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Leveraging Professional Learning to Impact Leadership of Technology Integration

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LEVERAGING PROFESSIONAL LEARNING TO IMPACT LEADERSHIP OF
TECHNOLOGY INTEGRATION

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ABSTRACT

School and district leaders lack awareness of the depth and complexity of the International Society for Technology in Education (ISTE) Standards for Education Leaders and how the implementation of the leader standards provides for students and teachers to learn relevant skills and strategies. Continuing the work of Schoenbart's 2019 dissertation, the Education Leaders Technology Survey (ELTS) provides a self-assessment for education leaders to reflect on their leadership of technology integration and provides baseline data for this study. Professional learning around the ISTE Standards for Education Leaders provided through a Canvas course provides education leaders with a theory of action to interact with the standards as students so the leaders can support teachers while providing vision and structures for the leadership of technology integration in school buildings and districts. One-on-one interviews provide context for how the course can evolve and support leaders, while the post-survey of the ELTS demonstrates that the professional learning course provides the intended impact. Professional learning around the ISTE's Standards for Education Leaders impacts school and district education leaders' ability to lead effective technology integration in three ways. First, school and district education leaders develop and increase their awareness of the ISTE Standards for Education Leaders, as evidenced by the qualitative feedback through interviews citing that the course helped them to either become aware of the standards for the first time or increase their understanding of the standards. Leaders also cited that some of the video vignettes provided in the course offered examples of what

students and teachers can create with access to technology resources in their schools and classrooms. Second, leaders increased their self-reported abilities around visionary leadership as evidenced by the quantitative increase in the ELTS Survey (increase from 2.60 to 3.90 from PreSurvey to PostSurvey). Visionary leadership increased through tools in the course that they could immediately use in their day-to-day roles as leaders in their schools and districts. Third, leaders' ability to lead effective technology integration is impacted by facilitating leaders' reflection practices around learning through the lens of students, teachers, and leaders. This impact is evidenced by activities provided in the course, which asked leaders to reflect on each standard through the lens of a school or district leader. Leaders provided feedback on ways to improve the course, thinking of practical application of leader standards and how their skills and abilities as a leader would benefit from the content in the course. Implications of this research should drive future learning, funding, and attention around the need for professional learning for education leaders to support the leadership of technology integration.

DEDICATION

To every child who has not completed a K-12 education yet, I am here to work tirelessly to create the school you deserve.

ACKNOWLEDGMENTS

This document, this degree has been a culmination of determination, grit, and endurance over personal and professional mountains that will serve as steppingstones for my future. While many people deserve my gratitude, I'd like to acknowledge Dr. Noelle Paufler, my dissertation chair. Your feedback and guidance have been a lighthouse, shining the way to a brighter future for me. You've encouraged me to stand firm in my values and beliefs and brought out the best in my thoughts and processes. Your feedback was always asset-minded and provided a framework to the finish line. Thank you! To my other committee members, Dr. Hans Klar, Dr. Barbara Nesbitt, and Dr. Sherry Hoyle, I appreciate your guidance, dedication, and support as I push this work that I am passionate about forward.

Thank you to the various professional mentors I have had throughout my career! Thank you for pushing my thinking and encouraging my growth. Thank you for the obstacles that have fueled my drive and resolve to provide better systems for all students.

Thank you to my teachers. My dad and my son. Dad, thank you for encouraging me to attend college all the way through high school. It made such a difference in my life. I hope I always make you proud. Colin, thank you for enduring an educational system that didn't always meet your needs. It taught me to fight for what children need.

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<center>**Introduction**</center>

Students today are growing up in a world brimming with innovative technology. From mobile devices to mobile platforms, careers like influencers have emerged because of social media and transformed the world for students. As technology becomes more prominent in all areas, from the schoolhouse to the workforce, educators and educational leaders need to be prepared to lead the integration of technology effectively to provide the skills that students require to be successful in this evolving world. Leadership of technology integration requires vision.

Creating a Vision

A vision for technology integration cannot be delegated to the professionals on our teams whose primary responsibility is maintaining our hardware, software, and network. Effective technology integration requires blended support from the instruction and technology areas of the organization. The recent merger of the Association for Supervision and Curriculum Development (ASCD) and the International Society for Technology in Education (ISTE) emphasizes this need (R. Culatta, personal communication, February 28, 2023). Currently, ISTE identifies the following as key standards for leadership of technology integration (Appendix A): leaders to be Equity and Citizenship Advocates, Visionary Planners, Empowering Leaders, Systems Designers, and Connected Learners (Crompton, 2018).

Leadership of technology integration can only sustain change in the classroom with these skills. The problem of practice in this study is school and district leaders lack

awareness of the depth and complexity of the ISTE Standards for Education Leaders and how the implementation of the leader standards provides for students and teachers to learn relevant skills and strategies. This study aims to provide professional learning, as an intervention, around the ISTE Standards for Education Leaders to increase the leaders' understanding of effective technology integration and its application to impact student learning.

Role of the Leader

Education leaders now go beyond management and administration, demanding shifts as both instructional and technology leaders (Zhong, 2017). According to McLeod et al. (2011), "Preparing future-ready citizens who are technologically savvy, globally competent, and prepared to engage in a 21st-century knowledge-based economy with applicable skills requires a school leader who is prepared to lead changes in schooling" (p. 216). The primary task of an education leader is to exercise the leadership necessary to make positive differences in student learning and improve everyone's quality of life within the school (Drake & Roe, 2003). Educational leaders are essential to the successful integration of technology in schools. According to Sincar (2013), "The level of technology leadership highly reflects the quality of leadership in school, and being good at technology leadership is associated with high-quality school leadership" (p. 1273). Leaders often need to be more knowledgeable about how to lead technology integration or be familiar with the technologies used by teachers. As a result, they need to prepare to succeed in leading technology integration (Christensen et al., 2018).

Education leaders play a critical role in preparing students to meet the needs of the ever-changing workforce by facilitating systemic change and the implementation of initiatives in school (Zhong, 2017). Moving forward effectively requires that education leaders integrate technology in ways that develop students' digital capabilities by implementing, monitoring, and evaluating plans that fully integrate technology (Thomas, 2016). According to Graves (2019) and Schoenbart (2019), extensive research has been conducted on teachers' technology behaviors and the impact on technology integration in schools, while limited research exists on the effects of education leaders' leadership of technology integration and the impact on schools. Education leaders must improve their understanding of their role in leadership of technology integration to close the existing digital divide, the gap between those with Internet access and those without (Graves, 2019; Schoenbart, 2019). According to the 2017 National Education Technology Plan (NETP) Update, published by the United States Department of Education (USDofE) Office of Educational Technology (OET), while significant progress is being made to eliminate the digital divide, it continues to separate those students who can transform their learning through access to tools and resources (USDofE, 2017). Current iterations of the NETP do more to address school leadership, the need for collaboration, vision, and personalized learning (USDofE, 2017)

ISTE and the Evolution of the Standards

The ISTE was created in 1979 when a group of K-12 educators from Oregon connected with others who believed in educational technology, spreading ideas and inspiration geographically and generationally. According to their mission statement,

ISTE "inspires educators worldwide to use technology to innovate teaching and learning, accelerate good practice and solve tough problems in education by providing community, knowledge and the ISTE Standards, a framework for rethinking education and empowering learners" (Crompton, 2018, p. 2) As an organization, they believe that integrating technology is not about technology at all. Rather, it is about changing the way teaching and learning take place to make it more meaningful and impactful for educators and educational leaders around the globe (Crompton, 2018). Over the years, ISTE has led the development of standards for technology integration for students, teachers, and educational leaders. In 2001, the Technology Standards for School Administrators (TSSA) were created. Those standards for leaders became the National Educational Technology Standards (NETS) and, most recently, in 2018, the ISTE Standards for Education Leaders.

The ISTE Standards for Education Leaders reflect the shift from a top-down manager to a facilitating leader who leverages digital technologies to build a favorable learning landscape in their classroom, school, district, and beyond. These standards highlight developing a system that embraces shared leadership, trust, and empowerment. There are five standards for education leaders: Equity and Citizenship Advocate, Visionary Planner, Empowering Leader, Systems Designer, and Connected Learner. These standards describe leaders who increase equity, inclusion, and digital citizenship practices with digital tools. They engage others in setting a vision for the institution and a strategic plan while ensuring a cyclical evaluation process. Education leaders foster a culture of empowerment for all as they support innovative thinking. The standards show

that education leaders work with others to implement, sustain, and improve educational

systems to support learning with technology. These standards recognize the importance

of education leaders seeking to continue learning in the digital arena.

Building Upon Previous Research

According to Sheninger (2019), "Change isn't coming; it is already on our

doorstep and about to knock down the front door. The need for digital leadership now is

more urgent than a few years ago" (para. 3). Measuring education leaders' current

technology leadership behaviors and activities is critical to helping them develop in these

areas. The Education Leaders Technology Survey (ELTS) (Appendix B) assesses

education leaders' technology leadership behaviors and activities over the last school

year. ELTS questions are based on the 2018 ISTE Standards for Education Leaders. This

survey tool was developed through doctoral research, resulting in the doctoral dissertation

titled *Principals' Perceptions of Their Technology Leadership & Behaviors: A Mixed

Methods Study (Schoenbart, 2019)*. The ELTS assesses the 2018 ISTE Standards for

Education Leaders addressing the limited research on principal leadership of technology

integration behaviors related to current leadership standards (Schoenbart, 2019).

Permission to use the ELTS in my research was obtained from Schoenbart (2019) and is

included in Appendix J.

Schoenbart (2019) recommended that school districts better understand and

prioritize the need for education leaders to fulfill the roles of technology leaders.

Education leaders are essential in creating school conditions that promote quality

instruction and student learning (Mavrogordato et al., 2018). Still, they need proper

training, support, and mentorship to fulfill this requirement. School districts must foster a professional learning culture for education leaders and set clear expectations about technology leadership. Education leaders must be better prepared and supported for schools to realize the power of technology for students and in the classroom.

In particular, the areas of weakness found in Schoenbart's study included the roles of education leaders as systems designer and connected leader. A systems designer is a leader that builds teams and systems to implement, sustain and continually improve the use of technology to support learning. Connected leaders must establish systems that support an infrastructure to implement a strategic plan around technology integration. This infrastructure should include software that can meet the needs of the organization and bandwidth sufficient to support the users (Crompton, 2018).

Education leaders are also tasked with ensuring teachers have access to resources that promote the learning process and demand new resources for future learning (Overstreet, 2021). Likewise, connected learners should encourage continuous professional development to stay fresh on emerging technologies such as digital tools and devices. Innovative instructional methods can be enhanced through inquiry and problem-based learning pedagogical strategies. Networking with other professionals through organizations, social media, and related conferences allow for leaders to connect and reflect on practices the foster professional growth (Overstreet, 2021). Harris (2017) 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). Leaders must understand the skills

necessary for student success, including how to effectively integrate technology to lead a school comprised of effective leadership of technology integration.

The ISTE Standards are a valuable resource for schools. More thought must be directed at the expectations and vision outlined in the strategic action plans districts and schools have for all aspects of technology. Schoenbart's (2019) study utilized the ISTE Standards for Education Leaders specifically, but all the ISTE Standards, especially those for students and educators, should have an essential role in our schools. Leaders and educators should identify authentic connections between the standards and their curricula so that these standards are not an extra burden but a tool to embed technology meaningfully into teaching and learning. Schoenbart's (2019) study implies a general lack of awareness of the standards. Still, if education leaders are not acting as strong technology leaders, they need tools, resources, and professional learning to develop a more robust understanding of this role. The ISTE Standards could be used to guide all our work with technology. The evolution of standards related to technology integration has been a work of progress. In 2001, the TSSA was created by ISTE, followed by the NETS. Technology is rarely studied through the lens of school leadership (Gallogray, 2015). Much of the existing research is anecdotal in nature (Sauers et al., 2014) with little focus on the relationship between school leaders and technology.

ISTE provides a professional learning course around the ISTE Standards for Students and the ISTE Standards for Educators. Both courses were designed by J. Parker, an interactive learning/school improvement and data consultant for the Department of Instructional Technology at Macomb Intermediate School District. Parker was part of the

first cohort of ISTE Certified Educators and was recognized as the 2018 ISTE Outstanding Leader. She and her team earned the ISTE Seal of Alignment for the 21things4educators and 21things4students sites. Her team began working on a course for leaders shortly before the pandemic and shelved the work for other priorities (J. Parker, personal communication, November 16, 2022).

In this research, I created a course that I plan to submit to ISTE as a course for leaders. The course provides essential learning around Leadership of Technology Integration where participants interacted with content using the ISTE Standards for Students so they can lead using the ISTE Standards for Education Leaders, supporting teachers using the ISTE Standards for Teachers so that teachers can support students to learn with the ISTE Standards for Students. Competency in technology integration can be built through professional learning emphasizing a technological approach to organizational management. These skills help education leaders create the character of technology leadership (Ismail et al., 2021).

Problem of Practice

Suburban Hill School District (SHSD) began putting devices in the hands of students in 2008. At the time, their use of technology was innovative and forward-thinking. In the fall of 2021, I invited all school leaders to participate in one-on-one meetings with me to collaborate and collect input on their vision for technology in the district. I started our conversation with a key question, "Tell me about your vision for technology in your school." I intended that this key question would provide a springboard for a conversation about how technology integration impacts student learning.

Throughout my meeting with the first seven school leaders, they asked for more spare devices and access to faster Wi-Fi. Within these conversations, I prompted their conversations for grander ideas and evidence of the impact of technology on student learning. School leaders were asking for mostly transactional items, and there was a pervasive lack of innovation and vision for using technology in the classroom and the potential impact on student learning.

In the summer of 2023, I found a similar scenario in Haven Area Public Schools (HAPS). Devices were put in the hands of all students in 2008 and the district was noted as a leader in the area when it came to device availability. Yet, the integration of technology and the relevant leadership was focused on the replacement of paper-and-pencil with devices. The district had not implemented a learning management system prior to 2020 and the use of Canvas, as it relates to this study, was not familiar to the leadership within the district.

The problem of practice in this study is school and district leaders lack awareness of the depth and complexity of the ISTE Standards for Education Leaders and how the implementation of the leader standards provides for students and teachers to learn relevant skills and strategies. This study aims to provide targeted professional learning, as an intervention, around the ISTE Standards for Education Leaders to increase the leaders' understanding of effective technology integration and its application to impact student learning. Competency in technology integration can be built through professional learning emphasizing a technological approach to organizational management. These

skills help education leaders create the character of technology leadership (Ismail et al., 2021).

Research Question

      This research study was designed to answer the following question: How does professional learning around ISTE's Standards for Education Leaders impact education leaders' ability to lead effective technology integration? Effective was defined and measured in my study by ISTE Standards for Education Leaders.

Literature Synthesis

      I used an improvement science approach. Improvement science is a systematic approach to continuous improvement in complex organizations, guided by three foundational questions (Hinnant-Crawford, 2020):

1. What is the exact problem I am trying to solve?

2. What change might I introduce to solve it (and why)?

3. How will I know that change is an improvement?

Leveraging the improvement science approach, Langley et al. (2009) combined the three foundational questions of improvement science with the Plan-Do-Study-Act (PDSA) framework to establish a Model for Improvement. The PDSA cycle is described as an "efficient trial-and-learning methodology" (Langley et al., 2009, p. 153) in developing a theory, testing that theory, and then revising that theory based on the results of those tests. This methodological process is designed to build knowledge through iterative cycles and can be used in developing answers to each question in the improvement science approach.

This study leveraged the PDSA cycle to assess the effectiveness of how targeted professional learning opportunities for education leaders around ISTE's Standards for Education Leaders increase leadership of technology integration. Leaders who believe they can delegate the articulation of a vision for how technology can support their goals fundamentally misunderstand how technology can impact learning. Education leaders need to be active participants in developing an idea for how transformative learning is enabled through technology. A study by Yu and Prince (2016) suggested that education leaders should understand and deepen their character as technology leaders recommended by the ISTE Standards for Education Leaders. The nature of a technology leader is synonymous with leading in technology-proficient organizations.

Leadership of Technology Integration

Today schools should have a culture that reflects real life as perceived by students and their customers. Education leaders' ability to affect technology integration through leadership may be the most influential factor in the success of technology integration (Claro et al., 2017). Technology beliefs and the technology culture of education leaders can impact leadership of technology integration.

Technology beliefs of education leaders. ISTE (Crompton, 2018) identifies the education leader's ability to "inspire and lead the development of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization" (p. 1). Tietjen (2020) added that the education leader's ability to model leadership of technology integration is critical (p. 45). A strong expectation of technology integration increases results when a clear classroom

purpose is established. Sometimes there is a gap between the education leaders'

expectations and the teacher's pedagogical approach. Still, when the education leader is

intimately involved in leading technology integration, there is a greater alignment of the

technology vision between education leaders, teachers, and the impact on learning in the

classroom (Claro et al., 2017).

Education leaders' expectations for technology and their ability to cast a vision

have been identified as a gap for many in the role. In a qualitative study, education

leaders ranked visionary leadership as the issue they were least prepared to address

(Metcalf & LaFrance, 2013). Education leaders set expectations and hold teachers

accountable for following those expectations (Shapley et al., 2011). Suppose an education

leader needs strong self-efficacy beliefs about their ability to use technology. In that case,

it is much less likely they will drive the use and integration at their site, dramatically

affecting technology integration among their teachers and students.

Technology culture of education leaders. Education leaders are responsible for

establishing and maintaining a vision for technology in their schools. However, they are

also the primary leaders of school technology culture (Machado & Chung, 2015).

Technology integration culture is established through leadership and a demonstrated

commitment to those expectations and actions that align with the promise (Tietjen, 2020).

Anderson and Dexter (2005) noted that technology is constantly changing, making it

challenging for education leaders to stay current. However, professional learning to

address their lack of knowledge has shown positive results in addressing the issue (Stuart

et al., 2009).

Education leaders who successfully integrate technology in their schools also support teachers in making changes in classroom practice initiated by integrating technology (Berrett et al., 2012). When an education leader's actions supporting leadership of technology integration are visible, integration occurs faster (Tietjen, 2020). Education leaders can use the ISTE Standards in various ways for positive systems change at the building level. This can come from the collective use of the ISTE Standards for Education Leaders, Educators, and Students to ensure a sustainable systemic change consistent throughout the school. The ISTE Standards for Education Leaders provide concrete strategies that building leaders should pursue. Each of the five standards is followed by a list of indicators illustrating specific goals a leader should aspire to integrate and model. For example, for a school to progress, constant change is necessary. While all the Standards for Education Leaders guide growth, Indicator 2.a describes the crucial step of developing and adopting a shared vision by engaging stakeholders. Sustainable change requires the collaboratively created shared vision and progress toward a strategic plan where impact is measured and technology transforms learning.

Purchasing new technology that seems fun and promising, distributing it to educators, and hoping this will bring about positive change is a plan that rarely works because technology is only a tool. Technology purchases should be based on thoughtful reasoning and involve educators and other stakeholders in decision-making. District and school leaders can avoid such purchasing pitfalls by following the ISTE Standards for Education Leaders guidelines. These standards outline what leaders can do to bring positive change to the districts and buildings in which they serve. They are not intended

to evaluate leaders but to provide aspirational goals to set educators in the right direction. Education leaders can adopt these standards to guide teachers and support them in developing positive digital pedagogy. Technology can be challenging for some educators, and the standards provide guidance and help build their confidence with digital tools.

Schools can no longer be successful with education leaders serving only in managerial and administrative roles; instead, the job demands instructional and technology leaders (Zhong, 2017). Technology changes faster than most educators can keep up with (Fullan, 2013). Education leaders must become users of technology in new ways beyond the traditional managerial and administrative purposes and build a culture of technology use with a fundamental understanding of technology for teaching and learning (Moreira et al., 2019).

However, some education leaders are worried about the harmful effects of technology and screen use (Herold, 2020). By viewing this technological revolution as a transformation of leadership and pedagogy, education leaders are better suited to help our students succeed in the rapidly changing, technology-filled world (Sauers et al., 2014). Technology efforts are seriously threatened when education leaders are not technology leaders (Anderson & Dexter, 2005). Cummings (2012) recommended that education leaders do more work to understand and implement the ISTE Standards. Education leaders' technology beliefs and technology culture impact leadership of technology integration.

Professional Learning

Professional learning, explicitly learning to integrate technology, should encourage confidence and provide opportunities to add technology practices to pedagogy (Sheffield et al., 2018). Research recommends professional learning in leadership of technology integration skills to address these gaps and improve the preparedness of current education leaders (Wilkins, 2014). Technology integration professional learning should include increasing motivation and attitude, components of self-efficacy (Sheffield et al., 2018).

Professional Learning Communities (PLCs) encompass all three strategies that help overcome barriers to incorporating technology in schools. PLCs go a long way toward helping to facilitate and sustain technology integration (Tondeur et al., 2017). PLCs function to engage educators in purposeful reforms of the educational environment (Watson, 2014). Educational leaders lean on a PLC to create a new or improved pedagogical approach to teaching and learning. Educators need help with increasing expectations and mounting reform efforts, and schools crave a mechanism through which to work. Educational leaders frame PLCs as a bridge between current challenges and opportunities to build capacity for teacher professional learning (Beavers, 2001). PLCs focus on classroom strategies, are facilitated by their members, and are data-driven (DuFour & DuFour, 2013). For this study, a PLC is defined as a group of educators who collaboratively work together with a common purpose to reflect on the school's needs to support student learning. PLCs create an environment for educators to incorporate "shared values and vision; collective responsibility for pupils' learning; individual and

collective professional learning, trust, respect, and support" (Bolam et al., 2005, p. iii). The PLC construct aids an organization in changing macro (organization) and micro (strategy or method) levels (Bray, 2019).

Quality professional learning around technology integration is essential. Darling-Hammond et al. (2017) identified that the characteristics of effective professional learning include sustained professional education, a collaboration between participants, and content aligned to the need. The partnership consists of sharing best practices in learning communities to discuss and support each other is supported in many studies (Presby, 2017). Professional learning through sustained and explicitly planned events can positively impact professional isolation and provide exposure to a broader view of practice (Tietjen, 2020). Darling-Hammond et al. (2017) also identified professional learning events with sustained follow-up and support as the most effective system for creating change, warranting a more extended intervention with multiple professional learning events, additional coaching, and sustained follow-up. Guskey's (2002) model for planning effective professional learning begins with considering the participants' learning goals, identifying new practices to be implemented, identifying organizational support, identifying desired skills and outcomes for leaders, and selecting optimal professional learning activities.

Many school leaders lack the ability to successfully implement technology in their schools without adequate technology leadership preparation (McLeod et al., 2011; Redish & Chan, 2007). More than a decade ago, McLeod et al. (2011) identified that the time has come for school leadership to be prepared to lead future-ready citizens who are

technologically savvy. To this point, there are numerous policymakers assembling standards for students, teachers, and leaders at the national levels. Yet a limited number of institutions are focused on technology competency for educational leaders. ISTE is one of the institutions that have developed standards for educational leaders.

ISTE Standards have been used as a framework in several studies around technology integration, with some connection to leadership and professional learning. Garcia and Abrego (2014) determined that the ISTE standards are an instrument that can be used to measure leaders' perceptions of their technology skills. Brockmeier et al. (2005) indicated that school administrators were inefficient in educational technologies and in need of professional learning around the standards. According to Yu and Prince (2016), the ISTE Standards for Education Leaders may represent the common wisdom about what technology leadership means for leaders in the field. In this study, I continued the research around the leadership of technology integration using the ISTE Standards for Education Leaders as a framework.

School leaders who are proficient in implementing and leading technology integration are expected to encourage teachers to actively engage technology integration in their classrooms, supporting their learning and professional learning (Richardson, et al., 2012). School leaders should build a shared vision, inspire team learning, and encourage systems thinking as a daily routine (Dexter, 2011; Divaharan & Ping, 2010). School leaders seek strategic partnerships with external organizations to enhance a school's collective learning capacity. School leaders are expected to exercise digital

citizenship behaviors as they collaborate with a wide range of stakeholders outside of the classrooms and school walls (Brown & Jacobsen, 2016).

Figure 1

International Society for Technology in Education Standards for Education Leaders

Theoretical Framework

The ISTE Standards for Education Leaders are the professional standards establishing a framework for technology leadership. These standards were released in June 2018 and describe technology leadership qualities and indicators that support learning in the digital age and leading changes in the educational ecosystem (Crompton, 2018). The 2018 ISTE Standards for Education Leaders contain 22 indicators across five different standard themes. "These standards represent a significant shift from previous versions by rebranding them as standards for education leaders instead of administrators. These standards will help school, and district leaders scale transformative education practices and expand pockets of innovation across entire organizations" (Crompton, 2018, p. 3). The standards provide clarity for leadership of technology integration, and this clarity provides support for education leaders to scale and expand transformation efforts in their schools and districts. While the standards for leaders have existed in

various forms since 2001, I took a closer look, in this study, at how they are embraced and understood by leaders.

Prior to the deployment of the ISTE Standards for Education Leaders and the related ELTS utilized in this study, the most used instrument to measure technology leadership behaviors is the Principals Technology Leadership Assessment (PTLA) developed by the University Council for Educational Administration (UCEA). The PTLA assesses principals' technology leadership behaviors over the last year (UCEA, 2005) and is widely used (Esplin & Thurston, 2018; Melton, 2015). The PTLA uses the framework of the 2002 NETS-A and was developed by the Center for the Advanced Study of Technology Leadership in Education (CASTLE), the only center focused specifically on school administrators and technology. CASTLE developed the instrument to adapt ISTE's NETS-A as a mechanism to highlight principals' relative strengths and needs in technology leadership (UCEA, 2005). Melton (2015) noted that the PLTA only focuses on quantitative correlations and does not address why principals do or do not engage in technology leadership behaviors.

Conclusion

Education leaders have an opportunity to transform teaching and learning through their role as leaders of technology integration. As an organization, ISTE is supporting this step by providing the ISTE Standards for Students, Educators, and Education Leaders. Currently, education leaders need to prepare to meet the needs of students and educators in this technological transformation so that educators can provide students with the

opportunities they deserve to be prepared for their futures. In that case, education leaders

will need to embrace their role as technology leaders.

Chapter Two

Research Design

The problem of practice in this study is that school and district leaders lack awareness of the depth and complexity of the ISTE Standards for Education Leaders and how the implementation of the leader standards provides for students and teachers to learn relevant skills and strategies. In this study, I aim to provide targeted professional learning, as an intervention, around the ISTE Standards for Education Leaders to impact the leaders' understanding of effective technology integration and its application to impact student learning.

Improvement Science Approach

Improvement science is the application of small, measurable, and individualized changes to address specific issues in an educational setting and help uncover the root cause of problems. Improvement science is explicitly designed to accelerate learning-by-doing. It's a more user-centered and problem-centered approach to improving teaching and learning. As a problem-solving approach centered on inquiry and learning, change ideas are tested in rapid cycles, resulting in efficient and useful feedback to inform system improvements (REL West, 2017)

Relevance of Improvement Science to the Study

Improving instruction and student results eludes many educational systems, especially for historically marginalized populations. The education community is known for "going fast and learning slowly" (Bryk et al., 2015, p. 6). Improvement science provides a new direction by focusing on continuous improvement that involves

collaboration between researchers and education practitioners to develop solution-oriented approaches to specific problems and consistently testing these solutions across educational environments. Improvement science provides for changes with an embedded feedback loop so that education practitioners can adjust and improve their practices.

Improvement Science Impact and Role in the Study

Christie et al. (2017) defined improvement science as a data-driven change strategy that aims to design systematically, test, implement, and scale change toward systemic improvement. Subject matter experts become more user-centered regarding educational interventions to prevent solutions (Bryk et al., 2015). Improvement science is framed around three improvement questions: "What is the specific problem I am trying to solve? What change might I introduce and why? And how will I know whether the difference is an improvement?" (Bryk et al., 2015, p. 9). Focusing on these questions will lead to lasting and pervasive changes across the system. Improvement science also requires us to understand why the current system and practices are not working so they can provide the impetus for reform to achieve greater efficacy at scale (Bryk et al., 2015). A significant difference between experimental and improvement science is the use of variation to inform the redesign of the intervention and, eventually, the system (Lewis, 2015). In this study, I reflected on the systematic differences and research limits that can inform future studies in other districts or states.

These questions guide me to answer the research question of this study: How does professional learning around ISTE's Standards for Education Leaders impact education leaders' ability to lead technology integration? Bryk et al. (2015) remind us that we must

be able to see the system for meaningful progress to occur, which is often difficult for participants to do because of their personal experiences and beliefs. For this study, after initially assessing leaders' technology leadership behaviors utilizing the ELTS survey, I provided a self-paced Canvas course that aligns to the ISTE Standards for Education Leaders. After completing the self-paced professional learning course, I interviewed participants to collect qualitative feedback to provide context and rationale to future studies prior to asking leaders to complete the ELTS survey a second time.

Theory of Action

Within the improvement science framework, a theory of action creates a causal system that walks the researcher through the intended outcomes of the research. There are underlying assumptions on how participants will move through the study and how it will impact the organization they are working in (Bryk et al., 2015). In this study, participants in the professional learning course learned as students using the ISTE Standards for Students as shown in Figure 2. Students in the course were empowered learners who experienced digital citizenship to construct knowledge, design innovatively, think computationally, communicate creatively, and collaborate globally.

Asking leaders to participate as students helped leaders to lead as advocates of equity and citizenship, visionary planners, empowering leaders, systems designers, and connected learners so that the leaders can support teachers in becoming learners, leaders, citizens of a digital world, collaborators, designers, facilitators, and analysts. Leaders are supporting teachers through these lenses so that teachers can support K-12 students in

becoming empowered learners, digital citizens, knowledge constructors, innovative

designers, computational thinkers, creative communicators, and global collaborators.

Figure 2

Theory of Action
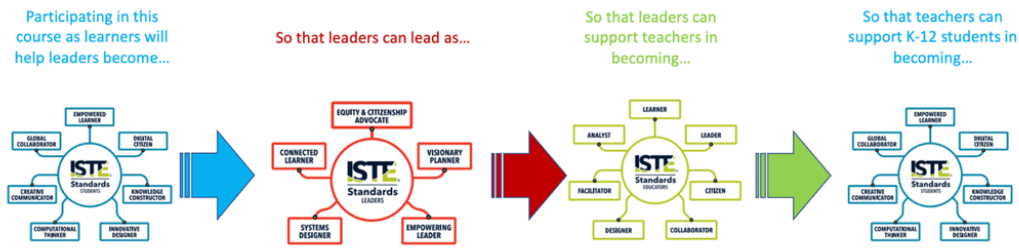
Plan-Do-Study-Act

The PDSA cycle repeats four steps (Bryk et al., 2015). These four steps, PDSA,

are: Plan – Change is defined, predictions are made, and a test to measure the change is

designed. Do – Change is carried out, and data is collected along with documentation of

how the changes were implemented. Study – Data is analyzed and compared to

predictions that will inform future cycles. Act – Decisions are informed with attention to

change for the future and related opportunities to scale (Bryk et al., 2015, p. 122).

In this study, I utilized the PDSA cycle to answer the research question by first

assessing the education leaders' technology leadership behaviors based on the 2018 ISTE

Standards for Education Leaders. Next, I provided professional learning around the 2018

ISTE Standards for Education Leaders and collected qualitative feedback from education

leaders to further develop the professional learning and capture additional thoughts

regarding leaders' obstacles to developing leadership of technology integration. Then, I

reassessed the education leaders' technology leadership behaviors.

Plan

During the Plan phase, I obtained permission from Schoenbart to use the ELTS

survey and created a Qualtrics version as a pre-and post-survey, as it does not currently

exist, and that tool is available to me as a Clemson student. I created a professional

learning course aligned with the ISTE Standards for Education Leaders using Canvas as a

Learning Management System to deliver the course to participants, including an

overview in Appendix C and an extended syllabus in Appendix D. After receiving IRB

approval (IRB2023-0442) from Clemson University, I moved to the Do phase.

Do

During the Do phase, I obtained a list of all employees identified as leaders within

both research sites. I then emailed all leaders within SHSD and HAPS identified as

district leadership (Appendix E). This group included school and district leaders. As

participants responded to my invitation to participate, I followed up with a welcome

email with a link to the ELTS pre-survey in Qualtrics (Appendix F). The welcome email

notified participants that they had a period of seven days to respond to the survey. Once

each participant completed the ELTS survey, I notified a Learning Technology Manager

at Clemson University, who added the participant to the Canvas course. Once I received

notification that the participant was added to the course, I followed up with an email to

the participant notifying them of a five-week window for participation (Appendix G).

The rationale for using Canvas is that teachers within SHSD were responsible for

providing lessons to students through Canvas. Using Canvas for leaders to learn content provided insight and awareness of the needs of teachers and students. The course contains seven modules: 1. Introduction to the ISTE Standards for Education Leaders, 2. Equity and Citizenship Advocate, 3. Visionary Planner, 4. Empowering Leader, 5. Systems Designer, 6. Connected Learner, and 7. Wrap-Up.

While the course was self-paced and participants had the ability to move through the course at their desired pace, the course is designed to allow one week for each of the five standards, and access is limited to five weeks. Once the participants completed the Canvas course, I sent an email to schedule an interview date and time (Appendix H). The email included a Zoom link. After the interview took place, the participant received an ELTS post-survey to capture changes in leadership of technology integration skills (Appendix I). The ELTS post-survey link was available for seven days. Participants received an email on day five of seven to remind them to complete the survey.

Study

In the Study phase, I analyzed the quantitative data below to determine the impact of professional learning around ISTE Standards for Education Leaders. I predicted that the professional learning provided would improve the ELTS survey scores from before to after. I analyzed the qualitative data to determine themes emerging from Principal Reflective Questions that provide opportunities to improve the professional learning course around ISTE Standards for Education Leaders.

Act

In the Act phase, feedback from education leaders, both qualitative and quantitative, informed improvements and changes to the professional learning course around ISTE Standards for Education Leaders. Specifically, based on the outcomes of this research, future studies could explore how school cultures influence educational change and adaptability, cultivating supportive environments for integrating new technologies into their curricula. I will share the study outcomes with leadership within state organizations and national levels within organizations such as ISTE to inform and engage leaders responsible for preparing school and district leaders. This study is also expected to influence and inform the ISTE Standards for Education Leaders professional learning available internationally through their website. At the local level, I will share the results of this study will be shared with district leaders with suggestions and evidence about how they can support district and school leaders to innovate and transform learning for students through leadership of technology integration.

Research Methods

In this improvement science study, I utilized a survey instrument and interviews to collect qualitative and quantitative data about education leaders' leadership of technology integration in two phases. Combined, these methods complemented each other to provide a complete understanding of the problem (Creswell & Clark, 2017). I collected quantitative data from education leader participants in phase one through the ELTS survey. According to Creswell (2003), the quantitative research methodology maintains that the research is independent of the researcher and the data is used to

objectively measure reality. In phase two, after participants completed the professional learning course around ISTE Standards for Education Leaders, I used semi-structured interviews to invite participants to explain their behaviors and motivations in more detail. Qualitative data benefits this study by providing detailed and thick descriptions and the ability to uncover meanings associated with people's beliefs, perceptions, or assumptions (Miles et al., 2020, p. 11).

Research Design Overview

This study identified the current self-reported technology leadership behaviors of education leaders in two public school districts, one in the Southeast and one in the Midwest. Technology leadership refers to education leader behaviors that support the effective integration of technology in schools and behaviors aligned with the 2018 ISTE Standards for Education Leaders (Schoenbart, 2019). I collected data using an online version of the ELTS, which assessed the 2018 ISTE Standards for Education leaders. After collecting quantitative data from participants, I collected interview data to gain additional perceptions in the qualitative form to inform the results and reflection of the study.

Research Site

The setting or site of a research study refers to the physical, social, or experimental context in which the research is conducted. The setting of this study included public school districts, one in the Southeast United States and one in the Midwest United States. One site was a suburban district, while the other was a rural district.

Site Selection

In this study, I focused on the education leaders of two school districts. Suburban Hill School District (SHSD) has nearly 17,000 Kindergarten to 12th-grade students (Name of State School Report Card, 2022). Haven Area Public Schools (HAPS) has almost 2,600 students in Kindergarten to 12th grade (Name of State School Report Card, 2023). The districts were selected for this study for multiple reasons. Both districts have had one-to-one devices since 2008 and mostly use the devices in place of pencil-and-paper or for accessing online learning software. Both districts are familiar and available to me as the researcher.

Participant Recruitment

I used a non-random, single-stage convenience sample as the design for this study. I chose convenience sampling because the education leader sample is easily accessible and readily available and limits the scope of possible participants from which to draw conclusions (Salkind, 2010). Convenience sampling can restrict the ability to generalize outcomes, and this limitation has been considered in this study. I invited 56 individuals in SHSD to participate; five participants responded to the initial invitation to participate. Of the five participants that initially responded, four took the pre-survey and three completed the course, interview and post-survey. I invited 17 individuals in HAPS to participate; nine participants responded to the initial invitation to participate. Of the nine participants who initially responded and took the presurvey, six completed the course, interview and postsurvey. Participation was entirely voluntary, and I advised education leaders that their participation in the study would not impact their employment

or evaluation. I provided professional learning around ISTE Standards for Education Leaders and then provided follow-up survey to gather the impact on leadership behaviors.

Data Collection Procedures

Instruments

       I used the ELTS developed by Schoenbart (2019) through doctoral research. The ELTS includes 45 survey items related to technology leadership. To determine the internal reliability of the ELTS, Schoenbart (2019) conducted Cronbach's alpha tests in SPSS for each of the five domains within the ISTE Standards for Education Leaders. Each standard demonstrated high levels of internal reliability (George & Mallery, 2021). This indicates that the survey items aligned to each ISTE Standards for Education Leaders effectively represented the general consistency of the responses within that standard. Based on these findings, the ELTS had high internal reliability and can be viewed as a reliable instrument for measuring technology leadership behaviors. This instrument measures the 2018 ISTE Standards for Education Leaders, establishes reliability, and requires minimal time for the administration. Schoenbart makes ELTS accessible for educational research. The ELTS is a 45-question survey using a five-point Likert scale to measure technology leadership behaviors (Schoenbart, 2019). The item responses are: 1 = not at all; 2 = minimally; 3 = somewhat; 4 = significantly; and 5 = fully (Schoenbart, 2019, p. 74). The instrument provides an overall technology leadership score and technology leadership score for each of the five standards identified in the ISTE Standards for Education Leaders (i.e., Standard 1: Equity and Citizenship

Advocate; Standard 2: Visionary Planner; Standard 3: Empowering Leader; Standard 4: Systems Designer; Standard 5: Connected Learner) (Schoenbart, 2019, p. 73).

To determine the extent of education leaders' technology leadership behaviors, Schoenbart (2019) created multiple indices to obtain individual measures of each technology leadership construct in the ELTS. A separate index was created for each ISTE Standard for Education Leaders and calculated based on all domains related to the specific standard. For these standard-specific indices, items related to education leaders' opportunities for technology leadership were not utilized because they did not represent actual technology leadership behaviors. Next, an index of all technology leadership items was created to obtain a single measure of the construct of technology leadership. This technology leadership index utilized all the data contributing to the individual standard indices. Finally, an opportunity index was created from the data of items 9, 20, 31, 39, and 45, representing the opportunity for technology leadership. In the initial study where the ELTS was created, education leaders reported having the opportunity for technology leadership behaviors at a higher level than when they acted as technology leaders.

Interviews

After participants completed the self-paced professional learning course, I invited each to participate in a semi-structured interview. In *Education Reimagined,* Crompton (2018) included reflective questions to provide a structure for education leaders to find themselves in the ISTE Standards for Education Leaders. I used the reflective questions provided to generate the interview questions in Appendix K. The interview questions were separated into three groups. The first group was reflective questions about why the

participant chose work in education leadership, how the leader views their role in the leadership of technology integration and particular strengths and challenges of supporting the leadership of technology integration in their school and district. The second part of the interview specifically asked for feedback on strengths and opportunities for improvement for the Canvas course provided. In the third section, I provided information from the pre-survey about the standard with the highest and lowest overall survey scores. I asked participants to reflect on how they feel those outcomes are evident from their individual perspectives. Participants completing interviews after professional learning provided feedback to me, the researcher, on areas of improvement in the course and guided the next steps in the PDSA cycle. After completing the professional learning course and the interview session, participants completed the ELTS survey, and I compared changes between the two surveys.

Data Analysis

The data analysis for this study included both quantitative and qualitative phases. According to Miles et al. (2020), mixed methods research is conducted to provide more analytical texture to work, combat the flaws of one methodology with the strengths of the other, or strengthen the findings when the results support or contradict each other.

Quantitative Data Analysis

I collected data via an online survey tool and entered the data in International Business Machines Statistical Package for Social Sciences (IBM SPSS) version 29 statistical analysis software. In the original creation of the ELTS survey, Schoenbart (2019) utilized Cronbach's alpha to determine the internal reliability of each section and

created an index for each ISTE for Leaders standard and an index that included all standards for overall technology leadership. Schoenbart used descriptive statistics and frequencies, including median, standard deviation, skewness, and kurtosis for each survey index. In presenting data consistently with the original researcher who created the ELTS survey, I created indices for overall technology leadership and each ISTE Education Leader Standard. I calculated descriptive statistics and frequencies for each relevant survey question, including median, standard deviation, skewness, and kurtosis.

Qualitative Data Analysis

With participants' permission, I recorded each interview, and transcriptions were created via Zoom to prepare for data analysis. I returned the interview transcripts to participants for member checking to ensure I accurately captured their thoughts and ideas. I used ATLAS.ti to summarize and code each interview. ATLAS.ti and its embedded OpenAI function provided a document group, which allowed me to summarize all interviews as one to find themes across all interviews. Coding and summarizing all interview data collected provided additional insight into the quantitative data collected (Creswell & Clark, 2017).

Positionality

I started teaching after a career as a financial auditor and systems analyst. Through these roles, I needed skills in technology software and hardware to be successful. I left corporate America and became a middle school teacher when my son was born because I wanted to ensure he had the best educational opportunities like I did when I was in school. When I started teaching middle school mathematics and science in

2004, I was one of the first classrooms in the district to receive a classroom cart of Mac laptops. A cohort of teachers received a two-week professional learning over the summer on how to use the laptops; then, they were delivered to our classrooms. Our district technology support department did not have extensive training on how to support these new devices, so as teachers in the classroom, we learned, through trial and error, how to integrate these devices into our learning environment.

In 2012, I became principal at an urban gifted magnet in Indianapolis, serving Grades 2-8. Immediately upon accepting the position, I requested iPads from the superintendent, who committed to providing opportunities for learning for our students. Since my school was the only one in the district with one-to-one devices, our technology department could not support our technical needs. Once again, I led our team in learning, through trial and error, how to effectively integrate these devices to impact learning for students. While in this role, our students grew to 100% passing on state assessments. I do not attribute our success solely to having access to devices. However, being able to directly engage each student in learning and differentiating assessment greatly impacted our ability to meet each student's needs.

In these roles, I learned firsthand why technology skills were important as students grew from K-12 to the workplace. And, in these roles, the district did not have the resources to support technology integration. I provided professional learning to teachers, students, and parents as a leader of technology integration. This study matters to me because effectively leading technology integration provides skills and experiences for students that they will use for a lifetime. In many situations, students are coming to

school with technology experience far surpassing what teachers and leaders have or are comfortable facilitating. Rather than being anxious about students' skills and abilities, we should be harnessing their creativity to empower a lifelong learning mentality. By leading effective technology integration, these changes can be integrated into our schools for the benefit of students.

Threats to Validity

I have worked as a teacher, education leader, executive director of technology, and director of educational systems within school districts. My own bias poses a threat to the validity of this study. The ability to generalize the results of this study to other situations, people, and settings require high external validity. There are two main types of external validity: To ensure that the data collected in this study was not impacted by bias, I followed an interview protocol, asking the same questions for each participant. Member checking provided participants the opportunity to review their interview transcript. I digitally recorded each interview through Zoom so that Zoom would provide a transcript for each interview. I mitigated potential bias in data analysis by ensuring I had a diversified data set that represented a broad range of individuals in the sample.

Limitations of the Study

This study collected data from one school district in the Southeast and one school district in the Midwest. The chosen district in the Southeast is in a suburban area, and data collected from this study may not represent leaders in districts that may be more rural or more urban. The district in the Midwest represents a rural district with an enrollment close to one-seventh the size of the district in the Southeast. Data collected

from the district in the Midwest may not represent a district that may be more suburban or a district with a larger enrollment.

Other limitations within the study may include the leaders' knowledge of standards before participation in the study. For example, one participant was unaware that the ISTE Standards for Education Leaders existed. Their potential impact on learning may not be representative of other individuals who have more exposure and familiarity with the standards.

The course was designed to be easily navigated whether the participant has familiarity with Canvas as a Learning Management System and required the participant to navigate through the standards sequentially. Feedback gained during the qualitative interviews with participants highlighted comfort with Canvas as an area of concern because participants wanted to return to a skill, standard, or activity to reflect and did not have access to go backward through the modules.

Time required by participants to fully experience the course was also noted as a limitation in the study results. I initially estimated about 10 hours for participants to complete the PreSurvey, course materials, interview and PostSurvey. Participants felt that this was not sufficient time to fully engage with the course materials. Participants felt that the total time commitment was close to 20 hours for all research activities. This time commitment contributed to a few participants initially volunteering to participate then not being able to complete all required activities related to research.

Implications for Research, Policy, and Practice

This study has implications for further research, opportunities to inform policy, and guidance to inform practice. As a result of this study, there are implications for further research. For example, further research may be conducted on the effectiveness of professional learning strategies that can help improve leadership of technology integration skills, such as studying the impact of peer-to-peer coaching versus personalized training programs tailored specifically toward leaders' needs. Policy implications that can be derived from the outcomes of this study include leading policymakers to allocate sufficient funding to provide ongoing professional learning for leaders and supporting updating common standards for leadership of technology integration that model and set expectations for technology-infused practices across educational leadership preparation programs. This study provides guidance to inform practice by supporting the needs of educational leaders through change leadership practices and providing support for assessing the efficacy of training programs around technology integration.

<div align="center">

Conclusion

</div>

In this chapter, I describe the research design and methods that were used in this study. The improvement science approach is intended to provide a more thorough understanding of the education leaders' role in leadership of technology integration and the role professional learning can play. The quantitative phase utilized the ELTS survey, a tool Schoenbart created in 2019 based on the 2018 ISTE Standards for Education Leaders. The qualitative phase included semi-structured interviews with participants. The

combination of qualitative and quantitative data collection created a practical

methodology for addressing gaps in the research on technology leadership.

Chapter Three

Data Analysis and Results

In this study, I aimed to investigate the implementation of targeted professional learning around the ISTE Standards for Education Leaders as an intervention to impact leadership of technology integration. There has been little research on leadership of technology integration (McLeod et al., 2011). In the first phase of this improvement science study, I used the ELTS to survey the self-assessed skills around the leadership of technology integration. Next, I provided a self-paced Canvas course that provided professional learning around the ISTE Standards for Education Leaders. Then, I conducted interviews with each participant to gather feedback on the course. Finally, I provided a post-survey of the ELTS.

In this chapter, I present the findings of this improvement cycle, answering the question: How does professional learning around ISTE's Standards for Education Leaders impact education leaders' ability to lead effective technology integration? In the previous chapter, I reviewed the research methodology providing details for both the quantitative and qualitative phases of the study. In this chapter, I summarize the findings aligned to the research question.

Summary of Setting and Data Collection Procedures

I invited all administrators within two school districts to participate in this study. I sent potential participants an e-mail, which included an introduction to the study. Once participants indicated their participation, I followed up with an email that included a link to the pre-survey in Qualtrics. There were 73 potential participants, 12 completed the

presurvey, and nine completed the course, follow-up interview and postsurvey. The total population (N=73) includes all administrators in the two districts, the sample size (n=12) reflects 16.4% of the population. The nine participants who completed the research through the post-survey reflect 12.3% of the population. Peng et al. (2006) noted that response rates under 10 percent are typical in educational research. Wright (2015) notes that response rates as low as 10 percent can be highly accurate. All 12 respondents completed 100% of the pre-survey and were provided with access to the Canvas course. Nine of the 12 participants logged into the Canvas course. After completing the Canvas course, all nine participants completed the interview and post-survey.

Table 1

Participants Completing the PreSurvey

	District Leader	*School Leader*	*Total*
SHSD	2	2	4
HAPS	3	5	8

Table 2

Participants Completing all Research Activities

	District Leader	*School Leader*	*Total*
SHSD	2	1	3
HAPS	2	4	6

Findings

I analyzed the data for this improvement science study using quantitative and qualitative methods. Quantitatively, the original researcher of the ELTS utilized

descriptive statistics and conducted tests for internal reliability to establish Cronbach's alphas, which I completed as part of my study. The original researcher conducted analyses of variances (ANOVAs) to examine differences in the perceived technological leadership practices of different demographic groups, including both principal and school demographics. I did not consider demographic implications in this study. Qualitatively, I recorded the interviews via Zoom and used its transcription feature. I used ATLAS.ti to code the interviews and to identify and analyze themes related to the research question.

ELTS participants

The ELTS included 45 survey items related to the leadership of technology integration and five demographic items. The demographic items related to the participants' number of years in education, number of years as a school principal, number of years since they worked as a classroom teacher, number of students enrolled in their school, and the extent to which the school has access to technology. Thirteen leaders completed the ELTS presurvey and nine completed the ELTS post-survey.

To determine the internal reliability of the ELTS, I conducted Cronbach's alpha tests in SPSS for all domains related to each of the five ISTE Standards for Education Leaders. The five ISTE Standards for Education Leaders are 1. equity and citizenship advocate, 2. Visionary planner, 3. empowering leader, 4. systems designer, and 5. connected learner (Crompton, 2018). The ELTS, initially created by Schoenbart (2019) deconstructed the 22 indicators within the five standards into 45 survey items. Cronbach's alpha measures the internal consistency and reliability of all variables that

make up the scale to ensure they are measuring the same thing (Muijs, 2022). The results

are five different measures of internal reliability as shown in Table 3 below.

Table 3

Internal Reliability Scale of the ELTS, Original Research compared to This Study

ISTE for Education Leaders Standard	ELTS Items	Cronbach's Alpha – Original Research	Internal Reliability	Cronbach's Alpha – This study	Internal Reliability
Standard 1: Equity and Citizenship Advocate	1-8	0.83	Good	0.74	Acceptable
Standard 2: Visionary Planner	10-19	0.93	Excellent	0.96	Excellent
Standard 3: Empowering Leader	21-30	0.84	Good	0.81	Good
Standard 4: Systems Designer	32-38	0.92	Excellent	0.90	Excellent
Standard 5: Connected Learner	40-44	0.84	Good	0.86	Good

In the original research, each of the ISTE Standards for Education Leaders

showed "good" (>0.8) or "excellent" (>0.9) levels of internal reliability (George &

Mallery, 2021). In this study, Standard 1 showed "acceptable" (>0.7) levels of internal

reliability. Items 9, 20, 31, 39, and 45 were not included in the analysis of internal

reliability because they represent the opportunity for leadership of technology integration

behaviors rather than the actual behaviors themselves. The ELTS had a high degree of

internal reliability based on these findings and can be viewed as a reliable instrument for

measuring leadership of technology integration behaviors.

I created multiple indices to obtain individual measures of leadership of

technology integration based on survey results in ELTS. Using the original researcher's

data analysis as a starting point, I created a separate index for each ISTE Standard for Education Leaders, an Opportunity Index (with items 9, 20, 31, 39, and 45), and a Technology Leadership Index with all 45 items in the survey. Descriptive statistics for these indices are presented in Table 4. Standard deviation, skewness, and kurtosis all fell within acceptable ranges (Pallant, 2020).

Table 4

Descriptive Statistics of ELTS Leadership of Technology Integration Indices – PreSurvey

			Skewness		Kurtosis	
Index	*Median*	*SD*	*Statistic*	*SE*	*Statistic*	*SE*
Leadership Index	3.02	0.61	-0.47	0.62	0.39	1.19
Standard 1 Index	3.63	0.61	-0.35	0.62	1.02	1.19
Standard 2 Index	2.60	0.89	0.80	0.62	0.42	1.19
Standard 3 Index	3.00	0.52	-1.38	0.62	2.66	1.19
Standard 4 Index	3.14	0.92	0.16	0.62	-0.61	1.19
Standard 5 Index	3.20	0.78	-0.11	0.62	-1.71	1.19
Opportunity Index	3.00	0.76	-0.40	0.62	0.83	1.19

Note. N = 12

In the presurvey data, the respective leadership of technology integration indices ranges from median values of 2.60 for Standard 2 to 3.63 for Standard 1, falling between the value of *somewhat* and *significantly* on the ELTS. These ranges indicate that leaders across both districts feel as though they have acted as leaders of technology integration in many respects. Participants reported the highest self-reported behaviors in ISTE Standards for Leaders Standard 1: Equity and Citizenship Advocate, with a median value of 3.63, nearing the *significantly* descriptor. This standard describes Leaders of Technology Integration who use technology to increase equity, inclusion and digital citizenship practices. Standard 2 had the lowest median value of 2.60. Standard 2: Visionary Planner describes Leaders of Technology Integration who engage others in

establishing a vision, strategic plan, and ongoing evaluation cycle for transforming learning with technology.

Overall, in the presurvey data, leaders reported having the opportunity for leadership of technology integration at a higher level than they actually acted as leaders of technology integration as it relates to Standard 5. Table 3 compares the standard-specific indices with the median values for each standard's opportunity question. For example, the Standard 1 index median value was 3.63 and the median value for the ELTS' question 9, "Overall, to what extent did you have the opportunity to use technology to use technology to increase equity, inclusion, and digital citizenship practices?" was a 3.0. Table 3 illustrates the contrast in actual leadership of technology integration behaviors and the opportunity for these behaviors for each standard. Respondents reported having more opportunities to act as technology leaders in standard 5. They reported having greater leadership of technology integration behaviors in standards 1-4 than their perceived opportunity for the same behaviors.

Table 5

Comparing Median Values of Leadership of Technology Integration and Related Opportunity – PreSurvey

ISTE Standard for Education Leaders	*Index*	*Opportunity*
Standard 1 Index	3.63	3.00
Standard 2 Index	2.60	2.00
Standard 3 Index	3.00	3.00
Standard 4 Index	3.14	3.00
Standard 5 Index	3.20	4.00

After participants completed the presurvey, course, and interview, they took the

ELTS postsurvey. Data collected during the post-survey is in Table 4. I calculated

descriptive statistics for the post-survey data, similar to the pre-survey data in Table 2.

The respective leadership of technology integration indices range from median values of

3.57 to 4.00, falling between the value of *somewhat* and *significantly* on the ELTS.

Respondents reported the highest self-reported behavior in ISTE Standard 2: Visionary

Planner, nearing the *significantly* descriptor. This standard describes leaders engaging

others in establishing a vision, strategic plan and ongoing evaluation cycle for

transforming learning with technology. In the post-survey data, Standard 4 had the lowest

median value of 3.57. Standard 4: Systems Designer describes leaders building teams and

systems to implement, sustain and continually improve the use of technology to support

learning.

Table 6

Descriptive Statistics of ELTS Leadership of Technology Integration Indices –
PostSurvey

			Skewness		Kurtosis	
Index	*Median*	*SD*	*Statistic*	*SE*	*Statistic*	*SE*
Leadership Index	3.78	0.52	-0.44	0.91	-0.69	2.00
Standard 1 Index	3.88	0.30	0.61	0.91	-0.95	2.00
Standard 2 Index	3.90	0.71	-1.66	0.91	2.61	2.00
Standard 3 Index	3.70	0.38	-0.33	0.91	-0.31	2.00
Standard 4 Index	3.57	0.85	-0.93	0.91	0.66	2.00
Standard 5 Index	3.60	0.43	0.91	0.91	-0.74	2.00
Opportunity Index	4.00	0.80	-0.59	0.91	1.40	2.00

Note. N = 9

Overall, in the post-survey data, leaders overwhelmingly reported having the

opportunity for leadership of technology integration at a higher level than they actually

acted as leaders of technology integration across all standards. Table 5 compares the standard-specific indices with the median values for each standard's opportunity question. For example, the Standard 1 index median value was 3.88 and the median value for the ELTS' question 9, "Overall, to what extent did you have the opportunity to use technology to use technology to increase equity, inclusion, and digital citizenship practices?" was a 4.0. Table 5 illustrates the contrast in actual leadership of technology integration behaviors and the opportunity for these behaviors for each standard. Respondents reported having more opportunities to act as technology leaders across all standards.

Table 7

Comparing Median Values of Leadership of Technology Integration and Related Opportunity – PostSurvey

ISTE Standard for Education Leaders	*Index*	*Opportunity*
Standard 1 Index	3.88	4.00
Standard 2 Index	3.90	4.00
Standard 3 Index	3.70	4.00
Standard 4 Index	3.57	4.00
Standard 5 Index	3.60	4.00

Comparing the pre-survey data to the post-survey data, Table 6 shows the increase in the median for each of the Standard indices, the Opportunity index and the Leadership Index. The greatest change from the pre-survey to the post-survey was Standard 2: Visionary Planner increasing from 2.60 on the pre-survey to 3.90 on the post-survey. The smallest change from the pre-survey to the post-survey was Standard 1:

Equity and Citizenship Advocate, growing from 3.63 on the pre-survey to 3.88 on the

post-survey.

Table 8

Comparing Median Values of Leadership of Technology Integration from PreSurvey to PostSurvey

ISTE Standard for Education Leaders	*PreSurvey*	*PostSurvey*	*Change*
Leadership Index	3.02	3.78	0.76
Standard 1 Index	3.63	3.88	0.25
Standard 2 Index	2.60	3.90	1.30
Standard 3 Index	3.00	3.70	0.70
Standard 4 Index	3.14	3.57	0.43
Standard 5 Index	3.20	3.60	0.40
Opportunity Index	3.00	4.00	1.00

Qualitative Data Findings

The interview of each participant was separated into three sections. Section 1

asked four questions of an introductive nature, such as:

1. *Educators pursue leadership positions for many different reasons and have a*

    wide range of experiences. What inspired you to become a school leader?

Across participants, a few themes emerged. Participants became school leaders

because they had a mentor in their life that inspired them to take on the role. Leaders

mentioned they saw the role to have a greater impact on a larger number of students. A

few participants were inspired by their parents who had similar roles in their careers.

For example, Participant 2 said, "I have always had mentors in my life. My father

was an administrator, and then I had a principal who saw something in me. That has

always been very impactful." Participant 3 said, "Truthfully, it was because somebody

said to me, I think you would be really good at this. I think you should give it a shot so that you can impact more than the 30 students in your classroom."

These responses resonated with me because I have had similar experiences where someone saw something in me and encouraged me to take the next step. This encouragement sends an overall message to current administrators to bring along other leaders into this work.

2. *How do you view the leader's role in leadership of technology integration?*

Participants had varied responses to this question. One leader emphatically felt the leader's role is crucial to establishing a vision, identifying the right people and empowering them to push the work forward. Another participant felt their role in leadership of technology integration was important and noted that typically decisions about technology integration are made without much input from teachers.

Participant 2 said, "So I believe that a leader's role in all areas is critical to establishing the vision, identifying people to help move that vision and the work related to the vision forward." Participant 6 had a different view and said, "When you look at the ISTE Standards, we have to ask ourselves, what is it that we want technology to mean for our students? What do we want technology to mean for our teachers? What do we want technology to be for leaders?"

Participant 1 elaborated more on this question, "I think every leader has different skill sets. I think there are some leaders who are exceptional with technology, and I'm always a little jealous of them because I'm not. I know my way around. I don't know all

the tips and tricks. I think it speaks to our competency when you're able to use technology efficiently and effectively."

This question and its related responses provided much insight to me as some responses aligned with the role of a leader. At the same time, for some, they felt that technology was more like one more thing for them, and I appreciated the balance in participant responses.

3. *How confident are you in leading technology integration in your school or district?*

Overwhelmingly, the participants felt confident in the importance of leading technology integration and communicated a high level of will to do the work. A few participants highlighted their desire to improve their personal technology skills so they felt comfortable leading by example.

Participant 4 felt, "I'd say that's a good question. I will say that I am confident as long as I'm able to familiarize myself with what type of technology it is. I am a problem solver, and I like to try things on, get hands-on and experience it for myself." Participant 2 shared, "I feel like I have a high level of will but not necessarily a high level of skill. I was in a meeting recently when a teacher was easily able to pull discipline data with one of the tools that we have access to. I immediately asked her, 'How'd you do that?' But I have a really high desire to get better. I don't know that I have the confidence to say where our competencies lie and this is how I am going to lead us to be better at it."

The participant reflection in this question was very powerful as leaders seem to know themselves, their skills, their abilities and their gaps. And, overwhelmingly,

participants wanted to know more, learn more, and lead more for their teachers, staff, and students.

4. *What challenges do you see to leading technology integration in your school or district?*

Participants shared challenges such as the consistency of use and ensuring that all students were benefiting from the use of technology. Participants felt that technology tools can level the playing field for students and provide access to information. Participant 4 highlighted that leadership of technology integration required adults to break old habits and required extensive professional learning.

Participant 5 stood out in this response. She said quickly, "Old habits. Typically, we have people not wanting to change as fast. Another barrier is exposure to what technology is capable of. We have several staff that hadn't participated in professional learning over the last several years, so when we were recently required to rely more consistently on technology to provide learning, it cause discomfort for a lot of our people."

I appreciated the transparency of this response. And as many educators are asking when will we return to normal, it is important to reflect that many educators hope this integration of technology is the new normal.

In section two, I asked participants about the Canvas course, specifically in what ways the course added to their understanding of the ISTE Standards for Education Leaders and suggestions they had for improving the course. Participants had positive feedback such as:

Participant 7 said, "Working through the Canvas course has made me reflect on my own practice right now and how I can better serve my teachers in the Virtual Academy. We have a state provided profile of a graduate that should be driving our work, but many of the jobs that we are preparing students for don't exist yet." Participant 5 found the course very interesting. She said, "As I navigated through the course, I was very reflective and thought, 'wow, I hadn't thought about that as a component to technology'. I really like the visuals and the layout was very easy to navigate."

Likewise, participants provided feedback on how the course could be improved for future participants. For example:

Participant 5 said, "I don't know if this is a user issue or not, but I tried to access the course on three different devices before I was able to be successful. It didn't stop me from moving forward but I had to restart a few times." Participant 6 shared her frustrations, "I am going to be as professional as possible. I wasn't sure where to click to navigate back to certain sections. We scaffold learning for students and I feel we could had more scaffolding embedded in the course."

Overall, I greatly appreciated the transparency of participants. Throughout the course development process, I intended to develop a course that was accessible whether or not participants had knowledge or experience with Canvas so I tried to keep navigation very simple. I think the simplicity added to the confusion.

In section three of the interview, I shared the ISTE Standard with the highest median (Standard 1) and the ISTE Standard whose median was the lowest (Standard 2). The highest median related to Standard 1: Equity and Citizenship Advocate. Leaders

were reminded that the standards require *Leaders to use technology to increase equity, inclusion and digital citizenship practices.*

Participant 2 felt passionate, I think leading as an Equity and Citizenship advocate is extremely important. And those considerations drive all our goal setting and strategic planning on some level. I feel very confident in moving teams and processes through a continuous improvement lens. But I have identified through this experience that I need a deeper understanding of the technology integration opportunity to support and lead that work in our district.

Participant 6 had more personal experience and shared, We had a lot of resources in my previous district and worked intentionally on providing digital citizenship lessons and support to students. We continued to be reflective and ask good questions. 'Are we doing a good job of teaching our kids how to utilize the tools appropriately? Are we teaching our kids to be adapatable? Are we teaching them how to use their personal communication devices appropriately?

Participants were very reflective about what it meant to be an advocate of equity and citizenship and brought many ideas on how this standard contributed to the overall environment of their buildings and district.

Standard 2 had the lowest median across all participants. Visionary Planners require leaders to engage others in establishing a vision, strategic plan and ongoing evaluation cycle for transforming learning with technology. When asked to reflect on the challenges of acting as a Visionary Planner, participants shared the following:

Participant 3 added, "In the area of being a visionary leader, we need to be able to have the conversations and build the strategic plan. It is similar to how we move forward with the academic needs of students. We need to evaluate what is working and what needs to be improved and then create the plan to move the work forward." Participant 6 said, "We have to begin with the end in mind. And have an understanding and each group of leaders that we support. But we need to have some sort of idea of what the puzzle will look like when it is put together."

In creating visionary plans for schools and districts, leaders felt that exposure to what is available in regards to technology, experiences with using the tools and seeing what is possible would add to their ability to lead the work at high levels and support their teams.

Study Findings

Professional learning around ISTE's Standards for Education Leaders impacts school and district leaders' ability to lead effective technology integration in several ways. Primarily, the findings of this study are centered around three topics: Awareness of ISTE Standards of Education Leaders, Increasing leaders' self-reported visionary leadership, and Facilitating leaders' practices of reflection around learning through the lens of students, teachers, and leaders.

Awareness of Standards

Participants of this study reported that the professional learning helped them develop and increase their awareness of ISTE Standards for Education Leaders. Leaders provided feedback through interviews citing that the course helped them to either become

aware of the standards or increase their understanding of the standards. Leaders also cited that some of the video vignettes provided in the course offered examples of what students and teachers can create with access to technology resources in their schools and classrooms.

Increasing Leaders' Self-Reported Visionary Leadership

As evidenced by quantitative data collected during the PostSurvey, leaders reported increasing visionary leadership, increasing from a 2.60 median score to a 3.90 median score. Leaders increased in their capacity as visionary leaders through tools in the course that they could immediately use in their day-to-day roles as leaders in their schools and districts.

Facilitating Leaders' Practices of Reflection

Activities provided in the course asked leaders to reflect on each standard through the lens of a school or district leader and look for application of each individual strategy as it relates to his or her work as a school or district leaders. Leaders also provided feedback on ways to improve the course, think of practical application of leader standards and how their skills and abilities as a leader would benefit from the content in the course.

<div align="center">

Conclusion

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The purpose of this study was to investigate the implementation of targeted professional learning around the ISTE Standards for Education Leaders as an intervention to impact leadership of technology integration. This chapter presented findings and data analysis for this study. This improvement science study addressed the research question:

How does professional learning around ISTE's Standards for Education Leaders impact education leaders' ability to lead effective technology integration?

Chapter Four

Summary and Discussion

This chapter is a concluding discussion of my research around leadership of technology integration. According to Sincar (2013), "The level of technology leadership highly reflects the quality of leadership in school, and being good at technology leadership is associated with high-quality school leadership" (p. 1273). While both school districts that participated in this research study have had one-to-one devices for students for over 10 years, the equitable availability of technology for students and teachers has not provided the necessary professional learning to support the leadership of technology integration in either district. The problem I sought to address was that school and district leaders lack awareness of the depth and complexity of the ISTE Standards for Education Leaders, and implementing the leader standards allows students and teachers to learn relevant skills and strategies. As a result of professional learning provided to school and district leaders, leaders are developing and increasing their awareness of the ISTE Standards for Education Leaders, increasing their self-reported visionary leadership, and facilitating leader practices of reflection around learning through the lens of students, teachers, and leaders.

Interpretation of the Findings

Professional learning around the ISTE Standards for Education Leaders impacts leaders' ability to lead technology integration in three significant ways. First, leaders are developing and increasing their awareness of the ISTE Standards for Education Leaders. In this study, leaders provided qualitative feedback through interviews, citing that the

course helped them become aware of the standards or increase their understanding of them. Leaders also cited that course content provided examples of what students and teachers can create with access to technology resources in their schools and classrooms.

Leaders' self-reported visionary leadership of technology integration increased as a result of the professional learning through this study. Leaders increased their capacity through exposure and guided practice with tools they can immediately use in their day-to-day roles as leaders in their schools and districts.

Professional learning provided in this study also facilitated leaders' practices of reflection around learning through the lens of students, teachers, and leaders. Activities provided in the course asked leaders to reflect on each standard through the lens of a school or district leader. Leaders also provided feedback on ways to improve the course, thinking of practical application of leader standards and how their skills and abilities as a leader would benefit from the content in the course.

Through this professional learning, education leaders better understand the theory of action whereby participating in the professional learning course as learners will help leaders understand the ISTE Standards for Students so that leaders can lead in support of ISTE Standards for Leaders so that leaders can support teachers in embracing the ISTE Standards for Educators so that teachers can support K-12 students in thriving through the ISTE Standards for Students. Education leaders are provided the tools and resources to monitor their self-assessed leadership of technology integration to self-monitor their improvement in each area of the ISTE Standards for Education Leaders.

Sincar (2013) states that the level of technology integration directly relates to high-quality school leadership. The consistent increases across each of the five standards, the Leadership Index and the Opportunity Index indicate increased self-efficacy. As evidenced by the data presented in Chapter 3, the professional learning course positively impacted the leadership of technology integration as measured by the ELTS survey.

Implications

Students in the K-12 education system are growing up in a world full of innovative technology. As technology becomes a necessary part of our society, students deserve visionary leadership around technology integration that supports their learning. As evidenced here, leadership of technology integration requires that education leaders understand and embrace the ISTE Standards for Education Leaders along with the relevant professional learning. With this information, there are implications for practice, research, and policy.

Implications for Practice

Leaders are essential in creating the conditions in schools and districts that promote quality instruction and student learning (Mavrogordato et al., 2018). Creating these conditions requires support, mentorship, and training. Leaders need professional learning around the ISTE Standards for Education Leaders to fulfill their role in their school and district. Leader preparation programs need to prioritize leadership of technology integration as part of their programs.

School and District Priorities

Leaders quickly find out that many of the skills and abilities they need to be successful are not taught in leader preparation programs. School districts need to ensure that leaders have access to high-quality professional learning that supports students, educators, and leaders embracing technology integration. By providing high-quality professional learning to leaders, we can ensure that they are supported to realize the power of technology for students and teacher. According to Schoenbart (2019), "For schools to realize the power of technology for students and in the classroom, principals must be better prepared and supported" (p. 150). This connection grounds my theory of action in this study. Professional learning around the ISTE Standards for Education Leaders as a student, ensures leaders can lead so that students and educators can engage and embrace new technology to provide relevant skills and strategies.

Self-efficacy and Collective Efficacy

Leadership of technology integration was captured in this study based on self-reported data which means that the data is subjective to the self-efficacy of leaders that participated in the study. Further consideration should be given to how leaders' self-efficacy and the collective efficacy of leadership teams impacts leadership of technology integration. As a district leader, it is important that I am aware of the school and district leaders' comfort and ability to lead technology as I develop professional learning plans.

Implications for Research

School and district self-efficacy was also an implication for research so I understand how to assess and continually improve self-efficacy of school and district

leaders. In addition, to date, research has provided evidence that the ELTS is a valid and reliable instrument to self-assess participant skills around leadership of technology integration. In the original research (Schoenbart, 2019) and here, the sample sizes of both studies were relatively small and geographically regional in nature. Future research is suggested across a more diverse geographical area.

Furthermore, the professional learning provided here was limited to a self-paced Canvas course. Additional research is suggested to further participant suggestions where participants are provided an opportunity to collaborate around the standards. Participants should be provided with personalized learning based on their presurvey data to determine if personalized learning provides a greater impact to the self-assessed leadership of technology integration and guidance on how to create a PLC related to this topic.

Participants in this study provided valuable feedback on the course design and suggested that the professional learning be embedded with opportunities to practice the technical skills presented to retain the additional learning and practice with educators and students. As a result, I will make suggested course modifications so that future participants have the opportunity to learn collaboratively, have access to a preassessment to guide their learning, and provide navigation support to allow participants to navigate to other areas of the course for additional learning.

Implications for Policy

As a beginning teacher in 2004, I had access to a class set of devices for students. Almost 20 years later, putting devices in the hands of students has not been fully embraced as an essential expectation across schools and districts. Students are required to

use devices after high school graduation whether they matriculate to college, career or military. Those in charge of education policy should assist with this slow transition and provide for equitable access to devices, related access to the internet, whether at school or at home, and professional learning that supports the technology integration from student to educator to education leader. Support of policy should include the requirement of already allocated funds to be directed to the equitable purchase of personal devices and classroom equipment that provides engaging learning spaces for students.

Policymakers should set standard expectations for leadership of technology integration and provide the necessary related funding for appropriate professional learning for leaders and educators to guarantee that students have equitable opportunities to learn as empowered learners, digital citizens, knowledge constructors, innovative designers, computational thinkers, creative communicators and global collaborators. Likewise, educators should be supported with the necessary resources to be learners, leaders, citizens, collaborators, designers, facilitators, and analysts in the educational environment. Leaders, then, would be expected to model as equity and citizenship advocates visionary planners, empowering leaders, systems designers, and connected learners.

Conclusion

The problem of practice in this study focused on school and district leaders' lack of awareness of the depth and complexity of the ISTE Standards for Education Leaders and how the implementation of the leader standards provides for students and teachers to learn relevant skills and strategies. By using the ELTS to self-assess leaders' knowledge

of ISTE Standards for Education Leaders and providing the related professional learning around the ISTE Standards for Education Leaders, participants have gained leadership of technology integration through the lens of students and educators as evidenced by the PostSurvey.

In this study, I found that professional learning around the ISTE Standards for Education Leaders impacts school and district leaders' ability to lead effective technology integration in three ways: by developing and increasing awareness of the ISTE Standards for Education Leaders, increasing leaders' self-reported visionary leadership, and facilitating leaders' practices of reflection around learning through the lens of students, teachers, and leaders. The leadership of technology integration continues to be an area of challenge for leaders and districts, yet the ecosystem of technology that students will need to be successful in their lifetime is not growing smaller. We owe it to students to provide access and encouragement in the appropriate use of technology, and that change starts with us, as leaders.

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APPENDICES

Appendix A

ISTE Standards for Education Leaders

Standard 1: *Equity and Citizenship Advocate*. Leaders use technology to increase

equity, inclusion, and digital citizenship practices. Education leaders:

a. Ensure all students have skilled teachers who actively use technology to meet

    student learning needs[1].

b. Ensure all students have access to the technology[2] and connectivity necessary to

    participate in authentic and engaging learning opportunities[3].

c. Model[4] digital citizenship by critically evaluating online resources[5], engaging in

    civil discourse online and using digital tools to contribute to positive social

    change[6].

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[1] Ensure all students have skilled teachers. For example, hiring for or building the quality and skill level of educators to effectively use technology through professional development and support; closing digital usage and access gaps.

[2] Ensure all students have access. Lead and advocate for equitable and sufficient access; for example, to make devices, bandwidth and online resources available to all students at school, home or public areas through policies, funding, partnerships and collaborations.

[3] Authentic and engaging learning opportunities. Learning made possible or improved by the use of technology, digital tools and digital resources; for example, by increasing personalization and differentiation, participating in real-time and asynchronous virtual collaboration, and accessing experts and real-world data.

[4] Model. Intentionally adopt and demonstrate best practices to lead and teach others.

[5] Critically evaluate online resources. Assess the credibility and usefulness of data, multimedia and other information resources found online for accuracy, authorship, timeliness and bias.

[6] Contribute to positive social change. For example, use collaborative tools to engage in virtual social action and leverage online strategies, such as crowdsourcing, crowdfunding and social entrepreneurship.

d. Cultivate[7] responsible online behavior, including safe[8], ethical and legal use of

technology.

Standard 2: *Visionary Planner*. Leaders engage others in establishing a vision,

strategic plan, and ongoing evaluation cycle for transforming learning with

technology. Education leaders:

a. Engage education stakeholders[9] in developing and adopting a shared vision[10] for

using technology to improve student success, informed by the learning sciences[11].

b. Build on the shared vision by collaboratively creating a strategic plan that

articulates how technology will be used to enhance learning.

c. Evaluate progress on the strategic plan, make course corrections, measure

impact[12] and scale effective approaches[13] for using technology to transform

learning.

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[7] Cultivate. Model best practices and behaviors; lead, mentor, and support others.
[8] Safe use of technology. Interactions online or with technology that keep you out of harm's way, such as being careful and deliberate about how much and what kind of personal information you release online as well as protecting yourself from scams, phishing schemes, poor purchasing practices and e-commerce theft.
[9] Education stakeholders. Includes a wide range of roles, including educators, staff, parents and student, and also may include community leaders, education experts, business leaders and others whose voices contribute to a successful outcome.
[10] Shared vision. Work together with common purpose and foresight to visualize the full potential of technology to transform learning and teaching.
[11] Learning sciences. Interdisciplinary field bringing together research findings from cognitive, social and cultural psychology, neuroscience and learning environments, among others, with the goal of implementing learning innovations and improving instructional practice.
[12] Evaluate progress on strategic plan, make course corrections, measure impact. For example, in data collection, benchmarks, metrics and regular reviews to provide evidence that efforts remain aligned with the vision and guide changes in tactics or strategies.
[13] Scale effective approaches. For example, move successful experiments or instances of innovation from pilot to rollout across a system to accelerate change.

d.   Communicate effectively[14] with stakeholders to gather input on the plan, celebrate

successes[15] and engage in a continuous improvement[16] cycle.

e.   Share[17] lessons learned, best practices, challenges and the impact[18] of learning

with technology with other education leaders who want to learn from this work.

Standard 3: *Empowering Leader*. Leaders create a culture where teachers and

learners are empowered to use technology innovatively to enrich teaching and

learning. Education leaders:

a.   Empower educators[19] to exercise professional agency[20], build teacher leadership[21]

skills and pursue personalized professional learning[22].

b.   Build the confidence and competency of educators to put the ISTE Standards for

Students and Educators into practice.

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[14] Communicate effectively. Leverage technology to keep stakeholders informed or to get their feedback; for example, by using online surveys, online communities or collaborative digital work spaces.

[15] Celebrate successes. Recognize progress made on the implementation of the strategic plan and the impact it is having on student learning.

[16] Continuous improvement. A process that involves collecting data at regular intervals to inform changes and make strategic plan implementation more efficient or effective.

[17] Share. Use digital tools and outlets, such as social media, news media, school system websites, digital newsletters or presentations, to communicate with a broader community.

[18] Lessons learned, best practices, challenges and impact. As the strategic plan gets implemented, reflect on, document and share the status so that others can replicate successes, avoid unintended consequences and inform their own planning.

[19] Empower educators. Create a working environment based on shared learning, teaching goals and distributed leadership that involves transparent decision making, willingness to accept feedback from peers and subordinates, collaboration on establishing policies, and trusting and mobilizing teaching staff to make appropriate decisions.

[20] Exercise professional agency. Take responsibility for and ownership of goals and learning and work strategies.

[21] Teacher leadership. Educators who advocate for students, collaborate and share with colleagues, are willing to experiment and take measured risk, and who work with administration to establish strategic directions for the school, especially with regard to curriculum and instruction.

[22] Personalized professional learning. Opportunities for educators and other staff to identify what and how to learn to meet their professional goals.

c. Inspire a culture of innovation[23] and collaboration that allows the time and space to explore and experiment with digital tools.

d. Support educators in using technology to advance learning that meets the diverse learning, cultural, and social-emotional needs[24] of individual students.

e. Develop learning assessments[25] that provide a personalized, actionable view of student progress[26] in real time.

Standard 4: *Systems Designer*. Leaders build teams and systems to implement, sustain and continually improve the use of technology to support learning. Education leaders:

a. Lead teams to collaboratively establish robust infrastructure and systems[27] needed to implement the strategic plan.

b. Ensure that resources[28] for supporting the effective use of technology for learning are sufficient and scalable[29] to meet future demand.

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[23] Create a work environment that values calculated risk-taking, experimentation and constructive examination of the results.

[24] Meets diverse learning, cultural and social-emotional needs. For example, provides culturally reflective curriculum, language supports, assistive technologies and personalized learning.

[25] Learning assessments. Evaluation of student learning that uses technology, including evaluations that reflect student choice and provide evidence of meeting certain competencies, such as e-portfolios or tools and applications that make reflection transparent, allow for peer review, embed questions or surveys and allow for voice or video recording.

[26] Personalized, actionable view of student progress. For example, tools and applications embedded with real-time learning analytics that provide timely and precise feedback and inform instruction.

[27] Robust infrastructure and systems. Sufficient bandwidth, network and enterprise software and applications that are able to consistently meet peak usage demands across the organization.

[28] Resources. Finances, human capital.

[29] Sufficient and scalable. Able to meet current needs and anticipate and plan for future needs.

c. Protect privacy and security[30] by ensuring that students and staff observe effective privacy and data management policies[31].

d. Establish partnerships[32] that support the strategic vision, achieve learning priorities and improve operations.

Standard 5: *Connected Learner*. Leaders model and promote continuous professional learning for themselves and others (Crompton, 2018). Education leaders:

a. Set goals to remain current on emerging technologies[33] for learning, innovations in pedagogy[34] and advancements in the learning sciences[35].

b. Participate regularly in online professional learning networks[36] to collaboratively learn with and mentor other professionals.

c. Use technology to regularly engage in reflective practices[37] that support personal and professional growth.

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[30] Protect privacy and security. Protect information and data through precautionary planning and actions, such as training to establish and maintain best practices among staff and students, complying with state and federal regulations for protecting student data and privacy, and choosing technology products and vendors that have robust privacy policies and security capabilities.

[31] Data management policies. A set of data privacy laws and best practices to maintain vigilance in the face of innovations in cybercrime.

[32] Establish partnerships. Cultivate useful connections with other school systems; local businesses and leaders; political leaders and staff; and/or companies, nonprofits, and other service providers.

[33] Emerging technologies. For example, new software, applications, tools and devices that can be used for educational purposes.

[34] Innovations in pedagogy. Teaching methods and instruction that are improved by the use of technologies.

[35] Learning sciences. As research provides new information about how we can learn, examine and implement how those findings can be applied with the system's educators and students.

[36] Professional learning networks. Virtual avenue for connecting with others to improve professional skills.

[37] Reflective practices. Think about your actions, your motivations and the outcomes, and then plan for future endeavors in an effort to learn and improve.

d. Develop the skills needed to lead and navigate change[38], advance systems[39] and promote a mindset of continuous improvement[40] for how technology can impro.

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[38] Skills needed to lead and navigate change. For example, building buy-in, listening, mentoring, providing opportunities for everyone to contribute, keeping vision and priorities at the forefront of stakeholders' thinking, breaking down silos.

[39] Advance systems. Decisions about how to prioritize and sequence change based on opportunities and dependencies within the system.

[40] Mindset of continuous improvement. For example, resilience, persistence, tolerance for uncertainty, willingness to learn, openness to feedback.

Appendix B

Education Leaders Technology Survey

Information about the Research Study

Clemson University

LEVERAGING PROFESSIONAL LEARNING TO IMPACT LEADERSHIP OF TECHNOLOGY INTEGRATION

KEY INFORMATION ABOUT THE RESEARCH STUDY

Dr. Noelle Paufler is inviting you to volunteer for a research study. Dr. Noelle Paufler is an Assistant Professor at Clemson University.

Study Purpose: The purpose of this research is to leverage professional learning to impact the leadership of technology integration. Participating in professional learning as learners will help leaders understand the ISTE Standards for so that leaders can lead with an understanding of the ISTE Standards for Leaders. As a result, leaders can support teacher's implementation of ISTE Standards for Teachers so that teachers can support K-12 students in becoming empowered learners, digital citizens, knowledge constructors, innovative designers, computational thinkers, creative communicators, and global collaborators.

Voluntary Consent: Participation is voluntary, and you have the option to not participate.

Activities and Procedures: Your part in the study will be to complete an electronic survey of your self-reported leadership of technology integration through Qualtrics. At the completion of the survey, you will be enrolled in a Canvas course. At the completion of the Canvas course, I will reach out to schedule a time to complete an interview. I will conduct the interview over Zoom so that I can record our conversation and transcribe the conversation. At the completion of the interview, I will send you a follow up survey through Qualtrics.

Participation Time: You will have five weeks to complete all activities, including the initial survey, Canvas course, interview and follow up survey. Participants should be able to complete all activities in about ten hours over five weeks.

Risks and Discomforts: We do not know of any risks or discomforts to you in this research study.

Possible Benefits: Participants in this study will benefit from receiving professional learning designed to impact his/her leadership of technology integration within their district or school community.

AUDIO/VIDEO RECORDING AND PHOTOGRAPHS

Participant interviews will be recorded on Zoom so that the conversation can be transcribed. Transcriptions may contain identifiable information and will be retained until the study is complete, when the transcriptions will be deleted, but no later than December 2024. Recordings will be maintained until the study is complete when, at such time, the recordings will be deleted, no later than December 2024. Tennille will not share the recordings publicly.

PROTECTION OF PRIVACY AND CONFIDENTIALITY

Identifiable information collected during the study will be removed and the deidentified information will not be used or distributed for future research studies. The results of this study may be published in scientific journals, professional publications, or educational presentations.

CONTACT INFORMATION

If you have any questions or concerns about your rights in this research study, please contact the Clemson University Office of Research Compliance (ORC) at 864-656-0636 or irb@clemson.edu. The Clemson IRB will not be able to answer some study-specific questions. However, you may contact the Clemson IRB if the research staff cannot be reached or if you wish to speak with someone other than the research staff.

If you have any study related questions or if any problems arise, please contact Dr. Noelle Paufler, npaufle@clemson.edu, 864-656-4777 or Tennille Woodward, tennilw@clemson.edu, 317-914-3534.

CONSENT

By participating in the study, you indicate that you have read the information written above, been allowed to ask any questions, and you are voluntarily choosing to take part in this research. You do not give up any legal rights by taking part in this research study.

The Education Leaders Technology Survey (ELTS) is intended to assess education leaders' technology leadership behaviors and activities over the course of the last school year. ELTS questions ae based on the 2018 International Society for Technology in Education (ISTE) Standards for Education Leaders. This survey tool was developed through doctoral research, resulting in the doctoral dissertation titled, *Principals' Perceptions of Their Technology Leadership Behaviors: A Mixed Methods Study*. The study can be found on ProQuest or by emailing its author at aschoenbart@gmail.com.

The ELTS is intended to assess education leaders' technology leadership behaviors and activities over the course of the last school year. ELTS questions were inspired by the Principals' Technology Leadership Assessment (PTLA).

As you answer the questions, think of your actual behavior over the course of the last school year. Do not take into account planned or intended behavior. Answer as many of the questions as possible. If a specific question is not applicable to your role or experiences, select "not at all."

For the purposes of this survey, definitions and examples appear in some questions; keep these definitions in mind as you read the items and make your responses.

Q1 Standard 1: EQUITY AND CITIZENSHIP ADVOCATE

	Not at all (1)	Minimally (2)	Somewhat (3)	Significantly (4)	Fully (5)
1. To what extent did you ensure that all students had skilled teachers who were actively using technology (definition: devices and tools like computers, tablets, cell phones, and other communication tools, as well as their related hardware and software) to meet student needs? (1)	○	○	○	○	○
2. To what extent did you ensure all students had access to the technology necessary to participate in engaging learning opportunities? (2)	○	○	○	○	○
3. To what extent did you ensure all students had access to the connectivity (e.g. Internet access) necessary to participate in engaging learning opportunities? (3)	○	○	○	○	○
4. To what extent did you model digital citizenship (definition: the behaviors, skills, and knowledge necessary for appropriate and responsible technology use) by critically evaluating online resources? (4)	○	○	○	○	○
5. To what extent did you model digital citizenship by engaging in civil discourse online? (5)	○	○	○	○	○
6. To what extent did you model digital citizenship by using digital tools to contribute to positive social change? (6)	○	○	○	○	○
7. To what extent did you cultivate responsible online behavior? (7)	○	○	○	○	○
8. To what extent did you cultivate the safe, ethical and legal use of technology? (8)	○	○	○	○	○
9. Overall, to what extent did you use technology to increase equity, inclusion, and digital citizenship practices? (9)	○	○	○	○	○

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Q2 Standard 2: VISIONARY PLANNER

	Not at all (1)	Minimally (2)	Somewhat (3)	Significantly (4)	Fully (5)
10. To what extent did you engage education stakeholders (definition: anyone who is invested in the welfare and success of a school and its students, including administrators, teachers, staff members, students, parents, families, community members, local business leaders, elected officials, etc.) in developing and adopting a shared vision for using technology to improve student success? (1)	○	○	○	○	○
11. To what extent did you build on the shared vision by collaboratively creating a strategic plan that articulated how technology would be used to enhance learning? (2)	○	○	○	○	○
12. To what extent did you evaluate progress on a strategic plan for using technology to transform learning? (3)	○	○	○	○	○
13. To what extent did you make changes to improve how technology is being used to transform learning? (4)	○	○	○	○	○
14. To what extent did you measure the impact of using technology to transform learning? (5)	○	○	○	○	○
15. To what extent did you encourage the development and growth of effective approaches for using technology to transform learning? (6)	○	○	○	○	○
16. To what extent did you communicate effectively with stakeholders to gather input on a strategic technology plan? (7)	○	○	○	○	○
17. To what extent did you communicate effectively with stakeholders to celebrate the successes of a strategic technology plan? (8)	○	○	○	○	○

18. To what extent did you communicate effectively with stakeholders to continually improve a strategic technology plan? (9)

○   ○   ○   ○   ○

19. To what extent did you share the impacts of learning with technology (e.g. lessons learned, best practices, challenges) with other education leaders who want to learn from this work? (10)

○   ○   ○   ○   ○

20. Overall, to what extent did you engage others in establishing a vision, strategic plan, and ongoing evaluation cycle for transforming learning with technology? (11)

○   ○   ○   ○   ○

☐

Q3 Standard 3: EMPOWERING LEADER

	Not at all (1)	Minimally (2)	Somewhat (3)	Significantly (4)	Fully (5)
21. To what extent did you empower educators to exercise professional agency (definition: to take responsibility for and ownership of goals and learning and work strategies)? (1)	○	○	○	○	○
22. To what extent did you empower educators to build teacher leadership skills? (2)	○	○	○	○	○
23. To what extent did you empower educators to pursue personalized professional learning? (3)	○	○	○	○	○
24. To what extent did you build the competency of educators to put the ISTE Standards for Students and Educators into practice? (4)	○	○	○	○	○
25. To what extent did you inspire an innovative learning environment that allowed the time and space to explore digital tools? (5)	○	○	○	○	○
26. To what extent did you support educators in using technology to advance learning that met the diverse learning needs of individual students? (6)	○	○	○	○	○
27. To what extent did you support educators in using technology to advance learning that met the diverse cultural needs of individual students? (7)	○	○	○	○	○
28. To what extent did you support educators in using technology to advance learning that met the diverse social-emotional needs of individual students? (8)	○	○	○	○	○
29. To what extent did you develop learning assessments that provided a personalized view of student progress in real time? (9)	○	○	○	○	○
30. To what extent did you develop learning assessments that provided an actionable view (e.g. specific	○	○	○	○	○

feedback to drive instruction) of student progress in real time? (10)

31. Overall, to what extent did you create a culture where the school community was empowered to use technology in innovative ways? (11)

Q4 Standard 4: SYSTEMS DESIGNER

	Not at all (1)	Minimally (2)	Somewhat (3)	Significantly (4)	Fully (5)
32. To what extent did you lead teams to collaboratively establish robust infrastructure to implement a strategic plan? (1)	○	○	○	○	○
33. To what extent did you ensure that resources for supporting the effective use of technology for learning were sufficient to meet future demand? (2)	○	○	○	○	○
34. To what extent did you ensure that resources for supporting the effective use of technology for learning could anticipate and meet future needs? (3)	○	○	○	○	○
35. To what extent did you protect privacy by ensuring that students and staff observed effective privacy and data management policies? (4)	○	○	○	○	○
36. To what extent did you establish partnerships that supported a strategic vision? (5)	○	○	○	○	○
37. To what extent did you establish partnerships to achieve learning priorities? (6)	○	○	○	○	○
38. To what extent did you establish partnerships that improve operations? (7)	○	○	○	○	○
39. Overall, to what extent did you build teams and systems to implement, sustain, and continually improve the use of technology to support learning? (8)	○	○	○	○	○

Q5 Standard 5: CONNECTED LEARNER

	Not at all (1)	Minimally (2)	Somewhat (3)	Significantly (4)	Fully (5)
41. To what extent did you set goals to remain current on emerging technologies for learning? (1)	○	○	○	○	○
42. To what extent did you participate regularly in online professional learning networks (definition: use of social media and technology to collect, communicate, collaborate, and create with connected colleagues anywhere at any time)? (2)	○	○	○	○	○
43. To what extent did you use technology to regularly engage in reflective practices that supported professional growth? (3)	○	○	○	○	○
44. To what extent did you develop the skills needed to lead change (e.g. building buy-in, listening, mentoring)? (4)	○	○	○	○	○
45. To what extent did you develop the skills needed to promote a mindset of continuous improvement for how technology can improve learning? (5)	○	○	○	○	○
46. Overall, to what extent did you model continuous professional learning? (6)	○	○	○	○	○

Q6 How many years have you worked in education?

_____

Q7 How many years have you worked as a school principal?

_____

Q8 How many years has it been since you worked as a classroom teacher (or similar position)?

_____

Q9 How many students are currently enrolled in your school?

_____

Q10 To what extent does your school community have regular access to technology?

_____

Appendix C

Introduction to ISTE Standards for Education Leaders Course Overview

Introduction

In the Course Introduction Module, you will explore:

- ISTE Standards for Students,
- ISTE Standards for Educators, and the
- ISTE Standards for Leaders.

Leader Standard 1: Equity and Citizenship Advocate

In the Leader Standard 1: Equity and Citizenship Advocate Module, you will:

- Browse an article about using Sketchnoting to unpack the ISTE Standards for Leaders and reflect on using Sketchnoting in school and district leadership
- View Common Sense Media links for TPACK, SAMR, and TIM as technology integration frameworks
- Explore Digital Citizenship resources in Common Sense Media and create a Canva handout on the top 5 facts about Digital Citizenship that you would share with students
- Reflect on tools available to you as a school or district leader that would help you monitor students and staff digital citizenship professional learning
- Reflect around your role as an Equity and Citizenship Advocate and look for application strategies that relate to your work as a school and district leader

Leader Standard 2: Visionary Planner

In the Leader Standard 2: Visionary Planner Module, you will:

- Conduct a Thought Exchange with your community about developing a shared vision around the leadership of technology integration
- Discover components of building a strategic plan for the Leadership of Technology Integration
- Collaboratively create one or two measurable outcomes for your Technology Integration Strategic Plan
- Learn more about the PDSA cycle and how it relates to the Leadership of Technology Integration
- Create a PowToon that you can share with others about the process of creating a strategic plan for Leadership of Technology Integration
- Reflect around your role as a Visionary Planner and look for application strategies that relate to your work as a school and district leader

Leader Standard 3: Empowering Leader

In the Leader Standard 3: Empowering Leader Module, you will:

- Brainstorm the creation of a technology leadership team and gather feedback from participants about how you can support technology integration
- Learn how to use Flippity to create a leaderboard of walkthrough data highlighting teachers consistently implementing ISTE Standards for Educators
- Foster a culture of innovation by supporting a technology playground with time for exploration in a supportive environment
- Survey educators about their needs for professional learning
- Develop an inventory of assessment tools and identify gaps in the assessment ecosystem that supports the Leadership of Technology Integration
- Reflect around your role as an Empowering Leader and look for application strategies that relate to your work as a school and district leader

Leader Standard 4: Systems Designer

In the Leader Standard 4: Systems Designer Module, you will:

- Align your strategic plan for the Leadership of Technology Integration with key components of Professional Learning Communities using the resource, "How Leadership Works".
- Extend your strategic plan for the Leadership of Technology Integration out five years, prioritizing action steps and accountability metrics to monitor success
- Understand FERPA and COPPA standards and the needs for Cyber Security
- Identify and explore professional learning organizations that support the strategic vision for the Leadership of Technology Integration, including FETC, COSN, and ISTE. Explore opportunities for memberships and attendance at conferences.
- Reflect around your role as a Systems Designer and look for application strategies that relate to your work as a school and district leader

Leader Standard 5: Connected Learner

In the Leader Standard 5: Connected Learner Module, you will:

- Become familiar with COSN's annual report on Leading Education Innovation with the Driving K-12 Innovation Hurdles + Accelerators, and Enablers, exploring:
  - Emerging technologies for learning
  - Innovations in pedagogy
  - Advancements in learning sciences
- Explore ISTE's Professional Learning Networks. Identify professional learning networks available for collaboration
- Learn more about The Three-Minute Pause as a structure for reflection and consider coaching around Leadership of Technology Integration

- Explore differences between Change Leadership and Change Management and consider the application to your work as a school or district leader.
- Reflect around your role as a Connected Learner and look for application strategies that relate to your work as a school and district leader

Appendix D

**Introduction to ISTE Standards for Education Leaders Extended Course
Description**

Introduction

In the Course Introduction Module, you will explore:

- ISTE Standards for Students,

ISTE Standards for Students and Educators

In this module, you will be introduced to the ISTE Standards for Students and ISTE Standards for Educators.

At the conclusion of this module:

- You will have a greater understanding of the ISTE Standards for Students and ISTE Standards for Educators.
- You will understand how the Students and Educators standards align to each other.
- You will see a series of short clips produced by ISTE to see the ISTE Standards for Students in action in classrooms.

ISTE Standards for Students Overview:

The **ISTE Standards for Students** emphasize the skills and qualities we want for students, enabling them to engage and thrive in a connected, digital world. The standards are designed for use by educators across the curriculum with every age student, with a goal of cultivating these skills throughout a student's academic career. Both students and teachers will be responsible for achieving foundational technology skills to fully apply the standards. The reward, however, will be educators who skillfully mentor and inspire students to amplify learning with technology, and challenge them to be agents of their own learning. (ISTE standards for students : a practical guide for learning with technology. (2017). International Society for Technology in Education.)

- ISTE Standards for Educators, and the

ISTE Standards for Educators Overview:

The **ISTE Standards for Educators** provides for a shift in thinking. In reviewing the history of teacher standards for using technology, there appear to be three major shifts in thinking.

1. In a previous version of the ISTE Standards for Teachers, the excitement was grounded in the potential of digital tools in the hands of educators who knew how to use them. Educators were taught how to use spreadsheets and word processing tools so they would be ready to use them with students. **In the first shift in thinking, the standards were revised to focus on how educators should use the digital tools for learning and teaching.**
2. The second shift was positive as it moved the focus away from the tool itself. However, this resulted in replication rather than innovation as worksheets became digital worksheets, dry-erase white boards became digital white boards, etc. **What is the point in using 21st century technologies for 20th century teaching? To advance the potential of their classrooms, educators must go beyond past practices to rethink their teaching methodology as they take advantage of the opportunities provided by technology.**
3. The third shift in thinking led to the ISTE Standards for Educators. Terms used to describe this new way of thinking include innovation, disruption and evolution. **It is innovative as new methods of teaching are developed, disruptive as educators consider approaches and tools that are only available with digital help and evolutionary as we come to understand how these digital tools can be used in the most effective ways for learning.**

Crompton. (2017). ISTE standards for educators : a guide for teachers and other professionals. (First edition.). ISTE.

- ISTE Standards for Leaders.

Leader Standard 1: Equity and Citizenship Advocate

In the Leader Standard 1: Equity and Citizenship Advocate Module, you will:

- Browse an article about using Sketchnoting to unpack the ISTE Standards for Leaders and reflect on using Sketchnoting in school and district leadership

Leaders: 1 A Equity and Citizenship Advocate: Sketchnoting

✅ Published   ✎ Edit   ⋮

Learning Outcomes:

Students will be able to: Ensure all students have skilled teachers who actively use technology to meet student learning needs.

Success Criteria:

Success looks like: Leaders will explore ideas on observing and supporting teachers who are skilled in actively using technology to meet learning needs.

Browse the following article:

Sketchnoting to Unpack the ISTE Standards for Educators & Students ⤏

How might you use this idea to delve into the ISTE Standards for Educators & Students to ensure that all students have skilled teachers who actively use technology to meet student learning needs?

- View Common Sense Media links for TPACK, SAMR, and TIM as technology integration frameworks

Leaders: 1 B Equity and Citizenship Advocate: Technology Integration Framework - TPACK

✔ Published   ✎ Edit   ⋮

Learning Outcomes:

Students will be able to: Ensure all students have access to the technology and connectivity necessary to participate in authentic and engaging learning opportunities.

Success Criteria:

Success looks like: Leaders will explore three technology integration frameworks (TPACK, TIM, and SAMR) as structures for authentic and engaging learning opportunities.

In a new browser tab, find a YouTube video from **Common Sense Media** with an overview of **TPACK** (Technological Pedagogical Content Knowledge). Copy and paste the link in the submission of this assignment.

- Explore Digital Citizenship resources in Common Sense Media and create a Canva handout on the top 5 facts about Digital Citizenship that you would share with students.

Leaders: 1 C Equity and Citizenship Advocate: Digital Citizenship Professional Learning

Published   Edit   ⋮

Learning Outcomes:

Students will be able to: Model digital citizenship by critically evaluating online resources, engaging in civil discourse online and using digital tools to contribute social change.

Success Criteria:

Success looks like: Leaders will explore digital citizenship resources available and develop a plan to ensure educators and students access digital citizenship resources.

View the following resources:

1. Watch the following videos

2. Log on to ClassLink Launchpad, click on Canva.

3. Create a Canva document with 5 Important Facts about Digital Citizenship that you would share with STUDENTS

4. Upload the Canva file here as a .pdf.

Meet The Digital Citizens!   Copy link

- Reflect on tools available to you as a school or district leader that would help you monitor students and staff digital citizenship professional learning.

Leaders: 1 D Equity and Citizenship Advocate: Digital Citizenship Metrics

Published   Edit   ⋮

Learning Outcomes:

Students will be able to: Cultivate responsible online behavior, including safe, ethical and legal use of technology.

Success Criteria:

Success looks like: Leaders will explore opportunities to ensure that educators and students are participating in digital citizenship learning on an annual basis.

Given that education leaders support the consistent implementation of digital citizenship resources by students and staff, and education leaders monitor the percentage of students and staff that complete digital citizenship professional learning on an annual basis, answer the following:

What tools and resources do you have available to you to monitor the percentage of students and staff that complete digital citizenship professional learning on an annual basis?

- Reflect around your role as an Equity and Citizenship Advocate and look for application strategies that relate to your work as a school and district leader.

Implementation / Next Steps - Reflection Around Equity and Citizenship Advocate

✅ Published   ✎ Edit   ⋮

Reflection is key to growth. The purpose of this course is to provide professional learning around the ISTE Standards for Leaders to impact your self-assessed Leadership of Technology Integration skills.

Effective evaluation of professional learning requires consideration of five critical levels of information (Guskey, 2000, 2013):

- **Level 1: Participants' reactions:** Did participants feel the professional learning was useful?
- **Level 2: Participants' learning:** Did you acquire the intended knowledge and skills?
- **Level 3: Organization support and change:** Was professional learning implementation advocated, facilitated, and supported?
- **Level 4: Participants' use of new knowledge and skills:** Did participants effectively apply the new knowledge and skills?
- **Level 5: Student learning outcomes:** What was the impact on students?

With regard to the Equity and Citizenship Advocate Module, please answer the following questions:

1. Was the content provided in this module useful to you as a leader?
2. What was the most impactful concept or skill you learned in this module?
3. How do you plan to apply your new learning in your role as a leader?
4. How will your new learning impact the students you serve?
5. What feedback do you have for the course creator in regard to this module?

Leader Standard 2: Visionary Planner

In the Leader Standard 2: Visionary Planner Module, you will:

- Conduct a Thought Exchange with your community about developing a shared vision around the leadership of technology integration

Leaders: 2 A Visionary Planner: Shared Vision Thought Exchange

✓ Published   ✎ Edit   ⋮

Learning Outcomes:

Students will be able to: Engage education stakeholders in developing and adopting a shared vision for using technology to improve student success, informed by the learning sciences.

Success Criteria:

Success looks like: Leaders will leverage an engagement platform to develop a shared vision for the Leadership of Technology Integration within their school or department.

ThoughtExchange is the world's most trusted engagement and survey platform for leaders who drive change and alignment. Using the sophisticated analytics and secure OpenAI integration, you can get broader participation, deeper insights, and actionable ideas in far less time.

Visit ThoughtExchange ⇨.

Create an account and create your first exchange. Post the question that you use for your Exchange here AND upload a copy of the results, in a .pdf, that you gathered from your Exchange.

- Discover components of building a strategic plan for the Leadership of Technology Integration

Leaders: 2 B Visionary Planner: Strategic Plan Building

 Learning Outcomes:

Students will be able to: Build on the shared vision by collaboratively creating a strategic plan that articulates how technology will be used to enhance learning.

 Success Criteria:

Success looks like: Leaders will begin drafting a Strategic Plan for Leadership of Technology Integration within their school or department.

Technology Integration Strategic Plan.docx

- Collaboratively create one or two measurable outcomes for your Technology Integration Strategic Plan

Leaders: 2 C Visionary Planner: Strategic Plan Accountability

✅ Published   ✎ Edit   ⋮

Learning Outcomes:

Students will be able to: Evaluate progress on the strategic plan, make course corrections, measure impact and scale effective approaches for using technology to transform learning.

Success Criteria:

Success looks like: Leaders will identify one or two measurable goals to achieve from the creation of the Technology Integration Strategic Plan.

Creation of a strategic plan around Technology Integration takes time and commitment from the team. As you work on developing and refining your strategic plan from the previous standard, identify one or two measurable outcomes that you will achieve by the end of the 2023 - 2024 school year. Please share them here.

- Learn more about the PDSA cycle and how it relates to the Leadership of Technology Integration

Leaders: 2 D Visionary Planner: PDSA Cycle   ✅ Published   ✎ Edit   ⋮

Learning Outcomes:

Students will be able to: Communicate effectively with stakeholders to gather input on the plan, celebrate successes and engage in a continuous improvement cycle.

Success Criteria:

Success looks like: Leaders will consider the Plan-Do-Study-Act Continuous Improvement model and identify steps to gather input on the Strategic Plan for the Leadership of Technology Integration created.

- Create a PowToon that you can share with others about the process of creating a strategic plan for Leadership of Technology Integration

Leaders: 2 E Visionary Planner: Strategic Plan Communications Plan

✅ Published   ✎ Edit   ⋮

Learning Outcomes:

Students will be able to: Share lessons learned, best practices, challenges and the impact of learning with technology with other education leaders who want to learn from this work.

Success Criteria:

Success looks like: Leaders will draft a presentation that can be shared with other leaders through venues such as FETC and ISTE conferences.

Visit PowToon ↗, a visual communication platform. Create a free account and create three slides with information that you have learned so far in this course around Leadership of Technology Integration that you can share with other leaders. Upload below.

- Reflect around your role as a Visionary Planner and look for application strategies that relate to your work as a school and district leader.

Implementation / Next Steps - Reflection Around Visionary Planner

✅ Published   ✎ Edit   ⋮

Reflection is key to growth. The purpose of this course is to provide professional learning around the ISTE Standards for Leaders to impact your self-assessed Leadership of Technology Integration skills.

Effective evaluation of professional learning requires consideration of five critical levels of information (Guskey, 2000, 2013):

- **Level 1: Participants' reactions:** Did participants feel the professional learning was useful?
- **Level 2: Participants' learning:** Did you acquire the intended knowledge and skills?
- **Level 3: Organization support and change:** Was professional learning implementation advocated, facilitated, and supported?
- **Level 4: Participants' use of new knowledge and skills:** Did participants effectively apply the new knowledge and skills?
- **Level 5: Student learning outcomes:** What was the impact on students?

With regard to the Visionary Planner Module, please answer the following questions:

1. Was the content provided in this module useful to you as a leader?
2. What was the most impactful concept or skill you learned in this module?
3. How do you plan to apply your new learning in your role as a leader?
4. How will your new learning impact the students you serve?
5. What feedback do you have for the course creator in regard to this module?

Leader Standard 3: Empowering Leader

In the Leader Standard 3: Empowering Leader Module, you will:

- Brainstorm the creation of a technology leadership team and gather feedback from participants about how you can support technology integration

Leaders: 3 A Empowering Leader: Technology Leadership Team

`✓ Published` `✎ Edit` `⋮`

Learning Outcomes:

Students will be able to: Empower educators to exercise professional agency, build teacher leadership skills and pursue personalized professional learning.

Success Criteria:

Success looks like: Leaders will identify a technology leadership team within their school or department. Teams will be collected across the district to provide for professional learning around Technology Integration.

- Learn how to use Flippity to create a leaderboard of walkthrough data highlighting teachers consistently implementing ISTE Standards for Educators

Leaders: 3 B Empowering Leader: Leaderboard

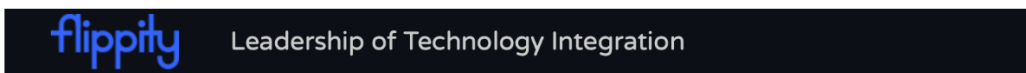`✓ Published` `✎ Edit` `⋮`

Learning Outcomes:

Students will be able to: Build the confidence and competency of educators to put the ISTE Standards for Students and Educators into practice.

Success Criteria:

Success looks like: Leaders will use a walkthrough tool created in Module 1 to create a Leaderboard in Flippity, creating confidence and competency of educators into practice.

Flippity is a powerful tool that can help you create widgets to create excitement and motivation with staff and students. In the example below, click on this Google Sheet/Flippity Data Entry ↪ and enter walkthrough data collected. Flippity turns the walkthrough data into the leaderboard below. Create a leaderboard for a group of teachers in your school and upload a picture of your data.

flippity Leadership of Technology Integration

- Foster a culture of innovation by supporting a technology playground with time for exploration in a supportive environment.

Leaders: 3 C Empowering Leader: Tech Playground

Published   Edit   ⋮

Learning Outcomes:

Students will be able to: Inspire a culture of innovation and collaboration that allows the time and space to explore and experiment with digital tools

Success Criteria:

Success looks like: Leaders providing a Tech Playground so educators and leaders have time and space to explore technology as learners.

"Changes call for innovation, and innovation leads to progress." Li Keqiang

Choose one or more articles linked below to read:

Edtech Playground: Helping Teachers Choose Better Tools ⇗

Digital Futures Institute ⇗

How to Build a Digital Innovation Playground for Educators ⇗

Best EdTech Tools of 2023 ⇗

As a leader, how might you provide a tech playground so that educators can engage with technology as a learner?

- Survey educators about their needs for professional learning

Leaders: 3 D Empowering Leader: Professional Learning Survey

✔ **Published**   ✎ **Edit**   ⋮

☀ **Learning Outcomes:**

Students will be able to: Support educators in using technology to advance learning that meets the diverse learning, cultural, and social-emotional needs of individual students.

Success Criteria:

Success looks like: Leaders will evaluate samples of two surveys of teachers' technology skills and consider how surveying teacher skills can help them create a plan to support the needs of those they support.

Browse the two surveys below:

Quick Teacher Technology Survey ⤇

Educational Technology Pre-Assessment ⤇

Answer the following:

- What components of these samples would you keep in a survey of teachers' technology needs?
- What additional information might you want to survey?
- How can a survey of teachers' technology skills provide for a plan of professional learning?

- Develop an inventory of assessment tools and identify gaps in the assessment ecosystem that supports the Leadership of Technology Integration

Leaders: 3 E Empowering Leader: Assessment Inventory

Learning Outcomes:

Students will be able to: Develop learning assessments that provide a personalized, actionable view of student progress in real time.

Success Criteria:

Success looks like: Leaders will create an inventory of assessment tools used in their school or department, identify the purpose of each tool, and identify gaps in the current assessment ecosystem.

Working with the leadership within your school or department, identify two or three of the most frequently used assessments.

Answer the following questions for each one:

- What is the purpose of the assessment?
- Is it formative or summative?
- What subject(s) does it assess?
- What data is collected as a result of the assessment?
- Does the assessment provide a personalized, actionable view of student learning?

Looking across the data you collected from the two or three assessment tools, answer the following:

- What gaps can you identify in the assessment ecosystem of your school or department?

- Reflect around your role as an Empowering Leader and look for application strategies that relate to your work as a school and district leader.

Implementation / Next Steps - Reflection Around Empowering Leader

✅ Published　✎ Edit　⋮

Reflection is key to growth. The purpose of this course is to provide professional learning around the ISTE Standards for Leaders to impact your self-assessed Leadership of Technology Integration skills.

Effective evaluation of professional learning requires consideration of five critical levels of information (Guskey, 2000, 2013):

- **Level 1: Participants' reactions:** Did participants feel the professional learning was useful?
- **Level 2: Participants' learning:** Did you acquire the intended knowledge and skills?
- **Level 3: Organization support and change:** Was professional learning implementation advocated, facilitated, and supported?
- **Level 4: Participants' use of new knowledge and skills:** Did participants effectively apply the new knowledge and skills?
- **Level 5: Student learning outcomes:** What was the impact on students?

With regard to the Empowering Leader Module, please answer the following questions:

1. Was the content provided in this module useful to you as a leader?
2. What was the most impactful concept or skill you learned in this module?
3. How do you plan to apply your new learning in your role as a leader?
4. How will your new learning impact the students you serve?
5. What feedback do you have for the course creator in regard to this module?

Leader Standard 4: Systems Designer

In the Leader Standard 4: Systems Designer Module, you will:

- Align your strategic plan for the Leadership of Technology Integration with key components of Professional Learning Communities using the resource, "How Leadership Works".

Leaders: 4 A Systems Designer: Strategic Plan Alignment to PLC

✅ Published   ✎ Edit   ⋮

Learning Outcomes:

Students will be able to: Lead teams to collaboratively establish robust infrastructure and systems needed to implement the strategic plan

Success Criteria:

Success looks like: Leaders will explore digital citizenship resources available and develop a plan to ensure educators and students access digital citizenship resources.

Leading teams to implement the strategic plan you began in Module 2, requires robust leadership skills. At our June Leadership meeting, you received How Leadership Works, a resource from Corwin. A recorded webinar that walks you through the content of the book is embedded below. After viewing the video, what leadership skills do you feel most confident in? What leadership skill would you benefit from additional support to grow your confidence as a leader?

CORWIN   How Leadership Works   ↪ Share

- Extend your strategic plan for the Leadership of Technology Integration out five years, prioritizing action steps and accountability metrics to monitor success.

Leaders: 4 B Systems Designer: Extending Strategic Plan

✅ Published   ✎ Edit   ⋮

Learning Outcomes:

Students will be able to: Ensure that resources for supporting the effective use of technology for learning are sufficient and scalable to meet future demand.

Success Criteria:

Success looks like: Leaders will envision a future self and share learning and resources needed to achieve the vision for Leadership of Technology Integration.

Assume you can predict the future, what does your future self see as your ability to lead Technology Integration in your school or department? What resources, professional learning, or support do you need to achieve this vision for Leadership of Technology Integration for your future self?

- Understand FERPA and COPPA standards and the needs for Cyber Security

Leaders: 4 C Systems Designer: FERPA / COPPA / Cybersecurity

Published   Edit   ⋮

Learning Outcomes:

Students will be able to: Protect privacy and security by ensuring that students and staff observe effective privacy and data management policies.

Success Criteria:

Success looks like: Leaders will understand FERPA, COPPA, and Cybersecurity Best Practices and create a plan for further implementation in their setting.

Watch this video about the Family Educational Rights and Privacy Act (FERPA):

After viewing the videos above related to FERPA, COPPA, and Cybersecurity Best Practices for Schools and Districts, answer the following:

- What are some things you learned?
- How did your new learning make you feel?
- What will you do next with your new learning?
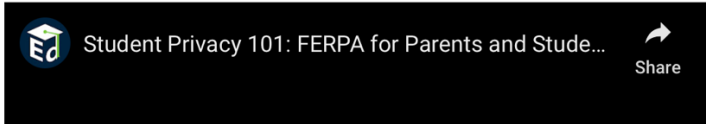
Ed   Student Privacy 101: FERPA for Parents and Stude...   Share

- Identify and explore professional learning organizations that support the strategic vision for the Leadership of Technology Integration, including FETC, COSN, and ISTE. Explore opportunities for memberships and attendance at conferences.

Leaders: 4 D Systems Designer: Extending Reach Through Professional Organizations

✅ Published   ✏️ Edit   ⋮

Learning Outcomes:

Students will be able to: Establish partnerships that support the strategic vision, achieve learning priorities and improve operations.

Success Criteria:

Success looks like: Leaders will become familiar with professional organizations that provide partnership opportunities.

Click on the following sites:

FETC ➫

COSN ➫

ISTE ➫

After browsing these three professional organizations, how you might engage in their communities? What opportunities are available to you as a leader?

- Reflect around your role as a Systems Designer and look for application strategies that relate to your work as a school and district leader.

Implementation / Next Steps - Reflection Around Systems Designer

Reflection is key to growth. The purpose of this course is to provide professional learning around the ISTE Standards for Leaders to impact your self-assessed Leadership of Technology Integration skills.

Effective evaluation of professional learning requires consideration of five critical levels of information (Guskey, 2000, 2013):

- **Level 1: Participants' reactions:** Did participants feel the professional learning was useful?
- **Level 2: Participants' learning:** Did you acquire the intended knowledge and skills?
- **Level 3: Organization support and change:** Was professional learning implementation advocated, facilitated, and supported?
- **Level 4: Participants' use of new knowledge and skills:** Did participants effectively apply the new knowledge and skills?
- **Level 5: Student learning outcomes:** What was the impact on students?

With regard to the Systems Designer Module, please answer the following questions:

1. Was the content provided in this module useful to you as a leader?
2. What was the most impactful concept or skill you learned in this module?
3. How do you plan to apply your new learning in your role as a leader?
4. How will your new learning impact the students you serve?
5. What feedback do you have for the course creator in regard to this module?

Leader Standard 5: Connected Learner

 In the Leader Standard 5: Connected Learner Module, you will:

- Become familiar with COSN's annual report on Leading Education Innovation with the Driving K-12 Innovation Hurdles + Accelerators, and Enablers, exploring:
  o Emerging technologies for learning
  o Innovations in pedagogy
  o Advancements in learning sciences

Leaders: 5 A Connected Learner: Emerging, Innovating, Advancing

✔ Published   ✎ Edit   ⋮

Learning Outcomes:

Students will be able to: Set goals to remain current on emerging technologies for learning, innovations in pedagogy and advancements in the learning sciences

Success Criteria:

Success looks like: Leaders will become familiar with COSN's annual report on Leading Education Innovation with the Driving K-12 Innovation Hurdles + Accelerators ↓ and Enablers ↓ .

After browsing the documents linked in the Success Criteria, answer the following:

How will you remain current in **emerging technologies for learning** in the upcoming school year?

How will you remain current in **innovations in pedagogy** in the upcoming school year?

How will you remain current in **advancements in the learning sciences** in the upcoming school year?

- Explore ISTE's Professional Learning Networks. Identify professional learning networks available for collaboration.

Leaders: 5 B Connected Learner: Professional Learning Networks

✔ Published   ✎ Edit   ⋮

Learning Outcomes:

Students will be able to: Participate regularly in online professional learning networks to collaboratively learn with and mentor other professionals.

Success Criteria:

Success looks like: Leaders will know how to leverage ISTE's Professional Learning Network and be aware of other Professional Learning Networks available to educators.

Access this:

Check out this site of ISTE's Professional Learning Network, ⮕ Browse through Topic Based Forums.

Not an ISTE member?

Contact your Executive Director of Technology to join the district ISTE membership.

Share your experience below. Which ISTE Community did you browse? What did you learn?

From your personal and professional experiences, are there other Professional Learning Networks that your peers would benefit from?

119

- Learn more about The Three-Minute Pause as a structure for reflection and consider coaching around Leadership of Technology Integration

Leaders: 5 C Connected Learner: Structures for Reflection
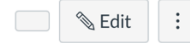
Learning Outcomes:

Students will be able to: Use technology to regularly engage in reflective practices that support personal and professional growth.

Success Criteria:

Success looks like: Leaders will share transparently about where they are in their Leadership of Technology Integration journey.

Answer the following:

3-Minute Pause:

The Three-Minute Pause provides a chance for students to stop, reflect on the concepts and ideas that have just been introduced, make connections to prior knowledge or experience, and seek clarification.

If you had access to every resource (time, people, software/hardware), what would you change tomorrow about your Leadership of Technology Integration?

Go deeper with your answer by adding the following:

• I changed my attitude about • I am more aware of • I was surprised about • I felt • I related to • I empathized with

What barrier would you remove from your situation?

- Explore differences between Change Leadership and Change Management and consider the application to your work as a school or district leader.

Leaders: 5 D Connected Learner: Leading Change

Published | **Edit** | ⋮

Learning Outcomes:

Students will be able to: Develop the skills needed to lead and navigate change, advance systems and promote a mindset of continuous improvement for how technology can improve learning.

Success Criteria:

Success looks like: Leaders adopting and integrating change leadership skills into daily practice.

1. Watch the following videos:

2. Based on what you've seen, share your thoughts about how 'Leading Change' is pivotal to the skillset of School and District Administrators.

Ⓚ Change Management versus Change Leadership: ...   Share

- Reflect around your role as a Connected Learner and look for application strategies that relate to your work as a school and district leader.

Implementation / Next Steps - Reflection Around Connected Learner

Published | **Edit** | ⋮

Reflection is key to growth. The purpose of this course is to provide professional learning around the ISTE Standards for Leaders to impact your self-assessed Leadership of Technology Integration skills.

Effective evaluation of professional learning requires consideration of five critical levels of information (Guskey, 2000, 2013):

- **Level 1: Participants' reactions:** Did participants feel the professional learning was useful?
- **Level 2: Participants' learning:** Did you acquire the intended knowledge and skills?
- **Level 3: Organization support and change:** Was professional learning implementation advocated, facilitated, and supported?
- **Level 4: Participants' use of new knowledge and skills:** Did participants effectively apply the new knowledge and skills?
- **Level 5: Student learning outcomes:** What was the impact on students?

With regard to the Equity and Citizenship Advocate Module, please answer the following questions:

1. Was the content provided in this module useful to you as a leader?
2. What was the most impactful concept or skill you learned in this module?
3. How do you plan to apply your new learning in your role as a leader?
4. How will your new learning impact the students you serve?
5. What feedback do you have for the course creator in regard to this module?

Appendix E

Request for Participation: Education Leaders

Dear Participant,

I am a doctoral student at Clemson University and am working on my doctoral dissertation. The study will be an improvement science study focusing on leadership of technology integration, and I would like to formally request your participation. You have been selected as a potential participant in this study because you are currently a leader in the district being researched.

This study will utilize professional learning around the ISTE Standards for Education Leaders as an intervention to increase the technology leadership skills of leaders within the district. Your involvement will require setting aside time to take an initial survey of leadership of technology integration, followed by professional learning around the ISTE Standards for Education Leaders and an interview in which you are asked to elaborate on how you have led technology integration throughout your school, department, or area of leadership. 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 inaccurate. Our interview will be conducted virtually through Zoom so that the transcription of the interview can be sent to you for your review. After the interview, you will complete the survey of ISTE Standards for Education Leaders so that I may measure the potential impact of professional learning.

If you are willing to participate, please get in touch with me at the email address below to let me know.

Thank you for your consideration.

Tennille Woodward
Doctoral Student, Clemson University
tennilw@clemson.edu

Appendix F

Welcome Letter: Education Leaders

Dear Participant,

Thank you for agreeing to participate in my doctoral dissertation research around leadership of technology integration. As previously mentioned, the next step of the process is for you to complete the Education Leaders Technology Survey (ELTS) linked here: <Qualtrics Survey Link>

At the completion of the survey, I will send you a link to the Canvas course around leadership of technology integration. You will have seven days to complete the ELTS survey.

Thank you so much for your participation,

Tennille Woodward

Appendix G

Professional Learning around Leadership of Technology Integration

<Participant name>,

Thank you for agreeing to participate in my doctoral dissertation research around leadership of technology integration. As previously mentioned, the next step of the process is for you to complete the Canvas course around Leadership of Technology Integration linked here: <Canvas Course Link>

At the completion of the course, I will send you a follow-up email to schedule an interview. The interview will take about an hour and will be held over Zoom so that I can provide a transcript to you when we are done.

You will have five weeks to complete the professional learning around Leadership of Technology Integration and I will send you an email weekly to check on your progress and answer any questions you might have.

Thank you so much for your participation,

Tennille Woodward

Appendix H

Interview Schedule: Education Leaders

\<Participant name\>,

Thank you for agreeing to participate in my doctoral dissertation research around leadership of technology integration. As previously mentioned, the next step of the process is for you to complete a one-on-one interview with me \<Interview Schedule Link\> over Zoom around Leadership of Technology Integration linked here: \<Zoom Interview Link\>

Below is a list of possible questions that we can discuss during our upcoming interview. Please note questions that you specifically would like to discuss prior to our meeting.

Interview Questions:

1. ***Introduction****: Educators pursue leadership positions for many different reasons and have a wide range of experiences. What inspired you to become a school leader?*
2. *How do you view the leader's role in leadership of technology integration?*
3. *How confident are you in leading technology integration in your school or district?*
4. *What challenges do you see to leading technology integration in your school or district?*

5. ***Canvas Course Follow Up****: The primary goal of this interview is to better understand how the professional learning provided through the Canvas course can be utilized to improve leadership of technology integration by leaders.*
   a. *In what ways do you feel the Canvas course added to your understanding of the ISTE Standards for Leaders and your leadership of technology integration?*
   b. *What suggestions do you have for improving the Canvas course for future participants?*

6. ***ELTS Follow Up****: One of the goals of this interview is to better understand the results of the survey portion of the study. I'd like to ask about your thoughts on a few of those findings.*
   a. *The highest scores on the ELTS related to leaders as Equity and Citizenship Advocates (Leaders use technology to increase equity, inclusion and digital citizenship practices.) What role, if any, do the qualities of a Equity and Citizenship Advocate play in your work as a leader?*
   b. *The lowest scores on the ELTS related to leaders as Visionary Planners (Leaders engage others in establishing a vision, strategic plan and ongoing evaluation cycle for transforming learning with technology.) What role, if any, do the qualities of a Visionary Planner play in your work as a leader?*
7. ***Closure****: Thank you for your time today. Before we end the interview, is there anything else you would like to share that may be helpful to understanding your work as a leader of technology integration?*

At the completion of the interview, I will send you a follow-up email with a transcript of our interview to provide you with an opportunity to review your thoughts and make any changes you'd like to make.

Thank you so much for your participation,
Tennille Woodward

Appendix I

ELTS Survey Post Professional Learning: Education Leaders

<Participant name>,

Thank you for agreeing to participate in my doctoral dissertation research around leadership of technology integration. As previously mentioned, the next step of the process is for you to complete the ELTS Survey Post Professional Learning linked here: <Qualtrics Survey Link – Post Professional Learning>

You will have seven days to complete this survey. I will send a follow-up email on day five of seven to remind you to complete the survey. As the completion of the survey is the final step in evidence collection in this study, I conclude with my gratitude for your participation in evolving the field of research around leadership of technology integration.

Thank you for your participation,

Tennille Woodward

Appendix J

Schoenbart Permission to Use ELTS Survey

From: **Adam Schoenbart** aschoenbart@gmail.com
Subject: Re: Permission to use ELTS
Date: April 9, 2023 at 4:22 PM
To: Tennille Woodward tennilw@g.clemson.edu

Hi Tennille,

There is not, but you are welcome to create one.

Best,
Adam

Sent from my iPhone

> On Apr 1, 2023, at 3:58 PM, Tennille Woodward <tennilw@g.clemson.edu> wrote:
>
> Adam,
>
> Is there a qualtrics version of the ELTS survey? If not, may I have permission to create one?
>
> Thanks so much,
> Tennille Woodward
>
>> On Jan 23, 2023, at 9:24 AM, Adam Schoenbart <aschoenbart@gmail.com> wrote:
>>
>> Tennille,
>>
>> I apologize for the delay. You have my permission to use the ELTS in your study. Please send me a copy of your findings and any related publications. I'm happy to help if I can.
>>
>> Best,
>> Adam
>>
>>> On Thu, Jan 12, 2023 at 7:03 AM Tennille Woodward <tennilw@g.clemson.edu> wrote:
>>> Good morning Adam,
>>>
>>> I am a doctoral student at Clemson University and am working on my doctoral dissertation. The study will be a mixed methods study focusing on leveraging professional learning around ISTE standards to increase technology integration leadership. I would like to formally request to use of the ELTS survey developed in 2019. I want to provide the survey electronically through Qualtrics, which is available to me as a Clemson student.
>>>
>>> Thanks in advance for your consideration.
>>>
>>> Tennille Woodward

Appendix K

Interview Questions

1. ***Introduction****: Educators pursue leadership positions for many different reasons and have a wide range of experiences. What inspired you to become a school leader?*
2. *How do you view the leader's role in leadership of technology integration?*
3. *How confident are you in leading technology integration in your school or district?*
4. *What challenges do you see to leading technology integration in your school or district?*

5. ***Canvas Course Follow Up****: The primary goal of this interview is to better understand how the professional learning provided through the Canvas course can be utilized to improve leadership of technology integration by leaders.*
    a. *In what ways do you feel the Canvas course added to your understanding of the ISTE Standards for Education Leaders and your leadership of technology integration?*
    b. *What suggestions do you have for improving the Canvas course for future participants?*

6. ***ELTS Follow Up****: One of the goals of this interview is to better understand the results of the survey portion of the study. I'd like to ask about your thoughts on a few of those findings.*
    a. *The highest scores on the ELTS related to leaders as Equity and Citizenship Advocates (Leaders use technology to increase equity, inclusion and digital citizenship practices.) What role, if any, do the qualities of a Equity and Citizenship Advocate play in your work as a leader?*
    b. *The lowest scores on the ELTS related to leaders as Visionary Planners (Leaders engage others in establishing a vision, strategic plan and ongoing evaluation cycle for transforming learning with technology.) What role, if any, do the qualities of a Visionary Planner play in your work as a leader?*
7. ***Closure****: Thank you for your time today. Before we end the interview, is there anything else you would like to share that may be helpful to understanding your work as a leader of technology integration?*