by administrators "to try to encourage us [teachers] to use it" (Participant 1.2).

Sixty percent of the participants attributed the lack of leaderships' prioritization for LMS use to low LMS implementation. Participants made comments like "it's not considered a priority," "there's not really a campus push for it," and "they're not necessarily using it that much" to illustrate their perceptions of leadership actions. Likewise, 100% of participants had negative perceptions of leaderships' ability to hold teachers accountable for using the platform. Participants cited "a lack of expectations" and "no one checking" as reasons for low LMS use by teachers. Participant 1.4 stated, "there's not an enforcement piece…it's not mandated." Four participants at Site Two expressed frustration that teachers were still using other platforms after their administration said to only use Canvas. Furthermore, 100% of the participants suggested

that there were no strategies to monitor teachers' growth using the platform and no tangible incentives or rewards given by administrators to encourage LMS use.

Creating a shared vision and an implementation plan are critical components of systems thinking design (Senge, 2006). According to the CIP for Site One, the strategic plan was to "adopt a robust technology integration model for transformational use of technology for teaching and learning" (Site One CIP, 2018-2019). The technology objective for Site Two was "to improve technology integration into the classroom environment and parental support" (Site Two CIP, 2018-2019). However, 100% of the study participants could not recall if their campus had a technology integration vision or an implementation plan regarding Canvas. One participant from Site One stated that the principal was "resistant" to create an implementation plan due to it being "challenging to monitor and control" (Participant 1.1). Four of the participants from Site Two remembered the principal verbally telling teachers at the beginning of the year to create a course calendar in Canvas and to use Canvas as the prescribed platform. However, participants stated that there was no documented implementation plan and no follow-up regarding the expectations set at the beginning of the year.

Coaching Support Provided to Teachers

Teachers' perceptions of the coaching support they received from district and campus coaches were varied. Eighty percent of Site One participants positively perceived the support they received from the district technology coach (DTC). Participants commented that they received consistent support throughout the school year, and the coach was responsive and "nice." On the other hand, 80% of participants at Site Two negatively perceived the support they received from the DTC assigned to their campus for the second half of the school year. Comments included not knowing whom the coach was, receiving long emails to questions

instead of face-to-face support, and being redirected to online support services to find solutions to problems. However, Site Two participants positively perceived support from the DTC who was assigned to the campus for the first half of the school year because the coach "housed on campus" once per week and provided "regular," "predictable," and "in-person support."

A total of five participants discussed the level of support provided by the district curriculum coaches (DCC). Four participants (Two from Site One and two from Site Two) negatively perceived support from the DCC. Participants shared that they had not received support, only saw the DCC at district training, or were given information only through email. One participant perceived no provision of support because they taught a "non-tested subject." Conversely, one participant from Site One positively perceived support from the DCC. The participant taught a state-tested core subject and said that the DCC met with them in person "at least once a week" (Participant 1.2).

Participants had varied perceptions of campus coaching support**.** Two participants from Site One explained that the campus technology coach was a fulltime teacher. One participant called the coach a "Canvas guru," and the other stated they had "already figured it out" before the coach could provide assistance. Two participants at Site Two mentioned that the school had a campus technology coach and were instructed to send an email if support was needed. Additionally, 100% of the participants at Site Two never mentioned receiving support from campus-level coaches, including the campus technology coach. Site Two participants explained that all of the campus coaches were either fulltime teachers or were split between teaching classes and coaching. One participant attributed a lack of campus coach support to not being a Title I school. Likewise, participants at Site One shared that campus-level coaches were also teachers. Participant 1.1 perceived that the curriculum/instructional coaches did not feel the

LMS was a priority and stated, “The math one is the best one - definitely the most receptive here. I think that there is not as much reception in the other ones. I would say there is indifference with the coaches.”

The availability of IT personnel to help maintain hardware and software was discussed as campus-level support. Site One participants shared that they had a designated IT support person on staff at the school. Participants described the IT person as “really responsive…not super trained but will figure it out” (P1.4) and “a blessing” to have someone on campus to help fix technology problems. Participants at Site Two shared that they did not have an IT support person on campus. However, Participant 2.4 shared that a person had been volunteering at the school for 19 years to provide IT support. Participants at Site Two explained that they requested district IT support by submitting an online service ticket and received support usually by the next day. Participants also shared that they “just try to fix stuff…because everyone’s busy” (P2.3).

Existing Infrastructure and LMS Implementation

Study participants communicated that existing infrastructure impacted LMS integration in classroom instruction. Participants cited accessibility to technology and resources as the primary factors affecting LMS implementation. Information processes, including communication and storage/retrieval of information as additional influencing factors. Not having access to technology was cited by 100% of the study participants as a barrier to LMS implementation in instruction. Participants at both sites shared that the campuses were not one-to-one, meaning; students did not have access to personal computers. Complaints common with both sites included not having enough computers for every student, sharing computers with other teachers, managing outdated technology, and redistributing computers for testing. Participants also expressed having difficulty storing and charging computers. Participants at both sites

opined that LMS implementation would be “ineffective” until campuses had one-to-one accessibility. One participant divulged their hesitancy to design lesson modules in Canvas because “I don’t know for sure that I will be able to get the computers when I need to teach this module” (P1.4).

Additional technology concerns pertained to the reliability of software programs and Wi-Fi access. Ninety percent of participants mentioned that access to digital resources was essential to the success of LMS implementation. Two participants had positive perceptions of the ability to access digital resources. They commented that they could access resources stored in Canvas courses at any time. Seventy percent of participants had negative perceptions about the accessibility of materials and resources. Participants shared that district-created modules did not always function on different types of technology such as iPads, they did not know how to access digital content from the adopted textbook materials, and interactive software programs purchased by the district “doesn't really function well in Canvas” (Participant 2.5).

Evidence of Quality

To establish trustworthiness (Lincoln & Guba, 1985 as cited in Creswell, 2013) and ensure the validity of the research, the researcher triangulated different data sources (Brown & Dowling, 2001; Creswell, 2013; Yin, 2009). Multiple data sources included quantitative data from the Instructure Learning Analytic reports in the Canvas LMS; artifacts from campus documents and websites; and qualitative data gathered from individual interviews. Data were collected and analyzed according to the transcendental phenomenological procedural plan (Creswell, 2013). The researcher followed the plan by determining a research problem, identifying a phenomenon to study, specifying the philosophical assumptions, and bracketing out researcher experiences. As such, personal bias and assumptions were addressed by sharing the

researcher's position in the district and by allowing participants to ask questions about the researcher's role (Merriam, 1988). The procedural plan was also followed by collecting data from participants using an interview protocol with broad, general questions about the phenomena. The interview protocol was reviewed and approved by an expert in the field of education and a research expert in the school district's Department of Research and Evaluation to certify the validity and reliability of the data collection instrument (Creswell, 2013). The protocol was designed to understand the phenomenon as described by the perceptions, emotions, and opinions of study participants (Abawi, 2012; Creswell, 2013; Walters, 2001).

To further ensure the validity and quality of the data the researcher used the following strategies for conducting and analyzing qualitative research:

- talk a little, listen a lot
- record accurately
- begin writing early
- let readers see for themselves
- report fully
- be candid
- seek feedback
- write accurately

(Wolcott, 1994, pp. 348-370)

The researcher asked questions directly from the interview protocol and used a handheld audio-recorder to capture participants' responses accurately. The researcher also took notes during each interview. Interviews were transcribed using computer software and were then validated by the researcher using the playback feature. Transcriptions were also validated by the study participants to ensure the accuracy of the information. Findings were presented using direct quotes and statements from the participants. As an additional quality measure, the researcher sought feedback from experts in the field of qualitative research to check for errors, bias, and

accuracy. Corroborating evidence from different sources provided validity and transferability to the findings (Brown & Dowling, 2001; Creswell, 2013). The findings from the quantitative and the qualitative data were compared between each site to determine transferability.

Summary

This instrumental multi-site case study was designed to cultivate a better understanding of how urban middle school teachers perceive the support provided for their implementation of a learning management system to facilitate blended learning. The study was designed to examine teachers' experiences through a retelling of their perceptions, emotions, and opinions. Two dichotomous sites in the southwestern region of the United States were chosen in order to gather data from varying perspectives about the phenomenon of low LMS implementation in K-12 education. Chapter IV included a description of each site's technology integration objectives, overall LMS use, and individual participants' LMS use. Data were collected from in-depth interviews, archival information from Instructure Analytics, and artifacts from documents, websites, and Canvas courses. Interviews were conducted at each site during April and May of the 2018-2019 school year. Interviews were transcribed and validated by the study participants to ensure the accuracy of the information they provided.

The data from each site were analyzed separately and then merged during a cross-case analysis. Findings were presented in a coding hierarchy of 29 codes, 13 subcategories, and 6 categories. All but two of the codes were similar at both sites. The results were examined as they related to the research questions and the theoretical and conceptual frameworks of experiential learning and systems thinking. A concept map was designed to depict the codes, subcategories, and categories that emerged from the data and were organized according to the theoretical and conceptual frameworks. A discussion of the six themes was arranged as follows:

(a) teachers' perceptions of learning opportunities; (b) cultural effects on LMS use; (c) influence of LMS use on students; (d) teachers' perceptions of leadership actions; (e) coaching support provided to teachers; and (f) existing infrastructure and LMS implementation. The findings suggest that teachers negatively perceived leaderships' execution of systems and strategies to support the implementation of an LMS. Additional findings revealed challenges pertaining to a lack of access to technology, inadequate time to practice building modules, cultural obstacles related to teacher buy-in, and insufficient coaching support. However, teachers positively perceived administrators' attempt to model LMS use, self-directed learning opportunities, and potential for students' academic success using an LMS.

An overview of the study and a summary of the key findings is discussed in Chapter V. The researcher presents an interpretation of the findings as they relate to the literature review. Furthermore, the limitations of the study, recommendations for future study, and the implications of the outcomes for educational leaders, policymakers, and researchers is conferred.

V. DISCUSSION

As mentioned in the preceding chapters, this study was conducted to examine teachers' perceptions of the types of support provided by instructional leaders, and the impact support had on teachers' implementation of a learning management system. This chapter begins with an overview of the study, including a statement of the problem, a review of the methodology, and a summary of the results. Next, interpretations of the findings are discussed in relation to the research questions and the literature review. Finally, limitations of the study, recommendations for future research, and the implications of the outcomes for educational leaders, policymakers, and researchers are presented. The findings may help inform educational leaders as to the most effective strategies for the system-wide implementation of an LMS in educational organizations.

Statement of the Problem

The purpose of this qualitative case study was to provide an understanding of teachers' perceptions of leadership support for the implementation of an LMS to facilitate blended learning in urban middle school classrooms. Research on the pedagogical approach of blended learning in primary and secondary education shows increases in student engagement and achievement (Garcia & Pacheco, 2013; Jackson et al., 2013; Marzano, 2004). Learning management systems provide the structure to facilitate blended learning, yet public school systems are slow to adopt such platforms (Akgunduz & Akinoglu, 2017; Alenezi, 2018; Aparicio et al., 2016; Magana & Marzano, 2014; Waters & Marzano, 2006).

Review of the Methodology

As explained in Chapter III, the research method was an instrumental multi-site case study used to examine teachers' perceptions of leadership support for their implementation of an LMS for teaching and learning. As a case study, this research primarily used a qualitative research design to access the thoughts, perceptions, and emotions of study participants, which "can enable the development of an understanding of the meaning that people ascribe to their experiences" (Sutton & Austin, 2015, p. 226). The objective of this qualitative study was to examine teachers' perceptions of leadership support and to extract strategies that district and school leaders can replicate to encourage systemic pedagogical change using technology.

The case study approach was chosen to uncover rich descriptions from participants regarding their use of the Canvas LMS and to investigate the phenomenon within a real-life context (Creswell, 2013; Stake, 2006; Yin, 2009). The methodology included triangulation using multiple sources and methods to corroborate evidence and provide validity to the findings (Brown & Dowling, 2001; Creswell, 2013). The researcher reviewed quantitative data from Canvas Instructure Learning Analytic reports and Course Analytic reports from two research sites and from each of the ten participants' courses. Course Analytics identified how participants were using the LMS for classroom instruction. Artifacts in the form of Campus Improvement Plan (CIP) documentation were collected and assessed for each site. In-depth interviews were conducted to gather a detailed account of participants' perceptions, opinions, and experiences about the phenomenon. An interview protocol with eight open-ended questions was used to gather data from the participants. Each interview took place at the end of the 2018-2019 school year to ensure that all of the participants had experience using an LMS. Interviews were audio-recorded and were 20-45 minutes in duration. All of the participants elected to meet in their

individual classrooms at each site. Interviews were transcribed using a software program and were then validated by each participant. Transcriptions were analyzed, a coding hierarchy was created, and a concept map was designed to represent the data visually. Triangulation of the data sources from Learning Analytics and Course Analytics in the Canvas LMS, artifacts from each site, coded interview transcripts, and the research literature addressed the research questions and enhanced confidence in the research findings.

Summary of the Results

As discussed in Chapter II, the theoretical framework of experiential learning posits that individuals learn in social settings and by linking their previous experiences and knowledge to present content (Dewey, 1938). The components of the theoretical framework revealed from the results of this study include: (a) learning through experience, professional development, and independent learning; (b) collaboration in PLCs, with peers, and in virtual communities; and (c) the influence of LMS use on student learning. The conceptual framework of systems thinking recognizes interdependencies and identifies the attributes and actions of effective change agents in implementing systemic change. Dewey's (1938) influential views on interdependence provide a theoretical foundation for the development of systems thinking in education, particularly regarding the role of stakeholders as agents of change (Tarrant & Thiele, 2015). The relevant concepts about the conceptual framework derived from this study include: (a) the systems and strategies used by leaders to encourage LMS implementation; (b) the coaching support provided by instructional leaders; and (c) the effect of existing infrastructure on technology integration. Congruently, experiential learning and systems thinking generate school change when instructional leaders provide a reliable infrastructure and use innovative strategies to encourage knowledge building and collaborative learning. School leadership is identified as a critical facet

for systemic change because leaders establish a framework that encourages learning in schools and improved student learning depends on the continued learning of the adults in those schools (Burke, 2018; Dweck, 2006; Edgelow, 2012; Levin et al., 2010; Waters & Marzano, 2006). District and school leaders provide the infrastructure and support to continually build a collaborative community of learners, as seen in Figure 5.1. As such, the conceptual framework of systems thinking provides the structure to support experiential learning. The phenomenon of low LMS implementation in K-12 education is revealed through identifiable deficiencies in systems thinking design.

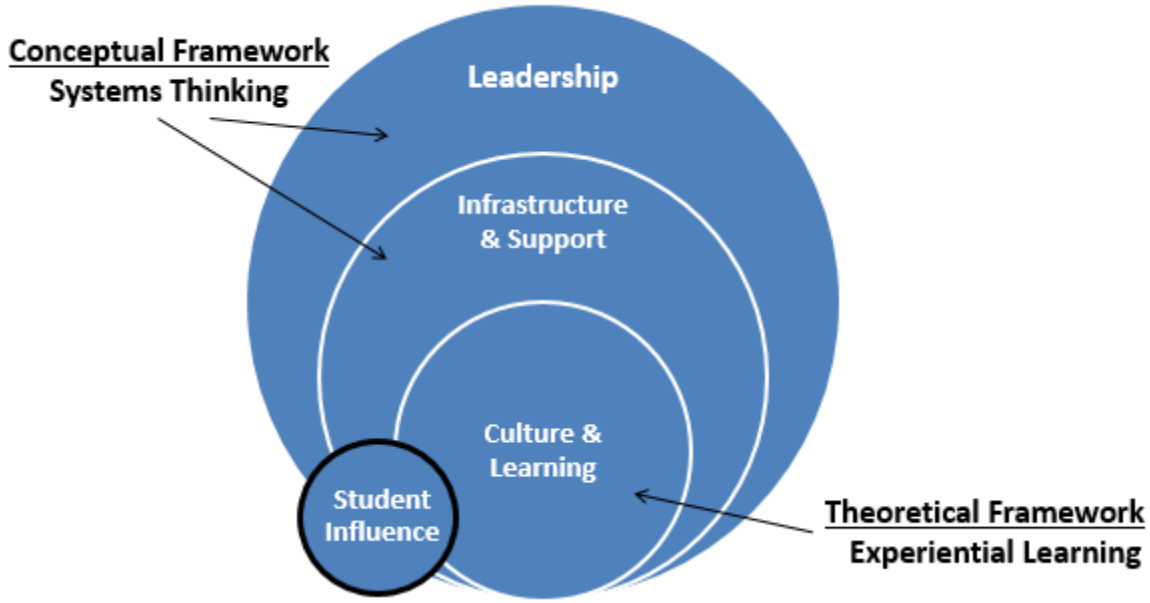

Figure 5.1. Conceptual and theoretical framework relationship

Figure 5.1 depicts the relationship between the conceptual framework of systems thinking and the theoretical framework of experiential learning, wherein instructional leaders provide the essential infrastructure in the organizational system to support a collaborative culture of innovative and adaptive learners.

Discussion by Research Question

The ten middle school teachers who participated in this study represented two dichotomous schools within one urban school district. Five participants worked in a school with students from predominantly economically disadvantaged homes and a large percentage of minority students. Conversely, five participants worked in a school with students from more affluent families and a small percentage of minority students. Although the demographics of the schools were different, teachers' experiences, perspectives, and perceptions regarding LMS implementation were mostly similar. The findings gathered from school artifacts, analytic data, and teacher interview transcripts were examined in relation to the research questions and the existing research regarding LMS implementation in public education.

Research Question 1: What are the factors that affect teachers and the successful adoption and implementation of an LMS in teaching and learning?

Teachers participating in this research study discussed four factors affecting their adoption and implementation of an LMS: (1) district and campus-level professional development; (2) time to learn and practice; (3) self-directed learning and knowledge building; and (4) virtual and peer collaboration. The four factors relate to the two themes of learning and culture and connect to the theoretical framework of experiential learning.

Finding 1.1. District and campus-level PD opportunities provided foundational LMS knowledge. All of the study participants mentioned attending district-sponsored professional development as an influencing factor in their adoption and implementation of an LMS. Seventy percent of the participants positively perceived the professional development opportunities provided by the school district. Summer sessions were explicitly described as helpful in building foundational knowledge about LMS tools and blended learning strategies. Likewise, participants

attributed successful LMS implementation to campus-level professional development. Sixty percent of participants positively perceived campus-level PD when they were able to suggest topics, rotate through sessions and learn from peers who had experience using the LMS with students.

Discussion 1.1. Teachers perceive professional development as a positive influence affecting LMS implementation. Data from participant interviews indicated that teachers felt elemental training using Canvas tools was the most critical factor in their implementation of an LMS. More importantly, teachers viewed ongoing professional learning that addressed their level of competency as valuable to improving their practice. As discussed in Chapter II, school leaders who provide ongoing professional development help teachers successfully make the transition from traditional instruction to blended learning models (Alijani et al., 2014). When leaders arrange for consistent professional development and support, teachers are more likely to incorporate new instructional methods. The findings suggest that differentiated learning experiences help teachers build their pedagogical toolkit regarding blended and personalized learning using an LMS.

Finding 1.2. District credentialing cohorts were influential to LMS implementation. Participants cited that the district's credentialing cohort PD (specifically, math) was the most influential factor in their implementation of the Canvas LMS. Moreover, participants at both sites mentioned collaborating with math teachers because they had experience using the LMS due to the specialized cohort.

Discussion 1.2. Creating lessons using an LMS requires teachers to shift the way they view teaching and learning. Additionally, teachers must understand how to design learning experiences using an LMS which necessitates acquiring technology design skills. The data from

this present study corroborated with the literature (Dewey, 1938) to show that teachers need to adapt to changing circumstances and gain new knowledge through active participation and creative collaboration. The design of the credentialing program cohorts allowed teachers to experience the functionality of the LMS and participate in blended learning activities throughout the school year. Designing with other like-minded educators provided a forum for exploration and coaction regarding technology integration. Consequently, teachers could focus on activities that promoted collaboration and construction of knowledge. As a result, teachers enrolled in a cohort were comfortable using the LMS and became mentors to other teachers at their respective campuses. Furthermore, colleagues of the cohort teachers were able to draw on their knowledge and experience using the LMS. Further research is necessary to examine the wide-ranging influence that the cohort design has on transforming pedagogy and if extending the model is warranted.

Finding 1.3. District and campus-level PD opportunities shared too much information in individual sessions. Thirty percent of the participants negatively perceived district PD opportunities that provided too much information. Negative comments about both district and campus PD included that too much information was shared during sessions, information was not immediately applicable, sessions were too basic for more experienced LMS users, and PD occurred infrequently.

Discussion 1.3. Assessing the needs of teachers to understand the levels of concern they have about digital platforms is a crucial component of systems thinking design. Davis et al. (2015) suggested that leaders utilize systemic discovery practices by gathering information through surveys and community meetings. Discovery practices will help district and campus-level instructional leaders design and deliver appropriate professional development. Participants

in the study suggested that training and support tailored to the concerns of teachers motivated them to integrate technology because their individual concerns are immediately addressed. During the conversations with teachers, it was evident that participants believed ongoing professional development was more effective in supporting their knowledge acquisition and facilitating instructional changes than attending a one-time professional development seminar. Research conducted by Sugar and Slagter van Tryon (2014) also found that "ongoing activities contribute to sustained adoption of knowledge" (pp. 54-55). An exploration into adopting a systems framework along with implementation of a professional development taxonomy plan will help instructional leaders deliver targeted training at individual campuses throughout the school year.

Finding 1.4. District and campus-level PD opportunities did not provide adequate time to practice new skills. Participants indicated that there was not enough practice time to apply new knowledge and build lesson modules during district and campus PD sessions. In fact, 60% of participants suggested that instructional leaders allot additional time for teachers to learn about the platform and practice building modules during PD days. Participants expressed frustration in their inability to apply the knowledge learned in PD sessions directly to the classroom because of inadequate time for lesson planning. Participant 1.3 stated, "not being able to apply and create makes it a little challenging."

Discussion 1.4. Teachers experience frustration when adequate time is not allocated to learning new technologies or to participating in collaborative professional development. Teachers need additional time to collaborate, observe, and share digital activities to increase their understanding of how to effectively integrate an LMS and other innovations into their instruction. Leaders need to purposefully and intentionally schedule time for teachers to create

lessons using an LMS, share good practices with colleagues, and generate ideas to support differentiated instruction.

Finding 1.5. Independent learning was essential for building LMS knowledge. Study participants indicated that independently learning how to use an LMS was important to their growth as an innovative educator. Seventy percent of participants practiced self-directed learning and stated that it was an influencing factor for the implementation of an LMS. Participants specified that they independently built knowledge on how to use Canvas by enrolling in online courses, analyzing media tools, copying modules, and searching Google for tips and tricks from experienced users. Participants positively perceived the ability to practice creating lessons in modules as they were learning. They also suggested that independent learning allowed them to experience how to use the LMS at their own pace, which resulted in better retention of the information and skills.

Discussion 1.5. Educators require varied and alternative methods of instruction to accommodate their learning needs. To make sense of new content, learners need to build on previous knowledge. Online professional development and e-learning provide highly flexible learning opportunities, including the ability for individuals to move at their own pace and reflect on their learning. Just-in-time learning is essential when PD and coaching support is unavailable. Furthermore, online lessons allow individuals to achieve a deeper understanding of the content, experience authentic learning scenarios and retain the information for longer periods. Similar to the literature (Loh et al., 2016; Staker & Horn, 2012), participants in this study appreciated online learning because it gave them control over time, place, and pace over their learning. However, acquisition of new knowledge must be put into practice so learners become

proficient using technology skills. Leaders can encourage the professional growth of teachers by making both face-to-face and e-learning opportunities highly accessible.

Finding 1.6. Peer collaboration was a positive influencing factor for the adoption and implementation of an LMS. Seventy percent of the participants shared their experiences with peer collaboration, and 40% of participants specifically mentioned virtual collaboration as an influencing factor. Participants shared that collaborating with peers in PLCs allowed them to learn, problem-solve, and overcome fears regarding integration collectively. Participants stated that learning to design modules with peers who had more experience using the platform was beneficial to their development. Participants also shared that participating in online meetings, using discussion boards, and sharing digital materials through the Canvas platform were valuable forms of virtual collaboration.

Discussion 1.6. Teachers perceive collaboration as a valuable resource for discussing technology integration and co-designing technology-enhanced lessons using an LMS. Teachers value collaborating with other educators during informal conversations and in professional learning communities. Therefore, instructional leaders should encourage collaboration and team learning on campuses by providing multiple outlets and modalities for educators to share their teaching experiences. A team-oriented and engaged staff is established by promoting collaboration (Bird et al., 2012; DuFour et al., 2010).

Research Question 2: How do middle school teachers perceive support from district and school leaders for the use of an LMS as a platform for implementing blended learning?

Participants discussed five concepts pertaining to their perceptions of the support they received from leaders for the implementation of an LMS: (1) modeling LMS use; (2) technology vision and implementation plan; (3) prioritization of LMS use; (4) accountability for LMS

implementation; and (5) support provided by district and campus coaches. The five concepts relate to the two themes of leadership and support and connect to the conceptual framework of systems thinking.

Finding 2.1. Participants perceived leaderships' modeling of the LMS as a supportive strategy for implementation. Seventy percent of study participants shared that campus leaders modeled how to use the Canvas LMS during staff meetings and professional development days and that meetings were occasionally held online with the information stored in Canvas. Participants also suggested that administrators modeled using the LMS as a way to distribute information.

Discussion 2.1. Instructional leaders who model best practices in technology integration influence educators' use of technology. Administrators and coaches who are equipped with the knowledge and skills they want teachers to embrace create alignment, nurture commitment, and set the direction for the organization. Instructional leaders can cultivate organizational alignment and cohesive teams by training, modeling, and structuring how digital tools will be used, including an LMS. The results from this study and the existing literature (Anthony & Patravanich, 2014; Fullan, 2006; Waxman et al., 2013) suggest that administrators can transform the attitudes of teachers when they model the use of technology and an LMS. Administrators who model the use of the platform during campus training and staff meetings provide an additional measure of support because teachers can see how the LMS is used for teaching and learning. Campus-level instructional leaders can showcase priority practices by developing their digital capabilities and modeling technological innovations including an LMS during daily school operations.

Finding 2.2. A technology vision and implementation plan were not communicated to teachers. When asked to share the campus technology vision and implementation plan, 100% of participants could not articulate knowledge of a vision or a plan. Eighty percent of participants at Site Two recalled that at the start of the school year, the principal verbally told teachers to incorporate the LMS into their curriculum. However, participants could not remember a repeat or check of the expectation by administrators during the remainder of the school year.

Discussion 2.2. Teachers do not have a clear understanding of the vision or implementation plan regarding the systemic use of an LMS to support blended and personalized learning. As a result, schools do not receive consistent and targeted supports because teachers are using different digital platforms. Moreover, the inconsistent use of one platform makes it difficult for schools to execute evaluative frameworks to inform instructional practices. Having a centralized learning platform in place supports a continuous learning environment throughout the entire school. However, teachers need to have a clear understanding of the organization's mission, purpose, and the new system design, to implement technology effectively. It is the responsibility of instructional leaders to ensure that a technology vision, implementation plan, and integration expectations are clearly communicated so that instruction shifts to blended learning models using an LMS. According to Alijani et al. (2014), "having a precise vision, mission, and purpose are crucial in implementing a blended model that produces improvement" (p. 139).

Finding 2.3. A lack of prioritization from leaders resulted in low LMS use by teachers. Sixty percent of study participants attributed prioritization of LMS use to leadership actions. Participants perceived that campus administrators did not prioritize the use of the LMS, which resulted in teachers not considering it a priority as well.

Discussion 2.3. Teachers associate the value of using an LMS with the level of prioritization that leaders demonstrate. Although schools have access to an LMS, many administrators and educators lack awareness of its functions or perceive using it as a low priority. Leaders communicate and validate priorities through their words, actions, and practices. Based on the results from this study and the research literature (Greer-Frazier, 2014; Kowch, 2013; Kroksmark, 2016), introducing an LMS changes the learning experiences for all involved because it adds different strategies, methods, and materials to curriculum and instruction. However, change only succeeds when the organization's leaders exemplify the characteristics of transformational leadership by actively supporting those changes. Leaders support change when they communicate what is valued, create systems to promote priorities, model necessary change practices, and maintain alignment to the shared vision.

Finding 2.4. Accountability measures for LMS implementation were inadequate or non-existent. All of the participants had negative perceptions of leaderships' accountability for LMS implementation. Participants explained that administrators were not monitoring LMS use, did not enforce implementation, and did not follow-up with teachers regarding minimum expectations. Participants also expressed frustration because administrators allowed teachers to continue using platforms other than Canvas. Participants shared that the inconsistencies with platform use by teachers negatively influenced teaching and learning. Moreover, 100% of participants indicated that there were no strategies to monitor teachers' growth using Canvas and no tangible incentives or rewards given by administrators to encourage LMS use other than occasional "kudos."

Discussion 2.4. Lack of accountability regarding platform use negatively affects teaching and learning. Thornton et al. (2004) suggested that "well-designed implementations

provide training, feedback, designed adjustments, and individualized support for teachers" (p. 225). Implementation of new programs and initiatives requires leaders to analyze feedback by collecting information from stakeholders. Leaders can assess the needs and wishes of stakeholders by encouraging open dialogue and conducting periodic surveys. Systems thinking leadership strategies can yield positive results with consistent monitoring and constructive feedback. Successful implementation of an LMS requires leaders who emphasize accountability for shared goals, student outcomes, teacher professionalism, and quality instructional practices. Teachers are motivated by transformational leaders who focus on educational effectiveness and faculty growth. Additionally, teachers value transactional leadership strategies such as performance incentives and small rewards. Teachers are also motivated by recognition for incorporating new initiatives to reach predetermined goals. The results from this study and the research literature (Bingham, 2017; DuFour et al., 2010; Fullan, 2006; Jackson, 2017; Senge, 2006; Thornton et al., 2004) suggest that facilitating systemic change and improving student achievement requires leaders to establish expectations, assess pedagogical practices, and conduct discussions using data from observations and assessment results. Furthermore, leaders need to remember to recognize, reward, and celebrate accomplishments throughout the school year to continually encourage alignment to the organization's vision.

Finding 2.5. Coaching support provided by the campus and the district was inconsistent. All of the participants at Site One mentioned that the campus technology coach (CTC) was a full-time teacher and had limited time to provide support. None of the participants at Site Two discussed receiving support from the CTC other than to send an email if support was needed. Site One participants stated that they had a full-time computer maintenance person on staff while Site Two did not. Participants from both sites shared that campus instructional coaches (IC)

were split between teaching classes and providing coaching support. Site One mentioned that the math IC was the only coach who supported LMS use with teachers. Site Two did not specifically discuss receiving support from any of the ICs on staff. Participants at Site Two suggested that they did not receive support from district curriculum coaches (DCC) because they were not designated as a Title I school. However, participants at Site One who taught a state-tested subject did receive regular support from a DCC.

Regarding support provided by the district technology coaches (DTC), 80% of Site One participants positively perceived support from a DTC while 80% of Site Two participants negatively perceived support from a DTC. Site One and Site Two had different DTCs. Site Two participants explained that their DTC changed in the middle of the year due to the retirement of the first coach (C1). Perceptions of C1 were positive because the coach held office hours at Site Two one day each week and provided regular support. Perceptions of the second coach (C2) were negative because the coach did not hold office hours, referred teachers to online solution centers, and answered technology questions/problems with long email responses.

Discussion 2.5. Teachers need coaching support that is timely and consistent. The type and frequency of support teachers receive is indicative of how an LMS and technology-enhanced practices are implemented. This research study and results in the literature (Alenezi, 2018) found that an absence of mentors to model the use of technology and an LMS hindered teachers' adoption and implementation of innovative technologies. Collaborating with a curriculum or technology coach helps teachers build confidence in their practice. However, support should be given promptly to reduce frustration and help teachers overcome their various levels of concern about integrating technology into their curriculum. Consistent support from technology coaches significantly increases teachers' technology skills, confidence, and implementation of an LMS.

Individuals felt working regularly with a mentor-teacher or technology coach had a significant positive influence on their pedagogical shift toward blended learning using an LMS. Coaches who are knowledgeable about digital learning tools and act as systems thinkers support institution-wide technology integration. The systems thinking literature (Ayers, 2002; Davis et al., 2015; Jenkins, 2007; Levin et al., 2010; Wang et al., 2015) and this current research show that increased alignment of support and resources greatly help schools achieve organizational goals. Coaches can cultivate organizational alignment by training, modeling, and structuring the use of digital tools.

Research Question 3: What are enablers and barriers teachers have encountered in implementing an LMS in classroom instruction?

Participants discussed six factors that affected their implementation of an LMS: (1) access to technology and digital resources; (2) information processes; (3) teacher attitudes; (4) student accessibility; (5) behavior management; and (6) parent access. Access to technology, access to digital resources, and information processes relate to the theme of infrastructure and connect to the conceptual framework of systems thinking. Teacher attitudes relate to the theme of culture. Student accessibility, behavior management, and parent access relate to the theme of student influence and connect to the theoretical framework of experiential learning.

Finding 3.1. Access to technology was the primary barrier to LMS implementation. Not having enough computers for every student was cited by 100% of participants as the main reason why teachers did not implement an LMS during classroom instruction. Participants explained that their apprehension in designing LMS modules was due to not knowing if they would have computer access. Participants described sharing computer carts with other teachers, removing computers during testing windows, and having outdated or broken computers as obstacles to

LMS use. Other technology concerns pertained to the reliability of online programs and Wi-Fi access. Participants shared that some websites and online programs were either blocked or not compatible with the technology, and the Wi-Fi connection would drop in the middle of lessons. Another barrier was that teachers did not have access to digital resources. The majority of participants (70%) commented that they either had trouble accessing digital resources or did not know how to access digital resources and materials. Participants expressed frustration with the compatibility of the adaptive software programs and the technology tools purchased by the district. They also suggested that district-created modules did not function as intended, resulting in the necessary deletion of activities from lesson modules. Participants also stated that they did not know how to find or integrate the digital content from the adopted textbook materials.

Discussion 3.1. Organizational preparedness regarding infrastructure influences teacher readiness for pedagogical change. Schools must have a reliable infrastructure to support the technology needs of both teachers and students. When the infrastructure is weak and technology tools fail, teachers and students become frustrated and are reluctant to implement new technology initiatives. This research indicates that school leaders need to evaluate the technological infrastructure to eliminate avoidable barriers in instituting system-wide pedagogical transformation. A robust infrastructure involves ensuring every learner has access to a computer or other device, incorporating engaging digital resources, maintaining constant Internet and networking capabilities, and providing technical support to troubleshoot accessibility issues. As found in this study and noted in the literature (Alijani et al., 2014), a viable implementation plan includes ensuring financial feasibility for ongoing hardware needs, maintaining a strong technological infrastructure, and providing ongoing professional development for teachers and other stakeholders.

Finding 3.2. Information processes were an enabler for LMS implementation. Eighty percent of participants discussed communication and the retrieval of information in relation to LMS implementation. Although some participants did not receive in-person support from a district curriculum coach, they did receive information through email and Canvas curriculum courses created by district coaches. Participants described receiving exemplary lessons and PowerPoints through email and positively perceived the compatibility between Google Docs and Canvas. Participants at both sites had positive perceptions of communication and resource retrieval in modules created by the math curriculum department. Participants also positively perceived resource storage and retrieval using Canvas and mentioned that the information provided and distributed using Canvas "never go away." However, two participants had negative perceptions of systems integration because the district's grading and student information systems were not compatible with Canvas.

Discussion 3.2. Ease of access to communication and information systems influence LMS implementation. According to the literature, the implementation of an LMS provides the infrastructure to communicate system-wide educational initiatives and distribute timely information to the entire organization (Davis & Surajballi, 2014; Kastens & Manduca, 2017). Likewise, this study found that LMS use ties technology and learning through online communication and announcement tools. According to Edgelow (2012), communication is what makes the change process work because the flow of information affects strategy, changes, and the transition from old systems to new. The communication tools in the LMS unite the community due to increased access to information pertaining to specific campuses. Using an LMS, school leaders can share actionable information across the system so stakeholders can respond to responsibilities, challenges, and opportunities. Furthermore, information stored in the

LMS is easily accessible and retrievable at any time. Consequently, the LMS becomes an information and communication hub for administrators, teachers, students, parents, and the school community at large. Therefore, the creation and implementation of LMS courses should be a priority of campus leaders.

Finding 3.3. Negative teacher attitudes were a barrier to LMS implementation. Fear of innovations and lack of compliance were cited as the main barriers. Lack of buy-in from teachers was cited by 60% of the participants as a barrier to LMS implementation in classroom instruction. Some participants expressed that teacher buy-in was challenging due to the perception that Canvas was not seen as a priority by campus leaders. Participants also shared that those teachers who were already using another website or platform such as Google Classroom or Edmodo did not want to switch to a new platform. Participants stated that some teachers were uncomfortable or felt overwhelmed using technology and some were afraid to spend time creating lessons in Canvas due to the lack of technology – they were unsure if students would have access to a computer at the time of instruction. Teachers were also hesitant to use the LMS because they believed it to be a fad and would not be used in subsequent years. Although the participants mentioned that they understood the need to use an LMS in classroom instruction, not one could remember seeing any data regarding the influence using an LMS has on teaching and learning.

Discussion 3.3. Systems thinking leadership improves organizational performance and leads to the successful adoption and implementation of new innovations. Data from this present study and the research literature (McKenney et al., 2016) indicate that technology integration increases when teachers' practical concerns are addressed, they are included in the instructional design process and are provided with support from content experts. Leaders can address teacher

concerns by structuring a taxonomy plan for change. A component of the taxonomy plan should include the provision of data regarding the influence of technology on student achievement because teachers positively respond to data-driven decisions. Leaders can then coordinate support networks to provide specialized training at the individual and team levels before and during the implementation process. Addressing teacher concerns and providing coaching support helps alleviate frustration and negative attitudes that inhibit teachers' use of digital tools, including an LMS. System-wide implementation will begin to actualize when concerns are validated and addressed.

Finding 3.4. Consistent use of the platform by all teachers was perceived as an influencing factor that affected student accessibility and knowledge of how to use an LMS. Participants agreed that systemic use of the LMS by all teachers would help enforce classroom structures throughout the school. Participants discussed the correlation between accessibility to content with the consistent use of the LMS and students' academic preparedness. Sixty percent of participants explained that it was important for teachers to consistently use the platform to enhance student achievement and prepare them for upcoming grades and future careers. Participants also expressed the need for PLCs to discuss vertical alignment in lesson planning using technology to prepare students for the future.

Participants shared that students' access to technology was crucial to LMS implementation, and 60% of participants allowed students to access Canvas by using their phones due to a lack of computers. Fifty percent of participants positively perceived students' ability to access and submit content in Canvas. Participants explained that content was always available to students, even when the teacher or the student was absent. Furthermore, participants shared that differentiating for students was possible with Canvas and that students were able to

self-assess their academic progress. Participants mentioned that communicating with students using announcements and calendar feeds was easy as was providing immediate feedback on assignments and assessments.

Discussion 3.4. Consistent use of an LMS prepares students for future learning. Colleges and universities increasingly use LMSs. Currently, more than 96% of colleges and universities in the United Kingdom and 95% of universities in the United States use an LMS to manage and supplement traditional classroom instruction (Alenezi, 2018). According to the existing literature (Bingham, 2017) and the data from this study, an organizational priority should include implementing one digital platform across the system to reduce stakeholder confusion and provide stability and consistency. Concurrent with the literature (Jackson, 2017; Mirriahi et al., 2015; Ratliff, 2009), this study indicates that when teachers and schools consistently use LMS technology, students gain the experience necessary to participate in technology-enhanced classes including advanced academics and courses in higher education. Furthermore, centralizing school processes creates a sense of uniformity among grade levels and teacher courses, thereby mitigating student barriers to LMS use.

Finding 3.5. Behavior management was an influencing factor for LMS implementation at Site One. However, participants at Site Two did not associate using an LMS with student behavior. Negative perceptions regarding student behavior issues were struggling with classroom management, relinquishing control, and dealing with "organized chaos." Positive perceptions included increased student engagement, higher rates of assignment completion, and less destructive student behaviors.

Discussion 3.5. A behavior management plan that focuses on improving academic behaviors increases the successful implementation of an LMS. When technology is adopted

without a comprehensive behavior management plan or alignment to curriculum and educational goals, teachers become frustrated and revert back to traditional methods of instruction. As indicated in the literature (Bingham, 2017; Loh et al., 2016) and in discussions with study participants, technology can become more of a distraction than a tool to enrich teaching and learning. Without a specific behavior plan regarding technology, teachers may struggle with managing differentiated instruction and have difficulty maintaining students' motivational levels. Therefore, organizational priorities should include accommodating the diverse academic needs of students, instructing students on how to be autonomous learners, incorporating a strong student behavior management system, phasing in incremental implementation of blended learning, and supporting teachers with pedagogical shifts using technology.

Finding 3.6. Parent accessibility to the Canvas LMS was a concern for participants at Site Two but was not discussed at Site One. All of the schools in the district can publish a Canvas community course for stakeholder access and include district-created information on how to use the LMS. However, neither site had a published course for the community. Study participants perceived that parents had difficulty understanding how to use the platform and suggested that some parents struggled because not all teachers were using the same platform. Teacher analytic reports and course documents showed that the majority of teachers did not create a home page, add to the syllabus, send announcements, or access the course calendar. Study participants recommended that the campus support parents by distributing district-created resources and having a parent Canvas course with information and tutorials on how to use the platform. Participants also suggested that all teachers needed to adopt the LMS to increase parent and student use.

Discussion 3.6. Parent access to the LMS supports student achievement. However, campuses and teachers must use the resources available to them to promote stakeholder involvement. Organizations that use an LMS provide a point of access for all stakeholders, including parents. Campus-wide communication and organizational systems provide transparency which leads to increases in the flow of information throughout the institution. When parents and guardians have access to the LMS, they can communicate with teachers, review course objectives, and see course calendars to determine assignment due dates. The research indicates that, when students spend time on homework, it is shown to have a positive effect on students' grades in both middle school and high school (Cooper, 1989; Keith et al., 1993; Peng & Wright, 1994). Participants in this study suggested that using an LMS provided an easy and convenient process for students to submit assignments. The LMS is a tool that parents and guardians can use with students to encourage positive academic behaviors and metacognitive skills such as organizational strategies, goal setting, and assignment completion. However, systems like the LMS must be used consistently by schools and teachers to influence student outcomes. Using one platform ensures that all students achieve the 21st-century learning goals that will prepare them for higher education and the global workplace (Alenezi, 2018; Davis et al., 2015; Fassbender & Lucier, 2014; Hilliard, 2015; Webster, 2016).

Study Limitations

This multi-site case study was limited to one district in the southwestern region of the United States, which may limit the generalizability to other populations (Yin, 2009). However, triangulation of data provided "convergence of evidence" (Yin, 2009, p. 117) and strengthened the trustworthiness of the findings and the possibilities for generalizability. The outcomes of this case study may contribute to related theories of teachers' experiences and perceptions regarding

the implementation of new innovations such as an LMS and the support they receive from instructional leaders. Nonetheless, there are several limitations to contemplate when considering the findings for generalizability or future research.

One limitation of this study is that only two schools from the same school district participated in the study. Selection of schools was based on campus analytic reports and the geographic location of the schools within the district. The exclusion of other schools in the district and schools in other districts reduce the generalizability of the study results.

Next, the focus of the study is limited to the perspectives of middle school teachers who had experience using an LMS. By narrowing the focus, in-depth beliefs and perceptions from the population were revealed. However, the selection process for study participants was a limitation because it excluded teachers from other grades and schools within the district and other districts. The study also excluded teachers who did not have experience using an LMS. As a result, the findings are specific to middle schools with access to an LMS and should be noted when considering the external validity of the study.

Another limitation was that the duration of the study was one school year. Data collection and interviews were conducted during the spring of the same school year. However, limiting the study to one school year allowed for follow-up interviews with the same participants instead of facing the possibility of losing contact due to staff changes that occur between school years.

Although there are many limitations regarding the generalizability of study results, the findings may apply to other schools attempting to implement an LMS in K-12 education systemically. Furthermore, the findings of the study uphold the conclusions in the research literature confirming the influential role that instructional leaders have in implementing new

pedagogical innovations such as an LMS (Badia et al., 2013; Haynes & Maddock, 2014; Schrum & Levin, 2013; Youngs et al., 2015).

Implications for Future Practice

The objective of this study was to understand how leaders support the implementation of an LMS as revealed through the beliefs, experiences, and perceptions of middle school teachers. The coded interview data were triangulated with artifacts from the study and the research literature. Implications for practice were extracted from the research data pertaining to teachers' perceptions of the supports they need to improve their role as a digitally confident teacher integrating the Canvas LMS. The allocation of time for teachers to plan and practice using an LMS was a primary factor influencing the implementation of the platform in classroom instruction. Additional factors included regular coaching support, access to technology, peer collaboration, consistent systemic use of the LMS, and clear LMS expectations/accountability measures by leaders. The findings of this study can inform the work of district and campus-level administrative and instructional leaders considering the systemic implementation of an LMS to improve organizational performance and classroom instruction. The findings also have implications for researchers and policymakers interested in increasing student access to educational technology in K-12 public schools.

There are six recommendations for future practice resulting from this study on LMS implementation.

Recommendation 1

Before implementing new technologies, schools and districts should have conversations regarding how digital tools might serve teaching and learning (Cho & Littenburg-Tobias, 2016). Teachers and administrators need the necessary knowledge to adopt and implement new

technologies and innovations in classroom instruction and should begin with the research data to support implementation. Teachers' attitudes are shaped by the cultural values and the relevance others place on the use of digital tools and platforms (Badia et al., 2013). The systems thinking leadership practices of discovery, framing, and action (Davis et al., 2015) provide the framework for leaders to assess the attitudes, knowledge, and experiences of teachers regarding the application of technology. Through discovery, leaders can address the concerns of teachers to realize successful adoption because "implementation of an innovation is accomplished at the individual level" (Lochner et al., 2015, p. 63). Framing draws boundaries to allow for focused design (Kastens & Manduca, 2017). Designing includes allotting adequate time for teachers to learn, practice, and create lessons using an LMS. Action refers to the systems thinking approach used to continually communicate and implement the phases of the change process. The findings from Question One of this study and the existing literature support the need for data-driven decisions regarding instructional practices and the "allocation of dedicated time" (Jackson, 2017, p. 184) for teachers to learn, design, and implement lessons using an LMS (Lochner et al., 2015).

Recommendation 2

Ongoing and consistent training and coaching support should be provided at the campus level to ensure the successful integration of technology into the teaching and learning environment. The research findings from Question Two, corroborated with reports in the literature, indicate that teachers who receive consistent coaching support are more likely to implement technology-enhanced instruction (Brown & Warschauer, 2006; Jackson, 2017; Schmid & Hegelheimer, 2014). Thornton et al. (2004) suggested that "well-designed implementations provide training, feedback, designed adjustments, and individualized support for teachers" (p. 225). Teachers need regular guidance on how to connect their personal and

professional awareness and experiences using technology to designing lessons with technology (Dewey, 1938; McKenney et al., 2015; Schmid & Hegelheimer, 2014). According to Basak and Govender (2015), teachers' main obstacle to technology and LMS integration is the lack of technical and educational training. However, full-time, campus-level instructional and technology coaches increase teachers' technology skills, confidence, and implementation of new digital tools, including an LMS (Lowther et al., 2008). Likewise, ongoing coaching increases teachers' knowledge acquisition and facilitation of instructional changes (Sugar & Slagter van Tryon, 2014). Therefore, district-level and campus-level instructional leaders must develop their digital capabilities to provide continued campus support to teachers (Cisco, 2018).

Recommendation 3

District and campus leaders must ensure that a strong infrastructure is in place prior to LMS implementation. The research findings from Question Three from this study and the corresponding literature found that lack of access to computers, unreliable equipment, and insufficient technical support were barriers to LMS implementation (Basak & Govender, 2015). Having a strong infrastructure establishes how the organization adapts to change and is an influential factor in how technology is used throughout the organization (Badia et al., 2013). Akgunduz and Akinoglu (2017) posited that problems with infrastructure, including lacking access to technology, difficulties with online activities, and losing access to the internet frustrate individuals and slow the implementation process. Without a strong and supportive infrastructure, teachers will either be reluctant to adopt new technologies or will revert to traditional methods of instruction (Alenezi, 2018; Fassbender & Lucier, 2014).

Recommendation 4

Leaders need to provide opportunities for teachers to collaborate and share instructional strategies and resources with peers. Findings from Question One and results in the literature suggest that teachers perceive collaboration as a valuable resource to discuss technology integration and co-design technology-enhanced lessons (Sugar & Slagter van Tryon, 2014). According to Menchaca et al. (2003), changes in instruction are "successfully implemented in a culture of innovation, collaboration and coordination where all participants in the system are involved in the change effort" (p. 3). Teachers can gain vital knowledge and skills through the sharing of expertise with peers who have experience implementing new tools and technologies (Jackson, 2017).

Recommendation 5

Administrators should promote the consistent and systemic use of one LMS to provide a stable infrastructure that supports a continuous learning environment (Cisco, 2018). Implementing one digital platform is instrumental in developing consistent systems in schools (Bingham, 2017). Instructional leaders who model the use of the platform encourage teachers to use it as well. Therefore, administrators and coaches should be familiar with the functionality of the LMS to promote institution-wide adoption (Cauthen, 2019; Lochner et al., 2015). LMSs support blended and personalized learning by providing educators, administrators, and schools with an instructional delivery method that alters the time, place, and space of learning (Fassbender & Lucier, 2014; Kabassi et al., 2016). The LMS supports a learner-centered environment as it "connects students or learners with the learning contents in a standardized manner through software and programs specifically developed for student learning" (Alenezi, 2018, p. 1). The findings from Question Three reveal that inconsistencies with LMS use among

teachers cause confusion and frustration among students and other stakeholders. Likewise, findings in the literature suggest that students become frustrated with variations in the type of platform instructors use and the different designs of course modules (Akgunduz & Akinoglu, 2017). Furthermore, inconsistent LMS use slows the implementation process due to inconsistencies in systemic supports (Bingham, 2017). However, schools that use one platform familiarize students with the tools and functions of LMS platforms, so they have the experience necessary to participate in technology-enhanced classes (Jackson, 2017; Mirriahi et al., 2015; Ratliff, 2009).

Recommendation 6

Administrators and instructional leaders need to establish clear expectations and accountability measures for LMS implementation. Teachers' use of technology in the classroom is influenced by the expectations and external requirements such as school and district outcomes for technology and LMS use (Badia et al., 2013; Lochner et al., 2015). According to the findings from Question Two in this study and the related literature, teachers want a clear understanding of what the expectations are regarding technology integration (Lochner et al., 2015). Therefore, leaders need to be transparent regarding goals and expectations. Leaders should also review data to hold teachers accountable for reaching predetermined goals, including LMS implementation (DuFour et al., 2010). Furthermore, administrators and instructional leaders need to understand leadership traits, strategies, and skills to help set organizational direction, create alignment, and nurture commitment in teachers and teams (McCauley & Douglas, 2004). The ability of the instructional leader to influence change depends on their ability to motivate individuals, which may include performance incentives such as recognition and rewards for incorporating the LMS to improve teaching (Jackson, 2017). Leaders who emphasize accountability for student

outcomes and recognize quality instructional practices help ensure the successful adoption and implementation of an LMS (Bingham, 2017; Fullan, 2006).

Recommendations for Future Research

The findings from this study serve to contribute to the developing knowledge regarding technology integration and LMS implementation in K-12 education. Based on the analysis and conclusions generated in this study, it is recommended that future research be conducted in the fields of systems thinking educational leadership, instructional coaching, and community responsiveness.

The narrow focus of this study is considered a limitation. Replicating a comparative qualitative study with educators from multiple districts and who teach different grades would increase the generalizability of the findings. Similarly, conducting a study of instructional leaders' perspectives of the support they provide for the implementation of an LMS would offer complementary information regarding the issue under investigation.

The findings from this study suggest that educational leaders do not exhibit strategic leadership traits or utilize systems thinking to implement organizational change. Technology-enhanced learning and the implementation of an LMS in education impacts all of the stakeholders due to changes in the educational system. An understanding of how all the parts are interrelated is required for fundamental change to take root in the system. Systems thinking in education focuses on the interconnectedness and interdependency of elements, events, and relationships within the system and is a useful tool for initiating organizational change (Davis et al., 2015; Thornton et al., 2004). Therefore, leaders need to understand and incorporate strategic leadership strategies and a systems thinking framework to successfully implement change. Conducting a qualitative or quantitative study with principals and instructional leaders would

contribute to developing a comprehensive understanding of the supports provided to academic leaders and the training they receive in organizational change management and strategic leadership.

In this study, instructional coaching was identified as an inconsistent means of support for teachers' implementation of an LMS in classroom instruction. Existing research indicates that teachers who receive consistent and ongoing coaching support are more likely to implement technology-enhanced instruction (Brown & Warschauer, 2006; Jackson, 2017; Schmid & Hegelheimer, 2014). It is recommended that additional studies be conducted to determine the influence that consistent coaching has on teachers' LMS implementation and how implementation affects student achievement. Policymakers may be interested in the results of such a study when deciding budgetary allotments for technology integration in public schools. Moreover, further research may inform continuing education administrators in the development of training programs for teachers, coaches, and instructional leaders to advance pedagogical improvements using technology.

Finally, an investigation into stakeholders' perceptions would create awareness of different perspectives regarding technology integration and open avenues for ensuring community inclusiveness. The findings from this current study suggest that school demographics influence different aspects of LMS implementation. A quantitative study of students, parents, and community members that examines cultural norms would support the development of best practices for technology integration in demographically dichotomous schools. Data from such a study would also inform administrators and policymakers as to the implications for ensuring all students have access to 21st-century learning environments.

Conclusion

Instructional leaders establish a framework for implementing and supporting organizational change. The introduction of new technologies such as an LMS requires adaptations to organizational operations and pedagogical approaches to function in a digital environment. LMS platforms integrate learning and communication tools that are streamlined within one system to provide continuity, interoperability, and transparency across the organization. Moreover, technology-enhanced learning using an LMS influences the way that K-12 programs prepare children for success in higher education and beyond (Staker et al., 2011). The existing research indicates that blended learning increases student academic achievement, motivation, and confidence (Akgunduz & Akinoglu, 2017; Fassbender & Lucier, 2014; Magana & Marzano, 2014; Rubin & Sanford, 2018). However, blended learning and LMS integration are not yet pervasive in K-12 education (Akgunduz & Akinoglu, 2017; Alijani et al., 2014).

An instrumental multi-site case study design was used to investigate the phenomenon of low LMS implementation in K-12 public education. Teachers from two dichotomous middle schools in the southwestern region of the United States who had experience using an LMS were invited to participate in this study. Analytic course data from the Canvas LMS, school documents, and individual interviews garnered an in-depth look into teachers' perceptions of the support they received for their implementation of an LMS in urban middle schools. This research was conducted in an effort to understand teachers' beliefs, experiences, and perceptions of leadership support to facilitate blended learning using an LMS.

Chapter Five included the triangulation of data, including a review of the relevant literature, discussion of the research questions, and a summary of the key findings. Implications for leaders, researchers, and policymakers were discussed, followed by limitations and

recommendations for future study. The findings indicate that when school leaders provide a robust infrastructure and consistent campus-based coaching, teachers are willing to adopt and implement an LMS for classroom instruction. The results also showed that teachers perceived administrators as supportive instructional leaders when they exhibited strategic leadership traits and incorporated components of systems thinking. Overall, the findings delineated in this study can reinforce an understanding of the types of support teachers need to implement new technologies and instructional methods successfully. Furthermore, understanding teachers' perceptions of leadership actions will inform administrators and policymakers regarding strategies for effectively encouraging educators to shift pedagogical practices toward blended learning models.

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APPENDICES

Appendix A

Interview Recruitment Letter
Using a Learning Management System as a Platform for Blended Learning

Dear Teacher,

My name is Laura Tolly Estill, and I am a doctoral student from the College of Education at Southeastern University. I am writing to invite you to participate as an interview subject in my research study about implementing a learning management system as a platform for blended learning.

As a middle school teacher, you may use various technological tools to enhance classroom instruction. Blended learning combines face-to-face learning with online learning, which means students use computers during class in addition to collaborating with you and other students. The district has decided to use Canvas which is a learning management system (LMS) to facilitate blended learning. LMSs act as an extension of the classroom which, benefits both students and teachers by creating connections among class participants. The LMS provides a platform for online discussions and the sharing of materials to facilitate individual and collaborative learning.

If you decide to participate in this study, you will be asked a number of questions about leadership support for the implementation of the LMS. Interviews will last approximately 30 minutes and will be audio recorded and transcribed. You will have an opportunity to review the transcriptions for accuracy. Transcriptions will be coded and analyzed for themes pertaining to the issue. It is important for educational leaders to understand how best to support teachers in the implementation of the LMS as a platform for blended learning. Your interview responses will help add to these understandings and inform organizational strategies and future research.

Remember, this is completely voluntary. You can choose to be in the study or not. If you would like to participate or have any questions about the study, please email me at xxxxxx@seu.edu.

Sincerely,

Laura Tolly Estill
Ed.D. Candidate
Southeastern University

Dr. Lisa A. Coscia
Dissertation Chair
xxxxxxx@seu.edu

Appendix B

Teacher Interview Protocol

Research Project: **Teachers' Perceptions of Leadership Support for the Implementation of a Learning Management System in Urban Middle Schools**

Time of Interview:

Date:

Place:

Interviewer: Laura Estill

Interviewee:

Position of Interviewee: grade(s)_____, subject(s)_____

Numbers of years teaching _____, years in current position _____

Consent form signed? _____

Notes to Interviewee:

Welcome and thank you for your participation. My name is Laura Estill. My role within the district is as an Instructional Specialist. I work for the Associate Superintendent of Middle Schools and am currently supporting one campus with their systemic integration of the Canvas learning management system (LMS). I also support teachers with instructional design using the Canvas learning management system. My role does not include any type of teacher or administrator evaluation. I am also a doctoral candidate at Southeastern University, located in Lakeland, Florida and am pursuing a Doctor of Education degree in Organizational Leadership. As a reminder, your participation is optional. Your decision whether or not to participate will not prejudice your present or future relations with Southeastern University or your school district. You are free to discontinue participation at any time without prejudice.

Purpose of Research

The purpose of this research is to gain an understanding of teacher perceptions of leadership support for their integration of technology into pedagogy and the implementation of a learning management system. I believe your input will be valuable to this research and in helping grow all of our professional practice. The interview will take approximately 30 minutes. Confidentiality of your responses is guaranteed. The three main research questions are:

i. What are the factors that affect teachers and the successful adoption and implementation of a learning management system in teaching and learning?
ii. How do middle school teachers perceive support from district and school leaders for the use of an LMS as a platform for implementing blended learning?
iii. What are enablers and barriers teachers have encountered in implementing an LMS in classroom instruction?

At this time, I would like to remind you of your written consent to participate in this study. You and I have both signed and dated each copy of the consent form, certifying that we agree to continue this interview. You will receive one copy and I will keep the other under lock and key, separate from your reported responses. Your participation is completely voluntary. If at any time you need to stop, take a break, or return to a previous question, please let me know. You may also withdraw your participation at any time without consequence.

There are no right or wrong answers to the interview questions or desirable or undesirable answers. I would like you to feel comfortable saying what you really think and how you feel. If it is okay with you, I will be tape-recording our conversation since it is hard for me to write down everything while simultaneously carrying an attentive conversation with you. Everything you say will remain confidential, meaning that only I and my dissertation chair, who is the principal investigator, will be aware of your answers - the purpose of that is so we know whom to contact should we have further follow-up questions after this interview. I want to assure you that the information you provide is confidential as is your participation. The data gathered will be used for research and teacher education purposes only.

- Do you have any questions regarding my role as an instructional specialist?
- Do you have any questions about this doctoral project or the interview process?

If there are no further questions, and with your permission, we will begin the interview.

[Note: the researcher will use phrases such as “Tell me more,” “Please give me an example?”, “Please expound/expand/develop your response for clarity?” as prompts to solicit more detailed information when needed.]

Interview Questions:

1. Describe the key actions utilized by the instructional leaders at your school (principal, assistant principals, academic deans, instructional coaches, campus innovation coach) in order to cultivate teaching and learning improvements integrating technology and the Canvas learning management system.

2. Tell me about the instructional design support you receive from the district (curriculum specialists, technology design coaches) to help you use the Canvas LMS and integrate technology into your lessons (type and frequency).

3. What types of professional development opportunities do your school and/or district provide regarding technology integration and the use of the Canvas learning management system?
   Probe:
   In your opinion, how are these professional development opportunities successful learning experiences?

4. Tell me about your school's Canvas learning management system vision and implementation plan and how it has been communicated to the faculty.

5. What has been the greatest enabler(s) for your implementation of new technologies including the Canvas learning management system?

6. What hinders your implementation of new technological innovations, including the Canvas learning management system?

7. What would help you improve your role as a digitally confident teacher integrating the Canvas learning management system into your instructional design plan?

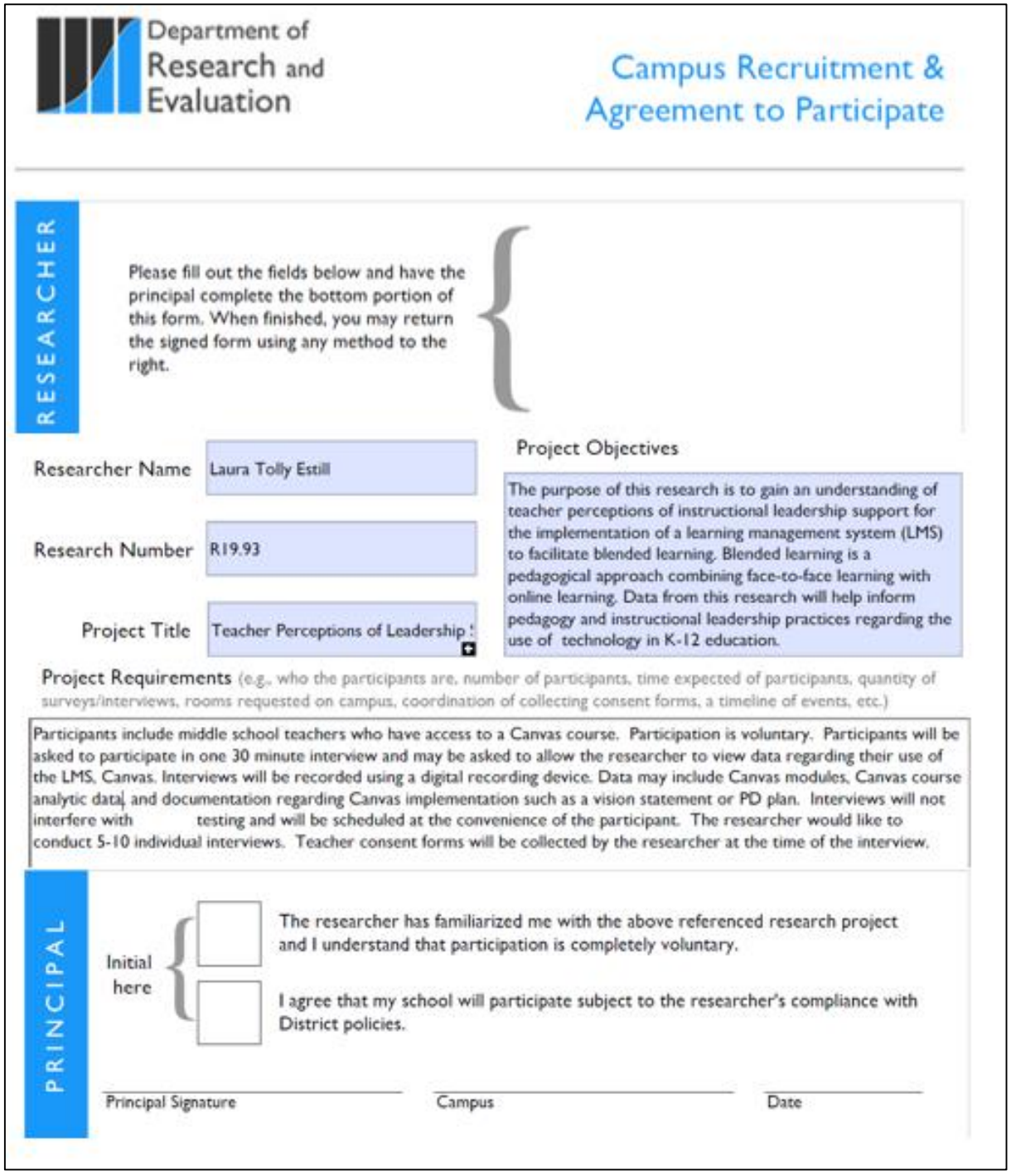
8. Before we conclude this interview is there anything else you would like to share regarding your experiences implementing Canvas?

Conclusion

Thank you for agreeing to meet with me today and for taking time to answer questions about your perceptions of leadership support for integrating technology and a learning management system. You have been instrumental in helping me understand how teachers are managing the key challenges of implementing and sustaining a blended learning environment to meet the needs of today's learners.

Appendix C

Principal Participation Consent Form



Department of Research and Evaluation

Campus Recruitment & Agreement to Participate

RESEARCHER

Please fill out the fields below and have the principal complete the bottom portion of this form. When finished, you may return the signed form using any method to the right.

Researcher Name: Laura Tolly Estill

Research Number: R19.93

Project Title: Teacher Perceptions of Leadership

Project Objectives

The purpose of this research is to gain an understanding of teacher perceptions of instructional leadership support for the implementation of a learning management system (LMS) to facilitate blended learning. Blended learning is a pedagogical approach combining face-to-face learning with online learning. Data from this research will help inform pedagogy and instructional leadership practices regarding the use of technology in K-12 education.

Project Requirements (e.g., who the participants are, number of participants, time expected of participants, quantity of surveys/interviews, rooms requested on campus, coordination of collecting consent forms, a timeline of events, etc.)

Participants include middle school teachers who have access to a Canvas course. Participation is voluntary. Participants will be asked to participate in one 30 minute interview and may be asked to allow the researcher to view data regarding their use of the LMS, Canvas. Interviews will be recorded using a digital recording device. Data may include Canvas modules, Canvas course analytic data, and documentation regarding Canvas implementation such as a vision statement or PD plan. Interviews will not interfere with testing and will be scheduled at the convenience of the participant. The researcher would like to conduct 5-10 individual interviews. Teacher consent forms will be collected by the researcher at the time of the interview.

PRINCIPAL

Initial here

☐ The researcher has familiarized me with the above referenced research project and I understand that participation is completely voluntary.

☐ I agree that my school will participate subject to the researcher's compliance with District policies.

Principal Signature _____ Campus _____ Date _____

Appendix D

Teacher and Staff Consent Form

Teachers' Perceptions of Leadership Support for the Implementation of a Learning Management System in Urban Middle Schools

The purpose of this research is to gain an understanding of teachers' perceptions of leadership support for the implementation of a learning management system (LMS) as a means to facilitate blended learning. Your input will be valuable to this research and in helping inform professional practices regarding the use of technology in education.

I agree to the conditions listed below with the understanding that I may withdraw my participation from the project at any time, and that I may choose not to answer any questions that I do not want to answer. I understand my participation is completely voluntary.

1. As a participant in this study, you will be asked to provide information regarding your use of the LMS, Canvas. You will be asked to participate in one 30 minute interview. And you may be asked if the researcher may view data regarding your use of the LMS, Canvas. Interviews will be recorded using a digital recording device. Data and artifacts may include Canvas modules, Canvas course analytics, and documentation regarding Canvas implementation at your school such as a vision statement or PD plan.

2. The primary use of the data will be to inform a doctoral research project for Southeastern University. Interview transcripts, interview audio recordings, and artifacts collected will be secured using password protected software and will be retained for a period of five years by the researcher prior to disposal. All information will be kept confidential. No individual information will be shared or reported on. Confidential data will not be accessed by anyone other than the researcher or the principal investigator during this time.

3. Collected data will be analyzed for themes and interpretations shared with the dissertation committee at Southeastern University in the form of a paper and a presentation. Analyzed data may also be shared with the district's technology design team to help inform technology integration practices within the school district.

4. Personal identifying information regarding your teaching experience and current job location will be collected. You will not be identifiable in any documents or presentations resulting from this research. Collected information will be secured using password protected software and will be retained for a period of five years by the researcher prior to disposal.

5. I understand my consent is optional. I understand that the researcher is pursuing a doctoral degree and is also an employee of the district. My decision whether or not to participate will not prejudice my present or future relations with Southeastern University or the district. If I decide to participate, I am free to discontinue participation at any time without prejudice. I can get information about the project by contacting Laura Estill at xxxxxxx@seu.edu or Lisa Coscia at xxxxxxx@seu.edu.

6. I understand that while this project has been reviewed by the district and by the principal at my school, the district is not conducting project activities.

You are making a decision whether to participate in this study. To participate, you must be 18 years or older. Your signature on the following page indicates that you have read the information above and have decided to participate in the study. If you later decide that you wish to withdraw your consent for participation in the study, simply tell me. You may discontinue your participation at any time.

Questions/Concerns

If you have any further questions or want clarification regarding this research and/or your participation, please contact:

Laura Tolly Estill
Doctoral Candidate, College of Education, Southeastern University
xxxxxxxx@seu.edu

Dr. Lisa A. Coscia
Principal Investigator, Chair Department of Undergraduate Programs of Education, Southeastern University
xxxxxxxx@seu.edu

A copy of this consent form has been given to you to keep for your records.

The researcher/investigator has also kept a copy of this consent form.

KEEP THIS PAGE FOR YOUR RECORDS

Statement of Consent:

I have read the above information and have sufficient information to make a decision about participating in this study. I consent to participate in the study and consent to allow the researcher to access the following data that I have checked:

- ☐ Canvas course modules (lesson creation and components) and course analytics (login usage, page views, submissions)
- ☐ Canvas Implementation Documents (campus vision statement, PD plans)

Printed Name of Participant:_____

Signature of Participant:_____ Date: _____

_____ Date: _____

Signature of Person Obtaining Consent/Researcher