HIGH-PERFORMING HIGH SCHOOL EDUCATORS' PERCEPTIONS OF HIGH-QUALITY TECHNOLOGY INTEGRATION AND THE TRANSFORMATIONAL LEADER

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HIGH-PERFORMING HIGH SCHOOL EDUCATORS' PERCEPTIONS OF HIGH-QUALITY TECHNOLOGY INTEGRATION AND THE TRANSFORMATIONAL LEADER

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HIGH-PERFORMING HIGH SCHOOL EDUCATORS' PERCEPTIONS OF HIGH-QUALITY TECHNOLOGY INTEGRATION AND THE TRANSFORMATIONAL LEADER

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ABSTRACT

The purpose of this basic narrative qualitative study was to examine educator perceptions of transformational leadership and influence on high-quality technology integration in high schools. The study identified high-performing secondary schools in Missouri using one-to-one technology. Principals and teachers from each of these schools were interviewed to understand which key 21st century skills were necessary for student success, how technology is used best to support the skills (Battelle, 2019b; ISTE, 2016). The study further explored educators' perceptions on the level of transformational leadership skills practiced and the prevalence of the ISTE Standards for Education Leaders (2018) used by principals considered leaders of technology integration (Bass, 1999; Burns, 1978). The study established it is essential for building leaders to change and improve classroom learning environments to support student learning of essential 21st century skills as supported through the use of technology. Leaders are responsible for cultivating these environments by having a vision for technology, designing professional development to support teachers, modeling for teachers what they want to see teachers provide for their students, and encouraging them as they use technology to prepare students for their future.

CHAPTER ONE
INTRODUCTION

The needs and demands of the 21st century have forced our education system to adapt to better meet the needs of students (Battelle for Kids, 2019a; Bellanca & Brandt, 2010; Kieschnick, 2017; Sheninger, 2016). Today's students need learning opportunities and experiences which will better prepare for the challenges which individuals will be faced with as citizens, college students, and workers in the 21st century workforce (Battelle for Kids, 2019a; Bellanca & Brandt, 2010; Kieschnick, 2017; Sheninger, 2016). Change must be reflected in classroom environments through the consideration of two key facets. First, teachers and school leaders must deeply understand both the knowledge and skills required of the 21st century learner and the supports necessary to achieve the learning outcomes such as key subjects and 21st century themes, life and career skills, learning and innovation skills, and information, media, and technology skills. Just as importantly, teachers and school leaders must identify and implement the use of technology to enhance and support the needs of the 21st century learner. Understanding and supporting the needs of 21st century learners establishes the essence of high-quality technology integration (Battelle for Kids, 2019b; ISTE, 2016).

The Battelle for Kids' Framework for 21st Century Learning (2019b) describes elements of effective technology integration, focusing on the learning and development of 21st century skills. The first element of high-quality effective technology integration identifies 21st century skills as unique expectations critical to preparing students for the changes which have occurred in society as a result of the rapid advancements in technology (Battelle for Kids, 2019b; ISTE, 2016). The second component of high-

quality technology integration includes students and teachers actually using the technology to support the teaching and learning process (ISTE, 2016; ISTE, 2018). The International Society for Technology in Integration (ISTE) Standards for Students (2016) provide educators the blueprint for best using devices, hardware, tools, software, and the internet to support the learning framework. Students utilizing technology in learning environments to demonstrate and apply the knowledge acquired can apply those same skills in order to be successful in their personal lives (Bellanca & Brandt, 2010; ISTE, 2016; Kieschnick, 2017). Collectively, 21st century skills developed and enhanced through the use of technology combine to create the definition of high-quality technology integration for the purposes of this study.

Education leaders are responsible for guiding digital age learning through creating a culture for change in the educational system and supporting the integration of technology into highly effective teaching practices and student learning experiences (ISTE, 2018; Sheninger, 2016; Wenglinsky, 1998). Education leaders must be visionary and innovative to ensure all students have access to technology and appropriate digital citizenship skills (Collin & Brotocorne, 2019; ISTE, 2018; Tucker, 2014). School district administrators are required to cast a vision which establishes a strategic plan for technology integration (Baldrige Performance Excellence Program, 2019; ISTE, 2018; Kotter, 2014; Kouzes & Posner, 2017). Leaders are charged with developing a culture where students and teachers are able to use technology in creative ways to enhance the learning and teaching process (Battelle for Kids, 2019b; ISTE, 2018; Starr, 2009; Wenglinsky, 1998). In order to sustain effective technology integration, leaders must develop systems which support the implementation of technology in a way which can be

continually improved to transform student learning (Baldrige Performance Excellence Program, 2019; ISTE, 2018). Effective technology leaders must also model and continuously improve personal technology skills through professional learning networks to effectively lead technology integration in schools (ISTE, 2018; Powers, 2017; Sheninger, 2016). Competent technology-driven leaders have an understanding of both pieces of high-quality technology integration, including the foundation of 21st century skills and how the use of technology can support and enhance those skills, and also have the transformational leadership skills and capacity to move innovative technology integration change initiatives forward (Battelle for Kids, 2019a; ISTE, 2018; Sheninger, 2016).

Leaders who possess transformational leadership traits are able to utilize the ISTE Standards for Education Leaders (2018) and become technology-driven leaders creating innovative culture and support effective change (Bass, 1997; ISTE, 2018). Key tenets of transformational leadership are evidenced throughout the ISTE Standards for Education Leaders (2018). Transformational leadership and the ISTE Standards for Education Leaders (2018) collectively provide guidance for educational leaders inspiring technology-rich classrooms with opportunities for students to develop 21st century technology skills (Bass, 1997; Bass, 1999). Educational leaders who emulate transformational leadership traits and implement the ISTE Standards for Education Leaders can create a culture which supports teachers to effectively integrate technology (Bass, 1997; Battelle for Kids, 2019b; ISTE, 2018).

Statement of the Problem

Technology has become an integral component of daily life (Bellanca & Brandt,

2011). Careers implementing technology has led to the building of networks and increased knowledge through the use of machines (Flanagan & Jacobsen, 2003; Kieschnick, 2017). Schools have been charged with making sure students are ready for technology-centered environments by ensuring students have the 21st century skills necessary to succeed in college, the workforce, and life (Battelle for Kids, 2019a; Darling-Hammond, 2010; Germaine, et al., 2016; Kieschnick, 2017; Sheninger, 2016; Trilling & Fadel, 2009). Educators need a clear understanding of 21st century skills and how the skills are best support through the use of technology. The effective utilization of technology is a second element for defining high-quality technology integration (ISTE, 2016). The ISTE Standards for Students (2016) provide educators a guide for using technology in the classroom emphasizing on promoting student learning and understanding 21st century skills. The level of classroom technology integration (both skills and technology use) are dependent on technology-driven leaders who are equipped to support teachers in creating classrooms and schools which meet the current 21st century needs of students (Flanagan & Jacobsen, 2003; Ormiston, 2011; Kieschnick, 2017). The problem schools are facing is ensuring educators understand which 21st century skills students need and how to effectively use technology to learn and develop needed skills (Battelle for Kids, 2019a; ISTE, 2016). Leaders need to have an understanding of the 21st century learning process, be equipped to provide support, and guide teachers in developing high-quality technology integrated learning environments (Battelle for Kids, 2019a; ISTE, 2018; Kieschnick, 2017; Sheninger, 2016).

Leadership is crucial when effectively integrating technology in schools. Demski (2012) identified the leader must create an environment that inspires innovation and an

openness to new ideas. Lewis (2010) stated leaders who are successful in leading a technology integration plan have a shared vision. A shared vision for technology includes a detailed plan for implementation, along with goals to determine the effectiveness of the implementation (Lewis, 2010; Kotter, 2014; Kouzes & Posner, 2017). The right kind of culture must be in place to create and facilitate an environment which allows for successful technology integration (Battelle for Kids, 2019; ISTE, 2018; Marzano, 2007; Sheninger, 2016). A current problem for educators is having clear vision of 21st century skills, best supporting classrooms through effective use of technology (Senge, 1990; Bass, 1999; Ormiston, 2011; Demski, 2012; ISTE, 2018).

Purpose of the Study

The purpose of this basic narrative qualitative study was to understand the perceptions of principals and teachers in academically successful Missouri high schools which were noted for technology integration (using a one-to-one approach). The research strived to uncover what educators deemed as the necessary knowledge and skills for 21st century learners. The study uncovered the views and experiences around what types of technology-enhanced supports are important to accomplish 21st century knowledge and skills. The research further investigated the perceptions in connection with the type of leadership skills exemplified by the high school principals in the identified schools. Specifically, the researcher focused on the types of transformational technology leadership skills used by the principals and how the skills were influential in creating a culture where high-quality technology integration was practiced. The study was designed to capture the understanding educators had of high-quality technology integration (skills, knowledge students need, and how to best use technology to enhance learning) and how

building level leadership supported high-quality technology integration in teaching and learning.

This qualitative study focused on educator's perception of the key 21st century skills necessary for student success, how educators and students used technology to develop the skills, and how educators promoted high-quality technology integration in public high schools. Participants selected for the study were building principals, novice teachers, and veteran teachers. Participants informed the research by providing ideas and experiences related to high-quality technology integration and how leadership might support high-quality technology learning experiences. Participant perceptions were examined around the 21st century skills, as framed by Battelle for Kids (2019a). ISTE Standards for Students (2019) was the lens for which the researcher gathered insights from participants for how technology could effectively support student learning. As the researcher examined classroom practices, the desire to explore how a leader might provide support for technology evolved. Educators shared their perceptions on how the leader utilized transformational leadership characteristics in conjunction with ISTE Standards for Education Leaders (2018) to influence technology integration. The researcher desired to better understand how school leaders were driving ongoing improvements in effective high schools currently implementing high-quality technology integration practices.

Theoretical Framework

Two bodies of research were used as the theoretical framework for the study. Technology integration grounded in the work of Harold Wenglinsky (1998) and transformational leadership derived from the work of Bass (1978) and Burns (1985) is the

framework for the study. Wenglinsky (1998) studied the relationship between various digital tools and different educational outcomes such as proficiency on standards. He concluded technology may serve as a critical tool for improving student proficiency and the school's learning culture (Wenglinsky, 1998). At the time of his research immense efforts to integrate technology into the classroom to support student learning were taking place (Wenglinsky, 1998). The purpose of Wenglinksy's (1998) research was to determine the impact of technology on student achievement through the integration of technology in teaching mathematics (Wenglinsky, 1998). The scope of his research covered the frequency in which technology was used to teach math, student access to devices in school and at home for the purposes of learning math, professional development required for teachers to effectively utilize technology, and effective digital instructional practices for math education (Wenglinsky, 1998).

Wenglinsky (1998) concluded his research by stating technology is not the magic cure to transforming student learning in the classroom but did have an impact on student achievement when used effectively. Participants in the study showed improvement in the mastery of mathematics standards, as well as the overall learning environment in the school (Wenglinsky, 1998). Students who had access to technology devices at home increased academic achievement in school (Wenglinsky, 1998). For technology to be used effectively in the classroom, teachers must have professional development using digital tools and technology so students can produce critical thinking skills (Wenglinsky, 1998). Any change effort, such as classroom technology integration, requires a supportive culture and visionary leadership.

Transformational Leadership Theory was first presented by James Burns who

believed individuals possessing certain leadership behaviors had the ability to influence followers to reach greater levels of performance and commitment (Burns, 1978; Gordon & Smith, 2015). Burns (1978) identified transactional and transformational leadership were the difference between ordinary and extraordinary. Burns described transactional leadership as a give-and-take approach where followers complied with the leader and expected something in return (Burns, 1978). Transformational leaders influenced individuals to see the importance and value in their work and how goals could be achieved (Burns, 1978).

Bass (1985) further examined the relationship between transformational and transactional leaders. Bass (1985) coined the term transformational to explain Burns' Leadership Theory when explaining effective behaviors leaders use. Bass (1985) developed a leadership theory which involved transactional and transformational leadership qualities. Bass & Avolio (1997) showed how the transformational and transactional leadership approach bring followers together through trust and respect to achieve goals. Bass & Avolio (1993, 1994, 2004) examined four qualities transformational leaders possess. The four qualities are referred to as the Four I's of Transformational Leadership (Bass & Avolio 1994, 2004). Idealized influence is demonstrated when the leader has a vision, describes how the vision can be accomplished, and models the behaviors necessary to achieve the vision (Bass, 1999). Inspirational motivation is shown when the leader is able to motivate and inspire individuals by making work meaningful and challenging (Bass, 1997). Intellectual stimulation is shown when leaders are able to assist followers in becoming more innovative and creative (Bass, 1999; Bass & Avolio, 2004). Individualized consideration

is demonstrated when leaders identify growth opportunities for followers and provided the support and coaching to help individuals progress (Bass, 1999). Transformational leadership was chosen for the study since research has shown transformational leadership can promote change in individuals, increase followers' motivation, and enhance an individual's performance in alignment with the goals of the mission (Bass, 1999; Yukl, 1999). The theoretical framework for the study focuses on how transformational leadership skills may impact change and could influence high-quality technology integration enhancing student learning through the development of 21st century skills (Bass, 1999; Wenglinsky, 1998). Wenglinsky (1998) stated technology did have an impact on student achievement when used effectively in the classroom. For teachers to understand how to effectively utilize technology in the classroom, leaders are charged with providing professional learning and support using digital tools (Wenglinsky, 1998). High-quality technology integration requires a leader who understands the learning and development of 21st century skills and how technology can best be leveraged for improved outcomes.

Research Questions

There are two overarching research questions for this basic narrative qualitative study, with each question having two sub-questions:

RQ1. What are educator perceptions of high-quality technology integration?

i. What are educator perceptions of the essential 21st century skills students need for success?

ii. What are educator perceptions for how teachers use technology to teach 21st century skills?

RQ2. What are educator perceptions for how leaders support high-quality technology integration?

i. What are educator perceptions for how transformational leadership supports high-quality technology integration?

ii. What are educator perceptions for how leaders integrate International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) to support high-quality technology integration?

Significance of the Study

This basic narrative qualitative study was designed to examine the perceptions of high school principals and teachers in Missouri in regards to high-performing schools using a one-to-one technology approach. The research was designed to capture how educators in high-performing buildings viewed 21st skills for student success and how technology effectively utilized to provide deeper learning and understanding of 21st century skills (Battelle, 2019b; ISTE, n.d). The building leader establishes the culture and environment to support high-performing classrooms, so the influence of transformational leadership framed with the ISTE Standards for Education Leaders will be examined to determine the influence of the principal on high-quality technology integration in Missouri public high schools (Bass, 1999; Burns, 1978; ISTE, 2018). At the time of research, the United States was experiencing the COVID-19 pandemic and schools were forced to create alternative learning methods, with many relying on online learning to continue to educate students (Schwarz, 2020). The pandemic created a sense of urgency for this research on high-quality technology integration in Missouri schools.

The study provides a unique view of high-quality technology integration by

combining two bodies of research from Battelle for Kids (2019a) and the International Society for Technology in Education Standards for Students (2016). The work of these two organizations are complementary to each other. Battelle for Kids (2019a) provides the foundation for student success through a focus on the development of 21st century skills, knowledge, expertise, and support systems. The International Society for Technology in Education (ISTE) Standards for Students (2016) indicates how 21st century skills can be further enhanced through the use of technology. The two frameworks combine to create the model used in the study for high-quality technology integrated classrooms. The research focuses on the high performing high schools in Missouri whose leaders are noted for quality work in leading technology integration (Battelle for Kids, 2019a; ISTE, 2016).

This study recognizes education leaders are responsible for creating the environment in which 21st century skills can be developed and enhanced through the use of technology (ISTE, 2018; Marzano, 2003). 21st century skills will not come to fruition without the proper learning conditions created by the teacher. (Hattie, 2012; ISTE, 2016; ISTE, 2018; Marzano, 2017). High school leaders are instrumental in creating a technology integrated vision for their buildings, and are charged with creating clear expectations for how and why teachers must focus on technology-enhanced learning environments (ISTE, 2018). The ISTE Standards for Education Leaders (2018) provide a guide for transformational leaders to move teachers toward higher levels of technology integration to increase student achievement and the development of 21st century skills (Bass, 1999; Bass & Avolio, 1993; ISTE, 2018). Literature on transformational leadership indicates transformational leaders are effective in creating a positive culture

for making change a reality (Bass & Avolio, 1993; Bass, 1999). ISTE Education Leaders Standards (2018) display a framework for effective technology integration in school buildings and could be enhanced through the use of transformational leadership characteristics (Bass, 1999; Battelle for Kids, 2019a; Hattie, 2012; ISTE, 2016; ISTE, 2018; Marzano, 2017). This study is unique because of the combined elements used to view technology integration. The study examines both the type of skills students need and how technology plays a role to enhance and support necessary skills. The study further explores the application of transformational leadership characteristics to the International Society for Technology (ISTE) Standards for Education Leaders (2018). The study will help identify the level of influence a technology-driven transformational leader has on high-quality technology integration at the classroom level.

The significance of the research project is two-fold. First, the study is focused on uncovering the 21st century skills students need for success and how a deep learning and understanding of 21st century skills can be developed through the effective use of technology. Additionally, this study is designed to provide additional insight on the influence an effective high school principal has on ensuring classroom level technology integration best meets the needs of the 21st century learner. The study explored the effect of transformational leadership in supporting the integration of technology in the high school setting when examined through the lens of the International Society for Technology in Education (ISTE) Standards for Education Leaders (2018).

Definition of Key Terms

For the purpose of this study, key terms were defined as follows:

21st century skills. Skills which separated students prepared for the age of

globalization and students who were not prepared. 21st century skills include the skills of creativity and innovation, critical thinking and problem solving, communication, and collaboration (Battelle for Kids, 2019b).

Transformational leadership. The practice of leaders and followers helping each other advance to a higher level of morale and motivation (Burns, 1978).

High-quality technology integration. For the purposes of this research, the definition for high-quality technology integration comes from combining the two bodies of research from Battelle for Kids (2019a) and the International Society for Technology in Education (2016). The work of the two organizations are complementary to each other. Battelle for Kids (2019a) laid the foundation for student success by focusing on the development of 21st century skills, knowledge, expertise, and support systems. The International Society for Technology in Education (ISTE) (2016) further enhanced 21st century skills through technology integration guided by the standards. The two frameworks combine to create the model for a high-quality technology integrated classroom (Battelle for Kids, 2019a; ISTE, 2016).

Limitations

The study has the possibility for limitations in the following areas:

1. The perspectives and experiences of the teachers and administrators participating in the study might not have provided a true response.
2. The perspectives of the teachers and administrators interviewed might be skewed by personal experience, time restrictions, personal preference, and understanding of the content.
3. The participants of the study may not have comprised a sample representative

of the desired population.

4. The schools' size, location, and demographics were not a consideration for the study.

Delimitations

The study has the possibility for delimitations in the following areas:

1. The study was delimited to public high schools containing grades 9-12 located in the state of Missouri.
2. The study was restricted to public high schools containing grades 9-12 integrating one-to-one technology.
3. Principals viewed as technology leaders were selected from recommendations provided by the Missouri Association of Secondary School Principals (MoASSP) and area supervisors with the Missouri Department of Elementary and Secondary Education (DESE). The lists from the recommendations were cross-referenced to identify the most qualified principals.
4. The study did not include retired teachers or administrators.

Assumptions

The study made the assumption the area supervisors for the Missouri Association of Secondary School Principals, along with the area supervisors for the Missouri Department of Elementary and Secondary, accurately identified principals who exemplified high levels of technology leadership. The researcher assumed the criteria used to select participants for the study was appropriate and identified participants who had experienced successful technology integration in their high schools. The researcher also assumed the principals who agreed to participate in the study had a sincere interest in

the research and had no other alternative motives. The researcher assumed the principal appropriately identified high-performing new and veteran teachers who effectively implemented technology in their learning environments. The researcher also assumed teachers who are effectively teaching 21st century skills received training with the skills and technology integration which enabled educators to implement such strategies in their classrooms. Additionally, the researcher assumed the answers provided to the interview questions by new and veteran teachers were done so openly and honestly. It was assumed the answers to the interview questions were reflective of each participant's perceptions of transformational leadership and the influence on high-quality technology integration in high schools.

Design Control

A basic narrative qualitative research approach was used for the study. Area directors of the Missouri Association of Secondary School Principals (MoASSP), along with area supervisors for the Missouri Department of Elementary and Secondary Education (DESE), were contacted to provide a list of high-performing digital leaders who championed one-to-one initiatives in their school buildings. The recommendations were cross-referenced, and five school leaders from different school districts were identified. Interviews were conducted virtually with each school selected for the study. Participants in the study were the building principal and two teachers from each school. Both teachers were recommended by their building principal as high-performing teachers effectively using technology in the classroom.

Limitations for the study were identified to enable the study to remain valid. Participants were ensured anonymity to help ensure true responses to each of the

questions. The researcher answered clarifying questions to allow for participants to fully understand the questions and content. In order to obtain participants representative of the desired population, the researcher cross-referenced recommendation lists for principals to participate. The researcher also established criteria for teacher participants which was shared with principals to receive appropriate recommendations. Two teachers from each building were interviewed, with one being a novice teacher and one being an experienced teacher. For the purposes of the study a novice teacher is defined as someone who has three years' experience or less. A veteran teacher is defined as an educator who has experience of ten years or more.

Delimitations of the study were identified to frame the study within parameters including making sure high schools selected to participate integrated technology in their buildings so the participants had an understanding of the content in each of the questions. The Missouri Association for Secondary School Principals (MoASSP) and the Missouri Department of Elementary and Secondary Education (DESE) were the organizations selected to provide principal recommendations. The two groups were selected as each work closely with school leaders across the state of Missouri. Through professional relationships with school principals each have a strong understanding of which leaders would be strong with technology integration and high levels of student achievement.

Assumptions which may make the study unstable were taken into consideration by the researcher through clearly articulating the criteria for selection of principals and teachers. The researcher worked with the educational organizations to identify leaders who exemplified high levels of technology leadership. The researcher provided building principals with criteria for selected teacher participants and clarified questions. The

criteria included identifying two teachers from each school who had received training for technology integration and were considered to be proficient in using technology to support student learning.

Summary

The purpose of this qualitative study was to understand the perceptions of principals and teachers in high performing Missouri high schools who use a one-to-one technology approach to uncover 21st century skills most necessary for student success. The study also examined how educators viewed the use of technology to develop 21st century skills and understand the possible influence of transformational and the ISTE Standards for Education Leaders on promoting high-quality technology integration. The research of Harold Wenglinsky (1998) was utilized to define the technology integration component of the theoretical framework, and the transformational leadership component was directed by James Burns (1978) and Bernard Bass (1985). The study explored the gap in literature between any connections which exist between high-quality effective technology integration and any influence transformational leadership might have.

21st century skills, as defined in the Battelle for Kids' Framework (2019b) was the first component of high-quality technology integration. 21st century skills are critical to success in the lives, careers, and college experiences due to the change brought about by the rapid advancements in technology (Battelle for Kids, 2019b; ISTE, 2016). 21st century skills, combined with effective uses of technology, as identified through the ISTE Standards for Students (2016), collectively create the definition for high-quality technology integration. Educational systems must ensure students are prepared for the digital landscape through utilizing technology to transform learning experiences (ISTE,

2016). Education leaders are responsible for guiding digital age learning through supporting classrooms with the integration of technology into highly effective teaching practices and student learning experiences (ISTE, 2018). Leaders who possess transformational leadership traits, specifically the Four I's of Transformational Leadership, can apply the traits to the ISTE Standards for Education Leaders (2018) to create the culture and support for effective change (Bass, 1997). Transformational education leaders who are able to effectively integrate technology into their building's culture and support the teaching and learning of 21st century skills and outcomes is what is needed to change the educational landscape (Bass, 1997; Battelle for Kids, 2019b; ISTE, 2018).

CHAPTER TWO
REVIEW OF RELATED LITERATURE

Introduction

The purpose of this qualitative study was to understand the perceptions of principals and teachers in high performing Missouri high schools who use a one-to-one technology approach to uncover 21st century skills most necessary for student success. The study examined how educators view the use of technology to develop student skills and understand the possible influence of transformational leadership and the ISTE Standards for Education Leaders (2018) on promoting high-quality technology integration. Knowledgeable digital leaders have an understanding of high-quality technology integration, including the foundation of 21st century skills and how the use of technology can support and enhance technology integration change initiatives forward in classrooms (ISTE, 2018). Changes and advancements in technology are happening at such a rapid pace it has become difficult for educators to understand what students need to learn to be prepared for success, and how teachers can deliver knowledge to prepare students for the future (Kereluik et al., 2013). Research indicates the educational system at the turn of the 21st century no longer properly prepares students for today's world (Bellanca & Brandt, 2010; Glenn, 2019; Ledward & Hirata, 2011; National Education Association, 2012). The disconnect aligns with what has been cited as a global shift from the Industrial Age to the Information Age (Kivunja, 2015; Ledward & Hirata, 2011). The disconnect became more important as schools adjusted to social distancing guidelines implemented through the COVID-19 pandemic in the spring of 2020. Schwartz (2020) described how schools were forced to provide remote learning opportunities through the use of technology as students and teachers were not allowed to be at school. The

immediate transition to remote learning created a noticeable change in how teachers used digital resources before, during, and after the COVID-19 pandemic (Schwartz, 2020). Schools have been charged with making sure students are ready for a remote learning environment by ensuring students have the skills necessary to succeed in college or the workforce (Darling-Hammond, 2010; Flanagan & Jacobsen, 2003). School leaders must build each teacher's capacity and provide support as teachers are challenged to create technology rich classrooms with focus on the deep learning and implementation of 21st century skills (Battelle for Kids, 2019b; ISTE, 2018).

Now the challenge for educational leaders is to ensure all students are equipped with 21st century skills (ISTE, 2018). Equipping students with 21st century skills is the foundation for the first of two components defined necessary for high-quality classroom level technology integration. The Battelle for Kids' Framework (2019a) was designed as a guide to help educators understand which 21st century skills are fundamental and integrate technology in all classrooms. The Battelle for Kids' Framework (2019a) integrates specific skills in the educational setting and support systems and includes the 21st century elements of standards and assessments, curriculum and instruction, professional development, and learning environments (Battelle for Kids, 2019b; Mishra & Kereluik, 2011). In addition to the Battelle for Kids' Framework, The International Society for Technology in Education (ISTE) Standards for Students (2016) support the learning and development of 21st century skills. The ISTE Standards for Students (2016) are used as a framework for supporting learning through the use of technology to prepare and equip students for life situations. Collectively, Battelle for Kids (2019a) and ISTE (2016) provide guidance for developing a high-quality technology integrated classroom

(Battelle for Kids, 2019a; ISTE, 2016).

Effective implementation of change efforts, such as high-quality technology integration in school systems, is highly dependent on effective leadership (ISTE, 2018). Leaders must create a vision with strategies, plans, and goals aligned to fulfill the vision (Kotter, 2012; Reeves, 2009). The ISTE Standards for Education Leaders (2018) provide a strategic, planned, and goal-oriented blueprint for school administrators to use to support high quality technology integration at the classroom level. The qualities and actions school leaders may need to consider in moving high-quality technology integration forward is included in the Transformational Leadership Theory. Transformational leaders inspire followers to reach greater levels of performance and commitment and potentially move high-quality technology integration forward (Burns, 1978; Gordon & Smith, 2015). High-quality technology integrated leaders need to understand how to support the effective use of technology in their buildings using the ISTE Standards for Education Leaders (2018) in conjunction with the application of transformational leadership traits (Bass, 1999; ISTE, 2018). The combination of ISTE Standards for Education Leaders (2018) and Transformational Leadership Theory could be a key lens as leaders strive to become effective technology-driven leaders.

Chapter Two reviews the current literature related to high-quality technology integration by examining the Battelle for Kids Framework for 21st Century Learning (2019a) and the International Society for Technology in Education (ISTE) Standards (2018). The expectations for the high-quality technology integrated classroom is discussed as a synthesis of Battelle for Kids (2019a) and ISTE Standards for Students (2016) along with additional supporting literature. Battelle for Kids (2019a) provides

insight into a framework for 21st century skills, and defined the classroom expectations for essential content, skills, and pedagogy. ISTE (2016) further supports the 21st century skills by providing guidance for how students should utilize technology effectively to engage in the learning environment. The research from both of the organizations combines to create the definition for high-quality technology integration. Next, the ISTE Standards for Education Leaders (2018) are presented and supported with relevant research as a guide for leaders to better understand the knowledge and actions expected to support high-quality digital classrooms. Literature then examines the importance of transformational leadership when bringing forth this type of major change. Finally, the research related to ISTE Standards for Educational Leaders (2018) and Transformational Leadership Theory is synthesized to indicate how leaders use both bodies of work to create conditions to best support teachers in creating classrooms with high-quality technology integration.

Technology Integration and Transformational Leadership

One theoretical framework for the study centers on the research of Harold Wenglinsky (1998) with the focus on the technology integration component of the study. Another theoretical framework for the study centers on the work of James Burns (1978) and Bernard Bass (1985) on transformational leadership. Wenglinsky (1998) explored the dynamic between different digital tools and resources and the possible impact on educational outcomes. The foundation of Wenglinsky's (1998) study explored the impact technology has on student achievement through the use of technology in teaching mathematics. He examined the frequency technology was used to teach math, student access to devices in school and at home for the purposes of learning math, professional

development required for teachers to effectively utilize technology, and effective digital instructional practices for math education (Wenglinsky, 1998).

Wenglinsky (1998) concluded his research by stating technology is not the only way to transform student learning in the classroom, but does have an impact on student achievement when used effectively. Results from his study showed improvement in the mastery of mathematics standards, as well as the overall learning environment in the school (Wenglinsky, 1998). To help students develop greater critical thinking skills and for technology to be used effectively in the classroom, teachers must receive professional develop using technology and digital tools (Wenglinsky, 1998). Any change effort, such as technology integration, requires a supportive culture and visionary leadership and is why the researcher chose transformational leadership theory for this study.

Transformational leadership theory was first presented by James Burns who believed individuals who possess certain leadership behaviors have the ability to inspire greater levels of performance and commitment (Burns, 1978; Gordon & Smith, 2015). Transformational leaders influence followers to see the importance and value in their work and how goals could be achieved (Burns, 1978). Bass (1985) coined the term "transformational" to explain Burns' leadership theory which is common when explaining effective behaviors leaders use (Bass, 1985). Bass & Avolio (1993, 1994, 2004) advanced Transformational Leadership Theory further with four qualities transformational leaders possess. The four qualities are referred to as the Four I's of Transformational Leadership which are idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass & Avolio, 1994, 2004). Idealized influence is demonstrated when the leader has a vision, describes how the

vision can be accomplished, and models the behaviors necessary to achieve the vision (Bass, 1999). Inspirational motivation is shown when the leader motivates and inspires individuals by making work meaningful and challenging (Bass, 1997). Intellectual stimulation is demonstrated when leaders are able to assist individuals in becoming more innovative and creative (Bass, 1999; Bass & Avolio, 2004). Individualized consideration is revealed when leaders identify growth opportunities for individuals and provide the support and coaching to help individuals progress (Bass, 1999).

High-Quality Technology Integration

Teachers are challenged to utilize technology effectively, as both the content and pedagogy needed for 21st century learners and skills for using technology must be considered (Battelle, 2019b; ISTE, 2016; Sheninger, 2016; Yu, 2013). Leaders must consider a framework of skills which must be taught and supported as well as guidelines to effectively using technology to promote high-quality technology integrated classrooms (ISTE, 2018). The Battelle for Kids (2019a) Framework for 21st Century Learning lays the foundation for high-quality technology integrated classrooms and describes essential student learning outcomes and required supports needed for the development of 21st century skills, knowledge, and expertise. The ISTE Standards for Students (2016) builds upon the Battelle for Kids (2019a) Framework to provide technology integration standards designed to prepare students for successfully using technology in the classroom and life. The combination of the two bodies of work create the definition of high-quality technology integration for the purposes of this study.

The first component of high-quality technology integration comes from the Battelle for Kids Network (Battelle for Kids, 2019a), a not-for-profit organization which

collaborates with schools to integrate 21st century learning. The organization was instrumental in designing a framework promoting the development of 21st century skills in learners from early childhood throughout K-12 education and beyond. In order to effectively do promote the development of 21st century skills, Battelle for Kids (2019a) created a framework for 21st century learning identifying student learning outcomes and support systems promoting high levels of effective technology integration (Ledward & Hirata, 2011; Mishra & Kereluik, 2011). The framework is visually represented in Appendix A. The Battelle for Kids' Framework (2019a) is divided into two main areas which include 21st century student outcomes and 21st century support systems (Appendix A). The framework begins by examining student outcomes which include: key subjects and 21st century themes, learning and innovation skills, information, media, and technology skills, and life and career skills. 21st century support systems promotes learning which is relevant, personalized, and engaging and includes 21st century: standards and assessments, curriculum and instruction, professional development, and learning environments (Battelle for Kids, 2019b). The framework for outcomes and support systems lays the foundation for the first component of high-quality technology integration (Ledward & Hirata, 2011; Mishra & Kereluik, 2011). The second component of high-quality technology integration is the effective use of technology in the classroom provided from standards created by the International Society for Technology in Education (ISTE, 2016).

The standards for effective technology utilization established by the International Society for Technology in Education (ISTE, 2016) provides the research supporting the second component of high-quality technology integration. The ISTE Standards (2018)

were designed to guide educators in preparing students for success in a digital world. Standards were created for students, educators, education leaders, and coaches (ISTE, 2018). For the purposes of this research, the ISTE Standards for Students (2016) were examined. The ISTE Standards for Students (2016) outlined effective technology integration supporting the development of 21st century skills contributing to a digital global society connected by technology.

21st Century Student Learning Outcomes

The Battelle for Kids' Framework (2019a), the first component of a high-quality technology integrated classroom, provided student learning outcomes to determine mastery of the knowledge and skills required for success in today's world. Skills required for students today are the foundation for student success in any classroom whether in a seated or virtual setting (Battelle for Kids, 2019a). The Battelle for Kids (2019a) Framework addressed essential learning outcomes and how the learning outcomes can best be integrated into the educational environment (Kandari & Qattan, 2020). The first outcome is core subjects and 21st century themes. The core subjects include the following: English, reading, world languages, arts, mathematics, economics, science, geography, history, government, and civics. The themes referenced included: global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health literacy, and environmental literacy. The integrated themes are designed to support the core content disciplines (Battelle for Kids, 2019a). The second outcome discussed is learning and innovation skills which included the four C's of creativity and innovation, critical thinking and problem-solving, communication, and collaboration (Battelle for Kids, 2019a; Germaine, et al., 2016). The information, media, and technology skills

outcome includes information literacy; media literacy; and information, communications, and technology literacy. The final outcome is life and career skills which included flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility. (Battelle for Kids, 2019a; Bellanca & Brandt, 2010; Germaine, et al., 2016; Kandari & Qattan, 2020).

Key Subjects and 21st Century Themes

Key subjects, along with 21st century themes, are vital to college and career readiness and foundational in all classrooms including classrooms which effectively utilize technology (Battelle for Kids, 2019a; Bransford, 2000). The content disciplines were English; reading or language arts; world languages; arts; mathematics; economics; sciences; geography; history; government; and civics (Kivunja, 2015). The Battelle for Kids (2019a) Framework indicated the importance for students to have a deep understanding or mastery of content disciplines. Superficial or just coverage of content disciplines does not prepare students for 21st century job expectations (Battelle for Kids, 2019a; Kivunja, 2015). Bransford (2000) identified three core learning principles which must be prevalent for deep learning with understanding to occur. Pre-existing knowledge is the foundation upon which new knowledge can be constructed (Bransford, 2000). New knowledge is developed by establishing a foundation of factual knowledge within a conceptual framework and the ability to organize the new learning so the new knowledge can be accessed and applied when necessary (Bransford, 2000). Learning concludes with metacognition and opportunities to reflect upon what was learned (Bransford, 2000). The outcome of each key subject emphasizes the importance for students to develop a deep understanding of content areas while integrating 21st century themes (Battelle for Kids,

2019a).

21st century interdisciplinary themes defined by the Battelle for Kids' Framework (2019a) includes: global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy, health literacy, and environmental literacy. The concepts work effectively when integrated with traditional academic subjects to promote deeper learning. (Alismail & McGuire, 2015; Bransford, 2000, Ledward & Hirata, 2011; National Education Association, 2012). Students able to develop 21st century skills can better understand and help solve global issues. 21st century learners equipped with 21st century skills are better suited to learn from and work with people from different backgrounds in personal, work, and community situations. 21st century skills help students better understand other countries' customs, including non-English languages (Liu, 2020; Robinson & Clardy, 2011). Students should utilize experiences of working with people from diverse backgrounds with mutual respect to better understand the world around them (Kereluik et al., 2013; Liu, 2020; Zhao, 2015). It is helpful for learners to gain an understanding for different regions throughout the world, including non-native languages (Battelle for Kids, 2019b). To increase global awareness, students need to be equipped with the knowledge and expertise to live and work as global citizens, no matter where national boundaries may lie (Zhao, 2015).

Additional interdisciplinary themes defined by Battelle for Kids (2019b) were financial, economic, business, and entrepreneurial literacy designed to help prepare students to make proper individual financial choices and have the capacity to understand and oversee business experiences. The additional interdisciplinary themes are important so students develop a comprehensive understanding of the current state of the economy.

Understanding students can use business skills to expand personal career options, allowing students to make personal economic decisions (Battelle for Kids, 2019a; Kivunja, 2015). As part of supporting students in developing competence and understanding with personal economic, the Graduation Requirements for Missouri Graduates in Public Schools (2019) require students to complete a half-unit of credit in personal finance (DESE, 2019). Missouri's required course in personal finance includes competencies for income, personal money management, spending habits and proper use of credit, and how to save and invest money wisely (DESE, 2019). Developing a students' understanding of personal finance is a result of an educational system promoting uniqueness and creativity to encourage entrepreneurship (Ruppert, 2010; Zhao, 2015).

The global economy is constantly changing with new industries and occupations being added rapidly (Bellanca & Brandt, 2010). Zhao (2015) described the new economy as favoring workers who possess specific skills. Students need entrepreneurial skills to increase productivity in the workplace and broaden career choices (Battelle for Kids, 2019b). Entrepreneurial skills include the ability to communicate, collaborate, and manage finances (Battelle for Kids, 2019b). Skills such as productivity and accountability which include the ability to manage projects are also key entrepreneurial skills for success in the 21st century (Battelle for Kids, 2019b). The current educational system must be shifted to properly prepare students with the skills needed to meet the needs of the new global economy (Zhao, 2015).

The Battelle for Kids Framework (2019b) described civic literacy as another interdisciplinary theme. Civic Literacy is important for success in the 21st century

because having the skill allows students to have a greater impact in civic life through understanding governmental procedures. Students should be productive contributors to civic life through knowledge and comprehension of how government works. 21st century students have a duty to know their rights as a citizen at the local, state, national, and worldwide levels and understand how they can influence decisions at each level (Battelle for Kids, 2019b; Ledward & Hirata, 2011). Through civic literacy students can recognize the local and worldwide repercussions of civic decisions (Battelle for Kids, 2019b; Ledward & Hirata, 2011). Civic literacy also includes students developing an understanding of people includes from diverse backgrounds and how they can sympathize and empathize with different groups of people (DiCicco, 2016; Liu 2020). 21st century students must also understand how quickly the world and society is evolving and people need to address changes in moral and virtuous ways (DiCicco, 2016).

The Battelle for Kids Framework (2019b) defined health literacy as another integrated theme which incorporates the comprehension of simple health concepts and the development of healthy lifestyles as part of school curriculum. The theme recommends students need to be proactive about physical and mental health strategies including having knowledge around proper nutrition, exercise, and lowering stress levels (Battelle for Kids, 2019b; Levin-Zemir & Bertschi, 2018). Health literacy is important for success in the 21st century as health literacy allows people to understand how to use information and services to improve individual health. Individuals can also understand how to create and observe progress toward personal health goals (Battelle for Kids, 2019b). 21st century learners should utilize information and decipher through unreliable information to make healthy choices (Battelle for Kids, 2019b; Levin-Zemir & Bertschi,

2018). Students must be able to create and monitor individual and family health objectives (Battelle for Kids, 2019b; Levin-Zemir & Bertschi, 2018). 21st century students must be able to comprehend health and safety issues around the world to better personal health and that of those around them (Battelle for Kids, 2019; Levin-Zemir & Bertschi, 2018).

A final interdisciplinary theme needed by the 21st century student is a realization of environmental challenges including conditions related to air, climate, land, food, energy, water, and ecosystems (Battelle for Kids, 2019b). Environmental ruin and destruction no longer occur in just one part of the world (Zhao, 2015). Battelle for Kids, (2019b) states students should demonstrate proficiency in understanding how society influences the world around understand factors including population growth and development, and the consumption of resources. Students benefit when opportunities are provided for students to explore and examine challenges the environment is facing and then potentially possible solutions. Students continuously develop and improve the initiative for addressing environmental issues through collaborating with others in creating solutions which potentially solve environmental issues. Students equipped with environmental awareness skills can also examine and discuss environmental issues and provide possible solutions to such problems. Integrating environmental awareness skills help create an understanding of the content at a higher level (Battelle for Kids, 2019a; Wenglinsky, 1998). The understanding comes from a curriculum which promotes the use of 21st century skills through acquiring knowledge and forcing students to generate information which can help develop new skills (Alismail & McGuire, 2015).

Proficiency in key subjects, along with 21st century themes, is vital to student

success (Battelle for Kids, 2019a). Schools must strive to integrate 21st century concepts into traditional academic subjects to allow students to understand content at a higher level (Ledward & Hirata, 2011; National Education Association, 2012; Alismail & McGuire, 2015). Core subjects and 21st century interdisciplinary themes are the components of the first student outcome and are complementary to the second student outcome of learning and innovation skills.

Learning and Innovation Skills

Learning and innovation skills is the second student outcome defined by the Battle for Kids' Framework (2019a), and is another foundation for high-quality technology integration. The learning and innovation skills include the four C's of creativity and innovation, critical thinking and problem solving, communication, and collaboration (Bellanca & Brandt, 2010; Kandari & Qattan, 2020; Kivunja, 2015). Ken Kay wrote the foreword for the book, *21st Century Skills: Rethinking How Students Learn*, and believed individuals who do not master 21st century skills will be limited to low-income and simple jobs (Bellanca & Brandt, 2010). A 2010 study by the American Management Association showed the four C's are vital to organizational success in the future (American Management Association, 2010; Bellanca & Brandt, 2010). Battelle for Kids' Framework (2019a) provides insight for what students in a technology integrated classroom should know and demonstrate in relation to the four C's of creativity and innovation, critical thinking and problem solving, communication, and collaboration.

The first learning and innovation skill defined by Battelle for Kids (2019a) is creativity and innovation. Herbert (2006) described how creativity should be a key component of every student's education in the new digital age. Focusing on developing

creativity and innovation helps prepare students for the future (Henriksen, et al., 2016; Herbert, 2006; Lewis, 2009). Student mastery of creativity and innovation must include the ability to think creatively, work creatively with others, and implement innovations (Kivunja, 2015). In order to think creatively, students must demonstrate proficiency in three areas (Battelle for Kids, 2019b). First, students must use a wide range of techniques to generate new ideas including brainstorming (Henriksen, et al., 2016). Next, students must generate fresh and relevant ideas including both incremental and radical concepts. Finally, students must be able to refine, analyze, and evaluate personal thoughts to improve and utilize creative efforts (Battelle for Kids, 2019b).

Working creatively with others includes an understanding of four different components (Battelle for Kids, 2019b). The first component in working creatively with others is demonstrating the ability to create, implement, and communicate new thoughts to different people efficiently (Henriksen, et al., 2016). The second way in working creatively with others openness and reactiveness to unique and diverse perspectives while incorporating input and feedback from others (Amabile, 2017; Bransford, 2000; Henriksen, et al., 2016). Feedback helps learners modify and refine personal thinking to develop a deeper understanding of content (Bransford, 2000). Hattie (2012) stated the goal of feedback is to reduce the gap by meeting the student in each individual's learning and then move students to where the student should be. The third component to working creatively with others is to display innovation in one's work and create new ideas based on real-world scenarios (Battelle for Kids, 2019b). The fourth and final approach to working creatively with others is to learn from failure and know creativity and innovation are learning processes occurring over time as a result of failures and successes

(Bransford, 2000; Marzano, 2007). Student failures in the learning process aids in activating background knowledge so students can progress toward comprehension of new knowledge (Bransford, 2000). Trial and error throughout the learning process allows students to work toward a concluding thought (Marzano, 2007). Through the trial and error process students learn to apply supporting evidence through trial and error to create new knowledge (Bransford, 2000; Marzano, 2007). Technology helps teachers make the process of trial and error more practical and accessible in the classroom (Gretter & Yadav, 2016; Guo & Woulfin, 2016; Henriksen et al., 2016). New technologies can also promote creative thinking by expanding students' experiences (Henriksen, et al. 2016). Technology helps students advance personal creative skills through instructional design and innovative activities (Lewis, 2009).

Student mastery of critical thinking and problem-solving is a second component of the Battelle for Kids' (2019b) learning and innovation student outcome. New methods of learning are still rooted in the importance of understanding facts as a part of the process (Bransford, 2000). The learner's ability to connect facts around important concepts allow individuals to support personal understanding and transfer of knowledge to go deeper in the content (Bransford, 2000). Marzano (2007) identified problem solving as one of the four types of ways to create hypotheses. Students who possess strong problem- solving skills display a level of knowledge which allows individuals to reason effectively in the 21st century (Battelle for Kids, 2019b). Creativity and critical thinking are linked because creativity is built upon content knowledge and thinking at a higher level on a topic helps increase knowledge of a particular concept (Kaufman & Beghetto, 2010). Reasoning effectively includes being able to use inductive and deductive

reasoning as applicable to situations a student faces (Battelle for Kids, 2019b; Bransford, 2000; Darling-Hammond; 2006; Trilling & Fadel, 2009). Systems thinking is a component of reasoning effectively (Battelle for Kids, 2019b; Senge, 1990). Reasoning effectively includes an understanding of how different functions of a system interact to create intended outcomes (Battelle for Kids, 2019b). Making judgments and decisions is a component of reasoning effectively (Battelle for Kids, 2019b). A student's ability to analyze and evaluate evidence, arguments, claims, and beliefs demonstrates a student's mastery of reasoning effectively (Bransford, 2000; Trilling & Fadel, 2009). Proficiency in making connections among a variety of sources of information demonstrates a student's ability to reason effectively (Bransford, 2000; Trilling & Fadel, 2009). Reasoning effectively includes a student's ability to analyze pieces of information and generate conclusions (Bransford, 2000; Trilling & Fadel, 2009). Students who can reflect critically on learning experiences and processes demonstrate a student's ability to reason effectively (Battelle for Kids, 2019b). Critical thinking and problem solving combine to encompass thinking skills required for success in current economic and social fields (Kereluik, et al., 2013).

Student mastery of critical thinking and problem-solving encompasses a student's ability to solve problems can increase through instructional strategies utilizing technology such as project-based methods (Battelle for Kids, 2019b; Drilling & Fadel, 2009; Wenglinsky, 1998). Bransford (2000) referred to critical thinking and problem solving type of learning as active learning focused on students taking control of their learning process (Bransford, 2000). Hattie (2012) stated critical thinking and problem solving type of learning is better understood than recitation of factual knowledge and abstract

standards. Project-based learning allows students to practice and hone individual abilities and approach to learning content at a deeper level (Bransford, 2000; Marzano, 2007). Problem-solving skills include a student's ability to solve different problems individuals are unfamiliar with implementing a combination of conventional and innovative solutions (Battelle for Kids, 2019b; Buck Institute for Education, 2020). Problem-solving skills include recognizing and asking important questions which provide clarification and generate better solutions (Battelle for Kids, 2019b; Buck Institute for Education, 2020).

Communication and collaboration are two learning and innovation skills which complement each other and are a third aspect of the second student outcome for learning and innovation skills (Battelle for Kids, 2019a). Pheeraphan (2013) defined communication as "the ability to compose, view, and communicate the ideas to others in order to understand via oral or written" (p. 370). The workforce needs people with the ability to think critically, communicate well, and work together (Ruppert, 2010). Opportunities for communication can be created in the classroom, as Hattie (2012) found classroom discussion is the seventh highest influence on learning, out of 150 influences, with an effect size of 0.82. Hattie's Zone of Desired Effects provides a range for his 135 influences on student achievement (2012). Any influence on student learning d=0.4 or greater is determined to have a greater than average influence on student learning (Hattie, 2012).

Evidence of communication in educational curriculum can be seen in the Common Core State Standards adopted by 41 states in America along with the District of Columbia in 2010 (Common Core State Standards, 2010). The Missouri Learning Standards adopted by the Missouri Department of Elementary and Secondary Education

(DESE) include the Common Core State Standards (Missouri Department of Elementary and Secondary Education, n.d.). Communication skills are prioritized within both the Missouri Learning Standards and the Common Core Standards through the English Language Arts expectations (Common Core State Standards, 2010; Missouri Department of Elementary and Secondary Education, n.d.). Communication skills include standards focused on students' speaking and listening abilities (Missouri Department of Elementary and Secondary Education, 2016). Speaking and listening is divided into sub-standards of conversations, questioning, viewpoints of others, verbal delivery, nonverbal, and multimedia (Battelle for Kids, 2019a; Missouri Department of Elementary and Secondary Education, n.d.;).

Communicating clearly comprises listening productively to understand the meaning of an intended message including the understanding, morals, behaviors, and intentions of the message (Battelle for Kids, 2019a; Pheeraphan, 2013). Communication is used for a range of purposes including for information, instruction, motivation, and persuasion (Battelle for Kids, 2019b). 21st century learners must understand how to use communication through different media and technologies to evaluate the effectiveness and impact of communication (Battelle for Kids, 2019b; Kereluik, et al., 2013; Pheeraphan, 2013). Communication is closely associated with the four C's of collaboration (National Education Association, 2012; Senge, 1990; Trilling & Fadel, 2009).

The ability to collaborate with others is an important outcome of 21st century skills (Battelle for Kids, 2019b; Trilling & Fadel, 2009). Pheeraphan (2013) defines collaboration as "…the ability to work effectively with others, to be respectful for the

value of the member, and also to be responsible on the group works" (p. 370). Collaboration in the 21st century is more complex and requires different skills to be effective because collaboration is accelerated by technology (Bellanca & Brandt, 2010; Pheeraphan, 2013). Students must work productively and respectfully with team members from different backgrounds (Battelle for Kids, 2019b; Kereluik, et al., 2013; Mishra & Kereluik, 2011). Student mastery of collaboration includes showing flexibility and willingness to help in generating compromises to achieve a common goal (Battelle for Kids, 2019b; Kereluik, et al., 2013). A key component of team learning involves mastering the practices of dialogue and discussion (Senge, 1990).

Technology has enhanced the need for students to have the ability to communicate and collaborate across the globe (Kandari & Qatan, 2020; Kereluik, et al., 2013; Maninger & Holden, 2009). Communication and collaboration are closely associated and are necessary for success in the 21st century (Kereluik, et al., 2013; Liu, 2020; Robinson & Clardy, 2011). Communication and collaboration are vital as students work with more diverse groups in a more globalized culture and economy (Kereluik, et al., 2013). Students must be able to develop the vital skills of critical thinking, problem solving, communication, and collaboration for success in today's world (Battelle for Kids, 2019b). It is critical individuals can process and utilize information through the use of technology and work together to create new knowledge (Ledward & Hirata, 2011).

Information, Media, and Technology Skills

The third aspect of student outcomes noted in Battelle for Kids' Framework (2019b), which is also the first component of high-quality technology integration, includes information, media, and technology (ICT) skills. Information, media, and

technology skills are important to help students maneuver through the current technology and media-obsessed world (Battelle for Kids, 2019b; Kivunja, 2015). People have access to a vast amount of information due to the rapid advancement of technology (Ledward & Hirata, 2011; Pheeraphan, 2013). The amount of information people are able to access increased the need for individuals to possess the skillset and knowledge to manage information, media, and technology (Battelle for Kids, 2019b; Pheeraphan, 2013). Battelle for Kids' Framework (2019a) provides insight for what students in a technology integrated classroom should know and demonstrate related to information, media, and technology skills.

Students must master information, media, and technology skills to keep up with a large quantity of information available through media and technology avenues (Battelle for Kids, 2019a; Kivunja, 2015; Ledward & Hirata, 2011; Pheeraphan, 2013). Pheeraphan (2013) defined information literacy as "…the ability to access, use, analyze, and evaluate information appropriately with responsibility and ethics" (p. 370). Technology has become a necessity and cannot be excluded when educators discuss the learning environment (Kandari & Qatan, 2020; Pheeraphan, 2013). Technology tools are constantly changing (Battelle for Kids, 2019b; Kivunja, 2015. Information, media, and technology also allow for collaboration and individual contributions to occur (Amabile, 2017; Battelle for Kids, 2019b; Bellanca & Brandt, 2010; Maninger & Holden, 2009). Productive members of society and the workplace must demonstrate a variety of practical and information literacy, media literacy, and ICT (information, communication, and technology) literacy skills (Battelle for Kids, 2019b; Ledward & Hirata, 2011; Pheeraphan, 2013; Tucker, 2014).

Students should be able to access and evaluate information quickly and effectively and should be skilled enough to analyze the information both critically and competently (Battelle for Kids, 2019b; Kereluik, et al., 2013; Ledward & Hirata, 2011). In addition, 21st century students should be able to use and manage information (Battelle for Kids, 2019b; Tucker, 2014). Learners must utilize and apply information accurately and creatively. Utilizing and applying information includes the skill of organizing information from a range of sources in an efficient manner (Battelle for Kids, 2019b; Ledward & Hirata, 2011). Students should have a basic understanding of moral and legal complications surrounding access and utilization of acquired information (Battelle for Kids, 2019b; Gretter & Yadav, 2016; Pheeraphan, 2013).

'Students competent with media literacy are able to implement various strategies and applications with different types of media (Battelle for Kids, 2019b; Kereluik et al., 2013). Pheerpahan (2013) defined media literacy as "…the ability to access, use, analyze, evaluate, and create media in different forms with responsibility and ethics" (p. 370). Demonstrating proficiency in media literacy can be shown in three different ways. First, students must understand the intent of media messages along with how the media is constructed (Gretter & Yadav, 2016). Next, 21st century learners must be competent with how people interpret messages differently, how personal principles and perspectives are involved and redacted, and how people's opinions and actions can be persuaded by media (Gretter & Yadav, 2016). Finally, students should recognize the moral and legal complications surrounding access and utilization of media (Battelle for Kids, 2019b; Kereluik et al., 2013).

Battelle for Kids (2019b) found students who demonstrate mastery in media

literacy must also apply technology effectively. Students demonstrate the effective application of technology in three ways. First, 21st century learners should understand how to use technology efficiently when researching, organizing, evaluating, and communicating information (Battelle for Kids, 2019b). “In a world driven by information and knowledge, students must utilize available digital technology, communication tools, and social networking properly to access, process, and create information successfully” (Battelle for Kids, 2019b, p. 6). Finally, students should understand the moral and legal complications surrounding digital technologies which allow students access and use information (Battelle for Kids, 2019b; Pheeraphan, 2013).

Information, media, and technology skills are important for students to master so students are prepared for a world with access to massive amounts of information which is available due to rapid developments in technology (Battelle for Kids, 2019b). Information, media, and technology skills are enhanced by also developing life and career skills which are the final student outcome identified by the Battelle for Kids Framework (2019b). Life and career skills go beyond an individual’s ability to think and retain information and provide students with the ability to succeed in diverse life and work situations which exist in a globally competitive society. Life and career skills allow individuals to maximize personal knowledge and understanding of key subjects and 21st century themes; learning and innovation skills; and information, media, and technology skills (Battelle for Kids, 2019b; Kereluik, et al., 2013).

Life and Career Skills

The fourth and final student outcome in the Battelle for Kids’ Framework (2019a) is life and career skills. Life and career skills maximize the knowledge and understanding

students gain from demonstrating proficiency in key subjects and 21st century themes including learning and innovation skills and information, technology, and media skills (Battelle for Kids, 2019b; Kereluik, et al., 2013). Life and career skills provide insight for what students in a technology integrated classroom should know and demonstrate related to life and career skills (Battelle for Kids, 2019b; Kereluik, et al., 2013). The skills are essential to the development of lifelong learners who understand what it takes to be successful in and out of the classroom (Kereluik, et al., 2013). Five life and career skills are highlighted by the Battelle for Kids' Framework (2019a) and include flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility.

The first life and career skill needed by 21st century learners is the ability to adapt to change and be flexible (Battelle for Kids, 2019b). Battelle for Kids (2019) suggests three ways for 21st century learners to be flexible. First, learners must value and use feedback for improvement to grow as individuals (Amabile, 2017; Henriksen, et al., 2016). Feedback helps learners modify and refine thinking to develop a deeper understanding as individuals grow and improve themselves (Bransford, 2000). Next, individuals must handle positive praise, delays, and criticism to succeed in the 21st century. Finally, individuals must comprehend different viewpoints and beliefs to achieve solutions, especially when working with people from different cultures and backgrounds (Battelle for Kids, 2019b; DiCicco, 2016).

In addition to flexibility and adaptability, 21st century learners must also be able to manage goals and time and work independently demonstrating the abilities of initiative and self-direction (Battelle for Kids, 2019b). Individuals must set goals with success

criteria for achievement (Bransford, 2000; Covey, 2014). Learners need to understand both short-term and long-term goals (Covey, 2014; Battelle for Kids, 2019b). By doing so, learners will have a better understanding of how to manage time and workload more effectively (Battelle for Kids, 2019b; Covey, 2014).

After understanding goal and time management, 21st century learners must work independently to demonstrate initiative and self-direction (Battelle for Kids, 2019b; Tucker, 2014). Learners must track progress and complete objectives without requiring someone to oversee progress (Battelle for Kids, 2019b; Covey, 2014). Students must be self-guided and surpass basic levels of comprehension to become experts in the subject area (Battelle for Kids, 2019b; Bransford, 2000). Students develop a level of expertise if taught within the proper conceptual framework, such as the Battelle for Kids (2019a) Framework for 21st Century Learning (Bransford, 2000). Students should demonstrate internal motivation and commitment to be lifelong learners able to learn from past experiences to progress toward future goals (Battelle for Kids, 2019b; Bransford, 2000; Covey, 2014; Hattie, 2012; Marzano, 2007).

Complementary to initiative and self-direction, 21st century learners must interact effectively with others and work in diverse groups to demonstrate social and cross-cultural skills, a third type of life and career skill (Amabile, 2017; Battelle for Kids, 2019b; DiCicco, 2016; Henriksen, et al., 2016). Liu (2020) recognized the student population in the United States is becoming more diverse. Teachers must create an environment for different voices and opinions to be heard while developing mutual respect among students from diverse backgrounds (Liu, 2020). Students must also conduct behavior appropriately in diverse environments (Battelle for Kids, 2019b).

Learners who work in diverse groups should respect individual differences based on others' backgrounds (Amabile, 2017; Henriksen, et al., 2016). Students must be open-minded when hearing others' ideas and values (Battelle for Kids, 2019b). Individuals must understand how to use social and cultural differences to develop new thoughts to become more innovative and produce better work (Battelle for Kids, 2019b).

Battelle for Kids (2019b) identified once initiative and self-direction are mastered, 21st century learners who demonstrate leadership and responsibility must guide and lead others. Guiding and leading others includes the ability to use conflict resolution skills to help others reach a common goal. Learners should use other's strengths to reach the goals of the group (Battelle for Kids, 2019b). Students must inspire others through modeling and putting others' interests first. Learners should display high moral character to motivate and influence others to reach the common goal (Battelle for Kids, 2019b).

The Battelle for Kids Framework (2019b) is a complex blueprint for effective classroom technology integration defining four 21st century student outcomes. The research laid the foundation for the skills students need to develop to be successful. The first part of Chapter Two has provided a synthesis of research denoting a description of these four outcomes defined as: 1) key subjects and 21st century themes; 2) learning and innovation skills; 3) information, media, and technology skills; and 4) life and career skills. Student mastery of each of the outcomes will demonstrate a preparedness for 21st century life and work environments (Battelle for Kids, 2019a; Bellanca & Brandt, 2010). The outcomes demonstrate skills students need to prepare for society and in the workplace (Battelle for Kids, 2019a; Bellanca & Brandt, 2010). Technology-driven leaders must have an understanding of the student learning outcomes to ensure each

outcome's effectiveness. A technology-driven leader can also support teachers' understanding of how to utilize technology to develop 21st century skills so teachers can better teach students (Battelle for Kids, 2019a; ISTE, 2018).

21st Century Learning Support Systems

The second component of the Battelle for Kids' Framework (2019a) focuses on the development of support systems. Support systems provide guidance and backing for 21st century outcomes to be achieved and provide the infrastructure for the first component of high-quality technology integration. Kandari and Qattan (2020) researched the process of change educational systems face in preparing students for the 21st century. The research identified the importance of curriculum and instructional design which helps students make progress toward 21st century learning outcomes (Battelle for Kids, 2019b; Kandari & Qattan, 2020). Support systems are critical to ensuring high-quality technology integration in classrooms, and falls on the leader to provide high-quality technology opportunities for teachers.

Support systems are necessary for technology to enhance student learning (Ormiston, 2011). "All the technological bells and whistles in the world will not engage students unless teachers structure meaningful learning situations" (p. 3). Osler, Bull, and Eaton (2012) discovered teachers'

> "…technology knowledge, content knowledge, and pedagogical knowledge as separate entities do not guarantee adequate preparation of teachers to develop rich and in-depth experiences that would enrich their knowledge of integrating technology in their teaching" (p. 34).

Support systems bring teachers' technology, content, and pedagogical knowledge

together so teachers are prepared to create environments where learning can take place and be supported by technology (Battelle for Kids, 2019b; Ormiston, 2011; Osler, et al., 2012).

Four support systems are necessary to guarantee all students are exposed to learning experiences which develop 21st century competencies (Battelle for Kids, 2019a). The four support systems encompass: 1) 21st century standards and assessments, 2) 21st century curriculum and instruction, 3) 21st century professional development, and 4) 21st century learning environments (Bellanca & Brandt, 2010; Anagun, 2018; Battelle for Kids, 2019a). The supports are essential and must be in place to ensure student proficiency in 21st century skills is an essential aspect for effective technology integration (Battelle for Kids, 2019b).

21st Century Standards and Assessments

According to the Battelle for Kids' Framework (2019a), the two pieces of the first support system are standards and assessments. High-quality technology integrated classrooms need quality standards to properly identify what students are expected to know (ISTE, 2016; Marzano, 2007). Standards should clearly define the outcomes for the skills, expertise, and knowledge students should gain from personal learning experiences. Proper assessments aligned to standards should be developed to allow students and teachers to determine if students are gaining proficiency toward specific learning targets (Battelle for Kids, 2019a; Marzano, 2007). The process will allow teachers and education leaders to determine the effectiveness of technology integration in the learning environment (Darling-Hammond, 2010; Drake, 2007; Marzano, 2007).

21st century standards should focus on a deep understanding of key academic

subjects along with 21st century interdisciplinary themes (Battelle for Kids, 2019a). Standards should be scaffolded to develop a foundation of knowledge across key subject areas along with 21st century interdisciplinary themes (Battelle for Kids, 2019b). Common Core State Standards (n.d.) provide an outline of learning goals for what students must know and do at the end of each school year (Common Core State Standards, n.d.). The Common Core State Standards (n.d.) established consistency in providing opportunities for all students to leave from high school with the knowledge and skills they need for their futures (Common Core State Standards, n.d.). The state of Missouri has adopted the Missouri Learning Standards to establish benchmarks for the knowledge and skills students in Missouri schools will be equipped with (Missouri Department of Elementary and Secondary Education, n.d.). The Missouri Learning Standards provide a guideline schools can use to prepare students with the skills necessary for success upon graduating from high school (Missouri Department of Elementary and Secondary Education, n.d.). Clear standards are foundational for effective instructional support systems (Marzano, 2007).

Marzano (2007) identified the importance of standards in the classroom. Teachers must set and communicate essential learning targets for students, work with the student to determine progress toward goals, and celebrate with the student when learning goals are met (Drake, 2007; Marzano, 2007). 21st century standards should set high expectations for learners, providing students with a strong foundation in essential content (American Association of School Librarians, 2009; Battelle for Kids, 2019b). Standards should prioritize a deep understanding of content rather than basic knowledge (Battelle for Kids, 2019b; Bransford, 2000; Hattie, 2012; Marzano, 2007). Standards should also allow

students to interact with relevant data, tools, and experts with whom individuals will intermingle with throughout their education, in the workforce, and in their personal lives to solve significant problems (Battelle for Kids, 2019b).

The second component of the first support system for 21st century learning includes the importance for using a variety of assessment methods to measure student's knowledge and skillset related to standards (Battelle for Kids, 2019b; Darling-Hammond, 2010; DuFour & Marzano, 2010; Hattie, 2012; Marzano, 2007; Pellegrino, 2006). A system of assessments, according to research, should include both formative and summative assessments which provide feedback on learning and instruction for students and teachers (Darling-Hammond, 2010; Hattie, 2012; Marzano, 2007; Smarter Balanced Assessment Consortium, n.d.).

It is important for assessments to be aligned to standards, such as the Common Core State Standards and the Missouri Learning Standards (Common Core State Standards Initiative, n.d.; Marzano, 2003; Missouri Department of Elementary and Secondary Education, n.d.; Pellegrino, 2006; Smarter Balanced Assessment Consortium, n.d.). The alignment of assessments to standards is important to gain an understanding of student proficiency for college and career readiness, core academic subjects, and 21st century skills A support system of assessments should meet the needs of students by allowing students to display knowledge, skills, and abilities (Bellanca & Brandt, 2010; Darling-Hammond, 2010; Pellegrino, 2006;).

DuFour and Marzano (2011) offered methods to accomplish an effective approach to progress monitoring through classroom embedded formative assessments. Wiliam and Black (1998) identified formative assessment as the core of effective teaching. Individual

formative assessments can be used as snapshots of where a student is at during a given point of time and how students strive to reach learning goals (DuFour & Marzano, 2011). Marzano's research emphasized the importance of formative assessments being tightly connected to the standard and the standard continually communicated to the student (Marzano, 2017). Students can use the feedback from formative assessments as motivation to participate in future activities which will further personal learning and understanding (Marzano, 2011; Hattie, 2012).

Summative assessments serve as a support system by identifying student learning at the end of a unit or the end of a school year, such as standardized tests (Smarter Balanced Assessment Consortium, n.d.; Wiliam, 2010). Tomlinson and Moon (2013) explained "Summative assessments are more formal and 'official' than pre-and ongoing assessments" (p. 91). Summative assessments also provide data and feedback to evaluate the effectiveness of curriculum and instruction for the purpose of continuous improvement (Tomlinson & Moon, 2013; Wiliam & Black, 1998; Wiliam, 2010;).

21st Century Curriculum and Instruction

The second support system outlined in the Battelle for Kids' Framework (2019a) is 21st century curriculum and instruction. High-quality technology integrated classrooms need a guaranteed and viable curriculum and instructional plan to set the course for what teachers need to teach and what students need to learn (Darling-Hammond, 2010; Wiggins & McTighe, 2005). Curriculum and instruction collectively support a high-quality technology integrated classroom because curriculum and instruction contain the learning activities and supports needed for teachers to implement effective learning activities (Ormiston, 2011; Wiggins & McTighe, 2007). Learning activities include the

incorporation of innovative learning experiences supported by technology (Battelle for Kids, 2019b; Kieschnick, 2017).

Curriculum and instruction support 21st century learning outcomes and provide the outline for what teachers are supposed to teach and what students are supposed to learn to meet proficiency on assessments as determined by standards (Battelle for Kids, 2019b; Darling-Hammond, 2010; Marzano, 2007; Pelligrino, 2006; Wiggins & McTighe, 2005; Wiggins & McTighe, 2007). A guaranteed and viable curriculum ensures all students have the opportunity to learn and access to the same material as other students (DuFour & Marzano, 2011; Marzano, 2003; Schmoker, 2018). Marzano (2003) identified a guaranteed and viable curriculum as having the greatest impact on student achievement. Schmoker (2018) outlined the relationship between curriculum and instruction as what we teach and how we teach it. 'What we teach' is encompassed in a curriculum which contains standards and themes selected by a team of teachers from the school or district (Schmoker, 2018). 'How we teach it' describes lessons and learning experiences teachers provide for students (Schmoker, 2018).

Curriculum should be designed with the best strategies to achieve desired results (Wiggins & McTighe, 2005). Effective curriculum consists of learning and skills across all content areas which teachers are expected to teach and students are expected to learn (Pellegrino, 2006; Schmoker, 2018). Curriculum and instruction include the instructional strategies teachers should utilize to best support student learning (Battelle for Kids, 2019b; Pellegrino, 2006; Wiggins & McTighe, 2005; Wiggins & McTighe, 2007). Effective curriculum is best accomplished through a backwards design approach where one starts at the results and then works backwards from the intended end result (Wiggins

& McTighe, 2005; Wiggins & McTighe, 2007). Backwards-designed curriculum starts with identifying standards and results but focuses on designing lesson activities and learning experiences which will best help students master standards (Wiggins & McTighe, 2005). Teachers must collaboratively agree upon which standards will be the focus and then collectively determine the learning and skills students will need (Marzano, 2007; Wiggins & McTighe, 2005). Curriculum should guide and outline the identified learning priorities and be aligned to both formative and summative assessments (DuFour et al., 2008; Schmoker, 2018; Wiggins & McTighe, 2005).

Curriculum supports must incorporate aligned instructional practices and materials to ensure high levels of student achievement (Wenglinsky, 1998; Wiggins & McTighe, 2005; Wiggins & McTighe, 2007). Common curriculum implemented effectively and containing sound lessons and learning experiences for students should be the goal for all schools (DuFour & Marzano, 2011; DuFour, et al., 2008; Schmoker, 2018). To support 21st century skills, an aligned and coherent curriculum containing effective instruction must be available to students and should be taught discretely through key academic subjects and 21st century interdisciplinary themes (Battelle for Kids, 2019b). Curriculum designed to support 21st century learning should include the incorporation of technology to support student learning and mastery of 21st century concepts (Battelle for Kids, 2019a; ISTE, 2016; Ormiston, 2011).

The instructional component encompasses the specific teaching strategies and learning activities designed to help students learn new content as outlined in the curriculum (Pellegrino, 2006). Effective classroom instruction must be developed around building upon prior knowledge, teaching content for understanding, and allowing

students time to reflect and process learning (Bransford, 2000; Hattie, 2012; Marzano, 2017). Effective instruction begins with identifying clear learning goals for students (Dean, et al., 2012; Drake, 2007; Hattie, 2012; Marzano, 2017). Instructional strategies and learning activities are designed to accomplish learning goals (Dean, et al., 2012; Drake, 2007; Hattie, 2012; Marzano, 2007; Marzano, 2017). Instructional strategies include effective ways to teach content and engage learners in the learning process (Marzano, 2017).

21st century instruction should allow for innovative learning which combines technology, inquiry-, project- and problem-based methods, and promotes higher order thinking skills (Alismail & McGuire, 2015; Battelle for Kids, 2019b; Buck Institute for Education, 2020; Trilling & Fadel, 2009; Wenglinsky, 1998). Effective curriculum and instruction is only as good as the teacher implementing, assessing, and driving the learning (Hattie, 2012). High quality professional development is required to ensure teachers are prepared to guide students to achieving desired results (Learning Forward, n.d.; Marzano, 2007; Wiggins & McTighe, 2005; Wiggins & McTighe, 2007).

21st Century Professional Development

To support the deep learning of a 21st century classroom, a third element of support must be prevalent (Battelle for Kids, 2019b). High-quality technology integrated classrooms rely on teachers to design and implement learning activities supported by technology. For teachers to be prepared to create high-quality technology learning environments, teachers must be provided with proper professional learning to enhance individual technology integration skills. This includes acquiring tools and teaching strategies for teachers incorporate in the classroom, along with opportunities to

collaborate with peers to share and learn best technology integration practices (Battelle for Kids, 2019b; DuFour & Marzano, 2011; Learning Forward, n.d.).

Professional development opportunities should increase the level of instruction for mastery of 21st century outcomes in a technology-rich classroom (Guo & Woulfin, 2016; Wenglinsky, 1998). Professional development is designed to build the capacity of teachers incorporating 21st century skills, digital tools, and teaching methods into classrooms (Battelle for Kids, 2019b; Trilling & Fadel, 2009; Wenglinsky, 1998). Professional development should support teachers in identifying learning standards, designing assessments to determine student proficiency, and supporting teacher instruction to achieve desired learning results (Learning Forward, n.d.; Wiggins & McTighe, 2005; Wiggins & McTighe, 2007).

Learning Forward (n.d.), an international professional learning organization, has the mission, "building the capacity of leaders to establish and sustain highly effective professional learning" (Learning Forward, n.d.) Learning Forward (n.d.) designed a system of standards outlining the traits of professional learning which support effective instructional practices, leadership, and student achievement. Learning Forward (n.d.) identified seven standards including: learning communities, resources, learning designs, outcomes, leadership, data, and implementation.

Effective professional learning supporting 21st century learners must be collaborative in nature (DuFour & Marzano, 2011; DuFour, et al., 2008; Learning Forward, n.d.). Learning communities must continuously meet to support curriculum, assessments, instructional practices, and learning results (Battelle for Kids, 2019b; DuFour, et al., 2008; Learning Forward, n.d.; Senge, 1990; Trilling & Fadel, 2009).

Professional development designed to support 21st century learning should allow for teachers to participate in professional learning communities that enable them learn and share a variety of classroom experiences that can enhance student proficiency with 21st century skills (Battelle for Kids, 2019b; Senge, 1990; Trilling & Fadel, 2009). Teachers able to continuously develop and improve information, communication, and technology skills and knowledge can effectively improve student learning through the use of technology (Raman et al., 2019; Wenglinsky, 1998). Devloping the personal capacity for leading and learning, along with supporting this growth is an important component of teacher leadership (Learning Forward, n.d.). Teachers must model and seek out professional learning opportunities for themselves and others (Learning Forward, n.d.) The management and utilization of resources, specifically fiscal, human, time, and technology, is important for professional learning (Learning Forward, n.d.). Data drives professional learning through the ability of the teacher to analyze student, educator, and system data to improve instructional practices (DuFour & Marzano, 2011; DuFour, et al., 2008; Learning Forward, n.d.). Evaluating the effectiveness of professional learning on student achievement is also important in improving instructional practices (DuFour & Marzano, 2011; DuFour, et al., 2008; Learning Forward, n.d.). Learning design is a key component of professional learning in providing goals and purpose (Learning Forward, n.d.). The learning design standard standard brings together learning theories and research to assist in the plan and design of professional learning (Learning Forward, n.d.). Factors influencing decisions about learning designs includes learning goals, learner characteristics, learner's comfort with themselves and others, content knowledge, and resources available to support learning (Learning Forward, n.d.). Implementation of

professional learning is designed to support and sustain long-term change through increasing teacher effectiveness and improving student learning results. Ultimately, effective professional learning should be designed to attain desired results for students and teachers (Learning Forward, n.d.).

Professional learning should nurture educators' ability to recognize students' specific learning styles, intelligences, strengths, and weaknesses (Battelle for Kids, 2019b). Professional learning should allow teachers to collaboratively develop curriculum and collectively design innovative pedagogies and authentic assessments to ensure a greater effect on student learning (Kandari & Qattan, 2020). The Battelle for Kids' Framework (2019b) denotes how 21st century professional development can increase the ability for teachers to instruct students to attain mastery of 21st century outcomes (Battelle for Kids, 2019b; Guo & Woulfin, 2016). Ultimately, professional learning builds teacher capacity to effectively create 21st century learning environments (Battelle for Kids, 2019b; Learning Forward, n.d.).

21st Century Learning Environments

High-quality technology integrated classrooms are learning environments which support the development of 21st century skills through the use of technology (Battelle for Kids, 2019a; ISTE, 2016). Technology-rich environments allow students the ability to learn in ways which are relevant and applicable to real-life (ISTE, 2016). Technology integrated 21st century learning environments include student access to effective technology and resources which can support learning for groups, teams, and individuals (Battelle for Kids, 2019b).

Learning environments should be supported by standards and assessments,

curriculum and instruction, and professional development (Battelle for Kids, 2019b; Bransford, 2000). Battelle for Kids (2019b) describes 21st century learning environments as places which support the teaching and learning of 21st century skill outcomes. Teachers create 21st century learning environments through the learning from participation in professional learning communities (Battelle for Kids, 2019b; DuFour & Marzano, 2011). Learning environments rich in technology should allow students opportunities to acquire new knowledge in real world situations students will face in life, careers, and in college (Battelle for Kids, 2019b).

"Learner centered environments are focused on the knowledge, skills, attitudes, and beliefs that learners bring to the educational setting" (Bransford, 2000, p. 133). Teachers who facilitate learner-centered environments must understand students will develop their own understanding of the content through personal beliefs and cultural backgrounds (Bransford, 2000). Learner-centered teachers are the conduit between the subject matter and students (Bransford, 2000). Teachers enhance learning in classrooms through understanding student strengths, weaknesses, and passions to help students drive their personal learning process (Bransford, 2000).

21st century learning environments support student learning through real world application of knowledge and skills, instructional support from the teacher, and the appropriate use of physical space (Alismail & McGuire, 2015; Battelle for Kids, 2019b). Students thrive in appropriate and practical 21st century contexts such as inquiry- and project-based instructional strategies utilizing technology (Battelle for Kids, 2019b; Kandari & Qatan, 2020; Trilling & Fadel, 2009). Bransford (2000) shared that learning environments must be "…learner centered, knowledge centered, assessment centered, and

community centered" (p. 131). Students must have fair and equitable access to valued learning technologies and resources in learning environments which support 21st century learning outcomes (Battelle for Kids, 2019b; Wiggins & McTighe, 2007). Learning environments incorporate modern age architectural and interior designs for collaborative and individual learning to occur (Battelle for Kids, 2019b; Kandari & Qatan, 2020). Learning environments should enable face-to-face and online learning to occur outside the classroom within the community and across the globe (Battelle for Kids, 2019b). It is a challenge to develop learning environments to include 21st century instructional practices and supports for teachers with information, communication, and technology but is necessary to increase success in the classroom (Kandari & Qatan, 2020).

ISTE Standards for Students in the High-Quality Technology-Integrated Classroom

The International Society for Technology in Education (2018) provides standards for students, educators, educational leaders, and coaches as a guide for directing digital age learning. The International Society for Technology Education (ISTE) Standards for Students (2016) describe the digital skills, knowledge, expertise, and support needed by today's students (Battelle for Kids, 2019a; ISTE, 2018). The ISTE standards were designed with the intent of empowering student voice and ensuring learning was student-driven and supported through the use of technology (ISTE, 2016). Examining the connections between the Student Standards (2016) and the Battelle for Kids (2019a) Framework created the definition of high-quality technology integration for the purposes of this study. Battelle for Kids (2019a) clearly defines the 21st century skills necessary for 21st century learners and the ISTE Standards for Students (2016) details how the skills can be further developed and enhanced through the effective use of technology. The

seven ISTE Standards for Students (2016) include: empowered learner, digital citizen, knowledge constructor, innovative designer, computational thinker, creative communicator, and global collaborator.

The first ISTE Standard for Students (2016) is empowered learner. The standard identifies how students use technology to be active in setting personal learning goals and determining how to achieve the learning goals. This connected to the Battelle for Kids' (2019a) student learning outcomes of key subjects and 21st century themes and learning and innovation. Student ownership in goal-setting inspires student motivation and feedback on progress toward learning goals while allowing students the opportunity to develop a deeper understanding of the content (Bransford, 2000; Hattie, 2012; ISTE, 2016). Proficiency in the empowered learner standard includes students demonstrating the ability to establish personal learning goals, determining how technology can help in reaching goals, and reflecting on learning for future improvement (Battelle for Kids, 2019a; Bransford, 2000; ISTE, 2016). Students must build networks and modify learning environments to support the learning process (ISTE, 2016). This connected to the Battelle for Kids' student learning outcome of learning and innovation skills, specifically collaboration (Battelle for Kids, 2019a). Technology allows students to work productively with other team members to support the learning process (Battelle for Kids, 2019a; Bellanca & Brandt, 2010; ISTE, 2016). ISTE (2016) recommends students use technology to receive feedback allowing for improvement and the ability to demonstrate learning in different ways. Empowered learners understand the different functions of technology and demonstrate "…the ability to choose, use, and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies"

(ISTE, 2016, p. 1). Bransford (2000) discussed transferring knowledge as applying learning to new situations and important to developing a deeper understanding of the content.

The second ISTE Standard for Students (2016) is the expectation of digital citizenship. ISTE (2016) guidelines for digital citizenship call for students to understand how to function properly in a digital world and do so in a safe, legal and ethical way. Digital citizenship is important for 21st century learners to implement when using technology to interact across the globe and with people from different backgrounds (Battelle for Kids, 2019b; ISTE, 2016). As resources and information flow freely, students need to develop an understanding of working with people from diverse backgrounds to better understand the world (Battelle for Kids, 2019b; ISTE, 2016; Kereluik, et al., 2013; Liu, 2020; Zhao, 2015). ISTE (2016) states students should develop and oversee "…digital identity and reputation and are aware of the permanence of their actions in the digital world" (ISTE, 2016, p. 1). Students must demonstrate appropriate behavior when using technology (Battelle for Kids, 2019b; ISTE, 2016). As students use technology to support learning, students must prepare for the massive amounts of information available with technology access (Battelle for Kids, 2019b; ISTE, 2016). Students must "manage their personal data to maintain digital privacy and security and be aware of data-collection technology used to track their navigation online" (ISTE, 2016, p. 1).

The third ISTE Standard for Students (2016) is a knowledge constructor which examines a variety of resources through the use of digital tools to develop new knowledge (ISTE, 2016). Knowledge constructor is an important skill for students to

master because the world is technology-based and media-obsessed (Battelle for Kids, 2019b; ISTE, 2016; Kivunja, 2014). Student proficiency in the Knowledge Constructor standard allows students to manufacture creative artifacts and engage in significant learning experiences (ISTE, 2016). Students should use technology to promote effective research strategies (Battelle for Kids, 2019b; ISTE, 2016; Ledward & Hirata, 2011; Tucker, 2014) It is important for students to determine the credibility, validity, and relevance of information and use the information to construct a deeper understanding of content (Battelle for Kids, 2019a; Bransford, 2000; ISTE, 2016; Ledward & Hirata, 2011). Students should acquire information through the use of digital resources which demonstrate meaningful connections in the content (Battelle for Kids, 2019a; ISTE, 2016). Student knowledge construction through the use of technology is demonstrated through the ability to develop understanding through examining real-world issues and come up with solutions to problems (Battelle for Kids, 2019b; Darling-Hammond, 2006; ISTE, 2016).

The fourth ISTE Standard for Students (2016) is an innovative designer which demonstrates an ability to use different technologies to solve problems through generating new solutions (ISTE, 2016). The innovative designer standard promotes the understanding and implementation of a design process for uncovering new ideas, testing hypotheses, creating innovative, and solving problems (ISTE, 2016). Marzano (2007) identified problem solving as one of the four types of ways to create a hypothesis. Students should display skills which allow them to reason effectively (Battelle for Kids, 2019b). ISTE (2016) identified students demonstrating the ability to be an innovative designer must choose and use digital tools to help guide them through the process of

determining design constraints and potential risks. Students must also show they can work with and solve open-ended problems (Battelle for Kids, 2019a; Bransford, 2000; ISTE, 2016). Problem-solving is a type of active learning, that when supported by technology, encompasses a student's ability to solve problems using instructional strategies such as project-based methods (Battelle for Kids, 2019b; ISTE, 2016; Trilling & Fadel, 2009). Hattie (2012) found project-based learning is better understood than recitation of factual knowledge and abstract standards. Using different technologies to solve problems allows students to demonstrate the ability to be an innovative designer (ISTE, 2016).

The fifth ISTE Standard for Students (2016) is a computational thinker which requires students to demonstrate the abilities to create and use strategies which help to understand and solve problems while using technology to create and check solutions (ISTE, 2016; Wenglinsky, 1998). Students should be able to gather data, use different technological tools to evaluate that data, and demonstrate in different ways to assist with solving problems and making decisions (ISTE, 2016). Students should break down problems, pull out pertinent information, create detailed ways of understanding different, or help with problem-solving (Battelle for Kids, 2019b; Bransford, 2000; ISTE, 2016; Wenglinsky, 1998). The process of computational thinking allows students to understand automation and utilize strategic thinking skills to create a series of steps to develop and check automated solutions (ISTE, 2016).

Creative Communicator

The sixth ISTE Standard for Students (2016) is creative communicator which demonstrates the ability to communicate and express their thoughts uniquely "…for a

variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals" (ISTE, 2016, p. 2). Students who demonstrate mastery of the creative communicator standard must apply technology effectively to desired learning outcomes (Battelle for Kids, 2019b; ISTE, 2016; Pheeraphan, 2013). Students should show an ability to choose appropriate technological tools which allow achievement of desired outcomes (Battelle for Kids, 2019b; ISTE, 2016; Kereluik, et al., 2013). Students should be able to create new work or make new creations from repurposed digital resources and communicate critical ideas through different "…digital objects such as visualizations, models, or simulations (ISTE, 2016, p. 2).

The seventh and final ISTE Standard for Students (2016) is global collaborator which calls for students to utilize technology tools to expand thinking and enhance learning by collaborating and working in teams (ISTE, 2016). Collaboration in the 21st century is more complex and requires different skills to be effective (Bellanca & Brandt, 2010; Pheeraphan, 2013). Students must demonstrate an ability to use technology tools to connect with learners from different backgrounds and to create mutual understanding and learning (ISTE, 2016). A student's ability to work productively and respectfully with team members from different backgrounds through the use of technology will become more successful in the 21st century (Battelle for Kids, 2019b; ISTE, 2016; Kereluik, et al., 2013; Mishra & Kereluik, 2011). Students should use technology in a collaborative way to work with others and consider multiple viewpoints (ISTE, 2016; Tucker, 2014). The importance of being a global collaborator has increased due to globalization which has increased the need for students to work with others across the globe (ISTE, 2016; Kereluik, et al., 2013; Liu, 2020; Robinson & Clardy, 2011). Students should contribute

and function in different roles and responsibilities to achieve a common goal (ISTE, 2016; Senge, 1990). Students must demonstrate an ability to find issues in society and use collaborative technologies to work with different people to pursue possible solutions (ISTE, 2016). Students who demonstrate the ability to be a global collaborator did so through taking 21st century skills and using the skills to enhance learning by working with others locally and globally (ISTE, 2016).

ISTE Standards for Education Leaders

The role of a high-quality educational technology leader requires a clear understanding of effective student learning of 21st century skills developed through technology integration, as noted in the Battelle for Kids Framework and further supported by the ISTE Standards for Students (2016) (Battelle for Kids, 2019a; Battelle for Kids, 2019b). Understanding student learning is important for the leader to best support technology-rich classrooms. In order to support this effective student learning, school leaders must have a clearly defined shared vision and lead in an inspirational way to ensure commitment from all stakeholders (Bass, 1999; Gordon & Smith, 2015; Kotter, 2014). The International Society for Technology in Education (ISTE, 2018) created a framework for education leaders to utilize to direct digital age learning. The framework identifies standards which are aligned to the knowledge and behaviors necessary for leaders to grow teachers and improve student learning through the use of technology (ISTE, 2018). The framework for education leaders is divided into five standards which include: equity and citizenship advocate, visionary planner, empowering leader, systems designer, and connected learner (ISTE, 2018).

Equity and Citizenship Advocate

The first ISTE Standard for Education Leaders (2018) which is recommended to establish high-quality technology integration in schools is equity and citizenship advocate. The first standard identifies how education leaders need to promote the safe and ethical use of technology while ensuring all students have access to technology to support personal learning. Educational leaders have the task to ensure all students have access to proficient teachers who understand how to use technology to meet the technology needs of students (Collin & Brotocorne, 2019; ISTE, 2018; Marzano, 2007; Tierney, et al., 2018). Leaders are tasked with hiring the best and most qualified teachers, along with enhancing the skill level of current teachers to appropriately use technology while closing digital usage and access gaps (ISTE, 2018). Once the most qualified teachers are hired and trained, education leaders must guarantee all students can access technology to use for authentic learning opportunities (Collin & Brotocorne, 2019; ISTE, 2018; Tierney, et al., 2018; Tucker, 2014). Educational leaders must make sure devices, bandwidth, and other available resources are provided to all students, to help guarantee student access and equity (Collin & Brotocorne, 2019; ISTE, 2018; Tierney, et al., 2018). Authentic and engaging learning opportunities available to all students should include learning which occurs or is enhanced by the use of technology (Boss & Larmer, 2018; Buck Institute for Education, 2020; ISTE, 2018). This could be done by developing more personalized learning opportunities and differentiation, partaking in virtual collaborations, and working with experts and real-world data (Boss & Larmer, 2018; Buck Institute for Education, 2020; ISTE, 2018). The education leader should develop partnerships, along with internal and external collaborative opportunities for educators, to

support learning (ISTE, 2018). As the leader in the building, technology-focused education leaders must model digital citizenship as leaders examine online resources, participate in civil discourse in an online environment, and apply digital tools to promote positive social change (ISTE, 2018; Starr, 2009). The social change involves the use of collaborative tools to engage in online social action and using online strategies such as "…crowdsourcing, crowdfunding, and social entrepreneurship" (ISTE, 2018, p. 1). Education leaders are charged with developing a culture of responsible online behavior which includes the safe, ethical, and legal use of digital tools (Collin & Brotocorne, 2019; ISTE, 2018; Tierney, et al., 2018).

It was important for education leaders in regards to the use of technology. The equity and citizenship advocate ISTE Standard for Education Leaders (2018) connects to the ISTE Standard for Students (2016) of being digital citizens. Education leaders set the tone for the digital culture in their building by making sure they promoted proper digital citizenship when using technology (ISTE, 2018; Kieschnick, 2017; Sheninger, 2016). The practice of the safe and ethical use of technology by leaders is also important as students use technology especially understanding the ethics of 21st century interdisciplinary themes of global awareness, financial, economic, business, and entrepreneurial literacy, civic literacy, health literacy, and environmental literacy (Battelle for Kids, 2019b; ISTE, 2018;). Understanding the interdisciplinary themes helps students to become aware of ethical and legal issues surrounding each of the topics (Battelle for Kids, 2019b).

Visionary Planner

The second ISTE Standard for Education Leaders (2018) is for leaders to become

a visionary planner. Becoming a visionary planner is important for high-quality technology integration because visionary planners identify effective strategies for involving stakeholders in creating a vision, strategic planning, and developing a system of continuous assessment for changing learning through the use of technology (Baldrige Performance Excellence Program, 2019; ISTE, 2018; Senge, 1990). Visionary planning beings with education leaders possessing the ability to engage stakeholders in creating and adopting a shared vision for utilizing technology for student success informed by the learning sciences (Bellanca & Brandt, 2010; ISTE, 2018; Kotter, 2014; Kouzes & Posner, 2017). ISTE (2018) defines the learning sciences as an "…interdisciplinary field bringing together research findings from cognitive, social and cultural psychology, neuroscience, and learning environments" (ISTE, 2018, p. 1). Education leaders must continue to develop a shared vision by working collaboratively with stakeholders to develop a strategic plan which outlines how digital resources will be used to support student learning (ISTE, 2018; Kotter, 2014; Kouzes & Posner, 2017; Ormiston, 2011). Once a strategic plan for technology implementation to supporting the development of 21st century skills is created, education leaders are charged with developing a system of sustainability which includes the ability to examine progress of the strategic plan, make adjustments as needed, determine effectiveness, and gauge effective approaches for applying technology to transform learning (Baldrige Performance Excellence Program, 2019; ISTE, 2018; Shipley, 2016). The examination of progress also includes the ability to analyze data and to establish benchmarks, metrics, and planned reviews of the plan (Baldrige Performance Excellence Program, 2019; ISTE, 2018; Shipley, 2016). Education leaders must communicate successfully with stakeholders to obtain input on

the plan, celebrate successes and accomplishments, while coming together in a continuous improvement cycle (Baldrige Performance Excellence Program, 2019; Gordon & Smith, 2015; ISTE, 2018; Shipley, 2016). As education leaders guide organizations through the strategic plan it is best to take a collaborative approach and share best practices, how to overcome challenges, and how technology has impacted student learning (DuFour & Eaker, 1998; DuFour & Marzano, 2011; ISTE, 2018). The sharing of lessons learned about the impact of technology on student learning outcomes is essential and requires educational leaders to consider what might be done differently or in implementing the plan (Baldrige Performance Excellence Program, 2019; ISTE, 2018 Shipley, 2016).

Empowering Leader

The third ISTE Standard for Education Leaders (2018) is becoming an empowering leader. High-performing education leaders well-versed in high-quality technology integration, develop a culture for teachers and learners to use technology in innovative ways to enhance teaching and learning. Leaders must encourage educators to use professional agency, develop leadership skills, and seek professional learning opportunities (ISTE, 2018; Learning Forward, n.d.). Professional learning opportunities should provide staff opportunities to choose areas of need and receive support in areas most needed to meet individual technology goals (ISTE, 2018; Learning Forward, n.d.). Education leaders are charged with building confidence and proficiency in educators empowering teachers to transform student learning through the use and support of technology (ISTE, 2018). Education leaders should create a culture of innovation and collaboration which permits opportunities for teachers to search and try new digital tools

(ISTE, 2018; Starr, 2009). The culture of innovation includes an environment which allows for risk-taking, experimentation, and productive analysis of results (Baldrige Performance Excellence Program, 2019; ISTE, 2018; Shipley, 2016). Education leaders should support teachers using technology to promote learning which meets the different academic, cultural, and social-emotional needs of individual students (DiCicco, 2016; ISTE, 2018). Student needs can be met by providing a diverse curriculum with language supports, supportive technologies, and opportunities for personalized learning (Battelle for Kids, 2019a; ISTE, 2018). Education leaders must also create personalized assessments and allow for students to view progress in real time (Battelle for Kids, 2019b; Darling-Hammond, 2010; Hattie, 2012; ISTE, 2018; Marzano, 2017; Smarter Balanced Assessment Consortium, n.d.).

Systems Designer

The systems designer is the fourth ISTE Standard for Education Leaders (2018). The standard encompasses how high-performing education leaders focused on high-quality technology integration should develop teams and systems to effectively integrate, sustain, and continuously progress the use of technology to support learning (ISTE, 2018; Senge, 1990). Education leaders must lead collaborative teams designed to establish an infrastructure and systems needed to implement the strategic plan (DuFour & Marzano, 2011; DuFour, et al., 1998; ISTE, 2018; Senge, 1990). The infrastructure should include adequate bandwidth and software which can meet the demands of the organization (ISTE, 2018; Ormiston, 2011). Education leaders should make sure teachers have access to resources promoting the effective use of technology in the learning process and the future demand for the acquisition of new resources (Bellanca & Brandt, 2010; ISTE, 2018).

ISTE Standards for Education Leaders (2018) recommends leaders should protect privacy and security by ensuring students and staff follow necessary privacy and data management policies. Protection and security is provided through properly training staff and students on best practices, following state and federal guidelines for data and privacy, and using technologies and vendors who follow privacy policies and security capabilities (ISTE, 2018). Education leaders should develop partnerships promoting their vision, accomplishing learning targets, and improving operations (Baldrige Performance Excellence Program, 2019; ISTE, 2018; Shipley, 2016). Partnerships can include working with other school districts, local businesses, political leaders, or companies and organizations (ISTE, 2018).

Connected Learner

Connected learner is the fifth and final International Society for Technology in Education Standard for Education Leaders (2018). Leaders who are connected learners should model and encourage continuous professional development (ISTE, 2018). Education leaders should establish goals to stay refreshed on current emerging technologies which promote learning, innovations in pedagogy, and developments in the learning sciences (ISTE, 2018; Learning Forward, n.d.; Ormiston, 2011; Trilling & Fadel, 2009). Emerging technologies include new digital tools and devices used for educational purposes (ISTE, 2018). Innovations in pedagogy consists of instructional methods enhanced through the use of technology such as inquiry-, problem-, and project-based learning pedagogies (Battelle for Kids, 2019b; Boss & Larmer, 2018; Buck Institute for Education, 2020; ISTE, 2018). Education leaders should regularly participate in online professional learning networks to learn with other professionals (ISTE, 2018; Powers,

2017). Professional learning experiences can provide leaders with opportunities to build personal leadership and the capacity to motivate teachers to incorporate 21st century skills, technological tools, and teaching methods into classrooms (Battelle for Kids, 2019b; ISTE, 2018; Trilling & Fadel, 2009). The development of professional learning networks are virtual ways for people to connect with different others in similar occupations to enhance professional skills (ISTE, 2018). Powers (2017) shared the importance for leaders to overcome the barrier of time and feelings of being overwhelmed which can occur with online professional learning networks. Education leaders should use technology to participate in reflective practices which promote personal and professional growth (DuFour & Marzano, 2011; ISTE, 2018). Leaders must continuously enhance individual skills for leading and navigating change, promoting student achievement, and developing continuous improvement practices for using technology to transform student learning (ISTE, 2018). The specific leadership skills for education leaders include developing buy-in, listening, leading, creating a sense of shared responsibility, working collaboratively, and keeping targets as a main priority for stakeholders (Baldrige Performance Excellence Program, 2019; ISTE, 2018; Kotter, 2014; Kouzes & Posner, 2017).

Transformational Leadership

High-performing technology-driven education leaders help guide teachers in identifying the most essential 21st century skills students need for success (Battelle for Kids, 2019a; ISTE, 2018). Leaders need to develop support systems around 21st century skills to ensure the skills are integrated into the classroom (Battelle for Kids, 2019b). Digital-age leaders demonstrate a deep understanding of how to support technology in the

classroom and help guide teachers in providing high-level learning experiences for students (ISTE, 2018; Kieschnick, 2017; Sheninger, 2016). The leader must possess and demonstrate leadership qualities which instill motivation and commitment from teachers for effective change to occur (Bass, 1999; Yukl, 2002). Research reveals transformational leadership possesses the leadership traits necessary to move toward high-quality technology integration forward in schools (Bass & Avolio, 1993, 1994; ISTE, 2018).

Transformational Leadership Theory was first presented by James Burns (Burns, 1978). Burns believed those who possess certain leadership behaviors have the ability to get followers to reach greater levels of performance and commitment (Burns, 1978; Gordon & Smith, 2015). Burns identified two components of leadership which were the difference between ordinary and extraordinary, and were known as transactional and transformational leadership (Burns, 1978). Burns described transactional leadership as a give-and-take approach where followers complied with the leader and expected something in return (Burns, 1978). Transformational leaders influence followers to see the importance and value in their work and how to achieve their goals (Burns, 1978).

Bass (1985) further examined the relationship between transformational and transactional leaders. Bass (1985) coined the term transformational to explain Burns' leadership theory which is common when explaining behaviors leaders use to make them effective. Bass's initial model consisted of seven leadership traits and included charisma, inspirational, intellectual stimulation, individualized consideration, contingent reward, management-by-exception, and laissez-faire leadership (1985). This led to the development of Transformational Leadership Theory that involved transactional and transformational leadership qualities (Bass, 1985). Followers influenced by

transformational leadership feel "…trust, admiration, loyalty, and respect toward the leader, and they are motivated to do more than they originally expected to do" (Yukl, 2002, p. 253). A leader accomplishes transformational leadership in three different ways (Yukl, 2002). The leader accomplishes transformational leadership by increasing awareness of results, motivating followers to exceed personal interests for the sake of the group, and triggers the awareness of even greater needs (Baldrige Performance Excellence Program, 2019; Bass, 1985; Burns, 1985; Grenny, et al., 2013; Yukl, 2002).

Transformational leaders influence others to arouse feelings of trust and respect toward the leader (Yukl, 1999). The leader motivates people to accomplish more than an individual thought he/she were capable of accomplishing (Yukl, 1999). Transformational leaders emphasize the importance of results and influence individuals to surpass their own interests for the greater good of the organization (Baldrige Performance Excellence Program; 2019; Yukl, 1999).

Transformational and Transactional Leadership

Transactional leadership and transformational leadership are different but can complement each other (Barnett et al., 2001; Burns, 1985; Yukl 2002). Transformational leadership is different from transactional leadership because transactional leadership includes a process based on an exchange to encourage follower compliance of the expectations of the leader and of the organization (Yukl, 1999). Transformational leadership is built on components of transactional leadership which makes the leader's influence more effective (Bass, 1998). Transformational leadership achieves desired results when the leader combines transformational principles with transactional leadership traits in a way which meets the needs of the followers (Barnett et al., 2001).

Transactional leadership is displayed when there is an exchange process between the leader and followers (Bass & Avolio, 1994; Yukl, 2002). The leader rewards followers who comply with requirements (Bass & Avolio, 1994; Yukl, 2002). Compliance is the most important behavior related to transactional leadership (Yukl, 1999).

Bass (1985) identified three specific transactional leadership traits which include contingent reward, management-by-exception, and laissez-faire leadership. Contingent reward is shown when followers work for rewards from the leader (Bass, 1985; Yukl, 2002). Leaders define expectations and engage in mutually satisfactory agreements for follower performance (Bass, 1997). The behavior of contingent rewards includes effects which are a part of an impersonal exchange process and include explaining reward contingencies, offering incentives, and encouraging high performance (Yukl, 1999).

Management-by-exception is when the leader provides negative criticism and feedback to followers and an exchanged process did not occur (Bass & Avolio, 1990; Yukl, 1999). Management-by-exception behavior can be both active and passive (Bass, 1997). Laissez-faire leadership occurs when the leader ignores problems and needs of the group (Yukl, 2002). Laissez-faire Leadership is an absence of leadership which occurs when the leader ignored personal responsibilities, was not found when needed, does not reply to requests for help, and will not share thoughts on important topics (Bass, 1997). Bass and Avolio (1997) showed how the transformational and transactional leadership approach brings followers together through trust and respect to achieve goals. Bass and Riggion (2006) identify four qualities transformational leaders possess. The four qualities are referred to as the four I's of transformational leadership including idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration and

form the foundation for transformational leadership.

Four I's of Transformational Leadership

Idealized influence is the first of the four I's of transformational leadership. Idealized influence is demonstrated when the leader has a vision, has a plan to accomplish the vision, and models the behavior necesry to fulfill the vision (Bass, 1999; Bass & Riggio, 2006; Kotter, 2014; Kouzes & Posner, 2017; Senge, 1990). Leaders who demonstrate idealized influence prioritize the needs and development of the organization above all (Conger & Kanungo, 1998; Gordon & Smith, 2015). A leader must be clear about their own beliefs in order to lead others (Allison et al, 2011). The idealized influence trait is closely associated with charisma (Bass, 1997). Idealized influence is divided into two categories of attributes and behaviors (Bass & Avolio, 1995). Characteristics which exemplify the idealized influence trait are charisma, confidence, ethics, commitment, and trustworthiness (Bass 1999; Bass & Avolio, 2004; Gordon & Smith, 2015). Idealized influence can stimulate passion from followers and provide individuals with a way to associate with and imitate the leader (Bass & Avolio, 2001; Gordon & Smith, 2015; Yukl, 2002). Idealized influence is demonstrated when the leader displays behavior which stimulates the emotions of followers and establishes a connection with the leader (Yukl, 2002). The emulation of the leader can create feelings of pride and devotion which help followers gather around a shared purpose (Bass, 1997). Idealized influence illuminates the leader as an individual able to model the proper way to accomplish tasks while generating a sense of pride and trust from followers (Bass, 1997; Bass & Avolio, 2001; Gordon & Smith, 2015; Yukl, 2002).

Idealized influence is often associated with charismatic leadership. Charismatic

leaders are separated from other leaders due to the ability to inspire and motivate others through making individuals believe the leader is extraordinary (Conger & Kanungo, 1994; Conger & Kanungo, 1998; Conger, et al., 2000). Conger and Kanungo (1994) describe a three-step process for charismatic leadership. The first stage is how followers perceived the leaders to change the status quo to better meet needs (Conger & Kanungo, 1994; Conger, et al., 2000). The second stage is the manner the leader articulates his or her future vision in an inspirational way (Conger & Kanungo, 1994; Conger, et al., 2000). The third and final stage is when charismatic leaders are seen to participate in risky and exemplary situations which followers perceive to require personal sacrifice (Conger & Kanungo, 1994; Conger, et al., 2000).

Inspirational motivation is the second of the four I's of transformational leadership and is displayed when the leader motivates and inspires followers by making the work of the followers meaningful and challenging (Bass, 1997). Inspirational motivation is closely associated with idealized influence through communicating a leaders' vision in an inspiring and challenging way (Bass 1997; Yukl, 1999). Inspirational leadership is achieved through communicating high expectations, getting buy-in from followers, and being optimistic (Bass 1997; Bass 1999; Bass & Avolio, 2004; Gordon & Smith, 2015; Senge 1990). Inspirational leadership includes the leader's ability to articulate a likeable vision, use signs to generate effort from followers, and model desired behavior (Bass & Avolio, 1990; Kouzes & Posner, 2017; Senge 1990; Yukl, 2002). High levels of communication skills are necessary to make a leader's vision understandable to followers (Bass, 1997; Bass & Avolio, 2004; Gordon & Smith, 2015; Kouzes & Posner, 2017). Inspirational leadership motivates and inspires followers

because followers are given a sense of purpose which inspire individuals to take action for the improvement of the organization (Bass & Avolio, 1990; Bass, 1999; Gordon & Smith, 2015). Transformational leaders who demonstrate the inspirational leadership trait behave in an ethical and moral way and can be depended upon to do the right thing at the right time (Bass & Avolio, 1994). Inspirational motivation helps followers stay positive about the future and possess a strong belief in what individuals are capable of personally and as a group (Bass & Avolio, 1990; Yukl, 2002). Inspirational motivation is the manner the leader can articulate his or her vision in an attractive manner through high standards, positivity, and meaning for followers (Bass & Avolio, 1990; Kouzes & Posner, 2017; Senge, 1990; Yukl, 2002).

Intellectual stimulation is the third of the four I's of transformational leadership and is exhibited when leaders assist followers in becoming more innovative and creative (Bass, 1999; Bass & Avolio, 2004). Yukl (1999) defined intellectual stimulation as "causing a subordinate to question traditional beliefs, clarifying the purpose of subordinate activities, and talking about the importance of mutual trust" (Yukl, 1999, p. 2). Intellectual stimulation includes the leader challenging followers to generate new perspectives about problems (Yukl, 1999). Leaders strengthen the connection with followers through celebrating, enhancing, and developing their followers (Yukl, 1999). Leaders portray intellectual stimulation by challenging followers' assumptions, views, and traditions to generate higher order thinking and creativity within the organization (Bass, 1997; Bass, 1999; Bass & Avolio, 2004). Intellectual stimulation is shown when the leader displays behavior which raises followers' awareness to issues and encourages individuals to see issues from a different perspective (Yukl, 2002). Leaders implementing

intellectual stimulation followers to express new thoughts and ideas (Bass, 1997). Leaders encourage followers to ask questions, process problems and situations with higher order thinking skills, and investigate more efficient methods to accomplish tasks (Bass, 1997; Bass & Avolio, 2004; Yukl, 1999). Intellectual stimulation is the trait leaders exemplify when challenging followers to question the status quo, take risks, and formulate new and innovative ways to accomplish tasks (Bass, 1997; Bass & Avolio, 2004; Yukl, 1999; Yukl, 2002).

Individualized consideration is the fourth of the four I's of transformational leadership and is demonstrated when leaders identify growth opportunities for followers and provide support and coaching to help individuals progress (Bass, 1999; Gordon & Smith, 2015). The individualized consideration tenet of transformational leadership characterizes the leader as a coach and mentor to their followers (Bass & Avolio, 1999; Gordon & Smith, 2015; Yukl, 2002). Leaders consider the needs of followers by listening attentively and using knowledge to improve (Bass, 1997). A leaders' ability to create a supportive environment allows people to grow and develop (Bass, 1997; Bass & Avolio, 2004; Gordon & Smith, 2015). Through the role of a coach and mentor, leaders understand the needs and issues their followers face and guide individuals to overcome challenges (Bass, 1999; Bass & Avolio, 2004). Leaders provide feedback to their followers and help individuals grow and develop personally (Bass, 1997; Bass & Avolio, 1992). As leaders coach and develop the growth of followers, leaders celebrate the individual accomplishment of the individuals to the organization (Bass, 1999; Bass & Avolio, 2004; Gordon & Smith, 2015; Grenny et al., 2013). Leaders implementing individualized consideration motivate followers to continuously improve while also

creating intrinsic motivation for other challenges which may be faced as a group (Bass, 1999; Bass & Avolio, 2004; Grenny et al., 2013; Yukl, 2002;). Individualized consideration was displayed by the leader when he or she was supportive, encouraging, and coached their followers (Yukl, 2002). Individualized consideration was displayed when the leader was able to coach and mentor their followers through providing feedback for personal growth and improvement (Bass, 1999; Bass & Avolio, 2004; Yukl, 2002).

ISTE Leader Standards and Transformational Leadership Supporting High-Quality Technology Integration

Administrators can provide support in technology integration efforts (Kieschnick, 2017; Sheninger, 2018). Harris (2016) acknowledged, "A supportive environment will give teachers the confidence they need to effectively design technology enhanced instruction that more directly and powerfully influences student learning outcomes" (p. 35). Principals can encourage the use of technology by supporting and encouraging teachers to integrate and use technology in the classroom (Starr, 2009; Sheninger, 2016). In order to effectively lead schools comprised of high-quality technology integration classrooms, leaders must understand the 21st century skills necessary for student success, how to effectively integrate technology to support and enhance 21st century skills, and utilize transformational leadership skills to move change initiatives forward.

The International Society for Education in Technology (ISTE) standard of equity and citizenship advocate examines how education leaders understanding high-quality technology integration can promote the utilization of technology to "…increase equity, inclusion, and digital citizenship practices" (ISTE, 2018, p. 1). One of the indicators for the equity and citizenship advocate standard education leaders must ensure all students

have access to proficient teachers who understand how to use technology to meet the needs of students (Hattie, 2012; ISTE, 2018; Marzano, 2017). Characteristics of the equity and citizenship standard include hiring for or enhancing the skill level of teachers to appropriately use technology through professional development and support while closing digital usage and access gaps (ISTE, 2018). Another indicator for the equity and citizenship advocate ISTE (2018) standard education leaders must model is digital citizenship as leaders examine online resources, participate in civil discourse in an online environment, and apply digital tools to promote positive social change (ISTE, 2018). Transformational leaders can help create 21st century learning environments by being an advocate for equity and citizenship (Bass, 1999; Bass & Avolio, 2004; ISTE, 2018).

A visionary planner demonstrates the ability to involve others in creating a vision, strategic plan, and continuous assessment for transforming learning through the use of technology (Baldrige Performance Excellence Program, 2019; ISTE, 2018). Kouzes & Posner (2017) emphasize two essentials needed when creating a vision (Kouzes & Posner, 2017). The first essential is a vision allows for people to imagine the possibilities (Kouzes & Posner, 2017). Imagining the possibilities allows individuals to begin with the end in mind and see where they are going (Kouzes & Posner, 2017). The second essential is finding a common purpose (Kouzes & Posner, 2017). Finding a common purpose motivates people to make the vision come to life (Kouzes & Posner, 2017; Senge, 1990). Characteristics which help the leader to promote the vision are charisma, confidence, ethics, commitment, and trustworthiness (Bass 1999; Bass & Avolio, 2004; Gordon & Smith, 2015). Visionary planners can evoke passion from followers and demonstrate how to associate with and imitate the leader (Bass & Avolio, 2001; Yukl, 2002).

Transformational leaders can help create 21st century learning environments by casting a vision to followers and inspiring them to follow that vision (Bass, 1999; ISTE, 2018; Bass & Avolio, 2004; Kotter, 2014; Senge, 1990).

High-performing digital education leaders demonstrate the ability to be an empowering leader through developing a culture allowing teachers and learners to use technology in innovative ways to enhance teaching and learning through high-quality technology integration (ISTE, 2018). Transformational leaders help create a technology-rich culture through intellectual stimulation, one of the four I's of transformational leadership (Bass & Avolio, 1994; Bass & Riggio, 2006). Another indicator for the empowering leader ISTE standard is education leaders should "inspire a culture of innovation and collaboration that allows the time and space to explore and experiment with digital tools" (ISTE, 2018, p. 1). Transformational leaders displaying one of the four I's of intellectual stimulation help create a culture of innovation that includes an environment which allows for risk-taking, experimentation, and productive analysis of results (ISTE, 2018; Sheninger, 2016). Transformational leaders help create 21st century learning environments by being an empowering leader who generates intellectual stimulation opportunities (Bass, 1999; Bass & Avolio, 2004; ISTE, 2018; Sheninger, 2016).

A leader possessing the ability to be a systems designer develops teams and systems to effectively incorporate, withstand, and continually improve the use of technology to support learning (ISTE, 2018). One of the indicators for the systems designer standard is education leaders must develop and lead teams to collaboratively establish necessary resources, supports, and systems to implement the strategic plan

(ISTE, 2018; Kotter, 2014). Systems designer transformational leaders create 21st century learning environments by being a systems designer who help maintain and improve technology integration to enhance student learning (Bass, 1999; Bass & Avolio, 2004; ISTE, 2018).

High-performing digital age leaders can effectively model and encourage continuous professional learning (ISTE, 2018; Learning Forward, n.d.; Senge, 1990; Sheninger, 2016). The connected learner standard aligns with idealized influence and individualized consideration, two of the four I's of transformational leadership (Bass, 1999). The standard connects to idealized influence by a transformational leader's ability to model desired behavior (Bass, 1999; Kouzes & Posner, 2017). The connected learner 'can be linked to individualized consideration from the transformational leader through coaching followers for improvement (Bass, 1999; Bass & Avolio, 1994; ISTE, 2018). Leaders who possessing transformational leadership traits, specifically the four I's of transformational leadership, utilizing the ISTE Standards for Education Leaders (2018) may be positioned to improve classroom practice, create an innovative culture, and support effective change (Bass, 1997; ISTE, 2018).

Summary

The purpose of this qualitative study was to understand the perceptions of principals and teachers in high performing Missouri high schools with one-to-one technology to uncover the 21st century skills most necessary for student success. The study also explored educators' views on the use of technology to develop student skills and strived to understand the possible influence of transformational leadership and ISTE Standards for Education Leaders (2018) on promoting high-quality technology

integration. The research of Harold Wenglinsky (1998) was used to define the technology integration component of the theoretical framework, and transformational leadership was directed by James Burns (1978) and Bernard Bass (1985). The study sought to explore the gap in literature between any connections existing between high-quality effective technology integration and transformational leadership.

21st century skills, as defined in the Battelle for Kids' Framework (2019b) are critical to the success in a student's life, career, and college experience due to the change brought about by rapid advancements in technology (Battelle for Kids, 2019a; Battelle for Kids, 2019b; ISTE, 2016). Battelle's work created the foundation for the first component of high-quality technology integration which is ensuring students are ready for technology-centered environments by ensuring students possess the 21st century skills necessary to succeed in college, the workforce, and life (Battelle for Kids, 2019a; Darling-Hammond, 2010; Germaine, et al., 2016; Kieschnick, 2017; Sheninger, 2016; Trilling & Fadel, 2009). The second component of high-quality technology integration is the effective utilization of technology to effectively teach and develop 21st century skills (ISTE, 2016). The ISTE Standards for Students (2016) provide educators a guide for using technology in the classroom emphasizing on promoting student learning and understanding 21st century skills. comes from the standards identified by the International Society for Technology in Education (n.d.). The ISTE standards outline how technology can further develop and transform 21st century skills and prepare students for the digital age. The two frameworks collectively create the model for high-quality technology integrated classrooms. Educational systems need leaders who understand high-quality technology integration to ensure students are prepared for the digital

landscape through utilizing technology to transform personal learning experiences (ISTE, 2016). Leaders who possess transformational leadership traits, specifically the four I's of transformational leadership which are idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, apply leadership traits to the ISTE Standards for Education Leaders (2018) to create the necessary culture and support for effective change (Bass, 1997).

CHAPTER THREE
METHODOLOGY

Introduction

The purpose of this basic narrative qualitative study was to examine educator perceptions of transformational leadership and influence on high-quality technology integration in high schools. The study identified high-performing secondary schools in Missouri using one-to-one technology. Research conducted for the study examined both teachers' and principals' perceptions for what each participant considered key 21st century skills and how technology is used best to support the skills (Battelle, 2019b; ISTE, 2018). The study further explored educators' perceptions on the level of transformational leadership skills practiced and the prevalence of the ISTE Standards for Education Leaders (2018) used by principals considered leaders of technology integration (Bass, 1999; Burns, 1978). A basic narrative qualitative methodology of research was utilized as the design of the study. The researcher intentionally chose school districts who met specific criteria as high performing and implemented a one-to-one technology approach. Semi-structured interviews were conducted with both groups of participants to understand the perceptions of educator participants concerning both elements of high-quality technology integration. This included 21st century skills supported with the effective use of technology, along with the leader's ability to implement the ISTE Standards for Education Leaders (2018) and any influence from transformational leadership characteristics. The researcher created an interview guide based on the framework for 21st century learning, ISTE Standards for Students (2016), ISTE Standards for Education Leaders (2018), and literature connected to transformational leadership.

Research Questions

There are two overarching research questions for this basic narrative qualitative study, with each having two sub-questions:

RQ1. What are educator perceptions of high-quality technology integration?

i. What are educator perceptions of the essential 21st century skills students need for success?

ii. What are educator perceptions for how teachers use technology to teach 21st century skills?

RQ2. What are educator perceptions for how leaders support high-quality technology integration?

iii. What are educator perceptions for how transformational leadership supports high-quality technology integration?

iv. What are educator perceptions for how leaders integrate International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) to support high-quality technology integration?

Participants and Sampling

The participants for the study were selected by the researcher using snowball sampling (Merriam & Tisdell, 2016). Snowball sampling was chosen for the study for the purpose of allowing the researcher to identify teacher participants through recommendations from the building principal (Merriam & Tisdell, 2016). The participants in this qualitative study included principals and teachers from three high-performing high schools in Missouri led by a high-performing technology-driven administrator. Merriam, and Tisdell (2016) recommend a sample size based off reaching

the point of saturation or redundancy. The researcher set out to interview principals and teachers from three different high schools, but allowed flexibility to increase the number if the level of saturation was not met. The administrator participants were recommended by Area Representatives from the Missouri Association of Secondary School Principals (MoASSP) (Appendix B). The MoASSP works to support secondary school administrators from Missouri. There are eight districts which each MoASSP Area Representative serves. Those recommendations were cross-referenced with recommendations from District Representatives for the Missouri Association of School Administrators (MASA) (Appendix C). The MASA serves school superintendents and central office administrators from Missouri. There are eight districts which each MASA District Representative serves. The educational experts making the recommendations had either been in the buildings of the nominated principals or had anecdotal information related to leadership style, student performance, and classroom practice in the buildings. Representatives were asked to identify ten high-performing technology-driven high school principals who had implemented one-to-one technology in their buildings. The International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) were provided as a basis for recommendations. It was important to identify building leaders who were well-versed on the use of technology so the leaders had experience implementing and supporting student learning through the use of technology.

The lists from MoASSP and MASA were cross-referenced and compared to identify three principals for interviews. Each building principal was asked to recommend two teachers from their buildings to be interviewed. Creswell (2013) suggested one or

two sites for interviews unless more are needed to increase the size of the collective story. For the purposes of this study, the researcher conducted interviews with five building principals and ten teachers. Principals appearing on both lists from MoASSP an MASA were identified first. Then each building's Annual Performance Report for the area of academic achievement was reviewed, looking specifically at the Map Percentage Index (MPI) scores in English Language Arts and Mathematics. The scores provided evidence of principals leading in high performing buildings. A final ranking list was created listing from the highest number of total MPI points to the lowest number of total MPI points. The top three schools were identified and principals contacted to determine if their schools utilize one-to-one technology integration. One-to-one technology was important because the study examines technology integration in high schools and one-to-one technology demonstrates full saturation of student devices within a school building and the assumption there is a high usage of technology at the classroom level. If the school implemented one-to-one technology, the principal was asked if he or she, and two teachers meeting specific criteria from their building, would be willing to participate in the study. If the principals were not willing to participate, the researcher next the next school from the nomination list until three schools were selected. The preference was to conduct interviews in five school districts, but three schools was acceptable for the purposes of the study.

The process allowed for the identification of the top five high-performing high schools with technology integration. Data was acquired through interviews and from analyzing documents related to educator perceptions of essential 21st century skills, the capacity of using technology tools and devices, the level of transformational leadership

traits, and prevalence of the ISTE Standards for Education Leaders (2018) found in each school. Once the three principals were identified through the selection process of recommendations from the MoASSP Board of Directors and DESE area supervisors and ranked by building MPI scores in English Language Arts and mathematics, the researcher emailed each principal (Appendix D) to confirm and officially ask if the principal, along with two teachers from their school, would be willing to participate in the study. If the principals did not wish to participate in the study the researcher went down the ranking list to the next principal.

The teacher participants in the study were recommended by their building principal. Each principal was asked to nominate two high-performing technology-driven teachers from their building. These teachers had strong technology and instructional pedagogy skills and had engaged in training related to technology integration. The teachers at each of the schools were selected to provide their perceptions of technology integration and share thoughts related to their building leader's influence on technology integration in their school. The researcher requested for the principal (Appendix E) and teachers (Appendix F) to complete the informed consent form to grant permission for conducting each interview. If participants were willing to participate, the researcher conducted virtual interviews due to social distancing complications as a result of the COVID-19 pandemic during the time of the study.

Participants in the study were ensured confidentiality through the interview process (Appendix E). The transcripts were managed for confidentiality as the researcher labeled the principal interviews as P1, P2, and P3. The teacher transcripts were labeled T1, T2, T3, T4, T5, and T6. Participants were granted anonymity and confidentiality

within the paper by the researcher not identifying any participant by name or school. Participants also had the ability to skip questions or remove participation at any time. Participants were given a word-for-word transcript of their interview. Transcripts were created to allow participants time to review the conversation the researcher recorded and have the opportunity to make any changes or additions to their statements. The transcribed interviews presented the evidence of any influence transformational leadership might have on high-quality technology integration.

Research Design

The study used a basic narrative qualitative design to determine building principals' and teachers' perceptions of technology integration and the use of transformational technology leadership skills which influence instructional practice in their high schools. Narrative research was chosen for this study because the researcher intended to gather stories from the interview participants regarding experiences with technology integration and how technology was influenced by leadership (Creswell, 2013). Through the process the researcher also obtained documents which furthered the narrative surrounding the topic (Creswell, 2013).

Before interviews were conducted, a pilot group was established to read the interview protocol to check for clarity and provide feedback. The feedback was used to improve the interview protocol. The pilot group was comprised of two superintendents, two principals, and four teachers assembled together to evaluate the interview protocol. The various perspectives from each of the pilot participants represented different perspectives which helped ensure clarity in the questions. The method of inquiry included one-on-one interviews with each building principal and two teachers from each school.

Participants were selected through snowball sampling in which principal recommendations were made from the MoASSP along with MASA. Principals appearing on both lists were then ranked by the Map Percentage Index in English Language Arts and Mathematics from their building Annual Performance Report. Teacher participants were recommended by the building principal through snowball sampling (Merriam & Tisdell, 2016). The researcher also examined documents from each building relating to the building technology integration plan along with technology integration training provided to teachers.

Permission to conduct the study was granted by the Research Review Board (RRB) from Southwest Baptist University. The researcher contacted each building principal, along with the two teachers each building principal recommended, by email to request participation in the study. After the building principal and two teachers indicated a willingness to participate they were sent a follow-up email. The follow-up email contained a letter (Appendix D) which explained the purpose of the study, the process for participant selection, and the structure of the interviews. An informed consent form (Appendix E) and an interview guide (Appendix F) which contained the interview questions was sent to each participant as well. Principal and teacher interviews were conducted simultaneously, but individually.

Due to social distancing guidelines established from the COVID-19 pandemic, all interviews were conducted virtually and did not require the researcher to travel. At each of the five high schools participating in the study, each of the building principals were interviewed along with two teachers. From each of the three high schools, a total of three different people were interviewed for a total of nine interviews conducted. Interview

questions were generated from the review of literature. The interview questions focused on connections which existed between high-quality technology integration with 21st century skills supported by the use of technology and how technology integration was influenced by transformational leadership skills when aligned to the five ISTE Standards for Education Leaders (2018). A copy of the interview questions for principals and teachers was provided in Appendix (F).

Research Setting

The research was conducted virtually and participants were educators employed at three high schools across the state of Missouri. The high schools selected for this study were chosen based on recommendations from the Missouri Association of Secondary School Principals (MoASSP) district representatives and area representatives with the Missouri Association of School Administrators (MASA). Teacher participants were nominated by each selected building principal. The research setting was limited geographically to high schools in the state of Missouri. The researcher conducted virtual interviews with the participants due to social distancing complications resulting from the COVID-19 pandemic at the time of the study. Once the participants were confirmed for the study, the researcher determined which virtual platform participants were most comfortable with for the interview. The researcher offered participants the choice to conduct interviews via Zoom or a Google Hangout. The researcher recorded and transcribed each interview conducted with each participant.

The researcher knew each building implemented a one-to-one technology initiative. A one-to-one technology initiative is defined as each student having access to a district-provided device. The researcher called each building principal prior to requesting

participation in the study to ensure a one-to-one technology initiative was in place. The assumption was the building principal had attempted to integrate technology since the building had a one-to-one technology initiative where every student had access to a district-issued technology device. The researcher made the assumption because the building principal is responsible for the implementation and utilization of resources to support learning in their schools. The researcher built relationships and trust with the participants through his own understanding of leading a high school which implemented technology and provided trainings for teachers to effectively integrate technology into classrooms. The high schools selected for this study were numbered HS 1, HS 2, and HS 3 to protect the anonymity of the building principals and teachers at each high school. The researcher kept the focus on transformational leadership traits and the prevalence of ISTE Standards for Education Leaders (2018) surrounding high-quality technology integration through the interview questions as outlined in the Interview Protocol (Appendix F).

Interviews

This study was designed to examine the influence of transformational technology leadership on high-quality technology classroom integration in high schools using the perceptions of principals and teachers. Interviews and textual data were acquired to understand the perceptions of the leader's role at each high school which participated in the study. The biggest source of data came from the interviews which were conducted with each participant. The interviews concentrated on principal and teacher perceptions and experiences of transformational leadership with the influence on high-quality technology integration in high schools. Research questions were developed based on the

ISTE Standards for Education Leaders (2018).

Interview data included both field notes and audio transcriptions for each of the interviews, and took place over a one-month period. Each interview conducted was transcribed through the portal at Rev.com for a fee paid by the researcher. Participants were given the opportunity for member checks (Appendix H) to review their statements from the interview and provide any additional information. The research question protocol and questions were provided to participants prior to each interview (Appendix F). A pilot group comprised of two superintendents, two principals, and four teachers was assembled to evaluate the interview protocol. The work of the pilot group increased the validity and reliability for the study. The feedback gathered from the pilot group provided consistency for the interviews. The various perspectives represented from each of the members of the pilot group contributed different perspectives ensuring clarity in the questions. Pilot participants were asked to read the questions to check for clarity and provide feedback. The feedback was used to adjust the interview protocol.

The interview protocol was designed to evoke educator perceptions related to the research questions. Interview questions numbers one and two were designed to capture an understanding of educator perceptions on the most essential 21st century skills. Interview questions numbers three and four delved into perceptions regarding the use of technology to support 21st century skills. The interview protocol also explored the leader's focus on ISTE Educational Leader Standards (2018) and transformational leadership which were covered in questions numbers five through 10.

Two research questions exist for this basic narrative qualitative study, with each having two sub-questions:

RQ1. What are educator perceptions of high-quality technology integration?

i. What are educator perceptions of the essential 21st century skills students need for success?

ii. What are educator perceptions for how teachers use technology to teach 21st century skills?

RQ2. What are educator perceptions for how leaders support high-quality technology integration?

i. What are educator perceptions for how transformational leadership supports high-quality technology integration?

ii. What are educator perceptions for how the leader integrates International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) to support high-quality technology integration?

Each principal recommended two teachers from each building. The recommended teachers needed to exemplify strong technology and instructional pedagogy skills and have engaged in training related to technology integration. Therefore, at each of the three high schools a total of three different people were interviewed from each school for a total of nine interviews conducted.

Assuring Trustworthiness

Validity and reliability were at the forefront of the researcher's approach in the qualitative study. Internal validity was addressed in the credibility of the participants as the researcher established selection criteria for recommendations and asked clarifying questions during each interview. Each interviews was also recorded to allow the

researcher to cross-reference their statements with documents ascertained through the research process. External validity was addressed in the approach used to keep the findings of the study general and able to be transferred to other settings. Reliability was addressed by the researcher through recording, transcribing, and coding the data.

The researcher ensured trustworthiness by utilizing the following processes outlined by Creswell (2013): (a) triangulation, (b) peer reviews, (c) clarifying researcher bias, (d) member checking, and (e) rich, thick description. The data was intentionally collected from a variety of educators including principals, novice teachers, and veteran teachers to gain insight from different perspectives. The interview responses were compared and contrasted to ensure the various themes uncovered were triangulated. Triangulation, member checks, and peer review processes brought internal validity to the study. Triangulation included using multiple perspectives from principals and teachers from interviews and transcriptions. The process of triangulation enables each participant to review detailed interview responses and verify the interpretive accuracy which increases reliability for the study (Carlson, 2010). Sources of data from documents were also reviewed. All of the sources were used to uncover findings related to the research questions. Member checks allowed participants the ability to review the transcript of their interview and make necessary changes to their statements. Peer examinations (Appendix I) were utilized when the researcher reached out to colleagues to solicit comments and feedback on the developing conclusions of the study. In addition, the researcher examined documents provided by the principals and teachers surrounding technology initiatives and training they received. The provided documents included technology integration plans for the building and technology integration professional learning

opportunities offered by the school district. Schools having integrated one-to-one technology was a criterion for participation in this study. The researcher utilized his personal high level of integrity and character while conducting this study. The researcher attempted to reveal any preconceived notions by explaining his role has a building principal in a high school which integrated 1:1 technology and his personal assumptions throughout the research. The researcher believed the discoveries from the study would contribute to the knowledge base for the influence of transformational leadership on high-quality technology integration in high schools.

Procedures

Qualitative data was collected through conducting interviews with each participant. Each interview was recorded by the researcher and then transcribed. The type of data collected was based off the interviews, transcripts, researcher's field notes, and school-specific documents regarding technology integration and leadership approach from participating school districts. The documents included any technology integration plans or technology-based trainings which occurred in the district. The documents were accessed by the researcher by asking the building principal in advance of the interview for any technology integration documents he or she could share. The researcher also searched each school district's website for any available technology integration documents. Participants were contacted via email and asked to participate. If a response was not received within one week, the researcher called the participant. If the participant did not respond after one week, the researcher sent an email. If the participant did not respond to the email sent by the researcher, the researcher determined the participant was not willing to participate in the study.

Data Analysis

Data acquired through this study was examined to determine perceptions of building principals and teachers on transformational leadership and the influence on high-quality technology integration in high schools. All interviews were audio recorded, examined on a number of occasions by the researcher, and transcribed by Rev.com. Interview participants were provided with the opportunity to review a written transcript of their interview to review their statements and provide additional information if desired. The interviewer fulfilled requests for changes and additions to the initial interviews. Data collection and data analysis happened concurrently during the study (Merriam & Tisdell, 2016).

A thorough examination and analysis of each interview occurred during the study. Each interview transcript was read in entirety and themes were created by the researcher. Data analysis started with the researcher listening to the audio tapes of the interview without making any notes. The audio tapes were then listened to again and the researcher made notes on general impressions such as tone of voice and emotions heard in participant voices. Each interview was observed by itself by the researcher reading the question and following response while the researcher paraphrased in a handwritten format. The transcripts were then read without notes being recorded. The transcripts were read for a second time and the researcher made general impression notes in the margins. Merriam, and Tisdell (2016) referred to this process as open coding. A third reading of the interview occurred when the researcher only read the answers provided by each interviewee. Once the transcripts were read, the researcher compared the notes from listening to the audio tapes to the transcript notes and noted any similarities or

differences. The notes were viewed again, as the researcher looked for words and created categories. The researcher also looked for quotes which represented themes. Once this step was completed, the researcher listened to the audio tapes again to determine if anything was missed. The notes were compared to the initial notes which were taken. Once patterns were established, the researcher examined the patterns closely while also taking into consideration the overall design of the study. Through this process the researcher identified possible gaps in the perceptions of the current practice with theories and concepts from the review of literature. The field notes and technology-related documents acquired through the interview process were included in the data analysis. This initiated the process of creating themes which were found to be true to the data, also accounted for any information which might be missing.

The themes were reviewed with a consideration toward the two research questions. First, looking under the combined lens of the Battelle for Kids (2019a) Framework for 21st Century Learning and the International Society for Technology in Education (ISTE) Standards for Students (2016) to capture evidence illuminating the perceptions of essential skills, supports, and tools most needed in a high- quality technology integrated classroom. The ISTE Standards for Education Leaders (2018) and the four I's of transformational leadership created the lens for exploring the perceptions of how transformational leadership might influence high-quality technology integration in a high school. The themes enabled the researcher to understand the perceptions of principals and teachers on the 21st skills the participants felt were necessary for student success, how to effectively use technology to develop 21st century skills, and the influence of transformational leadership on the ISTE Standards for Education Leaders

(2018) to promote high-quality technology integration in Missouri public high schools.

Summary

The purpose of this qualitative study was to understand the perceptions of principals and teachers in high performing Missouri high schools using a one-to-one technology approach to uncover 21st century skills individuals recognized as most necessary for student success. The study also explored educators' views on the use of technology to develop 21st century student skills and strived to understand the possible influence of transformational leadership with a focus toward ISTE Standards for Education Leaders (2018) on promoting high-quality technology integration. The methodology of the study including the participants, research setting, research design, instrumentation, interview process, and data analysis were explained. involved in this study. Chapter Four is the presentation for the findings of the study, and Chapter Five is a summary of the study along with recommendations for further research with implications of the findings for the field of education.

CHAPTER FOUR
ANALYSIS OF THE DATA

Introduction

The purpose of this basic narrative qualitative study was to examine educator perceptions of Transformational Leadership and influence on high-quality technology integration in high schools. In order to understand Transformational Leadership and influence on high-quality technology integration, the researcher identified three high-performing high schools in Missouri utilizing one-to-one technology. The researcher then conducted interviews with each building principal and two teachers from each building recommended by the building principal. In addition to the interview sessions, the researcher collected various documents to further understand each building's approach with technology integration. Chapter Four embodies the examination of the responses of each participant during the interview sessions in regard to their perceptions of Transformational Leadership and influence on high-quality technology integration in high schools.

The research was theoretically grounded using the work of Harold Wenglinsky (1998), Bass (1978), and Burns (1985). Wenglinsky's (1998) work focuses on technology integration and the work of Bass (1978) and Burns (1985) focuses on Transformational Leadership. More specifically, Wenglinsky (1998) examined the impact technology had on student achievement through technology integration in mathematics. 'Additionally, James Burns (1978) believed individuals possessing certain leadership behaviors had the ability to influence followers to achieve greater levels of performance and commitment and this was became the foundation for the Transformational Leadership Theory (Gordon & Smith, 2015). Furthermore, transformational leaders

motivate individuals to recognize the importance and value of their work and understand how goals could be achieved (Burns, 1978). Bass (1985) further explained Burns' Transformational Leadership Theory by identifying effective behaviors leaders implement. Bass & Avolio (1993, 1994, 2004) examined four qualities transformational leaders possess and the four qualities are referred to as the Four I's of Transformational Leadership (Bass & Avolio 1994, 2004).

The interviews for this study were conducted during the COVID-19 pandemic. To ensure the health and safety of the researcher and each participant all interviews were conducted virtually via Zoom. Since the study was designed to explore educator perceptions of high-quality technology integration and Transformational Leadership, the interviews and resulting data were as valid and reliable as if the interview sessions had been conducted in-person. The analysis of the data was separated into four different sections with the first section identifying the participants of the study which included the building principal and two teachers from each building. The second section describes the process used to verify the methods and the trustworthiness of the research. Subsequently, the third section explores the categories and themes which evolved from the interviews, document mining, and observations. Finally, the fourth section discusses the data in regard to the research questions.

Two overarching research questions were used for this basic narrative qualitative study and each question had two sub-questions:

RQ1. What are educator perceptions of high-quality technology integration?

i. What are educator perceptions of the essential 21st century skills students need for success?

ii. What are educator perceptions for how teachers use technology to teach 21st century skills?

RQ2. What are educator perceptions for how leaders support high-quality technology integration?

i. What are educator perceptions for how Transformational Leadership supports high-quality technology integration?

ii. What are educator perceptions for how leaders integrate International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) to support high-quality technology integration?

Participants

Interviews were conducted with nine participants from three different Missouri high schools. Schools were identified through nominations from area representatives with the Missouri Association of Secondary School Principals (MoASSP) and district representatives from the Missouri Association of School Administrators (MASA). Representatives were asked via email to recommend 10 high-performing technology-proficient high school principals from the state of Missouri. The recommendations were then cross-referenced and principals who appeared on both lists were then ranked by their building's MAP Percentage Index (MPI) for English Language Arts and Math from the 2019 state assessments. State assessment scores for both English Language Arts and Math then were combined to rank the principals and the top three principals were contacted to determine if their school implemented one-to-one technology. If yes, the principal was asked to participate in the study. Once each school was determined, the participants from each high school included the building principal and two teachers who

were considered to be high performing with technology integration in their classroom. The principal participants were identified as P1, P2, and P3 and the teacher participants were identified as T1, T2, T3, T4, T5, and T6.

School A.

School A was a Missouri public high school located in a rural area with 868 students in Grades 9 through 12. The predominant racial and ethnic composition of the school was 89.4% White, with 46.9% of students eligible for free and reduced priced meals. School A had an average student-to-classroom-teacher ratio of 1:21. The principal, identified as P1 in the study, had been in the position for 13 years and recommended two teachers who excelled with technology in the classroom to participate as well. The teachers included a business teacher, identified as T1 in the study, and a social studies teacher, identified as T2, in the study.

School B.

School B was a Missouri public high school located in a rural area with 1,594 students in Grades 9 through 12. The predominant racial and ethnic composition of the school was 90.5% White, with 30.1% of students eligible for free and reduced priced meals. School B had an average student-to-classroom-teacher ratio of 1:21. The principal, identified as P2 in the study, had been in the position for five years and recommended two teachers who excelled with technology in the classroom to participate as well. The teachers included a social studies teacher, identified as T3 in the study, and another social studies teacher, identified as T4, in the study.

School C.

School C was a Missouri public high school located in a rural area with 581 students in Grades 9 through 12. The predominant racial and ethnic composition of the school was 90.5% White, with 34.7% of students eligible for free and reduced priced meals. School C had an average student-to-classroom-teacher ratio of 1:18. The principal, identified as P3 in the study, had been in the position for 14 years and recommended two teachers who excelled with technology in the classroom to participate as well. The teachers included an English teacher, identified as T5 in the study, and a math teacher, identified as T6, in the study.

Verification/Trustworthiness

A basic narrative qualitative study approach was used for this study. Data were collected through interviews, observations, and document analysis (Merriam & Tisdell, 2016). Data collection through each of the methods was designed to allow participants and opportunity to tell the story of their experiences, practices, and interactions with high-quality technology integration in their classroom and school (Merriam & Tisdell, 2016). The interview sessions allowed the researcher to understand how participants interpreted their experiences, how each participant viewed high-quality technology integration in their classroom and school, and what meaning participants credited to their experiences (Merriam & Tisdell, 2016). Subsequently, purpose of this basic narrative qualitative study was to explore educator perceptions of Transformational Leadership and the influence such leadership has on high-quality technology integration within Missouri High Schools.

Credibility, validity, and reliability are key components for creating reliable qualitative research (Merriam & Tisdell, 2016). The collection of data through multiple methods is recommended to articulate findings (Creswell, 2013). The process of implementing multiple methods to collect data allowed the researcher to demonstrate how multiple viewpoints and approaches were used to analyze and portray the findings (Merriam & Tisdell, 2016). This basic narrative qualitative study ensured trustworthiness by utilizing triangulation, member checking, peer reviews, clarifying researcher bias, and rich, thick description as such processes brought internal validity to the study (Merriam & Tisdell, 2016).

Triangulation.

The researcher used triangulation of data to evaluate artifacts and better understand the themes which developed throughout the course of the study. Data collection included interviews, review of interview transcripts, and document mining (Merriam and Tisdell, 2016). The data collection process allowed the researcher to understand multiple perspectives in addition to the data included from corresponding documents related to the participants and their schools. Thus, the data collection process increased the validity of the study.

Interviews were conducted with each building principal and two teachers from each principal's school. The interviews were conducted individually and were scheduled at a time convenient for the participants. Once an established time was set, participants were offered the option to meet virtually through Google Meet or Zoom. Once the interview sessions were conducted, the transcripts allowed the researcher to detect themes which emerged from conversations with each participant. Themes emerged from notes

the researcher took during the interview sessions along with review of each interview's transcript. Furthermore, additional data was collected through document mining as documents were collected from each school's website and from participants sharing technology-related documents from their school. Artifacts collected from the document mining process included virtual learning expectations and professional development trainings for technology integration.

Member checking.

Member checking provided participants with the opportunity to review their interview transcript and make any changes or additions to their statements. Each interview was digitally recorded throughout the recording feature on Zoom. Then the digital recordings were uploaded to Rev.com and converted into transcripts. Once the interview transcripts were complete the transcripts were emailed to each participant to ensure the accuracy of each participant's answers and participants were able to make any additions, omissions, or clarifications to their interview transcripts. Subsequently, upon completion of member checking, no requests were made to modify the original interview transcript.

Peer reviews.

Peer reviews were conducted to increase the internal validity of the study (Merriam & Tisdell, 2016). The peer review process included a dissertation committee comprised of two Southwest Baptist University graduate education professors and a local school district superintendent. One of the dissertation committee members served as the advisor periodically monitored the progress of the research and communicated with other dissertation committee members to receive input and feedback. The dissertation

committee reviewed the research questions, theoretical framework, literature review, and methodology implemented during the study. The review process allowed the researcher to take input and feedback from the committee and focus the research questions, refine the literature review to align with the research questions, and implement an appropriate methodology for research.

Clarifying bias.

In qualitative research it is important to clarify bias to monitor the researcher's biases so biases can be monitored and made clear how such biases may influence the data (Merriam & Tisdell, 2016). The researcher was employed as a Missouri high school principal for part of the study. Through his professional relationships, the researcher did know one of the participants. The previous relationship between the researcher and the participant could have inadvertently impacted the participant's ability to answer questions with their true thoughts and feelings. Subsequently, the researcher was aware of the potential bias and made a conscious effort to adhere to the interview protocol as a result of the prior relationship.

Multiple theoretical perspectives.

Multiple theoretical perspectives provided the researcher the opportunity to examine educator perceptions and influence of Transformational Leadership on high-quality technology integration in high schools through multiple lenses. A combination of three theoretical perspectives were used within the study. The first theoretical perspective was Wenglinsky's (1998) study of the relationship between various digital tools and different educational outcomes such as proficiency on standards. The purpose of Wenglinksy's (1998) research was to determine the impact of technology in regard to

student achievement with the integration of technology when teaching mathematics (Wenglinsky, 1998). The scope of Wenglinsky's (1998) research covered the frequency technology was used to teach math. Additionally, the research examined student access to devices in school and at home for the purposes of learning math, professional development required for teachers to effectively utilize technology, and effective digital instructional practices designed for math education (Wenglinsky, 1998).

The second framework included the International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) which provide a framework for leading digital learning. The standards identify the essential knowledge and actions of leaders to equip teachers with the proper skills and tools to make learning possible through the use of technology. The ISTE Standards for Education Leaders (2018) are focused on equity, digital citizenship, visionary leadership, collaborative teams, continuous improvement, and professional development (ISTE, 2018).

Lastly, the study included the Four I's of Transformational Leadership Theory. The first I includes idealized influence which is demonstrated when the leader has a vision, describes how the vision can be accomplished, and models the behaviors necessary to achieve the vision (Bass, 1999). Inspirational motivation is the second I and is shown when the leader can motivate and inspire individuals by making work meaningful and challenging (Bass, 1997). The third I includes intellectual stimulation which is shown when leaders are able to assist followers in becoming more innovative and creative (Bass, 1999; Bass & Avolio, 2004). The fourth I is individualized consideration which is demonstrated when leaders identify growth opportunities for followers and provide support and coaching to help individuals progress (Bass, 1999).

Subsequently, Transformational Leadership Theory was chosen for the study since research has shown such leadership can promote change in individuals, increase followers' motivation, and enhance an individual's performance when alignment with the goals of the mission (Bass, 1999; Yukl, 1999).

Data Analysis Procedures

Creswell (2013) states qualitative research is a process comprised of data collection, data analysis, and report writing which are interrelated and occur simultaneously. Researchers learn by doing and use analytic procedures which evolve as the research occurs (Creswell, 2013). The Data Analysis Spiral approach suggested by Creswell (2013) allows the researcher to move in analytic circles as opposed to a fixed linear approach thus, creating opportunities for several aspects of analysis to occur (Creswell, 2013).

The Data Analysis Spiral approach begins with data management which happens as the researcher organizes the data into files by hand or by computer. Researchers read the transcripts in-depth to understand the data as a whole before dividing the data into separate parts. Codes and categories are then formed to develop themes as the data is interpreted (Creswell, 2013). The themes allow the data to be understood holistically. Moreover, once the data is interpreted the data is then presented in text, tables, or figures and allow these strategies allow for the data to be understood visually (Creswell, 2013).

Transcription and data cleaning.

The researcher conducted interviews to understand educator perceptions of technology integration from the perspective of the participants involved. The study included the analysis of interview responses among participants who had different

perspectives. The participants in the study included three Missouri high school principals and six Missouri high school teachers. After signing an informed consent, the participants scheduled a time with the researcher to interview via Zoom during a time which was convenient for both parties. The interview protocol can be found in Appendix F.

Interviews were designed to understand each educator's perceptions of and influence of Transformational Leadership on high-quality technology integration in high schools. Each interview was recorded through Zoom, which every participant chose instead of Google Meet and then the researcher used Rev.com to transcribe each interview. Once the transcripts were generated the researcher cleaned the transcripts through comparing the digital recordings with the transcripts and then adjusted the transcripts as necessary. After the transcripts were cleaned, the researcher sent each participant a copy of their individual transcript to check for accuracy and make adjustments as necessary.

Interview questions were designed to evoke participant's perceptions and influence of Transformational Leadership on high-quality technology integration. Bass's' (1985) Transformational Leadership Theory was a framework for the design of the study. Bass & Avolio (1993, 1994, 2004) examined four qualities referred to as the Four I's of Transformational Leadership which transformational leaders possess. The Four I's of Transformational Leadership and the five ISTE Standards for Education Leaders (2018) collectively served as the lens through which the interview questions were developed. The Four I's of Transformational Leadership include individualized consideration, idealized influence, inspirational motivation, and intellectual stimulation. Additionally, the five ISTE Standards for Education Leaders (2018) include equity and citizenship

advocate, visionary planner, empowering leader, systems designer, and connected learner.

Document mining.

Additional data was collected through document mining. Document mining provided the researcher an opportunity to continue to look for themes to connect with each participant's' perceptions related to the study. The researcher collected technology-related documents from the websites of schools participating in the study as well as from participants who shared documents utilized for technology integration within their school. Artifacts acquired through the document mining process included the following titles: School A: *One 4 One Technology Initiative Student Handbook*, *1:1 Student/Parent Handbook*, *TO Connect*, *Cyber Sandwich #EduProtocols*, School B: *Canvas Workshop Day One*, and School C: *Program Guide of Sessions*, *Virtual Learning Expectations,* and P*rofessional Development Trainings for Technology Integration*. Data acquired through document mining was used to compare each participants' perceptions from observations, interview notes, and interview transcripts to ascertain connections.

Coding procedures and theme development.

Once interviews were completed, the researcher analyzed each interview transcript and the supporting documents to identify key words and phrases. The researcher annotated and highlighted text within each transcript as commonly used key words and phrases occurring repeatedly were identified. Next, identified key words and phrases were developed into codes and the codes were then categorized and developed into themes as the researcher annotated transcripts throughout the process of analyzing the text for common words and phrases. Subsequently, individual phrases and statements

were coded within the transcripts using the cardinal numbering system beginning with 1, 2, 3 throughout the length of each interview transcript. The numbering system allowed the researcher to quickly find the exact statement when looking for a direct quote. The researcher repeated the coding process twice for each interview transcript to ensure statements were accurately coded and to minimize the possibility something might be accidentally withheld from the process. As similar pieces of data were identified, common categories emerged as similar codes were identified.

The researcher organized the data in an Excel spreadsheet as key words and phrases were identified from analyzing, annotating, and highlighting transcripts from the interview questions and supporting documents. The researcher identified 34 key words and phrases from the nine interview transcripts and the six documents which were collected from the participants. The 34 key words illustrated the data and were categorized together to establish patterns which helped the researcher identify six major themes. Thus, six major themes were generated from the 34 code words and phrases during the process of organizing the data.

Once the six main themes were determined, the researcher re-analyzed each participant's interview transcript to identify any similarities among each of the themes. Furthermore, nine interview transcripts were examined through each research question to understand the connection between the six main themes. Table 1 and Table 2 display the 34 coded words and phrases from the nine interview transcripts and six documents. Thus, the two tables demonstrate the frequency of each coded word or phrase and the six major themes which were developed from the 34 coded words and phrases.

Table 1

Record of Coded Information: Research Question 1

Coded words/phrases	Record of occurrence	Theme
Students	88	Student Learning and Life Skills
Communication/communicate	45	
Collaboration/collaborate	27	
Critical thinking/thinking	27	
Adapt/adaptable	9	
Creativity/creative	8	
Soft skills	4	
Teacher	153	Student Technology Skills
Classroom	68	
Tools	49	
Use/using technology	22	
Digital	16	
With technology	13	

Table 2

Record of Coded Information: Research Question 2

Coded words/phrases	Record of occurrence	Theme
Sharing/share	44	Leadership Modeling
Access	22	
Fail/mistake	15	
Model/modeling	14	
Weekly bulletin/update	9	
Serve/serving	7	
Push/pushing	30	Leadership Visionary
Leader/principal	23	
Vision/visionary	22	
Expect/expectations	11	
Clear/clarity	9	
Innovative	4	
Professional development	43	Leadership Professional Development
Training	23	
Resource	12	
Professional learning	6	
Encourage/encouraging	30	Leadership Encouraging
Support/supportive	22	
Feedback	13	
Coach/coaching	8	

Table 1 and Table 2 list each of the 34 coded words and phrases to display how the researcher sorted the words and phrases into comparable categories. Categories were then analyzed for connections between the themes presented by participants. Accordingly, the 34 key words and phrases described the data holistically and were organized together to display similarities within each theme. The first two themes related to skills necessary for student success. The first theme regarding student learning and life skills was mentioned 208 times by respondents and consisted of seven key words and phrases: (a) students, (b) communication/communicate, (c) collaboration/collaborate, (d) critical thinking/thinking, (e) adapt/adaptable, (f) creativity/creative, (g) soft skills. The second theme regarding student technology skills was mentioned 321 times by participants and included six key words and phrases: (a) teacher, (b) classroom, (c) tools, (d) use/using technology, (e) digital, (f) with technology.

The third, fourth, fifth, and sixth themes were related to the building leader. The third theme regarding leadership modeling was mentioned 111 times and consisted of six key words and phrases including: (a) sharing/share, (b) access, (c) fail/mistake, (d) model/modeling, (e) weekly bulletin/update, (f) serve/serving. Next, the fourth theme regarding leadership visionary was mentioned 99 times by participants and consisted of six key words and phrases including: (a) push/pushing, (b) leader/principal, (c) vision/visionary, (d) expect/expectations, (e) clear/clarity, (f) innovative. Furthermore, the fifth theme of leadership professional development was mentioned 84 times by respondents and consisted of four key words and phrases including: (a) professional development, (b) training, (c) resource, (d) professional learning. Lastly, the sixth and final theme of leadership regarding encouraging was mentioned 73 times by participants

and consisted of four key words and phrases including: (a) encourage/encouraging, (b) support/supportive, (c) feedback, (d) coach/coaching.

Analysis of Research Question 1

The purpose of Research Question 1 was to determine, "What are educator perceptions around high-quality technology integration?" Within Research Question 1, two additional sub-questions were also included related to Research Question 1. The first sub-question included, "What are educator perceptions of the essential 21st century skills students need for success?" Additionally, the second sub-question within Research Question 1 included, "What are educator perceptions for how teachers use technology to support 21st century skills?" The researcher stored annotated notes and thoughts focused on high-quality technology integration, essential student 21st century skills, and technology tools for Research Question 1 from each interview within a Microsoft Excel spreadsheet. The information associated with Research Question 1 was then analyzed and allowed the researcher to identify key codes and phrases within the data. Interview questions 1-4 (Appendix F) were associated with Research Question 1. Morerover, key codes and phrases identified within the data were then organized into two themes generated participants' responses: (a) student learning and life skills and (b) student technology skills. Key codes and phrases from the theme of student life and learning skills was formed from the responses of principals and teachers identifying the essential skills students need for success and included the following seven key words and phrases:

- Students: learners in the classroom
- Communication/communicate: share perspective and ideas with others
- Collaboration/collaborate: work together to accomplish a goal

- Critical thinking/thinking: understanding and applying knowledge at a deeper level
- Adapt/adaptable: ability to adjust to challenges and problems
- Creativity/creative: thinking outside the box, creating products reflective of learning
- Soft skills: skills to be productive citizens, positive behaviors for interactions

Key words and phrases from the second theme of student technology skills were identified from participants' responses described how teachers use technology to support 21st century skills from the following key words and phrases:

- Teacher: instructor
- Classroom: learning environment
- Tools: resources used to support learning
- Use/using technology: utilizing technology to leverage skills
- Digital: technology-based
- With technology: activities supported by technology

Table 3 displays participants' responses from participants surrounding Research Question 1 as responses were developed into two main themes of student life and learning skills and student technology skills. Research Question 1 focused on 21st century skills necessary for students and how teachers utilized technology to support 21st century skills for students. The researcher interviewed each participant independently to provide unbiased responses from principals and teachers.

Table 3

Major Themes Identified in Research Question 1

Theme	Number of respondents identifying theme	Percentage
First Theme: Student life and learning skills	9/9	100%
Second Theme: Student technology skills	9/9	100%

Additionally, Table 3 identifies the number of participants, based on data from interview transcripts, who recognized student life and learning skills and student technology skills as the essential 21st century skills students need to be successful and how teachers use technology to support the development of 21st century skills for students. Each of the nine interview participants identified student life and learning skills as the essential 21st century skills students need for success. Furthermore, each of the nine interview participants also identified student technology skills as strategies and tools teachers integrate to further develop 21st century skills for students.

Research Question 1 focused on the theoretical framework of Wenglinksy (1998) who sought to understand the impact of technology on student achievement through the integration of technology in teaching mathematics. Additionally, two bodies of research from Battelle for Kids (2019a) and the International Society for Technology in Education (2016) was also used as a framework for Research Question 1. Battelle for Kids (2019a) outlined skills necessary for student success by focusing on the development of 21st century skills. Additionally, the International Society for Technology in Education (ISTE) (2016) provided strategies to further develop 21st century skills through

technology integration. The two frameworks when combined created the model for a high-quality technology integrated classroom as discussed through this research (Battelle for Kids, 2019a; ISTE, 2016). Participants acknowledged criticalness for schools to identify, teach, and develop 21st century skills for students. Principal participant P2 stated,

> What we focus on as far as 21st century skills is the four C's, creativity, communication, collaboration, and then critical thinking. And so in what we try to do with technology at our school is really center our lessons, our instruction, just whole education design around creativity, communication, collaboration, and critical thinking. And so we feel like those areas are extremely important for what we're trying to do.

The first theme generated from Research Question 1 included student learning and life skills which were mentioned 208 times, with nine out of nine or 100%, of respondents recognizing learning and life skills as essential 21st century skills students need for success. Principal participant P1 stated, "the four C's...communication, creativity, collaboration, and critical thinking, those things are really important." Additionally, teacher participant T2 stated, "In my class, we use those every day...we just use them to further education." T2 also provided examples of when the skills were used through "research...use them to create presentations." Furthermore, teacher participant T3 stated,

> Kids are entering into a world where we don't even know the problems that are going to exist. Like the pandemic, how could anybody have ever anticipated some of the things that businesses are having to come up with now to even be able to

> run and function? So they're going to have information given to them and they have to dissect that information and then figure out the best possible solution...in every industry like technology, healthcare, agriculture, just across the board.

The theme of student learning and life skills was further supported by teacher participants T2 and T6. Teacher participant T2 mentioned the importance of students developing soft skills by stating, "...the little things you have to do in order to be a civilized society, good communicator, just little things like that, those basic soft skills I think are very important." Furthermore, teacher participant T6 mentioned adaptation as one of the soft skills by stating, "...because when you're pushing kids, those adaptations and let downs and problem solving, those are going to happen because kids are going to struggle and they're not always going to be given something that they're going to be successful at."

The second and final major theme associated with Research Question 1 was student technology skills. Student technology skills were mentioned 321 times by nine out of the nine participants, or 100%, who identified such skills as essential for student success. Teacher participant T4 for example, identified digital skills as an essential skill students need for success. When teacher participant T4 was asked about how digital tools are used to develop 21st century skills within students, T4 responded, "anything with digital skills...understanding how to use basic technology." T4 went on to say, "No matter what tool it is or what level of technology, if you don't know how to use it, it can't help you at all." Principal participant P1 also agreed technology skills were important by stating,

> I feel like we have to work with maintaining a comfort level with technology. I think sometimes what happens with students is that we pigeonholed them too much in one direction or another...but that they don't get comfortable outside of what they know how to do...an example...that we've seen in our lifetime is a real transcendence from Microsoft to Google. There's fundamental comfort levels that if you know one, you can operate in the other and vice versa. And it's those skills...to feel comfortable with technology, to engage with technology, to not sit down at a computer and go, I don't know how to do that and clam up and look for the answer, but to seek that. We have to be building a comfort level with using the technology across multiple platforms.

Furthermore, principal participant P1 also reflected on how students use technology to further develop skills,

> ...kids are going to need those technology skills, but really, I think it's the technology which helps us to leverage the creativity, the critical thinking, the communication, the collaboration. Those are really the things that are the most essential, and then being able to be adaptable and be someone who can learn technology and use it with things that maybe are going to help us to leverage skills.

Other participants described how technology can help students develop their skills, specifically through a learning management system. Teacher participant T3 explained, "The biggest piece is probably our use of Canvas, our LMS platform." Teacher participant T4 continued with, "...(Canvas) gives us a lot of opportunities to exercise those technology skills through...discussions...group work...project."

Furthermore, teacher participant T5 also agreed, "...we have a virtual classroom...that's where their assignments are given. They can download...and they learn their instruction is done through that." Teacher participant T5 further explained,

> These tools, when used in conjunction with me just being up there and lecturing...has a huge impact on how they work, and they all work at different speeds. So by using this, you can definitely change the tempo so that some kids learn faster than others, so when they're done, they can move on to something different that's more complicated, but the other kids who struggle, they're going to get the basics without having to worry about staying on pace with the rest of their classmates.

In addition to using a specific learning management system, other participant's also reflected on the use of technology in the classroom. Teacher participant T6 described the student use of technology in the classroom as, "I have always said that technology should be a tool to help drive your classroom instead of being the driver behind the wheel." Principal participant P1 agreed with T6 by sharing, "...we want to use technology in new and interesting ways with our students in terms of learning....as technology goes up, we also want to see classroom conversations go up."

Analysis of Research Question Two

The purpose of Research Question 2 was to determine, "What are educator perceptions for how leaders support high-quality technology integration?" Within Research Question 2, two additional sub-questions were also included related to Research Question 2. The first sub-question included, "What are educator perceptions for how Transformational Leadership supports high-quality technology integration?"

Additionally, the second sub-question within Research Question 2 included, “What are educator perceptions for how leaders integrate International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) to support high-quality technology integration?”

The researcher stored annotated notes and thoughts focused actions and behaviors of leaders through Transformational Leadership and the ISTE Standards for Education Leaders (2018) related to Research Question 2 from each interview within a Microsoft Excel spreadsheet. The data associated with Research Question 2 was then analyzed and allowed the researcher to identify key codes and phrases within the data. Interview questions 5-10 (Appendix F) were associated with Research Question 2. Moreover, key codes and phrases identified within the data were then organized into four main themes generated from participants’ responses: (a) leadership modeling, (b) leadership visionary, (c) leadership professional development, and (d) leadership encouraging. Key codes and phrases from the third major theme of leader: modeling was formed from the responses of principals and teachers identifying actions of the leader in which the leader would demonstrate for staff what was expected and included the following six key words and phrases:

- Sharing/share: sharing technological resources
- Access: provided technology access for students, teachers, and leaders with a device and appropriate internet bandwidth
- Fail/mistake: not afraid to make mistakes and learning from those mistakes
- Model/modeling: demonstrating the desirable behavior expected from teachers

- Weekly bulletin/update: weekly communication from leader to teacher including the sharing of technology resources
- Serve/serving: work to support

Key words and phrases from the fourth major theme of leader visionary were identified from the responses of participants which described how leaders casted a vision for their school from the following six key words and phrases:

- Push/pushing: pushing out communication of the vision
- Leader/principal: lead building administrator
- Vision/visionary: think outside the box, bigger picture
- Expect/expectations: the standard
- Clear/clarity: everyone knows where the building is headed
- Innovative: creative, willingness to try new things

Key words and phrases from the fifth major theme of leader professional development were generated from the responses of participants which described how leaders designed effective professional opportunities for both leaders and the staff from the following four key words and phrases:

- Professional development: staff learning to improve instructional practice
- Training: learning how to utilize a new technology tool
- Resource: supports for the use of technology including instructional coaches
- Professional learning: opportunities to learn and grow as teachers

Key words and phrases from the sixth and final major theme of leader encouraging were identified from participants' responses as participants described how leaders encourage and support staff from the following four key words and phrases:

- Encourage/encouraging: motivating and inspiring teachers to use technology
- Support/supportive: supporting teachers in the use of technology
- Feedback: sharing strengths and thinking of ways to do things better
- Coach/coaching: setting a goal, sharing ways to improve, and helping teachers improve

Table 4 displays participants' responses which aligned with Research Question 2. Responses were developed into four main themes of leader modeling, leader visionary, leader professional development, and leader encouraging. Research Question 2 focused on how the leader utilized Transformational Leadership skills and the International Society for Technology in Education Standards for Education Leaders (2018) to support high-quality technology integration in their buildings. The researcher interviewed each interview participant independently to provide unbiased responses from principals and teachers.

Table 4

Major Themes Identified in Research Question 2

Theme	Number of Respondents Identifying Theme	Percentage
Third Theme: Leadership modeling	9/9	100%
Fourth Theme: Leadership visionary	9/9	100%
Fifth Theme: Leadership professional development	9/9	100%
Sixth Theme: Leadership encouraging	9/9	100%

Table 4 identifies the number of participants, based on data from interview transcripts, who recognized the four major themes associated with Research Question 2 of leadership modeling, leadership visionary, leadership professional development, and leadership encouraging as how leaders can support high-quality technology integration in their schools. Each of the nine interview participants, or 100% of respondents, identified leadership modeling, leadership visionary, leadership professional development, and leadership encouraging as how leaders can support high-quality technology integration in their schools.

Research Question 2 focused on the theoretical framework of Burns (1978) and Bass's' (1985) Transformational Leadership Theory which examined leadership behaviors which influenced people to achieve greater levels of performance and commitment. Additionally, the International Society for Technology in Education (ISTE) Standards for Education Leaders also provided a foundation for Research Question 2 as the framework for education leaders is divided into five standards which include: equity and citizenship advocate, visionary planner, empowering leader, systems designer, and connected learner (ISTE, 2018). The two frameworks combine to guide leaders in building a culture which encourages teachers to effectively integrate technology to create high-quality technology integrated classrooms.

Table 5 displays participant responses, based on analysis of the transcribed text, from participants who specifically mentioned the leader modeling for staff.

Table 5

Participant Mention of Modeling

Key Word/Phrase	Frequency	P1	P2	P3	T1	T2	T3	T5
Model/modeling	14	3	4	1	1	1	1	3

Each of the principal participants explicitly mentioned modeling for staff. Additionally four out of six teacher participants mentioned the leader modeling for staff. Principal participant P1 stated,

> You have to be willing to learn new tools and share that learning. Whenever people see that, it creates the environment where you're modeling for others what you want to see. I don't expect you to be a technology expert. Everybody's not going to be a tech geek in our school, but everybody can be a technology learner. They can learn and grow in that area.

Furthermore, principal participant P2 agreed, "And so for us as leaders, we try to model everything that...we can for our teachers...any of the meetings that we're hosting, we're trying to incorporate as much technology as we can when we do that." Moreover, principal participant P2 went on to state, "...modeling is the biggest thing that we try to utilize with our teachers." Subsequently, teacher participant T1 explained, "I think in the beginning he's basically modeling like I'm doing this for your, you could do this for your students...if he can do it, so can we." Principal participant P3 added in agreement, "I'm not afraid to use a technological tool and then say, oh, that didn't work…we won't be seeing that again, and it happens sometimes. Additionally, teacher participant T4 agreed,

> ...sometimes it fails horribly, which allows us to feel more comfortable to try something new in our room. He's willing to get up in front of everyone and be

like, yeah, this just totally bombed. Let me switch to this, because that just didn't work. And it gives us leadership on...okay, we can try this in our room. If it doesn't work, we can go back and fix it.

The most frequently occurring key word within the major theme of leadership modeling was sharing/share. Principal participant P1 explained, "...modeling too happens by my own sharing of things that I'm learning. Again, I use the Lead Up Weekly email to do that." Table 5 displays participant responses, based on analysis of the transcribed text, from participants who specifically mentioned the leader sharing a weekly update/bulletin with technology information and/or technology integrated in the announcement to model for staff.

Table 6

Participant Mention of a Weekly Bulletin/Update for Technology

Key Word/Phrase	Frequency	P1	P3	T3	T5
Weekly update/bulletin	9	2	2	4	1

Table 6 exhibits participants who identified the leader sharing a weekly bulletin/update with technology information and/or technology integrated in the announcement with staff. Two out of three principal participants stated a weekly bulletin/update was shared with staff. Principal participant P3 stated, "...model kind of again, that engagement with technology...for daily announcements for parents and students and teachers and I use that for my weekly bulletins." Additionally, two out of six teacher participants stated their building principal shared a weekly bulletin/update with staff. Teacher participant T3 shared, "The big thing we get from our principal is weekly updates. He'll do like a weekly bulletin...a little bit of embedded video."

The second of the four major themes which connected with Research Question 2 was leadership visionary. Leadership visionary was mentioned 99 times by nine out of the nine participants who identified leadership visionary as a skill for leaders to possess to support high-quality technology integration in their schools. Principal participant P1 stated, "So the learning environment, I think, is important in setting the tone from leadership of the vision. When it's important to the leadership, then typically, if that's communicated well, then that translates to the classroom." Moreover, principal participant P2 agreed, "If we have high expectations for students and their learning, you got to give your teachers the correct tools to accomplish that." Teacher participant T1 explained accordingly, "I think from day one when that is one of your staff goals every year (technology use), I feel like that's setting a pretty strong precedence, like that's an expectation that it's important that we all use it." Furthermore, principal participant P3 also confirmed, "So for me, the vision is always about let's constantly try new things, let's continue to look, let's continue to evolve. Let's continue to look at where things don't work and let's fix that. Subsequently, teacher participant T5 agreed,

> I feel like his vision has been very open-minded, and he sees where education is going, I feel like. It is something that we don't fear...and he supports that. He realizes that sometimes we're not going to be successful when we're trying it. We're going to hit snags, and it's just a process of after you hit snags, assessing what you've done and applying it to the future if you need to do it again.

Additionally, principal participant P1 expanded upon the thought of the leader being open-minded about teachers use of technology accordingly,

> We don't really do a lot of mandating. This is exactly how much you need to use the technology, or you need to do this exactly this way. I feel like that puts a lid on it. A lot of times if you do that, people just get to the bar, they don't really go above that. It's more out of compliance than it is out of curiosity and just wanting to continue to be a learner.

Thus in agreement with P1, principal participant P3 confirmed, "I don't standardize much...I let the teachers work within the comfort levels of what they find...how they feel like they can relate with students using the technology." Additionally, teacher participant T6 added, "He doesn't push too much of how much technology or which technology to use." Teacher participant T1 also described this as, "He's not very rigid. He's not strict. He doesn't conform. He doesn't put us in a box. I don't know what that trait is called." Moreover, teacher participant T5 explained, "I think he's very structured, and he's very open-minded, though, within that structure. When we create things it's not in a vacuum or a box. It's a living, breathing thing that grows."

Furthermore, teacher participant T2 described the building leader in casting the vision as,

> We have a fantastic building principal who is cutting edge, innovative. He's a Twitter guru, and that's just one area of technology that he can utilize to get information out, to find information, to share information, which is critical...he's very innovative, very practical when it comes to trying new things, new approaches to different things, different ideas...

The third of the four major themes associated with Research Question 2 was leadership professional development. Leadership professional development was

mentioned 84 times each of the nine participants who identified professional development as a strategy for leaders to implement to support high-quality technology integration in their schools. Table 6 displays the number of participant responses, based on analysis of the transcribed text, participants who explicitly mentioned the key phrase of professional development within their interview responses.

Table 6

Participant Mention of Professional Development

Key Phrase	Frequency	P1	P2	P3	T1	T2	T3	T4	T5	T6
Professional development	43	8	4	2	4	3	11	7	3	3

Table 6 displays participants who identified professional development as a strategy for leaders to implement when supporting high-quality technology integration. Each of the three principal participants mentioned professional development as a key phrase throughout their interview responses. Each of the six teacher participants mentioned professional development as a key phrase as well. Teacher participant T3 stated,

> Professional development has been essential…there really isn't one that goes by that doesn't have…a piece of technology as the focus of the faculty meeting possibly, or a subject of the faculty meeting. We've done professional development carousels. For instance, just the other day…we rotated as departments through that professional development carousel…where they introduce the new technology…that goes back to the principal to organize that as professional development and making sure it's what's coming down the pipe to us and that we have that opportunity to ask questions.

Moreover, principal participant P1 also agreed, "I think that identifying 21st century skills has happened for us through a variety of different kinds of professional development, things that we've done on an ongoing basis." To further expand, professional development is also utilized to develop teacher capacity with technology tools. Teacher participant T6 explained,

> If we have a professional development day, we are allowed to have break-out sessions and pick and choose, this program seems like it could work for me. I'm going to watch this teacher present on Canva or different ways Google Classroom can really be linked up with other things. That's really helped.

In agreement, teacher participant T5 also added, "When it comes to technology, he (leader) has embraced and encouraged all teachers to continue their professional development in the use of new tools." Additionally, principal participant P2 further explained,

> Anytime we do professional development, in regards to technology…we want teachers that have experience with that, leading some of that professional development, and then ultimately try to create a collaborative environment to where teachers…can go see another lesson being taught by other teachers. And so, they can just become more familiar with technology.

Furthermore, principal participant P1 agreed, "…once a month every department is going to have an opportunity to lead some kind of professional development, so we shared the leadership on that…it was really good because I'd empowered teachers to be able to share, gave them a voice."

The fourth and final major theme related to Question 2 was leadership encouraging. Leadership encouraging was mentioned 73 times by each of the nine respondents who identified how leaders can support and encourage teachers to implement high-quality technology integration. Principal participant P1 stated, "I think about my leadership style, just to be a chief encourager, to support. When people bring me ideas, I want to…say, yes, let's do that." Principal Participant P2 agreed, "And just constant encouragement you can't go wrong." Subsequently, principal participant P3 added, "One of the things that I encourage more than anything else is make mistakes…when they were making mistakes, they were trying new things." Moreover, teacher participant T4 also noted, "He encourages you wherever you're at and whatever technology level, to try and advance it."

In addition to technology integration, principal participant P2 emphasized the leader supporting teachers to encourage them,

> And I feel that ultimately that's really what we try to do, be supportive. And so with that support, I always focus on being visible and available. If students and teachers see us out and about all the time, they know we're somewhat in tune with what's going on, and in doing so, you're making yourself more available. And as much as an administrator can make themselves available, I think teachers can say that they feel they're supported.

In agreement with participant P2, teacher participant T1 confirmed, "(Principal) is very supportive and he wants us to try new things. Even if it may not always work out, he...wants to know the thought processes behind it, but then is very supportive in what we're wanting to do."

The fourth theme also included how building leaders can challenge teachers to become better. Teacher participant T2 shared how the building leader challenges teachers to make them better, "...the constant challenging to make us better by, whether it's an evaluation...saying, this was a good idea, but have you thought about this?" Additionally, teacher participant T5 also confirmed, "So he'll challenge your thinking by throwing out some potential questions as to the nature of what you want, have you looked at this? This?" Subsequently, principal participant P1 added, "I think the challenging part in that is that we're not just going to be content. We're not going to accept just the status quo...we want to aim for excellence and excellence is always seeking to grow, learn, and change."

Furthermore, teacher participant T6 shared how the building leader encourages teachers to grow, learn, and change through coaching, "...the coaching or instruction...after the evaluation." Teacher participant T6 further stated, "He'll coach you up because he'll tell me, this is what you do the best. He doesn't try to make you somebody else. This is what you do the best, do this more." Principal participant P1 also discussed coaching through feedback,

> We try to give teachers feedback about what they're currently doing with technology and then questions like, have you ever thought about this? Have you ever tried that? This would be maybe the instructional coach or building leadership, just pushing their thinking a little bit, helping them grow.

In alignment with feedback from leadership, principal participant P2 shared how risk-taking is encouraging to teachers using technology, "Really tell them...think outside the box, take risks. How can you take this lesson and enhance it?...Is there anything you

could do from a technology standpoint to make this lesson better?" Furthermore, principal participant P3 added,

> I encourage (the use of technology) and a strategy that I use a lot is make mistakes, try new things, and report back what you tried. Going into this year...we asked each one of them (teachers) to submit to use after we did the March through May AMI, what new strategy or software did you use? How did you use it?...What software do you feel comfortable with?...And we wanted it at a level that you felt like if somebody came to you, you could tell them about it.

Summary

Chapter Four contained the findings of the study and an analysis of the transcribed text including interview quotes from each participant and tables which shared the importance of the study. Triangulated documents of data were utilized for validity and reliability through document mining from multiple resources outside of the interviews. The researcher stored notes, thoughts, and perceptions throughout the interview process on a Microsoft Excel spreadsheet and coding procedures were followed by the researcher as interview transcripts were annotated and highlighted to determine key words and phrases. Similar key words and phrases were then developed into common categories or groups and common categories were placed into groups which then allowed the researcher to identify major themes. The themes were used to explain the data holistically. Subsequently, triangulation provided validity and reliability for the major themes identified from the data and analysis of various documents outside of the interview sessions to minimize researcher bias.

Six major themes were established as a result of each participant's interview session. Creswell (2013) suggested five to seven themes should be present for a basic narrative qualitative study. Through the analysis of the data, the six themes identified by the researcher aligned with high-quality technology integration and the actions of the building leader to support high-quality technology integration in schools. The six major themes were (a) student learning and life skills, (b) student technology skills, (c) leadership modeling, (d) leadership visionary, (e) leadership professional development, (f) leadership encouraging. Student learning and life skills was the first major theme with 208 mentions as interview participants identified learning and life skills as essential skills students need for future success. Student technology skills was the second major theme with 321 mentions and interview participants acknowledged technology skills as ways students can use technology to leverage their personal skills. Leadership modeling was the third major theme with 116 mentions and interview participants described modeling as how the leader can display for staff how to use technology. Leadership visionary was the fourth theme with 99 mentions and interview participants recognized how the leader casts the vision for the use of technology in schools. Leadership professional development was the fifth major theme with 84 mentions and interview participants identifying professional development as critical for leaders to provide teacher professional development opportunities focusing on using technology in the classroom. Leadership encouraging was the sixth and final theme with 73 mentions and interview participants describing how leaders provide feedback to coach and help teacher improve in using technology in their classrooms.

Chapter Five contains the findings, conclusions, and the researcher's suggestions for further research. The researcher's opinions on the findings of the study based on the analysis of the transcribed interview data and documents from various sources are shared. Chapter Five concludes with a review of findings of the study, recommendations for educators in the field, and suggestions for future research.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

The purpose of this basic narrative qualitative study was to explore educators' perception of key 21st century skills necessary for student success, how technology was used in the classroom to develop the skills, and how building leaders promoted high-quality technology integration in public high schools. Participants selected for the study were building principals and classroom teachers from academically successful Missouri high schools which were noted for technology integration (using a one-to-one approach). Interviews were conducted with each individual participant and documents from the schools were acquired.

The theoretical framework for this research was based on Harold Wenglinsky's (1998) research regarding the impact of technology integration on student achievement through the use of technology in teaching mathematics. Additionally, the study included the Four I's of Transformational Leadership Theory to understand how the actions of leaders promote change in individuals, increase followers' motivation, and enhance an individual's performance in alignment with the goals of the mission (Bass, 1999; Yukl, 1999). Thus, the two bodies of research served as the theoretical framework for this research.

Chapter Five encompasses a concise summary of the problem while examining the limitations of the study. The researcher discusses how triangulation was used to analyze the data and a description of the research methods utilized throughout the study are described. Additionally, implications for educational practice are considered along with recommendations for future research as well. Following Chapter 5, a list of

references is provided along with appendices of the documents used throughout the study as well.

Research Questions

Two overarching research questions were used for this basic narrative qualitative study and each question had two sub-questions:

RQ1. What are educator perceptions of high-quality technology integration?

i. What are educator perceptions of the essential 21st century skills students need for success?

ii. What are educator perceptions for how teachers use technology to teach 21st century skills?

RQ2. What are educator perceptions for how leaders support high-quality technology integration?

i. What are educator perceptions for how Transformational Leadership supports high-quality technology integration?

ii. What are educator perceptions for how leaders integrate International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) to support high-quality technology integration?

Limitations

The researcher's objective was to acquire unbiased and usable data related to high-quality technology integration and the actions of the building leader to support high-quality technology integration in schools. The researcher made efforts to reduce the effects of external variables through delimitations associated with the study. However,

limitations were present. Within the basic narrative qualitative study the following limitations were identified and included as variables outside the researcher's control:

1. The perspectives and experiences of the teachers and administrators participating in the study might not have provided a true response.
2. The perspectives of the teachers and administrators interviewed might be skewed by personal experience, time restrictions, personal preference, and understanding of the content.
3. The participants of the study may not have comprised a sample representative of the desired population.
4. The schools' size, location, and demographics were not a consideration for the study.

Summary of Methods

The researcher identified three academically successful high schools in Missouri which were identified as successful with technology integration (using a one-to-one approach). The researcher reached out via email to area representatives from the Missouri Association of Secondary School Principals (MoASSP) and district representatives from the Missouri Association for School Administrators for recommendations of high performing technology driven principals. Recommendations were cross-referenced and ranked based on state assessment data from 2019 performance in English Language Arts and Math. Principals from three high schools were contacted by phone and email (Appendix D) to invite each school to participate in the study. Once confirmed, the administrators from each of the three high schools provided names of two teachers to interview from their building who the administrator believed to be successful with

technology integration. The teachers were then contacted via email with an invitation to participate in the study. Additionally, the researcher contacted the three principals and the six teachers via email to receive informed consent (Appendix E). Furthermore, the researcher also organized a pilot group to review the interview protocol for clarity and provide feedback. Following the feedback received from the pilot group, interviews were conducted via Zoom and transcribed using Rev.com, an audio transcription service.

Once the interview sessions were completed and data was collected, coding procedures consisted procedures consisted of the researcher analyzing both interview transcripts and related documents and taking notes to better understand the data holistically. Annotations and highlights were made throughout the transcripts as the researcher searched for key words and phrases between sets of data. As commonalities were identified, common categories were then created to identify codes. Through the process of analyzing each transcript and document, the researcher identified 34 coded words and phrases. The 34 coded words and phrases described the data holistically and were then clustered together with similarities and patterns and formed different themes. Overall, six major themes were recognized from the 34 coded words and phrases. Once the six major themes were identified, the researcher analyzed the transcribed text for similarities which were prevalent within the coded themes. The researcher then compared each of the six major themes to the two main research questions for this study.

Triangulation of data ensured both the validity and reliability of the data for the six major themes as the researcher analyzed each participant's interview and the supporting documents provided by the participants. The researcher compiled notes, thoughts, and annotations in a Microsoft Excel spreadsheet throughout the interview

process. Additionally, member checking occurred through each participant's reviewing their own interview transcript for accuracy. Furthermore, the document mining process also allowed for the researcher to compare information found in each document with the interview data.

Summary of Findings

The researcher was able to establish meaningful conclusions based on interviews conducted with three high school principals and six high school teachers from high-performing technology-driven schools. Interviews conducted with each of the nine participants revealed six major themes focused on high-quality technology integration and the actions and behaviors of leaders effectively leading buildings implementing high-quality technology integration. This study established perceptions of the essential skills students need for future success, how technology can enhance the development of essential skills for students, and how the building leader can support the types of learning environments in their building through Transformational Leadership and the International Society for Technology in Education (ISTE) Standards for Education Leaders (2018).

Research Question 1.

Research Question 1 asked, "What are educator perceptions around high-quality technology integration?" The first research question had two sub-questions. The first sub-question asked, "What are educator perceptions of the essential 21st century skills students need for success?" Additionally, the second sub-question to Research Question 1 asked, "What are educator perceptions for how teachers use technology to support 21st century skills?" As the data from each participant was analyzed, the researcher identified two major themes from Research Question 1: (a) student learning and life skills with 208

mentions and (b) student technology skills with 321 mentions. Furthermore, participants identified the four C's of collaboration, communication, creativity, and critical thinking as essential skills students need for future success. Participants also revealed basic soft skills such as eye contact and shaking hands as essential, along with being adaptable as important skills for students to possess. Additionally, respondents acknowledged specific technology tools used in the classroom develop, enhance, and leverage the essential skills students need for future success. From Research Question 1, the researcher concluded high-performing technology-driven high integrate technology to identify, teach, and implement essential 21st century skills students need for future success.

Twenty-first century students require learning opportunities and experiences to better equip students with the essential skills necessary to face the challenges and tribulations they will encounter as citizens, college students, and workers in the 21st century workforce (Battelle for Kids, 2019a; Bellanca & Brandt, 2010; Kieschnick, 2017; Sheninger, 2016). Accordingly, each of the nine participants for this study identified student learning and life skills, with 205 mentions, as essential for student success in the 21st century. Additionally, participants identified the following as essential skills: collaboration, communication, creativity, critical thinking, soft skills, and adaptability.

Collaboration, the first skill mentioned by participants, was mentioned as participants emphasized the importance of students having an opportunity to work together. The next skill, communication, was identified by participants as students need to be able to develop effective communication skills to share their perspective and amplify their voice. Creativity, the next skill mentioned by participants, was recognized by participants emphasized the need for students to be able to think outside the box for

possible solutions to problems. The last essential skills participants acknowledged as an essential 21st century skill for students was critical thinking. Students who acquired the skill of critical thinking are able to process information for a deeper understanding. Additionally, soft skills were also mentioned by participants to get students to be a productive member of society and work well with others. Moreover, adaptability was identified as an essential skill as students must understand how to adjust and overcome unforeseen challenges, including technical problems which can occur when using technology. Overall, high-performing technology-driven schools identify, teach, and implement essential skills with the use of technology.

Overall, identifying and developing the needs of 21st century learners through the use of technology is the foundation for high-quality technology integration (Battelle for Kids, 2019b; ISTE, 2016; Wenglinsky, 1998). Student technology skills was the most frequently mentioned major theme in this study with 321 mentions and acknowledged as a crucial component by each of the nine participants. Accordingly, students utilizing technology in learning environments are able to demonstrate and apply the knowledge gained from the learning environment to their personal lives (Bellanca & Brandt, 2010; ISTE, 2016; Kieschnick, 2017). Thus, as teachers teach and develop essential 21st century skills with their students, technology becomes a necessary tool to leverage and enhance the skills as well. As technology becomes a necessary tool, students need to maintain a foundational comfort level and basic understanding of how digital tools are used. Thus, schools must provide technology resources with proper internet access, school-issued devices, and technology tools for students to establish and maintain a comfort level with technology. High-performing technology-driven teachers require

students to use a variety of digital tools for the purpose of helping students develop collaboration, communication, creativity, and critical thinking skills.

Research Question 2.

Research Question 2 asked, "What are educator perceptions for how leaders support high-quality technology integration?" The second research question had two sub-questions. The first sub-question asked, "What are educator perceptions for how Transformational Leadership supports high-quality technology integration?" Additionally, the second sub-question for Research Question 2 asked, "What are educator perceptions for how leaders integrate International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) to support high-quality technology integration?" As the data from each participant was analyzed, the researcher identified four major themes associated with Research Question 2: (a) leadership modeling with 116 mentions, (b) leadership visionary with 99 mentions, leadership professional development with 84 mentions, and leadership encouraging with 73 mentions. Each of the nine interview participants from high-performing technology-driven high schools identified the four major themes as key characteristics of building leaders who effectively support high-quality technology integration within their schools. From Research Question 2, the researcher concluded high-performing technology-driven leaders model, cast a vision, provide professional development opportunities for staff, and encourage the use of technology within classrooms to further enhance essential 21st century skills for their students.

The first sub-question asked, "What are educator perceptions for how Transformational Leadership supports high-quality technology integration?"

Transformational Leadership was selected as a theoretical framework for this study since research surrounding Transformational Leadership demonstrates how leaders can promote change in organizations, increase followers' motivation, and increase individual's performance in alignment with the goals and mission of the organization (Bass, 1999; Yukl, 1999). The Four I's of Transformational Leadership served as the lens for this study to examine the actions and behaviors of high-performing technology-driven leaders and the level of influence leaders have on high-quality technology integration within their buildings (Bass & Avolio 1994, 2004). The first of the Four I's of Transformational Leadership includes idealized influence which is demonstrated when the leader has a vision, describes how the vision can be accomplished, and models the behaviors necessary to achieve the vision (Bass, 1999). Accordingly, leadership modeling was the most frequently mentioned major theme associated with Research Question 2 with 116 mentions from each of the nine interview participants. The leadership modeling theme is aligned with idealized influence through the leader modeling the use of technology for staff as interview participants identified opportunities in which the building leader integrated technology in weekly bulletins/updates, utilized digital tools for staff at faculty meetings, and provided leader-created technology tools.. The second most frequently mentioned them was leadership visionary with 99 mentions from the interview participants. The theme of leadership visionary aligned with idealized influence through participants identifying a leader's ability to articulate a clear vision for the use of technology in their schools. Participants shared such was accomplished by the leader for how leaders communicated and pushed the vision for the implementation of technology in their schools to stakeholders.

The second of the Four I's of Transformational Leadership is inspirational motivation which is displayed when the leader motivates and inspires individuals by making work meaningful and challenging (Bass, 1997). The Transformational Leadership component of inspirational motivation is connected to the theme of leadership professional development which was which was mentioned 84 times by each participant. Participants described how the leader identifies the essential 21st century skills students need through professional development opportunities. Moreover, through professional development opportunities, leaders train teachers to think about how the skills impact the education students receive. Furthermore, leaders also design professional development on the use of various technology tools and the professional development opportunities are led by leaders, instructional specialists, and teacher leaders who are proficient using the technology. Accordingly, professional development designed and led by the leader provides staff with how to use technology tools in a more meaningful way.

Intellectual stimulation, the third of the Four I's of Transformational Leadership is exhibited when leaders support followers in becoming more innovative and creative (Bass, 1999; Bass & Avolio, 2004). The intellectual stimulation component of component of Transformational Leadership was closely connected to two previously mentioned major themes associated with Research Question 2 of leadership modeling and leadership visionary. Intellectual stimulation aligned well with leadership modeling based on participants sharing their experience of the leader modeling the use of technology in a failing situation, as such a situation reassures faculty and staff it is okay for mistakes to happen. Thus such situations promote intellectual stimulation for followers as followers are reassured it is okay to try innovative and new ideas in the classroom, even if the ideas

fail. Furthermore, intellectual stimulation is also associated with the major theme of leadership visionary as participants expressed the importance of a leader being innovative and creative within the leader's vision for the use of technology to support the development of essential 21st century skills for students. Subsequently, participants shared how the leader does not mandate technology or put teachers in a box but the leader allows teachers to work within their current comfort level with technology. Overall, leaders work to help teachers find unique ways to engage students through their own vision for the use of technology.

Individualized consideration is the Fourth I of Transformational Leadership and is shown when leaders both identify growth opportunities for individuals and provide the support and coaching to help individuals progress (Bass, 1999). The individualized consideration component of Transformational Leadership connected with the theme of leadership encouraging which was mentioned 73 times. Participant key words and phrases associated with leadership encouraging included: (a) encourage/encouraging, (b) support/supportive, (c) feedback, and (d) coach/coaching. Accordingly, participants described how the leader was supportive in using technology to develop essential 21st century skills by being visible and approachable in classrooms. Furthermore, interview participants also explained how the leader provides coaching and feedback on the use of technology. Accordingly, such coaching and feedback allow leaders to meet each teacher where they are at for the use of technology, identify areas for improvement, and support each teacher's growth and development toward the goal.

The second sub-question for Research Question 2 asked, "What are educator perceptions for how leaders integrate International Society for Technology in Education

(ISTE) Standards for Education Leaders (2018) to support high-quality technology integration?" The ISTE Standards for Education Leaders (2018) provide an intentional, strategic, and outcome-oriented approach for building leaders to utilize to support high-quality technology integration in classrooms throughout their building. The first ISTE Standard for Education Leaders (2018), is equity and citizenship advocate, and describes how education leaders should encourage the safe and ethical use of technology while ensuring each student has access to technology to support their learning. The equity and citizenship advocate ISTE Standard for Education Leaders (2018) is connected to the leadership theme modeling. Participants shared the leader needs to provide students and teachers with devices, reliable internet access, and digital tools to support high-quality technology integration in classrooms. Leaders accomplishing high-performing technology integration provide and support students with high-quality technology devices through the provision of internet bandwidth and one-to-one initiatives. Accordingly, effective leaders quickly support and solve problem which arise with technology tools and initiatives.

The second ISTE Standard for Education Leaders (2018) embraces the importance for leaders to develop a mindset of a visionary planner. Leaders who are proficient visionary planners engage stakeholders to develop a vision, strategic plan, and continuously improve in high-quality technology integration (Baldrige Performance Excellence Program, 2019; ISTE, 2018; Senge, 1990). The second ISTE Standard for Education Leaders (2018), visionary planner, is closely connected to the theme of leadership visionary. Accordingly, participants described the importance of leaders

setting the tone for high-quality technology integration in schools through casting a clear vision, having high expectations for students and staff, and outlining a plan.

The third ISTE Standard for Education Leaders (2018), empowering leader, identifies how high-performing technology-driven education leaders foster a culture for teachers and learners to utilize technology in creative ways to enrich teaching and learning. Accordingly, the duty of leaders is to encourage educators to grow professionally, develop individual leadership skills, and seek professional learning opportunities (ISTE, 2018; Learning Forward, n.d.). Moreover, professional learning opportunities should allow staff opportunities to select areas of need and receive support in areas most needed to meet individual technology goals (ISTE, 2018; Learning Forward, n.d.). The third ISTE Standard for Education Leaders (2018), empowering leader, is tightly connected to the major theme of leadership professional development which was prevalent from participant responses. Participants shared professional development opportunities created by the leader improve the use of technology and include the leader establishing a collaborative culture among teachers in which teachers are comfortable in sharing best instructional practices centered around high-quality technology integration. Furthermore, participants explained how the leader empowered teacher leaders to lead both professional development opportunities and share how technology is utilized to support student learning.

Systems designer, the fourth ISTE Standard for Education Leaders (2018), examines how high-performing education leaders focus on high-quality technology integration and develop teams and systems to effectively integrate, sustain, and continuously progress with technology to support learning (ISTE, 2018; Senge, 1990).

The fourth ISTE Standard for Education Leaders (2018), systems designer, also aligns with the theme leadership professional development which was prevalent from the responses of participants in the study. Interview participants described strategies the building leader utilized to connect teachers with resources and regularly train teachers on new and effective digital tools to support the learning and development of essential 21st century skills for students. Moreover, the most frequently occurring example made by participants was how schools connected with local businesses to have students use technology outside of the school environment and in the workforce. The connection with local businesses included opportunities students using students using technology programs to design advertisement boards, take orders, and use software to track revenues and spreadsheets. The work with the local business is completed by a team of students expected to collaborate and communicate effectively, in person and via technology, to accomplish various objectives.

The fifth and final International Society for Technology in Education Standard for Education Leaders (2018), connected learner, and include leaders who model and promote continuous professional development (ISTE, 2018). Connected learners encompass building leaders setting goals to stay current on emerging technologies promoting learning, innovations in pedagogy, and developments in best instructional practices (ISTE, 2018; Learning Forward, n.d.; Ormiston, 2011; Trilling & Fadel, 2009). The fourth ISTE Standard for Education Leaders (2018), also connects well with the theme of leadership professional development which was prevalent from the responses of participants. Participants described methods building use technology for their own personal learning. Various methods leaders implement include taking an active role with

social media, sharing learning with staff, and attending conferences to continuously grow and develop skills for integrating best technological practices.

The two research questions used for the study were designed to explore educator perceptions for the essential skills students need for future success, how the technology utilized in the classroom can develop and enhance the learning of essential skills, and how a leader's actions and behaviors create and support classroom environments having high levels of high-quality technology integration. During the data collection process of the study, the researcher established six major themes generated from the perceptions of both principal and teacher participants regarding high-quality technology integration of: (a) student learning and life skills, (b) student technology skills, (c) leadership modeling, (d) leadership visionary, (e) leadership professional development, and (f) leadership encouraging. Participants revealed leaders must be strategic and intentional when creating the conditions which support and provide constant professional development for teachers regarding the vision for building the essential skills students need for success.

Discussion

The researcher interviewed three high school principals and six high school teachers from three different high-performing technology-driven high schools. The purpose of the interview sessions with each participant was to gather significant conclusions and evaluate themes and patterns regarding essential skills students need for future success. Additionally, the researcher sought to examine how technology was used to leverage essential skills as well as the actions of leader's creating the conditions in which high-performing technology learning environments can thrive. Interviews from the nine participants revealed six major themes regarding high-quality technology integration

and the influence of building leadership: (a) student learning and life skills, (b) student technology skills, (c) leadership modeling, (d) leadership visionary, (e) leadership professional development, and (f) leadership encouraging. This study recognized the importance of school leaders identifying the essential 21st century skills students need for success and how a deep learning and comprehension of 21st century skills can be established through the effective utilization of technology (Battelle, 2019a; ISTE, 2016; Wenglinsky, 1998). Additionally, this study established the influence an effective high school principal exhibiting Transformational Leadership characteristics has on ensuring high-quality technology integration when examined through the lens of the International Society for Technology in Education (ISTE) Standards for Education Leaders (2018).

Two theoretical frameworks from the work of Wenglinsky (1998) and Bass (1978) and Burns (1985) were utilized for this study. The foundation for technology integration originated from the work of Harold Wenglinsky (1998) and Transformational Leadership arose from the work of Bass (1978) and Burns (1985) as the frameworks for the study. Wenglinsky (1998) established how technology can serve as an essential tool for improving student proficiency and the school's learning culture. Wenglinsky (1998), concluded technology was not the magic cure to enhancing student learning in the classroom but did have an impact on student achievement when used effectively. Participants confirmed Wenglinsky's (1998) research by acknowledging the importance of technology in leveraging and developing essential 21st century skills for students (Battelle, 2019a; ISTE, 2016; Wenglinsky, 1998). Technology integration allows for students to understand the important 21st century skills and practice and utilize the skills in future learning and life situations (Battelle, 2019a; ISTE, 2016). Participants

emphasized every professional role and every job is going to utilize an aspect of technology. Thus, students' ability to leverage essential skills with technology is critical as an inability to apply essential skills as an adult will result in a disadvantage. Moreover, learning how to use technology to increase the impact of essential 21st century skills can help students be better prepared for college, work, and life situations (Battelle for Kids, 2019a; Bellanca & Brandt, 2010; Kieschnick, 2017; Sheninger, 2016). Furthermore, participants described the prevalence of technology in today's society and how learning environments can be created to replicate how students can apply essential skills through the use of technology. Hence, efficient use of a learning management system to guide student learning can help prepare students for virtual learning opportunities which might occur in college. Therefore, collaborative project-based activities emphasizing the importance of communication and collaboration among people with soft skills or through different technology platforms can be beneficial.

The second theoretical framework utilized for this study was Transformational Leadership Theory (1978). The Transformational Leadership Theory (1978) was first presented by James Burns who established individuals possessing specific leadership actions had the capability to influence followers to reach greater levels of performance and commitment (Burns, 1978; Gordon & Smith, 2015). Later, Bass (1985) developed a leadership theory which involved transactional and Transformational Leadership abilities. Moreover, Bass & Avolio (1993, 1994, 2004) observed four qualities transformational leaders retain and are referred to as the Four I's of Transformational Leadership. Participants established this research by acknowledging the influence leaders had on high-quality technology integration through modeling, casting a vision, professionally

developing teachers, and encouraging teachers to try new technological tools to further advance the essential skills students need for future success (Bass, 1999; ISTE, 2018; Bass & Avolio, 2004; Kotter, Kouzes & Posner, 2017, 2014; Senge, 1990; Starr, 2009; Sheninger, 2016). Furthermore, each participant specifically mentioned the leader set the expectation for how teachers could use technology with students by personally modeling the technology (Bass, 1999; Kouzes & Posner, 2017). More explicitly, participants mentioned when the leader shared technology resources through email, weekly bulletin, staff page within the school's learning management system, and utilized new digital tools with faculty as leaders led professional development opportunities and faculty meetings. Participants also shared how teachers were impacted when the teachers saw the leader fail using technology, as the failure made the teachers feel more comfortable to try new technology tools and understand it would be okay if the implementation of the new tools did not go as planned. Additionally, participants described the examples of failure included the tool not working correctly and loss of internet and leaders were able to model the ability to adapt and overcome the challenges by adjusting the delivery of the content through a different medium. Furthermore, participants described how the leader also modeled the importance of professional development as the leaders shared personal professional learning experiences and new ideas with staff.

Mentioned consistently throughout each of the interview, participants emphasized the impact the leader had on high-quality technology integration. Participants described how leaders with high expectations for student learning is communicated through the leader's vision for the use of technology in the building (Bass, 1999; ISTE, 2018; Bass & Avolio, 2004). Subsequently, participants also described how leaders share their vision at

the beginning of each school year and continuously throughout the year via weekly bulletins and emails to staff. Additionally, principal participants emphasized the importance of communicating their vision through their interaction with staff members. Accordingly, leaders equipped teachers with the resources necessary to meet the high expectations as the leaders planned, prepared, and prioritized professional development opportunities regarding the use of digital tools in the classroom (ISTE, 2016, Learning Forward, n.d.). Furthermore, participants also mentioned leaders encouraging teachers to use technology through support, coaching, and feedback helped the teachers grow and improve their ability to develop essential 21st century skills for students through the use of technology (Bass, 1999; Bass & Avolio, 1994; ISTE, 2018).

Throughout the course of the study several limitations were present. The researcher assumed participants delivered truthful and authentic responses to the interview questions. However the limitations of the study included participants potentially not being truthful in responses to interview questions. Another limitation of the study incorporated a slanted perspective by the researcher's personal experience, time restrictions, personal preference, and a lack of understanding of the content. Additionally, teacher interview participants came from recommendations from building leaders for the most technology-driven and proficient teachers in their buildings. Furthermore, an additional limitation to this study was each schools' size, location, and demographics were not a consideration for the study as researcher chose schools which implemented one-to-one with technology to ensure they had appropriate technological resources to contribute to the study.

Overall, this study deepened the current research by guiding a methodical and

organized examination of how high-performing technology-driven educational systems are currently identifying key 21st century skills for student success, using technology to leverage and develop essential skills, and how building leaders promote and support technology learning environments. The results of the study generated six major themes and connected how leaders must acquire teacher buy-in with their vision for the essential 21st century skills students need for future success and as well as how technology can be used to leverage essential skills (Bass, 1985; Battelle for Kids, 2019a; ISTE, 2018; Wenglinsky, 1998). Accordingly, professional development designed around effective technology instructional practice, including modeling the use of technology by the leader, demonstrates the conditions in which effective learning can take place (Bass & Avolio, 2004; ISTE, 2018; Kouzes & Posner, 2017). Moreover, encouraging and coaching teachers for improvement in using technology assists in bringing a leader's vision to life in the classroom for student learning of essential 21st century skills through the utilization of technology. Thus, classroom teachers create the conditions for which 21st century skills are taught and technology is used to leverage essential skills (Hattie, 2012; ISTE, 2016; Wenglinsky, 1998). This study occurred during the COVID-19 pandemic of 2020-2021 and participants were interviewed as their school was preparing for the 2020-2021 school year. Each of the three schools which participated in the study initially planned to start the year with seated instruction, but also prepared for situations which might occur throughout the year and might require learning to transpire remotely. Accordingly, participants emphasized the training and professional learning which was delivered to effectively teach in a virtual environment (DuFour & Marzano, 2011; DuFour, et al., 2008; Learning Forward, n.d.). Subsequently, respondents noted they

received training for effectively using their learning management system and supporting digital tools to engage students (ISTE, 2016; ISTE, 2018; Learning Forward, n.d.). Furthermore, participants also shared students needed to effectively utilize essential 21st century skills of communication and collaboration using digital tools with other students and their teachers to excel in a virtual learning environment (Battelle for Kids, 2019a; ISTE, 2016).

The COVID-19 pandemic forced leaders and teachers to be flexible and adaptable as they strived to create learning environments in which students could be successful. COVID-19 further magnified the importance of the development of 21st century skills through the use of technology as students and teachers were forced to collaborate, communicate, be creative, and think critically within both a virtual learning environment or a seated environment. Moreover, technology-proficient education leaders are responsible for directing such digital age learning systems by supporting classrooms with effective high-quality technology integration practices. Accordingly, leaders possessing Transformational Leadership traits, specifically the Four I's of Transformational Leadership, can apply the traits to the ISTE Standards for Education Leaders (2018) to establish the culture and lay the foundation for effective change (Bass, 1997). Transformational education leaders are able to effectively integrate technology into their school's culture and cultivate an environment for high levels of teaching and learning practices of 21st century skills and change the educational landscape (Bass, 1997; Battelle for Kids, 2019b; ISTE, 2018). Overall, findings from this study are relevant to larger populations and environments connected to high-quality technology integration as well as examining how building leaders can support, develop, and promote such

environments.

Educational Implications

The educational implications of this research were explicitly connected to the research questions which directed the study. Overall, the study aimed to examine the gap in research regarding the influence of Transformational Leadership on high-quality technology integration. The purpose of the study was to explore educator perceptions of Transformational Leadership and how such leadership can influence high-quality technology integration in schools. Thus, the importance of leaders utilizing Transformational Leadership, combined with the International Society for Technology in Education (ISTE) Standards for Education Leaders (2018), provided a unique opportunity to research what is needed to foster effective classroom environments which implementing essential 21st century skills with students and utilizing technology to enhance the essential skills (Bass, 1985; Battelle for Kids, 2019a; ISTE, 2016). Accordingly, participants noted the leader's ability to rally, motivate, and inspire followers having a vision for technology integration was integral in shifting their building from traditional learning environments to digital-age learning environments.

The foundation of high-quality technology integration begins at the classroom level. The results of the study demonstrated student learning and life skills and student technology skills were the most common major themes acknowledged and mentioned 556 times by each of the nine participants. Fittingly, participants identified student learning and life skills as the essential 21st century skills students need for future success and student technology skills to be used to leverage and further develop essential skills (Battelle for Kids, 2019a; ISTE, 2016; Wenglinsky, 1998). To promote essential skills,

school leaders must both identify and communicate the skills for teachers. To integrate essential skills into the classroom, teacher can use their learning management system, such as Canvas or Google Classroom, to provide students with opportunities to expand each student's technology skills by engaging students in research, discussions, group work, and collaborative projects. However, teachers must also prioritize teaching essential 21st century skills and utilizing technology to further develop such skills. Teaching and utilizing technology includes providing students access to digital resources and digital tools in the classroom as well as promoting and incorporating technology tools and resources into the instructional design of lessons (Battelle for Kids, 2019a; ISTE, 2016; Wenglinsky, 1998).

Building leaders must identify and communicate expectations for teaching essential 21st century skills in their schools. Teachers should integrate essential skills through their content and use technology to further develop essential skills (Bellanca & Brandt, 2010; ISTE, 2016; Kieschnick, 2017). Moreover, the aforementioned tools were found to be effective in developing student learning and life skills in the classroom. Furthermore, technology skills students acquire from such learning environments help prepare students for future endeavors in college, the workplace, and life. Likewise, participants also shared how the COVID-19 pandemic created a sense of urgency for preparing teachers to lead virtual learning environments and effective leaders ensured professional development and trainings were made available in preparation for the possibility of learning remotely. Thus, effective leaders ensured teachers were equipped with digital tools to promote key 21st century skills of collaboration, communication, creativity, and critical thinking in both a seated and virtual learning environment.

While the foundation of high-quality technology integration occurs at the classroom level, ultimately the leaders create, implement, and continuously develop conditions supported by the implementation of technology which allow deep learning environments to occur in their school buildings. Transformational leaders utilize one of the six major themes generated from the study, leadership visionary, to rally support from their teachers by casting a clear and planned vision for the use of technology in their buildings (Burns, 1985; Bass & Avolio, 2004; ISTE, 2018). Accordingly, principal and teacher participants shared a vision is not mandated, strict, or rigid, rather a vision is open-minded and structured. Thus, teachers use technology but do so in their own style as teachers see fit in their content areas. Furthermore, within a building leader's vision for the use of technology, the leader is innovative and creative in providing ways for teachers to engage students with technology opportunities to develop essential skills (ISTE, 2018).

High-performing technology-driven leaders are instrumental in creating systems of support for high-quality technology-enriched learning environments. Accordingly, participants identified the theme leadership professional development 84 times as a key as a key support to classrooms. Accordingly, a leader emphasizes the use of technology by creating professional development opportunities focused on ways teachers can improve instructional practices using technology tools (Raman et al., 2019; Wenglinsky, 1998; Learning Forward, n.d.). Moreover, participants described effective structures for professional development include breakout sessions which allow choice on the type of technology tool teachers want to learn more about. Thus, an effective leader designs professional development on technology by connecting technology instructional specialists with staff and also empowering teacher leaders to share best practices with

staff. Overall, it is important for leaders to create a collaborative environment among staff, where individual teachers are not afraid to reach out to a fellow teacher or a specialist and teacher-to-teacher peer observation can take place. Moreover, during professional development opportunities, leaders must ensure trainings are available to help teachers increase their skills in using technology with students. Effective leaders prioritize professional learning opportunities and focus on integrating technology tools during professional learning days. Furthermore, leaders can also connect teachers with other technology-proficient teachers for peer observations to see effective technology integration, ideas, and strategies implemented in other classrooms.

The theme leadership professional development is closely connected to leadership modeling which was another theme prevalent from the study. As leaders design professional development focused on using technology in the classroom, leaders should model the technology for their staff. Subsequently, leaders who try new digital tools with teachers during faculty meetings and professional development opportunities, create environments teachers are more likely to try new tools with their students. Moreover, participants specifically mentioned leaders modeling the use of Flipgrid, PearDeck, and Zoom for teachers and demonstrated how the digital tools could be utilized with students. As leaders model new digital tools for teachers at times the tools may fail. However, such failures and a leader's response to the failure actually supports teachers in taking risks and trying new things without feeling stressed if the tool was to fail on as well. Furthermore, high-performing technology leaders also model for staff by sharing resources. Participants mentioned the use of a weekly bulletin in which new technology tools, resources, and supports were shared. Additionally, tech-embedded materials, such

as the leader creating a video to share with staff, was also identified as an effective way the leader modeled the use of media for engagement teachers could replicate for their students. Thus, building leaders striving to lead technology-integrated learning environments must constantly try new digital tools and model the tools for teachers who see their building leader using digital tools are more willing to try or integrate new things in their classroom.

Transformational technology-driven leaders continuously develop high-quality technology integrated learning environments through leadership encouraging, a major theme mentioned 73 times by participants in the study. Participants shared how building leaders were effective in growing teacher technology capacity through encouragement, coaching, and feedback (Bass, 1997; Bass & Avolio, 2004; Gordon & Smith, 2015, ISTE 2018). Accordingly, opportunities for improving teacher instruction could be identified through leaders being visible and approachable in classrooms and to observing instruction supported by technology. In follow up conversations from such observations, leaders can provide coaching and feedback to support teachers in future growth using technology (Bass & Avolio, 2004; Gordon & Smith, 2015, ISTE, 2018). Challenging teachers' thinking with the use of questioning was a strategy participants identified which helped push teachers to keep moving forward with utilizing technology. Moreover, providing feedback was encouraging to teachers as the feedback did not allow the teachers to be content but encouraged the individuals to continue to push the limits with technology in new and exciting ways for student learning. Furthermore, building leaders wanting to develop higher levels of technology integration in their building can do so by encouraging teachers to use technology and providing coaching and feedback for

improvement. Subsequently, teachers must be willing to take leaders' words of encouragement and feedback and apply both to their instructional practice.

Overall, it is crucial for building leaders to inspire and support teachers as teachers work to change and improve classroom learning environments designed for student learning of essential 21st century skills and leveraged by the use of technology. Leaders are responsible for cultivating such environments by having a vision for technology, designing professional development to support teachers, modeling for teachers what they want to see teachers provide for their students, and encouraging teachers as teachers use technology to prepare students for the future. Inclusively, conclusions and recommendations from the study should assist leaders in developing and supporting high-quality technology integrated classrooms in their buildings.

Recommendations for Future Research

The researcher limited this study to nine participants from three high-performing technology-focused Missouri high schools. The researcher selected the three high schools based on recommendations for technology-driven high school principals from the Missouri Association for Secondary School Principals (MoASSP) and the Missouri Association for School Administrators (MASA). Each principal's student achievement data for teach individual school was ranked and the top three were asked to participate. However, future research should consider widening the school participant pool and increasing the number of principal and teacher participants with representation throughout the country.

The researcher also recommends future studies examine the influence of Transformational Leadership on high-quality technology integration at both elementary

and/or middle school level. Results of this study explored high school educator perceptions of essential 21st century skills students need for future success. However, elementary and/or middle school teachers might have a different perspective regarding essential skills students need for success than what was found from this study.

Furthermore, additional research would be valuable regarding the level of support teachers receive from building and/or district technology/instructional specialists. Participants identified such positions in serving as a resource for providing professional development and feedback for using technology in the classroom. Thus, continued research could examine the level of influence instructional support positions have on high-quality technology integration in classrooms and throughout school buildings.

Lastly, the researcher recommends future research regarding the examination of the influence a building leader has on high-quality technology integration through a different lens than Transformational Leadership. Transformational Leadership was chosen for the purposes of this study because of a gap in the literature. However, multiple other leadership philosophies could be combined with International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) as it is possible there could be a more effective philosophy for supporting technology-driven learning environments could be implemented.

Summary

Two main research questions were used for this study. The first research question included, “What are educator perceptions of high-quality technology integration?” The first research question had two sub-questions. The first sub-question asked, “What are educator perceptions of the essential 21st century skills students need for success?”

Additionally, the second sub-question to Research Question 1 asked, "What are educator perceptions for how teachers use technology to support 21st century skills?" The second research question included, "What are educator perceptions for how leaders support high-quality technology integration?" The second research question had two sub-questions. The first sub-question asked, "What are educator perceptions for how Transformational Leadership supports high-quality technology integration?" Additionally, the second sub-question for Research Question 2 asked, "What are educator perceptions for how leaders integrate International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) to support high-quality technology integration?" Guiding the study were two bodies of research which served as the theoretical frameworks for this study. The theoretical frameworks focused on the relationship between various digital tools and different educational outcomes combined with Transformational Leadership Theory which was grounded in the belief individuals possessing certain leadership behaviors have the ability to influence followers to reach greater levels of performance and commitment (Burns, 1978; Gordon & Smith, 2015; Wenglinsky, 1998).

The study intended to fill the gap in research between any connections existing between high-quality effective technology integration and Transformational Leadership. Three principals and six teachers participated in the study from three high-performing technology-focused Missouri high schools. Participants were interviewed so the researcher could examine their experiences in relation to 21st century skills students need for future success, how technology can further develop essential skills, and the influence Transformational Leadership might have on supporting such classroom environments through the lens of the International Society for Technology in Education (ISTE)

Standards for Education Leaders (2018). This study recognized building leaders must be meaningful and intentional in identifying essential 21st century skills students need for future success and equipping teachers with the digital tools necessary to further help students develop the essential skills. In order to support the learning, teaching, and development of technology-enhanced learning environments, leaders must cast a clear vision for the use of technology, design effective professional development for teachers implementing digital tools to support student learning of essential 21st century skills, model the use of digital tools for staff, and provide encouragement for teachers through coaching and feedback. The literature described 21st century skills for students along with how the skills can be further developed and enhanced in classrooms through the effective use of technology (Battelle for Kids, 2019a; ISTE, 2016; Wenglinksy, 1998). Leaders promote both teaching and learning of 21st century skills through identifying essential learning outcomes and providing support for teachers to implement effective instruction by guiding students to reach identified learning targets (Darling-Hammond, 2010; Drake, 2007; Hattie, 2012; Learning Forward, n.d.; Marzano, 2007).

Transformational leaders focused on technology integration can effect change as leaders support and develop capable 21st century learning environments while encouraging high levels of teaching, learning, and instructional support necessary for this type of culture throughout their schools (Bass, 1997; Bass & Avolio, 2004; ISTE, 2018). Ultimately, effective high school building leaders must strive to ensure classroom level technology integration best meets the needs of 21st century learners by identifying the appropriate skills needed for future success. Therefore, the effect of Transformational Leadership in supporting high-quality technology is shown to meet the needs of 21st

century learners and prepare learners for the future while making changes necessary to improve the educational landscape.

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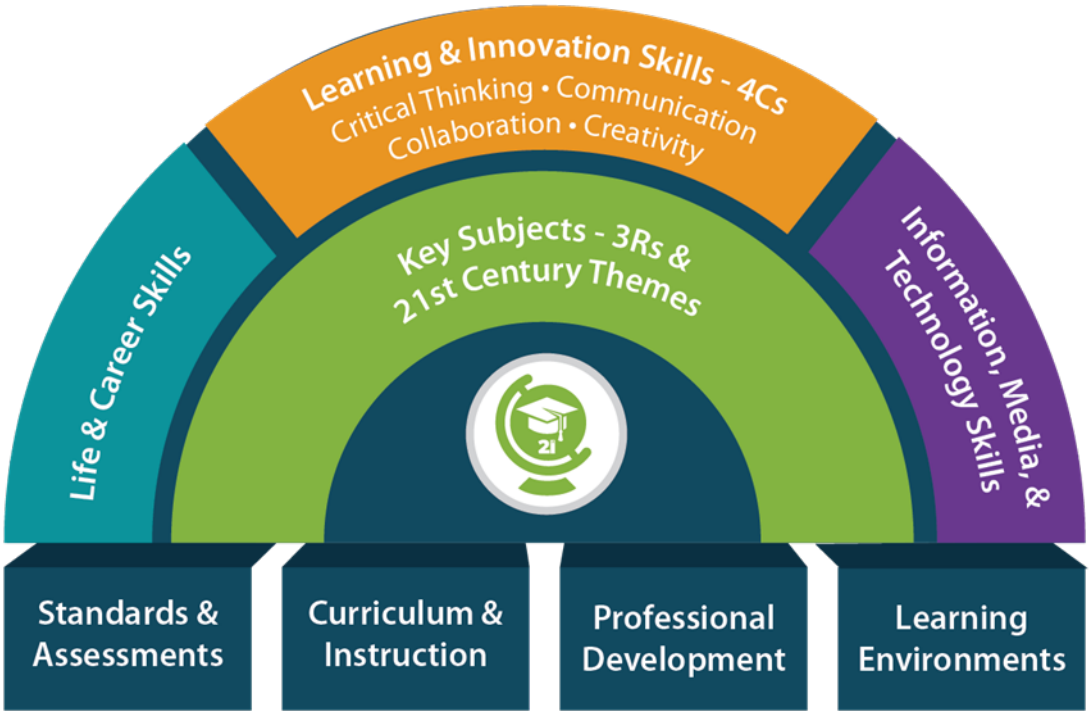
APPENDICES

Appendix A

Battelle for Kids' Framework for 21st Century Learning



Appendix B

Request for Recommendations: Missouri Association of Secondary School Principals

MoASSP Area Representative Name
MoASSP Area Representative Address

Dear MoASSP Area Representative,

I am a doctoral student at Southwest Baptist University and am working on my doctoral dissertation. The study will be a qualitative study focusing on the educator perceptions of transformational leadership and the influence on high-quality technology integration in high schools. I would like to formally request a recommendation from you. Could you please send me five names of high-performing technology-driven high school principals from the area you supervise? These principals would be viewed as possessing a strong understanding of effective technology-based instruction, someone who promotes a culture of risk-taking and innovation, along with being a high-performing visionary leader who has access to ample technology resources including infrastructure and devices. I will be cross-referencing your recommendations with those from MASA area supervisors to identify three high-performing, technology driven high school principals to participate in this study.

The study will help determine how principals can utilize transformational leadership traits and apply them to technology integration standards within the school culture. Given the circumstances we are currently facing due to the COVID-19 pandemic, all interviews would be conducted virtually through a Zoom meeting or Google Hangouts, whichever you prefer.

Thank you for your consideration and I look forward to reviewing your recommendations.

Tyler Overstreet
Principal
Republic High School
Doctoral Student, Southwest Baptist University
417-619-8683
tyler.overstreet@republicschools.org

Appendix C

Request for Recommendations: Missouri Association of School Administrators

MASA District Representative Name
MASA District Representative Address

Dear MASA District Representative,

I am a doctoral student at Southwest Baptist University and am working on my doctoral dissertation. The study will be a qualitative study focusing on educator perceptions of transformational leadership and the influence on high-quality technology integration, and I would like to formally request a recommendation from you. Could you please send me five names of high-performing technology-driven high school principals from the area you supervise? These principals would be viewed as possessing a strong understanding of effective technology-based instruction, someone who promotes a culture of risk-taking and innovation, along with being a high-performing visionary leader who has access to ample technology resources including infrastructure and devices. I will be cross-referencing your recommendations with those from other MASA district representatives, along with recommendations from the Missouri Association of Secondary School Principals (MoASSP) executives.

The study will help determine how principals can utilize transformational leadership traits for high levels of high-quality technology integration. Given the circumstances we are currently facing due to the COVID-19 pandemic, all interviews would be conducted virtually through a Zoom meeting or Google Hangouts, whichever you prefer.

Thank you for your consideration and I look forward to reviewing your recommendations.

Tyler Overstreet
Principal
Republic High School
Doctoral Student, Southwest Baptist University
417-619-8683
tyler.overstreet@republicschools.org

Appendix D

Request for Participation: Principals

Participant Name
Participant Address

Dear Participant,

I am a doctoral student at Southwest Baptist University and am working on my doctoral dissertation. The study will be a qualitative study focusing on the educator perceptions of transformational leadership and its influence on high-quality technology integration in high schools, and I would like to formally request your participation. You have been purposefully selected as a potential participant in this study, because you meet the following specific criteria established by the researcher: you have been recommended by the Missouri Association of Secondary School Principals (MoASSP) and also by an area supervisor with the Missouri Department of Elementary and Secondary Education as an effective technological leader, and you are a high school building principal located in Missouri.

The study will explore any influence transformational leadership traits might have on high-quality technology integration in high schools. Your involvement will require setting aside time for an interview in which you are asked to elaborate on how you have integrated technology throughout your school. You will be provided a transcript of our interview and will have the opportunity to change any statements that you feel are not clear or are inaccurate. Given the circumstances we are currently facing due to the COVID-19 pandemic, our interview would be conducted virtually through a Zoom meeting or Google Hangouts, whichever you prefer.

I would also request permission to visit with two teachers from your building who meet the following criteria: one is a novice teacher with three or less years teaching experience, and one is a veteran teacher with 10 or more years teaching experience. Both would come at your consideration for being effective with technology integration in their classrooms and have received training for best practices in doing so. The results of this study will be shared with you upon request.

If you can participate, we will set up an interview for a date and time that is convenient for you, and I will provide interview questions in advance. Please contact me at the phone number or the e-mail below to let me know if you can participate.

Thank you for your consideration.

Tyler Overstreet
Principal
Republic High School
Doctoral Student, Southwest Baptist University
417-619-8683
tyler.overstreet@republicschools.org

Appendix E

Informed Consent Form

Dear Colleague,

My name is Tyler Overstreet, and I am the principal at Republic High School in Republic, Missouri. I am a doctoral student at Southwest Baptist University, and I am conducting a research study to gather information about educator perceptions of transformational leadership and its influence on high-quality technology integration in high schools. I would like to invite you to participate in this qualitative case study incorporating in-depth, semi-structured interviews. You have been purposefully selected as a potential participant in this study, because you meet the specific criteria established by the researcher. Possible benefits include an opportunity for you to reflect on your leadership involving technology integration and offer insight to others concerning how you implement those practices.

I realize that you are very busy; the interview should take about one hour of your time to complete. During the interview, I will ask you for information about your experience with how you implement technology in your high school according to practices identified as effective by current literature. I will follow the included Researcher-developed Interview Guide, which contains questions pertaining to effective, research-based successful school practices.

Your privacy is important; information reported will not indicate individual participants or school districts. Each participant will be given a fictitious name, and no identifying characteristics will be acknowledged. There is no penalty should you choose not to participate or answer all of the questions. Your response to this letter will indicate your consent to participate and permission to use the information that you have provided in my study.

Before you make a final decision about participation, please read the following statements about how your responses will be used and how your rights as a participant will be protected:

- Participation in this study is completely voluntary. You may stop participating at any point without penalty.
- You need not answer all of the questions.
- Your answers will be kept confidential. Results will be presented to others in summary form only, without names or other identifying information.
- Your participation will take approximately one hour. During this time you will answer questions about how you implement effective, research-based leadership practices.

This project has been reviewed and approved by the RRB Committee at Southwest Baptist University 417-326-1659. The committee believes that the research procedures adequately safeguard the subject's privacy, welfare, civil liberties, and rights.

You may contact me at 417-619-8683 if you have questions or concerns about your participation. If you would like a copy of the results of this study, you may contact me via email at tyler.overstreet@republicschools.org. Thank you for your time and consideration.

Sincerely,
Tyler Overstreet
Republic High School

Appendix F

Interview Protocol and Questions

Instructions: The interview will be digitally recorded. The interview will be less than one hour in length.

Introduction: This interview is being digitally recorded, and confidentiality will be maintained as outlined in the consent form. Are you ready to begin the interview?

Guiding research questions:

There are two overarching research questions for this qualitative study, having two sub-questions:

1. Educator perceptions of high-quality technology integration:
    i. Perceptions of essential 21st century skills that students need.
    ii. Perceptions on how teachers use technology to teach 21st century skills.
2. Educator perceptions on how leaders support technology integration:
    i. Educator perceptions on how transformational leadership supports technology integration.
    ii. Educator perceptions of how the leader integrates International Society for Technology in Education (ISTE) Standards for Education Leaders.

The following questions come from the review of literature:

Interview Questions (will adjust question stems for principal/teacher interviews)

1. What twenty-first century skills do you believe students need to be successful post pre-K-12 education?
2. Please describe how these twenty-first century skills are identified, implemented, and taught in classrooms throughout your school.
3. Tell me how you use technology and/or digital tools to develop and provide a deep understanding of these twenty-first century skills within your students.
4. What strategies do you use for the effective use of technology in your classroom?
5. How would you describe your building principal's leadership style?
6. How has your building principal communicated their vision for the use of technology in your school?
7. Tell me how your building principal models the use of technology in your school.
8. Tell me how your building principal has identified areas for improvement and provided coaching/instruction regarding the use of technology.
9. Please share any professional learning opportunities you have participated in related to technology integration in the classroom.
10. How do you model and encourage continuous professional learning for technology integration in your high school?

Closing: Thank you for your participation in this study. As previously discussed, your responses will not be connected to any identifiable information.

Nondirective probes for open-ended questions:

- What else do you wish to add?
- Can you tell me more about your thinking on this?
- What are some other things that come to mind?
- What specifically occurred?
- Are there any other issues involved?

Appendix G

Request for Participation: Teachers

Participant Name
Participant Address,

Dear Participant,

I am a doctoral student at Southwest Baptist University and am working on my doctoral dissertation. The study will be a qualitative study focusing on educator perceptions of transformational leadership and the influence on high-quality technology integration in high schools, and I would like to formally request your participation. You have been purposefully selected as a potential participant in this study, because you were recommended by you building principal as a teacher who has high-levels of technology integration in your classroom, and you are a teacher located in Missouri.

The study will help determine how principals can utilize transformational leadership traits and apply them to technology integration standards within the school culture. Your involvement will require setting aside time for an interview in which you are asked to elaborate on how your building principal has integrated technology throughout your school. You will be provided a transcript of our interview and will have the opportunity to change any statements that you feel are not clear or are inaccurate. Given the circumstances we are currently facing due to the COVID-19 pandemic, our interview would be conducted virtually through a Zoom meeting or Google Hangouts, whichever you prefer.

If you can participate, we will set up an interview for a date and time that is convenient for you, and I will provide interview questions in advance. Please contact me at the phone number or the e-mail below to let me know if you can participate.

Thank you for your consideration.

Tyler Overstreet
Principal
Republic High School
Doctoral Student, Southwest Baptist University
417-619-8683
tyler.overstreet@republicschools.org

Appendix H

Member Checking Letter

Participant Name
Participant Address

Dear Participant,

Thank you again for taking part in my doctoral research project concerning Educator Perceptions of Transformational Leadership and its Influence on High-Quality Technology Integration in High Schools. The descriptive data you offered during our interview provided valuable insight toward answering the research questions for this study.

I am currently in the process of analyzing the descriptive data you provided. Ensuring trustworthiness is an important component of qualitative research. Therefore, I am using member checking as one step toward addressing the validity of this study.

I am including a copy of the transcription of our interview for you to review. Please let me know if there are any statements that need to be corrected or changed for accuracy or clarity purposes. These transcriptions will not be published and will remain confidential. Quotations and paraphrases from our interview will be used to support the emerging themes, but confidentially will be maintained throughout the study.

Your feedback is important, and I value any input or comments you may have to enhance my research. Thank you again for taking the time to participate in this study and allowing others to learn from your knowledge and experiences.

Sincerely,

Tyler Overstreet
Principal
Republic High School
Doctoral Student, Southwest Baptist University

Appendix I

Peer Review Letter

Colleague Name
Colleague Address

Dear Colleague,

I have a small favor to ask of you. I am working on my dissertation: Educator Perceptions of Transformational Leadership and its Influence on High-Quality Technology Integration in High Schools. I interviewed the building principal and two certified teachers at three separate school sites to gather their perceptions concerning technology integration. I analyzed this by applying the four tenets of transformational leadership to the International Society for Technology in Education (ISTE) Standards for Education Leaders (2018) from the literature and interviewed each person pertaining to these practices.

I am currently in the process of analyzing the descriptive data from each of the interviews. I coded all of the participants' responses and looked for emerging themes. Ensuring trustworthiness is an important component of qualitative research. Therefore, I am incorporating peer examinations of the emerging themes as one step toward addressing the validity of this study. I am including a copy of the emerging themes for the study for you to review. I have also included notes paraphrasing each of the interviewee's descriptive data. Each of the emerging themes is highlighted a specific color, and the matching supporting data from each interviewee is highlighted the same color. Please review this document and let me know if the themes that emerged from the supporting data seem plausible to you. Your feedback is important, and I value any input or comments you may have to enhance my research. Thank you for taking the time to assist me in this process.

Sincerely,

Tyler Overstreet
Assistant Superintendent
Republic School District
Doctoral Student, Southwest Baptist University