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CREATING 21ST CENTURY CLASSROOMS: WHAT DISTRICT LEVEL INSTRUCTIONAL LEADERS KNOW ABOUT LEADING 21ST CENTURY LEARNING

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LEARNING

by

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CREATING 21ST CENTURY CLASSROOMS: WHAT DISTRICT LEVEL

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Common Core standards and 21st century instruction are topics at the forefront of current educational literature (Greenstein, 2012; Long, 2012; Sheninger & Larkin, 2012; Wilson, 2006). Though Common Core standards may provide a foundation for the literacy and numeracy that has been identified in preparation for college and career, even Common Core agrees that this preparation and readiness is complex and more than the standards address. "The reality is that students must develop a complex skill set that prepares them for both the rigor of college and the demands of the workplace" (Greenstein, 2012). Twenty-first century skills have been described as those needed skills.

District instructional leaders must know about and be able to lead teachers in developing 21st century classrooms and practices. There is a set of knowledge that district instructional leaders must know in order to guide teachers in creating a classroom founded in 21st century technology and job skills (Amy Garrett, Hughes, & McLeod, 2005; Maurer & Davidson, 1998; McLeod & Lehmann, 2012). By specifically identifying what district instructional leaders know about leading teachers in creating 21st

century classrooms within their schools, the knowledge and skills they need in order to be a district instructional leader in 21st century education, but don't have, may be determined. The purpose of this study was to identify what district instructional leaders know and what they need to do in order to lead teachers in creating 21st century classrooms within their schools.

The results of this study indicated that district instructional leaders had general knowledge about leading teachers in creating 21st century classrooms, but lack knowledge of digital age learning in relation to instructional leadership. Based on these results, the researcher recommends that competencies be developed and immediate training provided in this area, as well as opportunities to engage with students, teachers, and other district instructional leaders in the use of digital tools for the purpose of building a cultural understanding and global awareness.

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Chapter 1

Introduction to the Study

There is a growing concern across America, in a time of uncertain economic prospects, as to whether the nation is building a foundation that will provide the stability and growth to succeed in the future. This future appears to be dependent on whether the nation can produce citizens with the skills related to innovation and the knowledge to navigate the extreme risks and opportunities prevalent in building and attracting competitive businesses in the 21st century (Partnership for 21st Century Skills, 2009a).

Preparing the nation's youth through education and instruction can provide a way forward in equipping future generations with the skills that are needed to meet the 21st century challenges and take advantage of opportunities for success (Larson & Miller, 2011; Miller, 2009; Partnership for 21st Century Skills, 2009a). Teachers must have relevant training and guidance in order to create a 21st classroom structure and utilize 21st century instructional practices to provide students with the skills and knowledge they need.

The critical nature of the need for this instructional change provides the impetus to identify what skills and knowledge the district instructional leader must possess in order to lead teachers in such an important shift.

Statement of the Problem

Students in the current technological era have a unique situation that has not been present for the generations preceding them. An almost immediate, ever increasing and seemingly endless amount of information is readily available to them, and it plays a role

in how they socialize and how they learn. This means that learning is taking place throughout the student's day and across the divide between the formal education setting and the social medium of today's student (McLeod & Lehmann, 2012).

Teachers must have an increased understanding of how today's student learns, the skills the student needs and teachers must teach in a way that supports the student's learning style and models the skills that the student needs to master. In order to lead the teacher in understanding and acquisition of new tools, the district instructional leader must also model these needed skills and establish a vision and direction deeply rooted in student-led and teacher-facilitated learning and continuous reflection (Maurer & Davidson, 1998).

Technology is the medium that these students are using to access the information at the instantaneous rate that they are accustomed to doing, and yet reports show that technology use in the classroom is minimally available for learning even in the classrooms that are the heaviest users (Beglau et al., 2011; Grunwald Associates, 2010). Democratic classroom structures allow students to learn based on their understanding and strengths, which include constructing their knowledge from adding one piece of knowledge to another and then another until they get it right. As opposed to much of the adult learning perspective that something is either right or wrong, children see it as a journey towards what works, with many stops along the way to evaluate what did and did not work in the process. In short, it helps move the classroom in the direction of a student-based outcome focus instead of a teacher-based outcome focus and places the

learners in the center of their learning (Maurer & Davidson, 1998; Skurat Harris, 2009; Waskow, 1998).

Almost exclusively, teachers today have had neither the experience to assimilate the culture of learning or socializing, or a combination of the two in a technology and information-rich 21st century, nor has there been a learner-based focus or participatory experience of a democratic classroom (Capuano & Knoderer, 2006; King, Williams, & Warren, 2011; Long, 2012; Sheninger, 2012; Wilson, 2006). This creates a gap between what we believe in the 21st century to be effective classroom structures and instructional skills for teachers to use and what is currently practiced in the classroom. This is referred to across disciplines as a knowing-doing gap (Alexandre Barsi, 2001; Dumas, 2010; Huang, 2000; Pfeffer & Sutton, 2000), and teachers turn to their district instructional leaders and principals to provide that knowledge, training, and direction to close that gap.

This study evaluated the question of whether the inability for elementary and secondary education to establish classrooms structures and instructional strategies embedded in 21st century practices identified as effective for 21st century learners is truly a knowing-doing gap. Educational leaders above the school level are critical for change and sustainability regarding access to knowledge and training, and setting the expectations and maintaining accountability for effective instructional practices (Marzano & Waters, 2009). Most district instructional leaders were not practitioners when 21st century skills were identified, and the current body of work regarding what skills are needed and how students learn was not available when they were in the classroom. What if the district instructional leaders, themselves, have not gained the knowledge,

understanding, and skills to lead teachers toward the classroom structures and instructional skills that are needed to lead teachers? What if this gap was a knowing gap on the part of the district instructional leader, that spills over to the schools and teacher's classrooms that they are accountable for leading.

If there is truly a knowing-doing gap for district instructional leaders, then training and accountability measures should be employed to reduce or eliminate the gap. If a knowing gap exists on the part of the district instructional leader and this is causing a bottle neck in providing schools and teachers needed resources and learners the most effective learning experience, then those skills need to be identified and the deficiency addressed with all haste. This has brought me to the point of this study: Do district instructional leaders know what they need to do in order to lead teachers in creating 21st century classrooms within their schools?

Purpose of the Study

District instructional leaders are positioned in a situation where they must have the knowledge and ability to lead teachers in developing 21st century classroom structures and instructional practices. This study sought to identify what district instructional leaders know about creating such a classroom and applying powerful instructional practices for the 21st century. The purpose of this study was to identify what district instructional leaders know and what they need to do in order to lead teachers in creating 21st century classrooms within their schools.

Background

As greater importance is placed on moving our schools toward using 21st century technology and instructional practices, funding decisions and resource investments are being made to support the effort in hope of getting the achievement gains desired (Christen, 2009; "Governor Quinn Calls for 21st Century Classrooms Throughout Illinois," 2012).

District instructional leaders are expected to provide the direction, training, and access to knowledge in order to arrange the resources provided for optimal teaching and learning. This creates a critical situation where district instructional leaders must know and be able to provide direction to schools and teachers as to where their focus must be and what instructional practices must be deployed to reach the outcomes that are expected (McLeod, 2007). So, what should the classroom structure become and what instructional skills are most important to be an effective 21st century teacher? And, do district instructional leaders have the knowledge and skills to lead their teachers in that direction?

The gap between knowing and doing is well known and discussed in terms of knowing what needs to be accomplished and actually taking the actions necessary to make it happen. Absent the basic knowledge of what it is that needs to be accomplished, it would not be possible to identify and enact the actions needed for successful implementation. This is the foundation for this descriptive quantitative study to identify the knowledge of district instructional leaders about 21st century classroom structures and

instructional practices. Do district instructional leaders know what they need to do in order to lead teachers in creating 21st century classrooms within their schools?

Research Questions

The overarching research question is: "What do district instructional leaders know and what do they need to do in order to lead teachers in creating 21st century classrooms within their schools."

The sub-questions are: "What 21st century instructional knowledge do the district instructional leaders possess as defined by the International Society for Technology in Education (ISTE)?" and "What 21st century instructional knowledge do the district instructional leaders need to develop in order to lead teachers in creating 21st century classrooms?"

Method

This descriptive quantitative study identifies the knowledge that district instructional leaders have in relation to leading teachers in creating a 21st century classroom. Instructional specialists, superintendents, and assistant superintendents at the superintendent's offices of a public school system serving the dependents of military members, with the exception of the researcher, were surveyed to study their knowledge. This included 14 district superintendent's offices, which consist of 167 assistant superintendents, superintendents, and district instructional leaders. Seventy-six questions using a 5 point rating scale, 3 open-ended questions and 6 demographic questions were asked via an on-line survey system.

Definition of Terms

Instruction—Teaching, learning, and implementing the curricula (McEwan, 1998).

Leadership—An entity providing personal influence and communication directed toward the attainment of a goal or multiple goals (McEwan, 1998).

District instructional leader—A person providing the direction for teaching, learning, and curriculum implementation, in terms of personal influence and communication, for elementary and secondary teachers toward teaching practices identified as the goal or goals. Currently in education that goal is 21st century instruction (Capuano & Knoderer, 2006; Mager, 1996; "West Virginia Classrooms Becoming 21st Century Learning Centers," 2008; Wilson, 2006). For the purpose of this study, this includes instructional specialists, superintendents, and assistant superintendents at the superintendent's offices of a public school system serving the dependents of military members.

21st Century Skills—For the purpose of this study, the researcher has identified 21st century skills for students ("ISTE•NETS•S," 2007), teachers ("ISTE•NETS•T," 2008), instructional coaches ("ISTE•NETS•C," 2011) and administrators ("ISTE•NETS•A," 2009) through the International Society for Technology in Education (ISTE). ISTE's organization includes more than 100,000 educational leaders, affiliates and corporations as members. In addition, the organization in this study currently references ISTE's standards in relation to 21st century skills.

21st Century Instruction—The teaching, learning, and implementation of curriculum for the attainment of 21st century skills. This would include the organizing

and structuring of the environment in the classroom and the strategies and activities for learning to allow for students to master 21st century skills necessary for their success. The instruction and the instructor must model 21st century student skills as they plan for and deliver instruction. A democratic classroom provides the organization and structure best suited for 21st century student outcomes.

Democratic Classroom—A place where students and teachers engage in a common interest in a way that each has to refer his own action to that of others, and to consider the action of others to give point and direction to his own (Dewey, 1918). Liberty in a classroom for self-directed activities and student decision making that considers the benefit of the whole society of the classroom, as well as the individual student. The democratic classroom seeks to develop independent thinkers that are considerate of the needs and goals of others while striving and being driven to implement their own ideas.

Knowing-Doing Gap—The gap between having the knowledge needed to make an organization better and being able to implement that knowledge to actually make the desired impact (Burstyn, 2003; Dumas, 2010; Pfeffer & Sutton, 2000; E. A. Smith, 2009).

Assumptions

One assumption was that the district instructional leader is necessary in whole and in part for teachers systematically to effectively make the change to employ 21st century classroom structures and instructional practices. Another assumption was that it is possible to identify the knowledge necessary to lead teachers in developing 21st century

classroom structures and instructional practices, and further, to assess that knowledge based on a survey instrument.

Delimitations of the Study

In order to narrow the scope of this study, delimitations were used (Creswell, 2005). The study was narrowed to a single organization for public education serving dependents of active duty military members.

Limitations

Due to the dispersed geographic location of the district instructional leadership in the organization, an online survey was utilized to collect data.

Significance of the Study

The significance of this study is rooted in the gap that currently exists in the development of classroom structures and use of instructional practices that are identified as effective for today's learners and part of 21st century education. If a lack of the district instructional leader's knowledge is identified, correcting this may be the catalyst or remove the road block that is preventing the creation of such a 21st century education and provide students with the knowledge and skills to be 21st century contributors and leaders.

Summary

This descriptive quantitative study sought to identify if district instructional leaders know what they need to do in order to lead teachers in creating 21st century classrooms. The importance of the district instructional leader and the knowledge and skills they need to lead teachers in creating 21st century classrooms is articulated in the

next chapter of this proposal, the review of literature. Chapter 3 provides a description of

the methodology proposed to complete this study.

Chapter 2

Review of the Literature

The researcher's review of literature included books, journal articles, studies, and professional literature to address the topic of the knowledge needed by the district instructional leader to lead schools and teachers in creating 21st century classrooms. There are four main sections of this review, with one section, 21st Century Education, divided into four subsections. The first section examines the role of the instructional leader, and more specifically, the purpose and impact of the district instructional leader. The second section addresses leading change in relation to educational systems and instruction. The third section addresses 21st century education based upon the direction of the 21st century students, 21st century classrooms, 21st century instruction and the democratic classroom. The last section addresses the knowing-doing gap, and the summary concludes the review of literature.

The Instructional Leader

Where the term "instruction," which McEwan (1998) defined as teaching, learning, and implementing the curricula, seems to be fairly easy to define as it relates to education, the term "leader" has been debated and defined hundreds of different ways (S. C. Smith & Piele, 1989). Instruction in the case of this study refers to the organization and structure of the environment in the classroom and the strategies and activities involved in managing learning opportunities for students provided by teachers in those classrooms. McEwan (1998) preferred a definition of a leader in terms of personal influence and communication directed toward the attaining of a goal or multiple goals.

The instructional leader therefore would provide the direction for teachers toward teaching practices identified as the goal or goals. There are many publications that identify that goal currently in education to be 21st century instruction (Capuano & Knoderer, 2006; Mager, 1996; "West Virginia Classrooms Becoming 21st Century Learning Centers," 2008; Wilson, 2006). In response, today's district instructional leader in elementary and secondary education would lead teachers in the implementation of 21st century instruction in their classrooms. The teacher must understand and model the skills needed by the 21st century student. The knowledge of the district instructional leader must include an understanding of the role and knowledge of the teacher and the knowledge of an administrator and an instructional coach.

The idea that new professionals, either new to their profession or a specific practice, need to be mentored, or lead, into the profession or the practice is one in which is accepted without question in most professions, to include education. These types of programs can be successful if they are designed to change the professional's practice (Hargreaves & Fullan, 2000). Leadership in a system is subject to forces within that system that may help or hinder the leader in accomplishing their goal. The leader's role is essential to the performance or causing the performance of actions that lead to accomplishing the goal that is set forth. The leader engages within the system with those whom they lead in a two-way interaction and two-way communication experience. The leader is impacted and changed in some way by those that they lead, as well as impacting the system and people they lead (Jossey-Bass Inc., 2000).

District instructional leaders in education have not been able to provide the desired impact upon teachers and instruction. This lack of movement toward our desired outcomes may be, in part, due to the failure to recognize that a single method or practice will not be effective as the students themselves are so vastly different and present themselves with great variations in readiness and abilities (Donaldson, 2001). From this evidence, perhaps a focus on instructional practices and leadership toward student-based instruction, as opposed to teacher-based instruction, will provide better outcomes toward the achievement goals of which instruction is focused (Luterbach & Brown, 2011; National Association of Elementary School Principals (U.S.), 2002). Fullan (2002) identified five action and mind sets that effective leaders combine. Two of these are a commitment to developing and sharing new knowledge and a capacity for coherence making. The role of the instructional leader as it relates to district leadership is critical and incorporates the planning, organizing, and providing of the instructional program to assist instructional practitioner (Petersen, 2002).

Willison (2008) described three things that he believed an instructional leader must do in order to be effective. The first is to talk the talk, which is described as understanding the instructional design language. This is necessary in order to be able to speak with practitioners in clarity. The second is to walk the walk. It is not enough to know the correct terminology, but instructional leaders must model the effective practices relevant to the situation every opportunity that they get. The third is to be a "caddy." This involves providing teachers with necessary tools based on the district instructional

leader's knowledge and the given situation and advice as to the best way to utilize those tools.

Marzano and Waters (2009) found that there was a statistically significant correlation between student achievement and five district-level responsibilities. These responsibilities include:

1. ensuring collaborative goal setting,
2. establishing nonnegotiable goals for achievement and instruction,
3. creating board alignment with and support of district goals,
4. monitoring achievement and instruction goals, and
5. allocating resources to support the goals for achievement and instruction. (Marzano & Waters, 2009, p. 6)

The three responsibilities with the highest effect size, or greatest impact, were establishing nonnegotiable goals for achievement and instruction, monitoring achievement and instruction goals, and allocating resources to support the goals for achievement and instruction. These responsibilities convey the need for and identify the impact of district leadership in leading, guiding, and supporting instructional goals, practices, and change to address student achievement.

DuFour and Marzano (2011) discussed the ideology that schools, if given complete autonomy, would focus on and increase areas such as innovation, creativity, enthusiasm, ownership, commitment, and identifying and solving their own problems. However, the educators were not able to increase engagement in essential teaching and learning needs any more than more closely supervised schools. Even where schools were able to make a desired improvement, the improvement was not expandable or sustainable without the support of the district level office and leadership.

Change Leadership

Change is an accepted dynamic of every part of life. Change will happen regardless of whether it is planned or whether there is a leader at the forefront of the change. In recent times, the pace of change has increased to the extent that the leader is barely capable of keeping up. This pace of change can also put the leader into a state of awareness that otherwise would not exist. The added awareness from the leader's unsettled state can allow for innovations that would not otherwise be possible without the discomfort (Fullan, 2001).

Change is a topic that has been increasingly studied and discussed over the past few decades. There seems to be an increase in the rate of change or number of change initiatives. Society in past generations marketed stability and incremental change that was infrequent. Things that were not broken, were not fixed (Kotter, 1996). Leading change that occurs at a constantly increasing rate necessitates a different kind of leadership skills. Kotter (1996) discussed how a globalized society is creating change and forcing decisions at a rate that creates a dynamic for the leader that is both more opportune and more hazardous simultaneously. No one is removed from this rapid increase in change and its potential impact, regardless of the size of the organization or its purpose.

Henderson and Hawthorne (2000) presented a rationale for transformative curriculum leadership that involves the need for a core level change in educational beliefs and structures. This rationale involves the need for learners in democratic societies to play a larger, self-directed role in their learning. In this role, they increase their level of

self-direction based on personal knowledge and decision making about what is important, what is needed, and what is best for themselves as learners. The transformative leader must foster change in terms of persuading and leading others to greater levels of personal direction and democratic engagement in their learning.

Research has shown that the active engagement and participation of the learner may be the most effective practice that the instructor uses (Quinn, 2002). Change will have a greater potential to be effective if the practice or goal that the organization is working toward has a research or data driven validation behind it (Richards & Skolits, 2009). Leaders of change that are knowledgeable of the effective research based practices and are leading their organization toward those practices are much more likely to be successful.

Fullan (2001) proposed that leaders will become more effective with their efforts to lead in a culture of change if they are constant in their efforts to establish five components of leadership that he has identified.

1. Moral Purpose – a commitment to betterment and improving life (Fullan, 2001, p. 13).

2. Understanding Change – "A culture of change consists of great rapidity and nonlinearity on the one hand and equally great potential for creative breakthroughs on the other. The paradox is that transformation would not be possible without accompanying messiness" (Fullan, 2001, p. 31).

3. Relationships, Relationships, Relationships – How people interact with each other and the trust and loyalty they are able to create is essential to the success or failure of a change (Fullan, 2001, p. 51).

4. Knowledge Building – The process of a person taking information in and creating an understanding that is then used in society (Fullan, 2001, pp. 77-78).

5. Coherence Building – Accepting that change is inevitable and can be positive, this is helping everyone make sense of the "messiness" that comes along with the changes that are being experienced (Fullan, 2001, pp. 107-109).

Kotter (1996) warned of eight commons errors to organizational change. These warnings include:

- allowing too much complacency;
- failing to create a sufficiently powerful guiding coalition;
- underestimating the power of vision;
- undercommunicating the vision by a factor of 10 (100 or even 1,000);
- permitting obstacles to block the new vision;
- failing to create short-term wins;
- declaring victory too soon; and
- neglecting to anchor changes firmly in the corporate culture. (p. 16)

Once change is implemented and the desired direction for the change has been established, focus of the efforts must be targeted to allow the change to be sustained. This takes much more than setting the structures in place to prepare, motivate, and guide an organization to become active and move. In order to sustain the change, structures must change the culture of an organization to include a new way of doing things as structures are embedded into the daily forces that guide the organization. A transformation, with interconnections across the organization, must occur to sustain change (Ling, 2008). Organizations that have recognized sustainability have taken action

to ensure that these structures for sustainability are part of their process for change as a whole. Practices must include the behaviors expected as a result of the change as part of a new performance appraisal system, basing incentive and promotion opportunities on the tenets of the change, collecting data relating to the change, and using the results to drive meetings, discussions, and professional development throughout the organization (Bain, Walker, & Chan, 2011). In addition, the broader public to the organization must be made aware of the change and educated as to the purpose and benefits to garner their understanding and support (Henderson & Hawthorne, 2000).

21st Century Education

21st century students. Identifying what skills will be needed for the 21st century is increasingly complicated. These skills should drive what is taught to students in the classroom. Without knowing what people will want in the future will make determining those skills more difficult. The demands of people are, in part, responsible for what is marketable and, therefore, what is produced. Of course what is produced will drive what skills are needed to produce those items. The inability to make these predictions due to the diverse nature of people will cloud any identification of these future skills (Posner, 2002). Coupled with this is the ever changing and advancing of technology. Many of the skills that educators have identified and focused their efforts on in schools to date have been displaced by, or at least affected by technological discoveries and innovations. This includes simple skills such as spelling and vocabulary usage to complex mathematical computations. The speed and accuracy of using technology for calculations has impacted what skills are taught, or at least the focus and importance of those skills for the future.

With the advancement of technology moving at an ever-increasing speed, the prediction

of what skills a child should be taught for future career or adult use is questionable at the

minimum. Posner (2002) emphasized, "What our 21st-century citizens need are trained

minds and a passion for creative endeavor. And by a "trained mind" I mean not only the

ability to think, to gather data, to formulate models, to test hypotheses, to reason to

conclusions, and so on. I mean, most importantly, the desire for and habit of thinking"

(p. 2).

A study of twenty of the highest regarded American universities for research

(Bassett, 2005) identified skills needed in the 21st century to be competitive in not only

gaining admission into universities, but to also be successful once admitted to a

university. These skills included leadership, teamwork, problem solving, and

communication. In addition, skills such as time management, self-management,

adaptability, analytical thinking, and global consciousness were additional skills and

attributes identified.

Research by the North Central Regional Educational Laboratory (NCREL) and

the Metiri Group (Capuano & Knoderer, 2006) identified the following 21st century skills

needed by today's students :

- Basic literacy: Language and numeracy proficiency using conventional or technology-based media.
- Technological literacy: Competence in the use of computers, networks, applications, and other technological devices.
- Visual literacy: The ability to decipher, interpret, and express ideas using images, graphics, icons, charts, graphs, and video.
- Information literacy: The competence to find, evaluate, and make use of information appropriately.
- Global awareness/cultural competence: The ability and willingness to form authentic relationships across differences.

- Self-direction: The ability to set goals, plan for achievement, independently manage time and effort, and independently assess the quality of one's learning and any products that result.
- Higher-order thinking/sound reasoning: Process of analysis, comparison, inference and interpretation, synthesis, and evaluation. (pp. 114-115)

The Partnership for 21st Century Skills (P21) was a coalition of American business leaders, policy makers and educational leaders. Their work has been widely used in work related to 21st century skills. The Partnership for 21st Century Skills identified the focus must be placed on the Core Academic Subject Mastery and 21st Century Skills Outcomes (Partnership for 21st Century Skills, 2009b). The coalition reported that schools must require students to meet mastery in core academic subjects to gain a foundation on which to build other knowledge and skills. In addition, P21 emphasizes that states, schools, and districts must make sure that they are addressing the following 21st century skills outcomes by asking if their schools are helping students become (Partnership for 21st Century Skills, 2009b):

- Critical thinkers?
- Problem solvers?
- Good communicators?
- Good collaborators?
- Information and technology literate?
- Flexible and adaptable?
- Innovative and creative?
- Globally competent?
- Financially literate? (p. 2)

The International Society for Technology in Education (ISTE) is another leading organization in the field of 21st century skills for students. ISTE boasts a membership of more than 100,000 educational leaders ("About-ISTE," 2013b) around the world and serves to inform its membership of national and global educational issues. ISTE has

identified a set of standards that students should be evaluated on in order to assess the

skills and knowledge the organization has recognized as those that students in today's

world need. These standards for students are ("ISTE•NETS•S," 2007):

1. Creativity and Innovation - Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
2. Communication and Collaboration - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning, and to contribute to the learning of others.
3. Research and Information Fluency - Students apply digital tools to gather, evaluate, and use information.
4. Critical Thinking, Problem Solving, and Decision Making - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
5. Digital Citizenship - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
6. Technology Operations and Concepts - Students demonstrate a sound understanding of technology concepts, systems, and operations. ("ISTE•NETS•S," pp. 1-2)

The common threads of self-motivated and self-directed thinkers and problem

solvers seem to permeate through the different research and discussions represented.

21st century classroom. There are many factors to consider as the development

of the 21st century classroom occurs. Among these are the tools available for collecting

data and assessing progress, the way the student in the 21st century thinks and learns, and

the technology available now and in the future and its role and purpose in a 21st century

classroom (Karanian & Chedid, 2004).

When the physical classroom is discussed separate from the instructional design

and flow in the classroom, most conversations revolve around the available technology

for the classroom and the design and flow of the movement in the classroom in regard to

access to the technology for specific arrangement of students and teacher in the room.

Governor Pat Quinn of Illinois stated in a newspaper article ("Governor Quinn Calls for 21st Century Classrooms Throughout Illinois," 2012) that "The most valuable investment we can make is in the education of our children. Preparing our students for a 21st century economy starts with making sure their classrooms use the technology that will be vital to their success in high school, higher education and their careers" ("Governor Quinn Calls for 21st Century Classrooms Throughout Illinois," 2012, p. 1).

In Iceland, a study was conducted to identify what impact 21st century designs might have on instructional practices for those teachers in the 21st century classroom (Sigurðardóttir & Hjartarson, 2011). As part of this study, policies developed by educational authorities identified individualized learning and collaborative learning as the focus of all educational endeavors, to include the design of the school building and the learning environment. The schools and classrooms in newly constructed schools, to meet this focus, were designed with a flexible, open concept to meet the changing needs of the educational needs of students and their activities. The study provided data sharing that collaboration among teachers was slightly more prevalent in the newly designed, flexible, open-concept schools and that students had slightly more opportunities to choose assignments. Other instructional practices were not vastly different between the schools. The topic of flexibility for both individual learning and collaboration, as well as flexibility for the purpose of meeting what unknowns the future will hold, seems to be found throughout discussions and literature concerning 21st educational facility design (Madden, Wilks, Maione, Loader, & Robinson, 2012).

Though literature also discusses both school and classroom design and instructional design and delivery, for the purpose of this review the researcher will discuss the 21st century instructional practices in the next section.

21st century instruction. Schank (2000) stated at the turn of the century that "Technology is on the verge of fundamentally reshaping the American education system. . . . The computer will allow the creation of "learn by doing" . . . Teachers will be left to provide things that technology cannot: personal one-on-one tutoring; teaching kids how to work in a group to accomplish something; and teaching crucial interpersonal relationship skills" (Schank, 2000, p. 1). Schank was discussing the demise of the traditional school and the replacement of that school with online courses. Though his prediction has not come to reality, there does seem to be some implications for teachers in the 21st century in this literature review.

Angiello (2001) discussed the removal of walls in relation to the workplace in the 21st century. He explained that work, in a similar fashion to education, is slowly moving to erase the lines that are separating home and work. This concept is also relevant to our educational classroom, students, and instructional design. Just as work is no longer where you are, but more of what you do, learning and the classroom must take into account the connection of the classroom and social aspects of students that carry over from the classroom to outside the classroom and from outside the classroom to inside the classroom (Sheninger & Larkin, 2012).

Twenty-first century instruction is probably best described in terms of both the teacher themselves and the instructional design. The teacher's training and skills must

meet those expectations for leading the classroom into the 21st century. Future teachers

must be trained in these skills and be able to implement them in the classroom. In an

introduction letter to a paper jointly produced by The American Association of Colleges

for Teacher Education (AACTE) and the Partnership for 21st Century Skills, the

following was expressed in regard to teacher training and skills (Partnership for 21st

Century Skills, 2010):

> new teacher candidates must be equipped with 21st century knowledge and skills
> and learn how to integrate them into their classroom practice for our nation to
> realize its goal of successfully meeting the challenges of this century. This is not
> a matter of teaching either academic or 21st century knowledge and skills. It's
> about fusing the two, so that our children meet the demands of a global economy,
> as well as engage in good citizenship and participate fully in a vibrant and civil
> society. This paper is an important step in an effort to promote the inclusion of
> 21st century knowledge and skills formally into teacher preparation programs. In
> subsequent phases of this work, we hope to provide additional resources and
> technical assistance to support this effort among colleges of education nationwide.
> (p. 3)

The same skills and knowledge are necessary for the teachers in the classroom now. The

21st century student and the skills they need are in the classroom now. The paper goes on

to identify the following competencies necessary for teachers to effectively teach the 21st

century student:

- successfully aligning technologies with content and pedagogy and developing
  the ability to creatively use technologies to meet specific learning needs;
- aligning instruction with standards, particularly those standards that embody
  21st century knowledge and skills;
- balancing direct instruction strategically with project-oriented teaching
  methods;
- applying child and adolescent development knowledge to educator preparation
  and education policy;
- using a range of assessment strategies to evaluate student performance and
  differentiate instruction (including but not limited to formative, portfolio-
  based, curriculum-embedded, and summative);

- participating actively in learning communities; tapping the expertise within a school or school district through coaching, mentoring, knowledge-sharing, and team teaching;
- acting as mentors and peer coaches with fellow educators;
- using a range of strategies (such as formative assessments) to reach diverse students and to create environments that support differentiated teaching and learning; and
- pursuing continuous learning opportunities and embracing career-long learning as a professional ethic. (Partnership for 21st Century Skills, 2010, pp. 11-12)

In addition, those standards that are necessary for students to master for the 21st century are also necessary for teachers to model as they plan for the learning activities they will use in their instruction ("ISTE•NETS•T," 2008). The teacher must look to master those 21st century student skills, and the International Society for Technology in Education (ISTE) identified the following additional skills for teachers:

1. Facilitate and Inspire Student Learning and Creativity - teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.
2. Design and Develop Digital Age Learning Experiences and Assessments - Teachers design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS·S.
3. Model Digital Age Work and Learning - Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.
4. Promote and Model Digital Citizenship and Responsibility - Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.
5. Engage in Professional Growth and Leadership - Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources. ("ISTE•NETS•T," 2008, pp. 1-2)

The instructional design of the 21st century classroom must meet the needs of and focus on developing skills for the 21st century learner. The skills of the 21st century student have been discussed earlier in this review. To that end, the instructional design must include the development of classrooms that promote self-directed, self-motivated learning, collaboration, creativity, innovation, and a global understanding of society with respect and consideration for the ideas of the larger community. This type of learning and classroom has been described as a democratic classroom (Anonymous, 2007; Eikenberry, 2009; Kesici, 2008). The democratic classroom will be discussed further in the next section of this review as an instructional design practice to develop 21st century skills for students.

The Democratic Classroom

As early as the start of the 20th century, Dewey (1918) defined the democratic classroom as one where the students and teacher "participate in an interest so that each has to refer his own action to that of others, and to consider the action of others to give point and direction to his own." As early as 1933, American educational literature was discussing the value of the democratic classroom (Pryor, 2004). Educators at the time suggested that teachers consider liberty as a focus for their classrooms. This liberty in the classroom reveals itself as more self-directed activities and student decision making that considers the benefit of the whole society of the classroom, as well as themselves. The democratic classroom seeks to develop independent thinkers who are considerate of the needs and goals of others while striving and being driven to implement their own ideas.

A democratic classroom has also been described as a classroom that supports individual expression and creativity and a sense of accountability and responsibility for producing required work and establishment of community (Anonymous, 2007). This is a classroom that provides a positive environment where students can simultaneously create, defend, argue, take risks, make mistakes, and express views as an individual while still being respectful, cognizant, concerned, and contributive of the community of which they are part. There is an equality of opportunity in every situation (Anonymous, 2007; Kesici, 2008; Paul, 1998; Waskow, 1998).

Teachers in these classrooms work to build structures that simultaneously support individual student rights, protection, community, collaboration, and cooperation. Kesici (2008) identified seven categories of teacher duties in developing a democratic classroom. These duties included:

- shared decision-making,
- provide equality,
- effective communication,
- student-centered education,
- give importance to students,
- be fair, and
- express ideas freely. (p. 4)

Though the teacher can put strategies in place, another dynamic that comes into play is the difference in power between the teacher and the student. This can sometimes become a barrier to the development of the democratic classroom. This power difference can be addressed by providing as many opportunities for the students to be involved in the decision making in the classroom, alongside the teacher, and by openly exploring together the dynamics of power in the classroom and why there will always be a need for

some differences. By bringing greater understanding of the differences in power and these differences being transparent, it may allow for the students to feel more responsible and in control of their learning (Eikenberry, 2009).

Once the decision is made, Ellis (2013) warned of some potential perceptions, considerations, decisions, and governing practices that may impact the teacher as they make the move to a democratic classroom. These include the limitations the teacher has in regard to program standards and assessment that are required. As the teacher strives to involve the students in the decision making for the class regarding how learning will take place, the teacher and the students are limited in their decision making authority by those regulatory requirements of the organization for which they are both accountable. This can be addressed by recognizing the boundaries set forth as given parameters in which the democratic classroom will operate. Another factor to be considered is the prior knowledge and expertise the teacher brings to the classroom of instructional design and instructional practices that are most effective. The students, as part of the decision making process for their learning, may certainly identify and advocate for practices that the teacher may not see as ideal. They are not experts, and usually have very little experience in group dynamics and teaching practices associated with the decisions they are being asked to be a part of making. This dynamic requires knowledge building and a structure where the governing decisions made by the group about learning are constantly reevaluated based on the growing experience and knowledge of the group.

The Knowing-Doing Gap

Organizations have long evaluated and researched the factors that are involved in making their organization more effective, more efficient, more lean, more powerful, more influential, and more profitable. At a minimum, organizations seek to know how they are doing in comparison to other similar organizations. In the business sector, these organizations are consistently engaged with measures that will allow them to have an edge over their competitors in the same market. Strategies and personnel actions are the topic of most meetings toward this competitive edge. When a business entity is identified as an industry leader, the strategies and decisions of that company are often investigated and an attempt to identify the causes of the success is made (E. A. Smith, 2009).

There is a lot of emphasis placed on identifying the mystical practice, idea, or strategy that will make that impact and will carry the organization to great new heights. Often consultants and consulting firms are hired to come into the organization and study the dynamics of the organization and provide options, based on the study of the organization, which will take the organization to the level it desires to be. These consultants, the study, and the recommendations often come at great expense and time commitment (Burstyn, 2003; E. A. Smith, 2009).

However, these consultations rarely have any recognizable impact on the organization in regard to movement toward the desired goal (Burstyn, 2003; Dumas, 2010). A study was conducted by Pfeffer and Sutton (2000) across a multitude of different industries to identify what truly makes a difference between high performing companies and the other companies in the industry. What they found was that there was

not much difference between what managers know about what should be done in order for the company to move toward the desired goals. The difference was that high performing companies were actually able to implement the knowledge in order to move their companies in the desired direction. This gap between having the knowledge needed to make an organization better and being able to implement that knowledge to actually make the desired impact is the knowing-doing gap (Burstyn, 2003; Dumas, 2010; Pfeffer & Sutton, 2000; E. A. Smith, 2009).

Pfeffer and Sutton (2000) also summarized themes they found that can serve as both a platform for understanding and discussion as to how such a gap could occur in an organization that desires to improve, as well as areas to focus improvement efforts.

Summary of the Literature Review

The role of the district instructional leader is paramount in the change of the classroom to meet the 21st century needs of the student. This change must be strategically led in order for the change to be implemented in accordance with organizational goals and to be sustainable. The district level instructional leadership has a statistically significant impact (Marzano & Waters, 2009) on the success of this change and the sustainability of the change through development and monitoring of instructional goals and providing resources for achieving the goals.

Twenty-first century skills of students are centered on self-directed, self-motivated learning that supports the individual thinker and collaborative communities simultaneously. These skills also include core curriculum knowledge, creativity,

innovation, communication, technology literacy, and a global understanding and appreciation for society around the student and at large.

Teachers must first develop the 21st century skills that there students must master and then model these skills in the instructional design process. In addition, the 21st century teacher must develop classroom structures that will support the acquisition by students of the 21st century skills that they need to master. This classroom structure is best portrayed as a democratic classroom, which places the student at the center of the learning and promotes the learning experiences needed to obtain identified 21st century skills. A set of skills or standards for 21st century teachers, students, and educational leaders has been identified through an international organization ("About-ISTE," 2013a) of more than 100,000 educational leaders across more than 80 countries, 6 regional affiliates, and 60 major corporations. There are common threads through these standards for students, teachers, and educational leaders suggesting a common understanding necessary to create a 21st century classroom and provide a 21st century education.

Programs are just starting to be developed for training of new teachers in the future to acquire these skills and develop democratic classrooms to support students. More than a decade into the 21st century, teachers in the classroom today need the skills and knowledge to provide these classroom structures and instructional practices. District instructional leaders are accountable and looked to for providing the knowledge, training, and accountability to practicing teachers to make necessary change.

A knowing-doing gap describes the difference between what is known in regard to making necessary changes for improvement and using that knowledge to actually take

actions and make improvement. The purpose of this study was to identify what district

instructional leaders know and what they need to do in order to lead teachers in creating

21st century classrooms within their schools.

Chapter 3

Methodology

Introduction

The purpose of this study was to identify what district instructional leaders know and what they need to do in order to lead teachers in creating 21st century classrooms within their schools. This descriptive quantitative study will add to the body of knowledge regarding the shift to 21st century education in elementary and secondary schools by identifying what district instructional leaders know about developing 21st century classroom structures and implementing 21st century instructional strategies. Currently, the U.S. is more than a decade into the 21st century, and the implementation of instruction and classroom structures for the development of 21st century skills for students is still not currently prevalent (Beglau et al., 2011). There is an acute need to consider where the blockage is occurring and what to do about it. The district instructional leader is the focal point for the study and holds the accountability for practicing teachers to gain the understanding needed and make the shift to 21st century classroom structures and utilizing 21st century instructional practices.

Research Questions

The overarching research question for this study was: What do district instructional leaders know and what do they need to do in order to lead teachers in creating 21st century classrooms within their schools?

The two sub-questions were: (a) What 21st century instructional knowledge and experience do district instructional leaders possess? and (b) What 21st century

instructional knowledge and experience do district instructional leaders need to develop in order to lead teachers in creating 21st century classrooms?

Research Design

This study was designed to identify what district instructional leaders know and what they need to do in order to lead teachers in creating 21st century classrooms within their schools. The researcher chose a descriptive quantitative research methodology and designed a survey instrument to collect the data for the study (McMillan, 2000). What district instructional leaders must know has been identified through a comprehensive review of the literature and the International Society for Technology in Education's (ISTE) National Educational Technology Standards (NETS) for Students, Teachers, Administrators, and Coaches (Appendix A). In addition, the researcher has identified the correlation between the standards in each of these four areas through the use of a Venn diagram (see Figure 1).

Population

For this study, the population consisted of district administrators and specialist occupying positions above the school level whose job duties were instrumental in knowing and leading shifts of instructional practice to meet the needs of students in a world of change. The population consisted of instructional specialists, superintendents, and assistant superintendents at the superintendent's offices of a public school system serving the dependents of military members, with the exception of the researcher. This included 14 district offices, which consisted of 167 district instructional leaders. These

Student

Digital Age
Work and
Learning

Digital Age Learning
Experiences and
Assessment

Facilitate and
Inspire Student
Learning
and Creativity

Excellence in
Professional
Practice

Teacher

Digital Citizenship and
Responsibility

Admin

Teaching,
Learning, &
Assessments

Professional
Development
& Growth

Visionary
Leadership

Coach
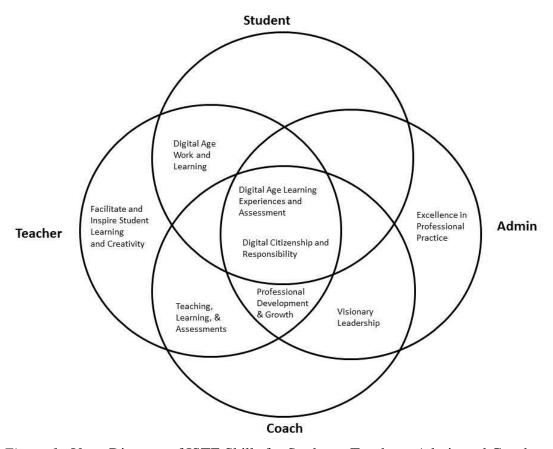
Figure 1. Venn Diagram of ISTE Skills for Students, Teachers, Admin and Coaches

leaders must have an understanding of the role and knowledge of the teacher and the

knowledge of an administrator and an instructional coach. The participants included 14

district superintendents, 17 assistant superintendents, and approximately 136 instructional

support specialists. The instructional specialists were subject matter experts in all

curricular and support services provided within the schools and provide instructional

support to teachers and school level administrators.

Survey Instrument and Procedures

The researcher developed an Internet-accessible survey to collect data for this study. A 5-point rating scale was used for the majority of the questions, as well as a few open-ended questions and a few questions to gain demographic information of the participants. The demographic information assisted in a better understanding of subgroup populations and the different instructional leadership roles. The survey can be found in Appendix B. Responses with a value of a 4 or a 5 were considered to be correct for all items except those distractor items identified in the survey. The responses included "Agree," "Strongly Agree," "Important," and "Very Important." Items self-assessing knowledge were analyzed based on the responses each participant gave, realizing that "High Knowledge Level" or "Very High Knowledge Level or Expert" was used to identify adequate skill level needed for leading teachers in creating 21st century classrooms. The 3 open-ended questions were analyzed based on the participant's response as it related to the 21st century knowledge and skills identified by the researcher for district instructional leaders.

After Institutional Review Board approval was granted, an email was sent to superintendents and assistant superintendents in each district explaining the study, inviting their participation and asking them to forward the email invitation to all instructional specialists in their district office. The email addresses for the superintendent and assistant superintendent were publically available on the organization's website. The email contained the link to the online survey, the timeline that the survey will be open, and the letter from the organization headquarters approving the study. The researcher

obtained permission from the organization to conduct the study. The letter of approval from the organization required that the researcher not identify the organization in any way during this study or in published documents. The email invitation can be found in Appendix C. A follow up email was sent 14 days after the invitation email and the opening of the survey to remind the participants of the study, the invitation to participate, the link to the survey, and the deadline to complete the survey. The reminder email was sent to the superintendent and assistant superintendent with a request that they forward to instructional specialists in their district. The reminder email may be found in Appendix D. The survey was open for 32 days.

Construct Validity

The researcher collaborated with educational researchers at the national and regional level within his organization, as well as members of the Midcontinent Education Research Lab and his advisor regarding question development and survey design. The educational researchers reviewed the survey and made recommendations concerning question format and placement in the survey, as well suggestions about distractor questions and reducing bias. All recommendations were implemented and are reflected in the survey. Though bias cannot be completely eliminated due to the fact that the study is being conducted within a single organization, the reduction of bias was addressed by inviting all possible participants holding the positions being studied to participate.

The survey instrument was piloted by the superintendent and five instructional specialists in one district. No necessary changes were identified during the pilot. The pilot study was conducted immediately following approval of the study proposal and

before the formal approval by the Institution Review Board at the University of

Nebraska-Lincoln.

Reliability

The researcher measured internal consistency reliability of the survey instrument.

Since the survey instrument used primarily a continuous variable scale, Cronbach's alpha

was calculated to evaluate consistency through a coefficient of reliability measuring

whether or not the items in each element are closely related. The results are listed below

in Table 1.

Table 1

Cronbach's alpha Measure of Reliability by Element

Element	Category	Title	Number of Items	Cronbach's alpha
1	Teacher	Digital Age Learning	20	.812
2	Instructional Leader	Digital Age Learning	19	.874
3	Digital Citizen	Digital Citizenship	8	.803
4	Teacher	Digital Citizenship	9	.767
5	Instructional Leader	Digital Citizenship	15	.833

A Cronbach alpha level of .7 or above is generally considered to be an acceptable

level of consistency when evaluating reliability of variable scale items within a construct

or element (Nunnally, 1978). All elements resulted in a Cronbach alpha level well above

the acceptable level.

Data Analysis

The researcher first collected data using an Internet accessible survey and then analyzed the data to attain value and meaning from the collected data for the purpose of describing what district instructional leaders know and do not know. An inferential, quantitative research methodology was used to study what district instructional leaders know about developing 21st century classrooms.

The researcher analyzed the results of the survey by item, element, and demographic groups. The items, elements, and element descriptions can be found in Appendices E, F, and G. The groups were based on the demographics, to include assistant superintendent, superintendent, instructional specialist, geographic area of employment, years since the participant was last a classroom teacher, years of teaching, years since last post secondary course was taken, and years since last technology related course was taken.

For the purpose of analysis, the organizational region in which the respondent works was excluded, as it has no hierarchal or ordinal relationship and the organization hires district instructional leaders from any region and places them and moves them throughout all regions. For each demographic, excluding the organizational region in which the respondent works, the demographic was correlated to the items on the survey through a correlation calculation using Spearman's Rank Correlation Coefficient, also known as Spearman's rho. The Spearman's rho correlation values, when significant at the $p < .05$ level, were reported along with the significance levels and results discussed.

The researcher identified and reported the central tendency of the data collected based on whole group and sub groups identified for each question, category, and element. This included the mean, median, and mode. For each element, the mean, median, mode, standard deviation, and percent correct were reported, as well as high and low results discussed. In addition, for each item, the mean, median, mode, standard deviation and percent correct were reported, along with discussion of high and lows within the results. From these, correlations, relationships, and any significance are discussed.

One section of the survey asked for the respondent to self-assess their own knowledge related to two of the elements, Element 2, Instructional Leader Digital Age Learning and Element 5, Instructional Leader Digital Citizenship. Element 2 consisted of 19 items, of which 10 (Items 52, 54, 56-60, 62-64) were self-assessment knowledge items. Element 5 consisted of 15 items, of which 6 (Items 53, 55, 61, 65-67) were self-assessment knowledge items. The researcher compared the item responses from the self-assessment items within each element with the actual knowledge items in the same element. The researcher used a two-tailed, nonpaired, unequal variance t-test to identify any significant differences between the two groups within Element 2 and Element 5. After the t-test was conducted and the probability significance and p-value were found, the mean and standard deviation were used to identify the effect size through both Cohen's d value and Pearson's r value.

Three questions were open-ended and assessed the knowledge and skills of the participant across all elements. The researcher coded the open-ended responses looking for key terms or phrases in the responses. In addition, an assistant also coded the

responses and then the researcher coded them a second time. The responses were also put into Wordle (Feinberg, 2014), an online electronic generator that visually quantifies the repetition of words and phrases. A comparison of the multiple methods and evaluations identified the frequently repeated responses. Using a spreadsheet function, the researcher then created a formula to generate the number of respondents that submitted the common themes for each item. The same process was used across all three open-ended items and a percent was reported.

Summary

In summary, this is an analysis of what district instructional leaders know about what they need to do in order to lead teachers in creating 21st century classrooms within their schools. District instructional leaders in an educational organization serving dependents of active duty military members were surveyed concerning their knowledge of leading teachers in creating 21st century classrooms. The results were analyzed based on percentage of correct responses of district instructional leaders of the knowledge and skills identified by the researcher through the review of literature.

The survey was administered online over a 4-week period of time, and it had seven elements and 85 items. The analysis included the calculations of mean, median, mode and standard deviation to address the central tendencies of the data for each element and each item on the survey. Subgroup populations identified in the demographics were used to analyze if there were any correlations between subgroups and the knowledge level based on the responses.

Chapter 4

Results

Purpose

The purpose of this study was to identify what district instructional leaders know and what they need to do in order to lead teachers in creating 21st century classrooms within their schools. The study will contribute to the body of knowledge on what might be next steps in equipping instructional leaders in guiding teachers in the creation of these classrooms. Instructional specialists, superintendents, and assistant superintendents at the superintendent's offices of a public school system serving the dependents of military members during the 2013-2014 school year were asked to complete an online survey created by the researcher based on a review of literature and the International Society for Technology in Education's (ISTE) National Educational Technology Standards (NETS) for Students, Teachers, Administrators, and Coaches.

Research Questions

The overarching research question for this study was: What do district instructional leaders know and what do they need to do in order to lead teachers in creating 21st century classrooms within their schools?

The two sub-questions were: (a) What 21st century instructional knowledge and experience do district instructional leaders possess? and (b) What 21st century instructional knowledge and experience do district instructional leaders need to develop in order to lead teachers in creating 21st century classrooms?

The first question focuses upon what instructional leaders know about the skills and classroom instructional practices and processes that are part of the 21st century classroom. The second question centers around the knowledge that instructional leaders need, but do not yet possess, in order to lead in the development of the 21st century classroom. The gravity of the need to answer these two questions relates to the important role the instructional leader plays in motivating and guiding the shift in classroom instructional practices toward true 21st century instruction and practices.

Participants

The population consisted of district administrators and specialist occupying positions above the school level. This included employed district instructional specialists, superintendents, and assistant superintendents at the superintendent's offices of a public school system serving the dependents of military members, with the exception of the researcher. The organization comprises 14 district offices, which at the time of the survey and not including vacant positions, consisted of 167 district instructional leaders. Out of these 167 instructional leaders, 137 were district instructional specialists, 16 were assistant superintendents, and 14 were superintendents.

There were 73 participants that started the survey and 67 completed at least one section of the survey. Six started the survey and agreed to participate, but did not complete at least one of the sections. After eliminating the 6 that did not complete at least one section, the 67 remaining participant responses were used to analyze the data. Therefore, the survey had a participation rate of 40.1%.

A typical response rate for an online survey is 39.6% (Shannon & Bradshaw, 2002). The response rate of this study is similar to the typical response rate. This is most likely due to the reminder emails and the relationship that the researcher has within the organization and with the potential respondents.

Of the 67 responses that were included in the analysis, 66 of those included demographic responses. From the 66 responses with demographics, approximately 2 out of 3 (68%) were district instructional specialist, the next highest participation group by position was assistant superintendents, and then superintendents (Table 2). When broken down by organizational geographic region, most (43%) participants were from the Pacific region (Table 3). Of those participants from the Pacific, which had the most participants, the majority (64.0%) were instructional specialists. Assistant superintendents were the next highest group of participants from the Pacific and then superintendents (Table 6). From the Americas, which consists of primarily the continental United States, more than 8 out of every 10 (82%) were instructional specialists and about 2 out of every 10 (18%) were assistant superintendents (Table 4). No superintendents in the organization from the Americas responded. The remaining respondents were from the European region of the organization, which includes all of Europe, broken down as primarily instructional specialists (45%) and a lesser, but equal, amount for each the assistant superintendents and superintendents (Table 5).

Table 2

Respondents by Position

Superintendents	Assistant Superintendents	District Instructional Specialist
11.9%	20.3%	67.8%

Table 3

Geographical Locations of Respondents

Americas	Europe	Pacific
37.9%	19.0%	43.1%

Table 4

Position of Respondents in the Americas

Superintendents	Assistant Superintendents	District Instructional Specialist
0%	18.2%	81.8%

Table 5

Position of Respondents in Europe

Superintendents	Assistant Superintendents	District Instructional Specialist
27.3%	27.3%	45.4%

Table 6

Position of Respondents in the Pacific

Superintendents	Assistant Superintendents	District Instructional Specialist
16.0%	20.0%	64.0%

In relation to time spent in the classroom as a teacher, the majority of the respondents (55%) were classroom teachers for 10-20 years (Table 7). More than 20 years as a classroom teacher was the next highest group for this demographic, and participants with less than 10 years as a classroom teacher had the smallest representation from the responses. From the demographic relating to number of years since the respondent had last been a classroom teacher, the majority (53%) of the respondents had left the classroom as a teacher within the last 10 years (Table 8). About another 1 out of 3 (33%) had not been a classroom teacher for 10-20 years and it had been more than 20 years since the remainder of the respondents had been in the classroom.

Table 7

Years as a Classroom Teacher

Less than 10 years	10 – 20 years	More than 20 years
29.3%	55.2%	15.5%

Table 8

Years since Respondent was a Classroom Teacher

Less than 10	10 – 20 years	More than 20 years
53.4%	32.8%	13.8%

As it relates to post-secondary courses, more than 5 out of 6 (85%) participants had taken a course within the last 5 years. For the next largest group, it had been 10-20

years since their last course and the smallest group had not taken a post-secondary course in more than 10 years (Table 9). Specifically related to technology courses, by far the majority (78%) of the respondents had taken a course in the last 5 years and about 1 out of 10 (10%) had taken a course in the last 5-10 years. The remaining respondents had not taken a technology related course in more than 10 years (Table 10).

Table 9

Years since Last Post-Secondary Course

Less than 5 years	5 – 10 years	More than 10 years
84.5%	10.3%	5.2%

Table 10

Years since Last Technology Course

Less than 5 years	5 – 10 years	More than 10 years
77.6%	10.3%	12.1%

Findings by Element and Item

Superintendents, assistant superintendents, and instructional specialists at the superintendent's offices of a public school system serving the dependents of military members were surveyed to find out what 21st century instructional knowledge and experience they possess and what 21st century instructional knowledge and experience they need to develop in order to lead teachers in creating 21st century classrooms?

Through a comprehensive review of the literature and the International Society for Technology in Education's (ISTE) National Educational Technology Standards (NETS) for Students, Teachers, Administrators, and Coaches (Appendix A), the researcher identified the five elements of knowledge (Appendix G) used in the survey (Appendix B).

To address the questions and sub-questions of this study, the mean, median, mode, and standard deviation were identified for each item and each element. Excluding the demographic and distractor items (Element 6 and Element 7), the remaining items were also analyzed in relation to a set value for correct and incorrect. A value of "4 - Agree" or "5 - Strongly Agree" was identified as correct. The percentage of respondents answering correct on each item and each element was also reported. This percentage is used to evaluate what district instructional leaders know and what they need to develop in order to lead teachers in creating 21st century classrooms.

There were three open-ended questions that each extended across all elements and addressed the knowledge of the participant as it relates to the skills, classroom activities, and what instructional leaders needed to know about 21st century instruction and classroom practices to lead teachers in developing 21st century skills and classrooms. These items were not included in relational and correlational analysis due to the nature of the items extending across all elements and the open-ended format of response. The responses were coded to identify frequency and reported per item and for the overall responses across all three items.

Results by element. The results suggest that the highest level of knowledge possessed by the district instructional leaders responding to the survey according to both percent correct and mean is in Element 3, Digital Citizen (any person engaging digitally) Digital Citizenship (Table 11). Element 1, Teacher Digital Age Learning, and Element 4, Teacher Digital Citizenship both follow next with approximately the same results. Fourth in the ranking of level of knowledge is Element 5, Instructional Leader Digital Citizenship, with a little more than 3 out of 4 (77.1%) getting it correct and last out of the 5 elements, Element 2, Instructional Leader Digital Age Learning was the lowest level of knowledge with just over two-thirds (69%) getting it correct.

Element 2, Instructional Leader Digital Age Learning, is identified as an area that district instructional leaders lack sufficient knowledge, as represented by a mean of less than 4, with a value of 4 or 5 considered a correct response. Element 5, Instructional Leader Digital Citizenship would also be identified as an area where knowledge is missing, with a mean just over 4 and more than 20% of the respondents answering incorrectly.

Results by item. The item results will be discussed in the order of the elements, starting with Element 1, Teacher Digital Age Learning, and ending with Element 5, Instructional Leader Digital Citizenship.

Table 11

Results by Element

Element	Category	Title	Mean	Median	Mode	Standard Deviation	Percent Correct
1	Teacher	Digital Age Learning	4.50	5	5	0.81	90.6
2	Instructional Leader	Digital Age Learning	3.96	4	5	1.05	69.1
3	Digital Citizen	Digital Citizenship	4.71	5	5	0.61	95.9
4	Teacher	Digital Citizenship	4.50	5	5	0.70	90.7
5	Instructional Leader	Digital Citizenship	4.15	4	5	0.95	77.1

Element 1, Teacher Digital Age Learning, was among the elements with the highest level of knowledge as more than 90% of district instructional leaders answered questions in this element correct (Table 12). Among the different items within this element, questions regarding assessments to inform learning and teaching and the incorporation of digital tools to promote student creativity were answered correctly by all respondents. Items related to providing technology-enriched learning, aligning assessments and standards, customizing and personalizing learning and the use of digital tools to address students' diverse learning styles were answered correctly at a rate of almost perfect also (98%). On the lower end of correct responses, by far the item related to being able to troubleshoot basic hardware problems was the lowest, with far less than half (42%) answering this question correctly. One additional item, with less than three-fourths (74%) answering it correctly, addressed promoting and participating in national learning communities.

For Element 2, Instructional Leader Digital Age Learning, only one item, related to modeling collaborative learning strategies, was answered correctly by all respondents (Table 13). Maximizing teacher and student access to technology-rich environments, collaborating to select digital tools and resources that enhance teaching and learning, providing learner-centered environments equipped with technology, and learning and promoting and participating in local learning communities each had a rate of correct response greater than 90% also. The item addressing the troubleshooting of basic connectivity problems common in digital learning represented the lowest level of

Table 12

Element 1, Teacher Digital Age Learning Item Results

Item	Category	Mean	Median	Mode	Standard Deviation	Percent Correct
Element 1	Teacher Digital Age Learning	4.50	5	5	0.81	90.6
1	Effective Classroom Management	4.42	5	5	0.78	89.6
2	Digital Tools & Resources	4.42	5	5	0.87	92.5
3	Collaborative Learning Networks	4.73	5	5	0.64	97.0
5	Basic Hardware Problems	3.12	3	2	1.21	41.8
6	Digital Tools & Resources	4.46	5	5	0.77	89.6
8	Creativity	4.70	5	5	0.70	97.0
9	Use Adaptive/Assistive Technology	4.27	5	5	0.93	83.6
10	National Learning Communities	4.11	4	5	0.83	74.2
39	Pursue Individual Curiosities	4.51	5	5	0.70	93.6
40	Technology-enriched Learning	4.69	5	5	0.50	98.4
42	Varied Formative Assessments	4.81	5	5	0.54	96.8
43	Align Assessments & Standards	4.84	5	5	0.41	98.4

Item	Category	Mean	Median	Mode	Standard Deviation	Percent Correct
44	Assessments Inform Learning & Teaching	4.95	5	5	0.22	100
45	Custom & Personalized Learning	4.74	5	5	0.48	98.4
46	Digital Tools Address Students' Diverse Learning Styles	4.63	5	5	0.58	98.4
47	Students Set Educational Goals	4.66	5	5	0.70	95.2
48	Varied Summative Assessments	4.46	5	5	0.89	88.5
49	Digital Tools Address Creativity	4.69	5	5	0.46	100
50	Align Assessments & Standards	4.18	4	4	0.80	85.5
51	Students Assess Their Progress	4.84	5	5	0.42	98.4

Table 13

Element 2, Instructional Leader Digital Age Learning Item Results

Item	Category	Mean	Median	Mode	Standard Deviation	Percent Correct
Element 2	Instructional Leader Digital Age Learning	3.96	4	5	1.05	69.1
23	Collaborative Learning	4.91	5	5	0.29	100.0
24	Teacher & Student Access	4.66	5	5	0.57	95.3
25	Online & Blended Learning	4.38	5	5	0.83	89.1
27	Adaptive/Assistive Technology	4.24	4	5	0.80	82.8
29	Digital Tools & Resources	4.54	5	5	0.67	93.7
30	Technology & Learning Resources to Meet Diverse Needs	4.60	5	5	0.64	92.1
31	Basic Software Problems	3.53	4	4	1.05	55.6
33	Local Learning Communities	4.49	5	5	0.76	95.2
35	Digital Communication	4.11	4	5	1.05	77.8
52	Student Use of Digital Tools	3.71	4	3	0.93	54.8
54	Online Professional Development	3.98	4	4	0.85	66.7
56	Basic Connectivity Problems	3.15	3	3	1.11	33.9

Item	Category	Mean	Median	Mode	Standard Deviation	Percent Correct
57	Digital Tools	3.31	3	3	1.21	41.9
58	Global Digital Communication	3.85	4	4	0.85	66.1
59	Effective Technology Infusion	3.63	4	3	1.00	51.6
60	Global Learning Communities	3.68	4	4	1.04	58.1
62	Adaptive/Assistive Technology Use	3.27	3	4	1.18	45.2
63	Use of Digital Content	3.56	4	4	1.10	53.2
64	Digital Collaboration	3.60	4	4	1.02	54.8

knowledge with 1 out of 3 (34%) showing an acceptable knowledge level. Items related to selecting and evaluating digital tools and resources compatible with the school and evaluating the use of adaptive and assistive technologies to support student learning were also low, with less than 50% of the respondents showing knowledge. It is important to note that Items 52, 54, 56-60 and 62-64 were self-assessment of knowledge and may have been a factor in the lower ratings for these items and resulting in this element being the lowest element regarding district instructional leadership knowledge. Item 31, troubleshooting basic software problems common in digital learning environments, was not a self-assessment item and only about half (56%) showed knowledge on this item.

Element 3, Digital Citizen Digital Citizenship, ranks highest among the elements using the measure of percent correct responses overall with less that 5% of the responses across the items responded to incorrectly (Table 14). Of the items within this element, advocating for the responsible use of technology and information, practicing safe use of technology and information, and advocating for the safe and legal use of technology and information having the highest percent correct and exhibiting a positive attitude toward using technology that supports collaboration and exhibiting a positive attitude toward using technology that supports collaboration being the lowest. However, within this element, all items were responded to at a rate of greater than 90% correct.

With more than 90% of the responses to items in Element 4 being correct, this element is considered to reflect a high level of knowledge by district instructional leaders regarding Teacher Digital Citizenship (Table 15). The items with responses less than

Table 14

Element 3, Digital Citizen Digital Citizenship Item Results

Item	Category	Mean	Median	Mode	Standard Deviation	Percent Correct
Element 3	Digital Citizen Digital Citizenship	4.71	5	5	0.61	95.9
68	Technology Collaboration	4.54	5	5	0.74	91.8
69	Responsible use of Technology & Information	4.80	5	5	0.44	98.4
70	Safe Use of Technology & Information	4.82	5	5	0.43	98.4
72	Safe & Legal Use of Technology & Information	4.74	5	5	0.48	98.4
73	Technology Supporting Learning	4.61	5	5	0.78	90.2
74	Lifelong Learning	4.72	5	5	0.67	96.7
75	Legal & Responsible Use of Technology & Information	4.74	5	5	0.57	96.7
76	Technology Supporting Productivity	4.70	5	5	0.67	96.7

Table 15

Element 4, Teacher Digital Citizenship Item Results

Item	Category	Mean	Median	Mode	Standard Deviation	Percent Correct
Element 4	Digital Citizenship	4.50	5	5	0.70	90.7
13	Cultural Understanding	4.06	4	4	0.83	74.6
14	Global Societal Issues	4.25	4	5	0.76	84.1
15	Safe Use of Digital Information & Technology	4.67	5	5	0.51	98.4
16	Equitable Access	4.68	5	5	0.53	96.8
17	Global Awareness	4.13	4	4	0.86	79.4
18	Learner-Centered Strategies	4.79	5	5	0.57	95.2
20	Digital Etiquette	4.71	5	5	0.49	98.4
21	Local Societal Issues	4.38	5	5	0.73	88.9
22	Copyright & Intellectual Property	4.81	5	5	0.40	100.0

80% correct were related to developing and modeling cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital age communication and collaboration tools. The items with the highest percentage of correct responses were advocating, modeling, and teaching safe use of digital information and technology and promoting and modeling digital etiquette related to the use of technology and information with almost all responses correct (98%).

Second lowest element for percent correct responses was Element 5, Instructional Leader Digital Citizenship, at just over 3 out of 4 (77%) respondents answering correctly (Table 16). This element also contains self-assessed knowledge items that may have contributed to the overall lower percent of correct responses. Items 53, 55, 61, 65-67 were self-assessment of knowledge questions. Item 38, modeling and facilitating involvement in global issues, was not a self-assessment item and more than 20% of the responses were not correct on this item. This was the lowest item that was not self-assessment. From the self-assessed items, and overall, using contemporary communication and collaboration tools to develop a shared cultural understanding and involvement in global issues was the lowest, with less than half (45%) reflecting knowledge on this item. The item with the highest percent of correct answers, with less than 2% not answering correctly, was modeling and facilitating ethical uses of digital information and technologies.

Table 16

Element 5, Instructional Leader Digital Citizenship Item Results

Item	Category	Mean	Median	Mode	Standard Deviation	Percent Correct
Element 5	Instructional Leader Digital Citizenship	4.15	4	5	0.95	77.1
4	Equitable Access	4.59	5	5	0.72	92.5
7	Diversity	4.63	5	5	0.76	89.4
11	Digital Communication & Collaboration	4.40	5	5	0.89	91.0
26	Ethical Use of Digital Information	4.69	5	5	0.50	98.4
29	Digital Citizenship	4.60	5	5	0.66	93.7
32	Equitable Access	4.56	5	5	0.62	96.8
36	Cultural Legal Issues	4.53	5	5	0.59	95.2
37	Policies for Legal Digital Use	4.29	4	5	0.77	87.3
38	Global Issues	4.10	4	4	0.79	79.0
53	Digital Age Communication	3.69	4	4	0.97	58.1
55	Global Diversity Awareness	3.69	4	4	0.98	62.9
61	Digital Culture Ethical Issues	3.71	4	3	1.03	56.5

Item	Category	Mean	Median	Mode	Standard Deviation	Percent Correct
65	Policies for Ethical Digital Use	3.65	4	3	1.06	54.8
66	Shared Global Cultural Understanding	3.55	4	3	1.08	51.6
67	Shared Cultural Understanding	3.48	3	3	0.94	45.2

The researcher coded the open-ended responses looking for key terms or phrases in the responses. In addition, an assistant also coded the responses and then the researcher coded them a second time. The responses were also inputted into an Wordle (Feinberg, 2014), an online electronic generator that visually quantifies the repetition of words and phrases. A comparison of the multiple methods and evaluations identified the frequently repeated responses. Using a spreadsheet function, the researcher then created a formula to generate the number of respondents that submitted the common themes for each item and then across all three open-ended items and a percent reported.

The first of the three open-ended items examined the knowledge of the district instructional leader as related to skills that 21st century students, teachers, and instructional leaders all three must possess. All three open-ended items received 47 responses. Of those responses, more than half of them (60%) included collaboration as part of their response (Table 17). Other responses with at least 10% of the respondents including the theme were communication, problem solving, critical thinking, technology literacy, creativity, adaptability, curiosity, and flexibility.

The second open-ended item asked the respondent to identify practices that should be present in a 21st century classroom. From the responses, again, more than half (57%) included collaboration as part of their response (Table 18). Other responses, in descending order based on percent frequency of response, with at least 10% of the respondents including in their response were technology literacy, assessment, project based learning, differentiation, problem solving, communication focused learning, and critical thinking.

Table 17

Open-ended Responses for Item 77

Item 77	Percent
Collaboration	59.6
Communication	44.7
Problem Solving	36.2
Critical Thinking	29.8
Technology Literacy	29.8
Creativity	21.3
Adaptability	19.2
Curiosity	12.8
Flexibility	12.8

Table 18

Open-ended Responses for Item 78

Item 78	Percent
Collaboration	57.4
Technology Literacy	36.2
Assessment	29.8
Project Based Learning	25.5
Differentiation	23.4
Problem Solving	19.1
Communication	12.8
Critical Thinking	10.6

The last of the open-ended items provided the respondents to address the overall question of their knowledge regarding what district instructional leaders must know in order to lead teachers in creating a 21st century classroom and utilizing 21st century instructional practices. The most repeated theme was technology literacy (Table 19). Other identified responses that were significant are collaboration, assessment, resources, communication differentiation, and problem solving.

Table 19

Open-ended Responses for Item 79

Item 79	Percent
Technology Literacy	40.4
Collaboration	29.8
Assessment	21.3
Resources	14.9
Communication	12.8
Differentiation	10.6
Problem Solving	10.6

An analysis was conducted to identify whether any of the themes that were frequent within any one open-ended item were repetitive across all three open-ended items. Collaboration was included in the responses of almost half (49%) of the responses across all three open-ended items (Table 20). In descending order and following collaboration was technology literacy, communication, problem solving, assessment,

Table 20

Open-ended Responses for Items 77, 78 and 79 Combined

Overall items 77, 78, and 79	Percent
Collaboration	48.9
Technology Literacy	35.5
Communication	23.4
Problem Solving	22.0
Assessment	17.0
Critical Thinking	14.2
Project Based Learning	12.1
Differentiation	11.3
Creativity	10.6

critical thinking, project based learning, differentiation, and creativity with at least 10%

of the responses across all three items including these themes.

Results by Demographic

There were six demographic questions included in the survey. These six

questions asked the respondent to identify the organizational region they work within, the

current district instructional leadership position they hold, the number of years since they

were a classroom teacher, the number of years they served as a classroom teacher, the

number of years since they last took a post-secondary course, and the number of years

since they have taken a technology related course. The organizational region in which

the respondent works has no hierarchal or ordinal relationship. The organization hires

district instructional leaders from any region and places them and moves them throughout

all regions. This demographic was not identified as suitable for a correlational analysis. With the exception of the region in which the respondent worked, the researcher conducted an analysis on the responses to determine a nonparametric of statistical dependence between each demographic item and each item in Elements 1 through 5. This was accomplished through a correlation calculation using Spearman's Rank Correlation Coefficient, better known as Spearman's rho. The Spearman's rho correlation values, when significant at the $p < .05$ and smaller level, were reported along with the significance levels.

The first demographic item reported in the survey pertained to the organizational region in which the respondent worked. The three positions of which the respondents may be currently serving within were superintendent, assistant superintendent, and instructional specialist. For the purposes of the calculation, the researcher coded blanks as a 0, superintendent as a 1, assistant superintendent as a 2, and instructional specialist as a 3. The hierarchy of the organization at the district level starts with the superintendent, then the assistant superintendent and then the instructional specialist. Item 10, related to promoting and participating in national learning communities, and associated with Element 1, Teacher Digital Age Learning, was found to have a positive significant correlation (Table 21). This means the higher the positional level of the district instructional leader, or the further the positional distance from the classroom and teacher, the less likely that they will respond correctly, or be knowledgeable about promoting and participating in national learning communities as a part of teacher digital age learning.

Table 21

Relationship and Significance between Organizational Position and Survey Items

Item	Category	Element	Spearman's rho	Significance
10	National Learning Communities	1	.29	.018

Items 1 and 3 from Element 1, Teacher Digital Age Learning, were found to have a significant negative correlation when compared with the number of years since the respondent was a classroom teacher (Table 22). This would infer that the more years it has been since the respondent was in the classroom, the less likely it is that they will have knowledge concerning modeling effective classroom management and coaching and modeling collaborative learning networks for teachers. Items 20, 23, and 24 associate with Element 2, Instructional Leader Digital Age Learning. These items also have a significant negative correlation with the number of years since the respondent was a classroom teacher, suggesting that the knowledge about these items decreases as the number of years since being a classroom teacher increases. The remaining two items are one each from Element 3 and Element 4 and relate to responsible use of technology and information and digital etiquette, respectively. The correlation is again significant and negative, conveying that the knowledge level decreases as the years out of the classroom increases.

In relation to the number of years as a classroom teacher and significantly correlated items, my analysis resulted in three items all within Element 2, Instructional Leader Digital Age Learning. The significant correlation between the items and the years

Table 22

Relationship and Significance between Years since being a Classroom Teacher and

Survey Items

Item	Category	Element	Spearman's rho	Significance
1	Effective Classroom Management	1	-.28	.033
3	Collaborative Learning Networks	1	-.44	.001
20	Digital Etiquette	4	-.28	.040
23	Collaborative Learning	2	-.37	.005
24	Teacher & Student Access	2	-.28	.037
28	Digital Tools & Resources	2	-.31	.021
69	Responsible Use of Technology & Information	3	-.28	.036

as a classroom teacher was positive, suggesting that the longer the respondent was a

classroom teacher, the more likely they were to have knowledge of these three items

associated with instructional leadership and digital age learning (Table 23).

One item from Element 3 and one item from Element 4 were found to have a

positive significant correlation with the number of years since last taking a post-

secondary course (Table 24). This infers that the longer it has been since the respondent

took a post-secondary course, the less likely they are to have knowledge concerning the

provision of equitable access to appropriate digital tools and resources as it relates to

digital citizenship for teachers and to exhibit a positive attitude toward using technology

that supports learning as a part of digital citizenship for the digital citizen.

Table 23

Relationship and Significance between Years as a Classroom Teacher and Survey Items

Item	Category	Element	Spearman's rho	Significance
56	Basic Connectivity Problems	2	.26	.049
60	Global Learning Communities	2	.39	.003
62	Adaptive/Assistive Technology Use	2	.32	.014

Table 24

Relationship and Significance between Years since taking a Post-Secondary Course and Survey Items

Item	Category	Element	Spearman's rho	Significance
16	Equitable Access	4	.32	.017
73	Technology Supporting Learning	3	.31	.022

The final demographic correlation calculation involved the number of years since taking a technology related course and the items on the survey across Elements 1 through 5. The results of this correlation calculation found 13 items across four elements, all with a significant negative correlation (Table 25). As the number of years increased since the respondent had taken a technology related course, the number of respondents with correct answers, or knowledge about these items decreased.

Table 25

Relationship and Significance between Years since taking a Technology Related Course and Survey Items

Item	Category	Element	Spearman's rho	Significance
3	Collaborative Learning networks	1	-.31	.020
8	Creative Basic	1	-.27	.046
10	National Learning Communities	1	-.31	.019
18	Learner-Centered Strategies	4	-.27	.047
32	Equitable Access	5	-.26	.048
52	Student Use of Digital Tools	2	-.28	.034
53	Digital age Communication	5	-.27	.042
57	Digital Tools	2	-.35	.007
58	Global Digital Communication	2	-.50	.000
59	Effective Technology Infusion	2	-.35	.008
61	Digital Culture Ethical Issues	5	-.28	.033
64	Digital Collaboration	2	-.31	.020
65	Policies for Ethical Digital use	5	-.31	.021

Results of Self-Assessment of Knowledge to Actual Knowledge

One section of the survey asked for the respondent to self-assess their own knowledge related to two of the elements, Element 2, Instructional Leader Digital Age Learning and Element 5, Instructional Leader Digital Citizenship. Element 2 consisted of 19 items, of which 10 (Items 52, 54, 56-60, 62-64) were self-assessment knowledge items. Element 5 consisted of 15 items, of which 6 (Items 53, 55, 61, 65-67) were self-assessment knowledge items. The researcher compared the item responses from the

self-assessment items within each element with the actual knowledge items in the same element. The researcher used a two-tailed, nonpaired, unequal variance t-test to identify any significant differences between the two groups within Element 2 and Element 5. After the t-test was conducted and the probability significance, p-value, found, the mean and standard deviation were used to identify the effect size through both Cohen's d value and Pearson's r value.

The results of the actual knowledge items reflect that the participants were able to answer questions within Element 2 at a much higher percent than they self-assessed their knowledge (Table 26). When comparing the two sub-elements, the t-test reflected that there was a significant difference between the self-assessment of knowledge and the actual knowledge, with a medium to large effect size, depending on whether Cohen's d or Pearson's r was used. The effect size conveys that respondents' actual knowledge related to the element is .85 standard deviations above the self-assessed knowledge of the element (Table 27).

The same results as Element 2 were observed for Element 5 in comparing the two sub-elements (Table 28). When comparing the two sub-elements, the t-test reflected that there was a significant difference between the self-assessment of knowledge and the actual knowledge, with a large effect size for both Cohen's d and Pearson's r. The effect size conveys that respondents' actual knowledge related to the element is .98 standard deviations above the self-assessed knowledge of the element (Table 29).

Table 26

Sub-Element Results for Element 2 Self-Assessment and Actual Knowledge

Item	Category	Mean	Median	Mode	Standard Deviation	Percent Correct
Element 2	Self-Assessment	3.57	4	3	1.06	52.8
Element 2	Actual Knowledge	4.39	5	5	0.85	87.2

Table 27

t-test Results for Element 2 between Self-Assessment Items and Actual Knowledge Items

t-test p –Value	Cohen's d	r
.000	0.85	0.39

Table 28

Sub-Element Results for Element 2 Self-Assessment and Actual Knowledge

Item	Category	Mean	Median	Mode	Standard Deviation	Percent Correct
Element 5	Self-Assessment	3.63	4	4	1.01	54.9
Element 5	Test of Knowledge	4.49	5	5	0.73	92.0

Table 29

t-test Results for Element 2 between Self-Assessment Items and Actual Knowledge Items

t-test p –Value	Cohen's d	r
.000	0.98	0.44

Summary

The results of the online survey (Appendix B) created by the researcher were reported based on the items in each element (Appendix G). The elements were derived from the International Society for Technology in Education (ISTE) National Educational Technology Standards (NETS) for Students, Teachers, Coaches, and Administrators (Appendix A). The organization in which the study was conducted reference the ISTE standards in relation to 21st century skills. District Instructional specialists, superintendents, and assistant superintendents at the superintendent's offices of a public school system serving the dependents of military members during the 2013-2014 school year responded to the survey. Out of the organization's 14 district offices, which consisted of 167 district instructional leaders, there were 73 participants that started the survey and 67 completed at least one section of the survey. Six started the survey and agreed to participate, but did not complete at least one of the sections. After eliminating the six that did not complete at least one section, the 67 remaining participant responses were used to analyze the data. Therefore, the survey has a participation rate of 40.1%.

An analysis of the data collected as part of this descriptive quantitative study was conducted to measure what district instructional leaders know and what they need to do in order to lead teachers in creating 21st century classrooms. The study indicated that district instructional leaders have a general level of knowledge in four of the elements, but lack knowledge in one element, which is digital age learning as it relates to instructional leaders. Digital citizenship as it relates to instructional leaders also showed a deficiency, but had a mean slightly above the threshold identified as necessary to reflect

knowledge of the element. However, these elements contained items to assess actual knowledge and self-assessment items related to the elements. A significant difference with a large effect size was identified between the survey item assessed knowledge and self-assessed knowledge, resulting in a much higher level of survey item assessed knowledge for both elements than the participant's self-assessment of their knowledge. The element reflecting the highest level of knowledge based on percent of correct responses was digital citizenship for the digital citizen, which refers to any person digitally engaged.

Open-ended items suggested that there was a common knowledge concerning collaboration, technological literacy, and communication, as well as dynamic project-based learning that motivates creativity, problem solving, and critical thinking, while incorporating assessment and differentiation. Based on the percent of participants answering correctly, a lack of knowledge was most evident in regard to understanding basic software, hardware, connectivity, digital tools, adaptive and assistive technology, and contemporary digital communication and collaboration with regard to use, modeling, troubleshooting, and coaching. Within the items and elements making up the survey, a common thread existed. Though an overall understanding of the general principles of 21st century instruction and classroom practices was evident, the data suggested that district instructional leaders lacked the knowledge and experience as a practitioner themselves with the technology and digital resources used in education today for communication and collaboration as part of the learning process in the classroom and beyond.

In addition, the analysis reflected that a significant negative correlation existed between the amount of time the district instructional leader had been out of the classroom as a teacher or out of the classroom learning about technology and their knowledge of many of the areas within the elements identified for this study.

Chapter 5

Summary, Discussion and Recommendations

Summary

The overarching research question for this study was to identify what district instructional leaders know and what they need to do in order to lead teachers in creating 21st century classrooms within their schools? The first question focused on what instructional leaders know about the skills and classroom instructional practices and processes that are part of the 21st century classroom. The second question centered around that knowledge that instructional leaders need, but do not yet possess, in order to lead in the development of the 21st century classroom. The gravity of the need to answer these two questions relates to the important role the instructional leader plays in motivating and guiding the shift in classroom instructional practices toward true 21st century instruction and practices.

The population consisted of district administrators and specialist occupying positions above the school level. This included employed district instructional specialists, superintendents, and assistant superintendents at the superintendent's offices of a public school system serving the dependents of military members during the 2013-2014 school year, with the exception of the researcher's district. The researcher developed an online survey instrument titled, "21st Century District Level Instructional Leadership" (Appendix B), which was based on a review of literature and the International Society for Technology in Education's (ISTE) National Educational Technology Standards (NETS) for Students, Teachers, Administrators, and Coaches.   The survey utilized a 5-point

rating scale for the first 76 questions, as well as 3 open-ended questions assessing the knowledge of the district instructional leader about 21st century skills and instructional practices based on the ISTE standards, and 6 questions to gain demographic information of the participants. One section of the survey asked for the respondent to self-assess their own knowledge, which related to two of the elements the survey addressed. An analysis between actual knowledge based on their answers for the respective elements and the self-assessment knowledge of those elements was also conducted. The survey had a participation rate of 40.1%.

21st Century Findings by Element

A deeper understanding of the knowledge possessed by district instructional leaders regarding 21st century skills and classroom instructional practices and processes as they lead teachers in their schools to create 21st century classrooms was gained from the data analyzed in this study. For the purpose of this study, the researcher identified 21st century skills for students ("ISTE•NETS•S," 2007), teachers ("ISTE•NETS•T," 2008), instructional coaches ("ISTE•NETS•C," 2011), and administrators ("ISTE•NETS•A," 2009) through the International Society for Technology in Education (ISTE). This study found that district instructional leaders have a general level of knowledge in four of the elements, but lack knowledge in one element (Instructional Leader Digital Age Learning). In addition, there are components in each element that together identify knowledge related to a technology understanding and interaction, or literacy, which the district instructional leader does not yet possess.

Element 1: Teacher digital age learning. Element 1, Teacher Digital Age Learning, resulted in 90.6% of the responses being correct. In the item analysis for this element, two items (assessments to inform learning and teaching and the incorporation of digital tools to promote student creativity) were answered correctly by all respondents. The item with the lowest percent of respondents with a correct response was troubleshooting basic hardware problems, with only 41.8% answering this question correctly. This suggests that the district instructional leaders do know what digital age learning for the teacher involves as a whole, but they did not know that basic troubleshooting of systems, or hardware, was part of the teacher's role in digital age learning. A deeper understanding of this role is needed.

Element 2: Instructional leader digital age learning. The lowest rate of correct responses, at 69.1%, occurred for Element 2, Instructional Leader Digital Age Learning. One item, related to modeling collaborative learning strategies, was answered correctly by all respondents, which supports the response of collaboration as the most frequent response across the three open-ended questions assessing knowledge across all elements. Four items (maximizing teacher and student access to technology-rich environments, collaborating to select digital tools and resources that enhance teaching and learning, providing learner-centered environments equipped with technology and learning, and promoting and participating in local learning communities) each had a rate of correct response greater than 90%, supporting their knowledge of the need for digital access and also supporting collaboration. The item addressing the troubleshooting of basic connectivity problems common in digital learning represented the lowest level of

knowledge, with only 33.9% answering correctly. Items related to selecting and

evaluating digital tools and resources compatible with the school and evaluating the use

of adaptive and assistive technologies to support student learning were also low, with less

than 50% of the respondents answering correctly.

It is important to note that 10 of the 20 items required a self-assessment of

knowledge and this may have been a factor in the lower ratings for these items, resulting

in this element being the lowest element regarding district instructional leadership

knowledge. One item, troubleshooting basic software problems common in digital

learning environments, was not a self-assessment item, and only 55.6% showed

knowledge on this item. Looking at the lowest percentage of items answered correctly

that were not self-assessed (troubleshooting basic software) and the lowest percentage

correct of the self-assessed items within this element (basic connectivity problems

common in digital learning, selecting and evaluating digital tools and resources

compatible with the school, and evaluating the use of adaptive and assistive technologies

to support student learning), a deficit needs to be addressed in the understanding of the

district instructional leader of the technology itself at a basic level. A need to understand

what and how to select, use, and troubleshoot technology was also observed in the data.

Element 3: Digital citizen digital citizenship. Element 3, Digital Citizen Digital

Citizenship ranked highest among the elements for knowledge based on the percent of

correct responses, with 95.9% correct overall. Within this element, all items were

responded to at a rate of greater than 90% correct. Based on this, the district instructional

leaders within this organization have a strong working knowledge of digital citizenship in the 21st century.

Element 4: Teacher digital citizenship. With 90.7% of the responses to items in Element 4, Teacher Digital Citizenship, being correct, this element is considered to reflect a high level of knowledge by district instructional leaders. This group appears to understand digital citizenship specific to teachers in the 21st century. The lowest items in this element, with responses falling between 70% and 80% correct, were related to developing and modeling cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital age communication and collaboration tools. Though still reflecting overall knowledge about these items, this suggests that more discussion may be needed regarding the role of the 21st century teacher in using digital age tools and collaborating for cultural understanding and global awareness.

Element 5: Instructional leader digital citizenship. Element 5, Instructional Leader Digital Citizenship, with 77.1% of respondents answering correctly was the second lowest element. This element also contained six out of 15 items that were self-assessed and may have contributed to the overall lower percent correct. Modeling and facilitating involvement in global issues was the item with the least correct that was not a self-assessment item, with more than 20% of the responses not correct. From the self-assessed items and overall, using contemporary communication and collaboration tools to develop a shared cultural understanding and involvement in global issues was the lowest, with less than half showing knowledge on this item. The item with the highest percent of

correct answers at 98.4% was modeling and facilitating ethical uses of digital information and technologies. The data suggests a strong understanding in digital citizenship relating to ethics, copyrights, and legal aspects, but a need for more understanding with cultural and global issues in the digital age.

21st Century Findings by Research Question

The overarching research question for this study was: What do district instructional leaders know and what do they need to do in order to lead teachers in creating 21st century classrooms within their schools? Two sub-questions were developed to assist in answering the overarching question. The first sub-question asked what 21st century instructional knowledge and experience do district instructional leaders possess? The researcher found that district instructional leaders have a general level of knowledge in four of the elements within this study. Specifically, these four elements were Element 1, Teacher Digital Age Learning, with 90.6% of the respondents answering correctly; Element 3, Digital Citizen Digital Citizenship ranks, with 95.9% of the respondents answering correctly; Element 4, Teacher Digital Citizenship, with 90.7% of respondents answering correctly; and Element 5, Instructional Leader Digital Citizenship, with 77.1% of respondents answering correctly. The knowledge that district instructional leaders must have was identified through a comprehensive review of the literature and a correlation by the researcher of the International Society for Technology in Education's (ISTE) National Educational Technology Standards (NETS) for Students, Teachers, Administrators, and Coaches (Appendix A).

The second sub-question asked what 21st century instructional knowledge and experience do district instructional leaders need to develop in order to lead teachers in creating 21st century classrooms? Overall, district instructional leaders did not show knowledge in Element 2, Instructional Leader Digital Age Learning. Specifically, within the items, district instructional leaders did not know that an understanding and use of the technology and digital age tools, an understanding of what and how to select technology and digital age tools, and an ability to troubleshoot systems and programs were necessary components for teachers and district instructional leaders. In addition, the results suggested a need for more understanding about cultural and global issues in the digital age. Based on these findings, the researcher recommends that district instructional leaders identify and engage in training and professional development opportunities to deepen their understanding of currently available technology and digital tools. The training and professional development should provide the opportunity to gain a basic understanding of how the technology and digital tools function, their strengths and weaknesses, and the potential future development of those technologies and tools and competency in systematically evaluating and selecting appropriate technologies, digital tools, and systems. In addition, the district instructional leader needs to garner knowledge of the role of the leader and the teacher in, as well as the purpose of, establishing cultural understanding and global awareness through digital tool usage for learning and collaboration.

Discussion

Collaboration and technological literacy were the two most frequently observed themes within the responses to the open-ended items on the survey. This suggests that there is clear overall understanding that technology literacy plays a role, alongside collaboration, in 21st century classrooms. However, the results from the evaluation of the elements and their items also suggest the level of understanding and interaction, or literacy, which the district instructional leader must have with technology, is not fully understood.

In relation to what 21st century instructional knowledge and experience district instructional leaders need to develop in order to lead teachers in creating 21st century classrooms, a common strand is seen by looking across the elements and items where the lower percentage of correct responses was identified. Overall, while including the self-assessment questions, district instructional leaders did not show knowledge in the element of digital age learning for the instructional leader. Specifically, within the items, district instructional leaders did not know that an understanding and use of the technology and digital age tools, an understanding of what and how to select technology and digital age tools, and being able to troubleshoot systems and programs is a necessary component for teachers and district instructional leaders. In addition, the results suggest a need for more understanding with cultural and global issues in the digital age.

An analysis of demographic items reported in the survey found 26 significant correlations across the five demographics suitable for analysis. A look at the demographics provided an opportunity to see a little more about the population

responding to the survey. As it relates to positional level of the district instructional leader, promoting and participating in national learning communities was found to have a positive significant correlation with Element 1, Teacher Digital Age Learning. The higher the positional level of the district instructional leader, or the further the positional distance from the classroom and teacher, the less they knew about promoting and participating in national learning communities as a part of teacher digital age learning.

Two items from Element 1, Digital Age Learning, were found to have a significant negative correlation when compared with the number of years since the respondent was a classroom teacher, inferring that the more years it has been since the respondent was in the classroom, the less likely it is that they will have knowledge concerning modeling effective classroom management and coaching and modeling collaborative learning networks for teachers. Three items from Element 2, Instructional Leader Digital Age Learning, have a significant negative correlation with the number of years since the respondent was a classroom teacher, suggesting that the knowledge about these items decreases as the number of years since being a classroom teacher increase. One item from Element 3 (responsible use of technology and information) and one item from Element 4 (digital etiquette) have a significant negative correlation, conveying that the knowledge level decreases as the years out of the classroom increases.

In relation to the number of years as a classroom teacher, three items in Element 2, Instructional Leader Digital Age Learning, showed a significant positive correlation, suggesting that the longer the respondent was a classroom teacher, the more likely they

were to have knowledge of basic connectivity problems, global learning communities, and adaptive/assistive technology use.

One item from Element 3, Digital Citizen, Digital Citizenship, and one item from Element 4, Teacher Digital Citizenship, were found to have a positive significant correlation with the number of years since last taking a post-secondary course. The longer it has been since the respondent took a post-secondary course, the less likely they are to have knowledge concerning the provision of equitable access to appropriate digital tools and resources as it relates to digital citizenship for teachers and exhibiting a positive attitude toward using technology that supports learning as a part of digital citizenship for the digital citizen.

The final demographic, number of years since taking a technology related course, found 13 items across four elements with a significant negative correlation, which was by far the most items correlated with a demographic. As the number of years increased since the respondent had taken a technology related course, the number of respondents with correct answers decreased for all 13 items. Thus, from the demographics, the number of years since having a technology related course, which is negatively correlated, had the most impact on knowledge of 21st century classroom practices. Second to that is the negative impact of the amount of years since the respondent was last a classroom teacher on knowledge across four elements.

The survey also asked for the respondents to self-assess their own knowledge related to Elements 2 and 5. These elements consisted of both self-assessment items and actual knowledge items. The researcher compared the item responses from the self-

assessment items within each element with the actual knowledge items in the same element. The results reflect that a significant difference existed between the self-assessment of knowledge and the actual knowledge, with a medium to large effect size. The participants were able to answer questions within both elements at a much higher percentage than they self-assessed their knowledge.

This study and the results of the survey are limited to the district instructional leaders within the organization of which the study took place. As a descriptive quantitative study, it is important that the results of this study be used appropriately.

Recommendations

The purpose of this descriptive quantitative study was to add to the body of knowledge regarding the shift to 21st century education in elementary and secondary schools as it relates to leading teachers in creating 21st century classrooms within their schools, what 21st century instructional knowledge and experience district instructional leaders possess, and what they need to develop. District instructional leaders are positioned in a situation where they must know about and be able to lead teachers in developing a 21st century classroom structure and instructional practices. The results of this study may assist in focusing future development efforts for the district instructional leader on the right target.

Recommendation one. Element 2, Instructional Leader Digital Age Learning Literacy, showed an overall lack of knowledge. Within Element 2, the items with the lowest percent of correct responses related to the understanding of the technology itself at a basic level and what and how to select, use, and troubleshoot digital age tools, systems,

and programs. In addition, a correlation analysis of the number of years since taking a

technology related course was negatively correlated with knowledge of 13 different items

across four elements. To address this gap in district instructional leaders' knowledge,

competencies should be developed and immediate training provided. This training

should deepen the understanding of the district instructional leader of currently available

technology and digital tools, along with a basic understanding of how they function, their

strengths and weaknesses, and the potential future development of those technologies and

tools. In addition, training should be provided for systematically evaluating and selecting

appropriate technologies, digital tools, and systems for their respective organizations and

taking into consideration the future needs of that organization. This could be

accomplished through organizationally provided trainings, higher learning opportunities,

or a number of other options that allow the district instructional leader to meet the

established competencies.

Recommendation two. Items within Elements 4 and 5 reflect a lack of

knowledge related to using digital age tools and collaborating for cultural understanding

and global awareness. The district instructional leader needs to garner knowledge of the

role of the leader and the teacher, as well as the purpose of, establishing cultural

understanding and global awareness through digital tool usage for learning and

collaboration. In addition, a significant correlation was also found between the number

of years since the respondent was a classroom teacher and items across four of the

elements. Authentic experiences in the classroom engaged with and among students,

teachers, and other district instructional leaders through the use of digital tools for the

purpose of building a cultural understanding and global awareness would be the second recommendation. This planned, authentic learning opportunity in the 21st century classroom can address the negative correlation between the needed knowledge and number of years since being in the classroom, as well as allow the acquisition of the needed knowledge. This would most likely need to be established within the organization and within the classroom and beside the teachers which they lead.

Future Research

This descriptive quantitative study was designed to identify the knowledge of district instructional leaders about 21st century classroom structures and instructional practices, and specifically, to answer whether district instructional leaders know what they need to do in order to lead teachers in creating 21st century classrooms within their schools. A study including building level administrators and building level instructional coaches or professional developers would allow for a broader range of analysis of those that directly lead teachers as they develop 21st century classrooms. Expanding the research to include a broader range of elementary and secondary organizations beyond the single organization this study was based on would be a future research option.

Another future research option might be to explore the knowledge of students and teachers who are currently in a classroom that has been established since the start of the 21st century in relation to identified necessary 21st century skills and classrooms. This study may be able to establish with more definition whether the gaps that are currently discussed in professional educational literature are due to a knowing-doing gap.

A third area of potential research would be to take a deeper look at the significant difference found between district instructional leaders self-assessed knowledge and the actual knowledge assessed in items that were not self-assessed. Since the actual knowledge was found to be significantly higher than their self-assessed knowledge of the same elements, this may provide insight as to perceived barriers to leading teachers with the development of 21st century classroom. How might this impact their ability to lead, with confidence, the teachers within their organization? Could their true lack of knowledge in some areas cause them to feel they have inadequate knowledge overall to truly lead this shift to 21st century classrooms and instruction?

Fourth, this study identified Instructional Leader Digital Learning as an area where knowledge was lacking for district instructional leaders. A focused study, with more specificity in regard to digital learning for instructional leaders, may serve to identify more fully the areas that are lacking. This information, in turn, can assist in focused and powerful responses to build this knowledge.

Fifth, the number of years since the participant had been a classroom teacher and the number of years since the participant had taken a technology related course had significant negative correlations with many different items across all elements. Further study is recommended to explore the impact these factors may have in creating 21st century classrooms and the specific aspects of implementation that are impacted. Conclusions from such a study may provide evidence related to the need for direct engagement in the classroom and with technology by instructional leaders above the classroom level.

Finally, institutions and organizations where 21st century instruction, classrooms, and learning are marketed as happening as normal routine could be studied. This research may bring not only a better understanding as to whether the requisite knowledge exists in these schools, but also an examination of where and how the members of the organization were able to acquire such knowledge and understanding.

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Appendix A

International Society for Technology in Education (ISTE) National Educational

Technology Standards (NETS) for Students, Teachers, Coaches, and Administrators

ISTE NETS Standards for Students

1. Creativity and Innovation

   Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

   a. Apply existing knowledge to generate new ideas, products, or processes

   b. Create original works as a means of personal or group expression

   c. Use models and simulations to explore complex systems and issues

   d. Identify trends and forecast possibilities

2. Communication and Collaboration

   Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

   a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media

   b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats

   c. Develop cultural understanding and global awareness by engaging with learners of other cultures

   d. Contribute to project teams to produce original works or solve problems

3. Research and Information Fluency

   Students apply digital tools to gather, evaluate, and use information.

   a. Plan strategies to guide inquiry

   b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media

   c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks

   d. Process data and report results

4. Critical Thinking, Problem Solving, and Decision Making

   Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

   a. Identify and define authentic problems and significant questions for investigation

   b. Plan and manage activities to develop a solution or complete a project

   c. Collect and analyze data to identify solutions and/or make informed decisions

   d. Use multiple processes and diverse perspectives to explore alternative solutions

5. Digital Citizenship

   Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

   a. Advocate and practice safe, legal, and responsible use of information and technology

   b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity

   c. Demonstrate personal responsibility for lifelong learning

   d. Exhibit leadership for digital citizenship

6. Technology Operations and Concepts

   Students demonstrate a sound understanding of technology concepts, systems, and operations.

   a. Understand and use technology systems

   b. Select and use applications effectively and productively

   c. Troubleshoot systems and applications

   d. Transfer current knowledge to learning of new technologies

ISTE NETS Standards for Teachers

Effective teachers model and apply the NETS·S as they design, implement, and assess learning experiences to engage students and improve learning; enrich professional practice; and provide positive models for students, colleagues, and the community. All teachers should meet the following standards and performance indicators.

1. Facilitate and Inspire Student Learning and Creativity

    Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.

    a. Promote, support, and model creative and innovative thinking and inventiveness

    b. Engage students in exploring real-world issues and solving authentic problems using digital tools and resources

    c. Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes

    d. Model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments

2. Design and Develop Digital Age Learning Experiences and Assessments

    Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS·S.

    a. Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity

    b. Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress

    c. Customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources

    d. Provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching

3. Model Digital Age Work and Learning

   Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.

   a. Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations

   b. Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation

   c. Communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital age media and formats

   d. Model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning

4. Promote and Model Digital Citizenship and Responsibility

   Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

   a. Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources

   b. Address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources

   c. Promote and model digital etiquette and responsible social interactions related to the use of technology and information

   d. Develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital age communication and collaboration tools

5. Engage in Professional Growth and Leadership

   Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

   a. Participate in local and global learning communities to explore creative applications of technology to improve student learning

b. Exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others

c. Evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning

d. Contribute to the effectiveness, vitality, and self-renewal of the teaching profession and of their school and community

ISTE NETS Standards for Education Coaches

1. Visionary Leadership

   Technology Coaches inspire and participate in the development and implementation of a shared vision for the comprehensive integration of technology to promote excellence and support transformational change throughout the instructional environment.

   a. Contribute to the development, communication, and implementation of a shared vision for the comprehensive use of technology to support a digital-age education for all students

   b. Contribute to the planning, development, communication, implementation, and evaluation of technology-infused strategic plans at the district and school levels

   c. Advocate for policies, procedures, programs, and funding strategies to support implementation of the shared vision represented in the school and district technology plans and guidelines

   d. Implement strategies for initiating and sustaining technology innovations and manage the change process in schools and classrooms

2. Teaching, Learning, & Assessments

   Technology Coaches assist teachers in using technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students.

   a. Coach teachers in and model design and implementation of technology-enhanced learning experiences addressing content standards and student technology standards

   b. Coach teachers in and model design and implementation of technology-enhanced learning experiences using a variety of research-based, learner-centered instructional strategies and assessment tools to address the diverse needs and interests of all students

   c. Coach teachers in and model engagement of students in local and global interdisciplinary units in which technology helps students assume professional roles, research real-world problems, collaborate with others, and produce products that are meaningful and useful to a wide audience

   d. Coach teachers in and model design and implementation of technology-enhanced learning experiences emphasizing creativity, higher-order thinking skills and

processes, and mental habits of mind (e.g., critical thinking, meta-cognition, and self-regulation)

e. Coach teachers in and model design and implementation of technology-enhanced learning experiences using differentiation, including adjusting content, process, product, and learning environment based upon student readiness levels, learning styles, interests, and personal goals

f. Coach teachers in and model incorporation of research-based best practices in instructional design when planning technology-enhanced learning experiences

g. Coach teachers in and model effective use of technology tools and resources to continuously assess student learning and technology literacy by applying a rich variety of formative and summative assessments aligned with content and student technology standards

h. Coach teachers in and model effective use of technology tools and resources to systematically collect and analyze student achievement data, interpret results, and communicate findings to improve instructional practice and maximize student learning

3. Digital Age Learning Environments

Technology coaches create and support effective digital-age learning environments to maximize the learning of all students.

a. Model effective classroom management and collaborative learning strategies to maximize teacher and student use of digital tools and resources and access to technology-rich learning environments

b. Maintain and manage a variety of digital tools and resources for teacher and student use in technology-rich learning environments

c. Coach teachers in and model use of online and blended learning, digital content, and collaborative learning networks to support and extend student learning as well as expand opportunities and choices for online professional development for teachers and administrators

d. Select, evaluate, and facilitate the use of adaptive and assistive technologies to support student learning

e. Troubleshoot basic software, hardware, and connectivity problems common in digital learning environments

f. Collaborate with teachers and administrators to select and evaluate digital tools and resources that enhance teaching and learning and are compatible with the school technology infrastructure

g. Use digital communication and collaboration tools to communicate locally and globally with students, parents, peers, and the larger community

4. Professional Development & Program Evaluation

Technology coaches conduct needs assessments, develop technology-related professional learning programs, and evaluate the impact on instructional practice and student learning.

a. Conduct needs assessments to inform the content and delivery of technology-related professional learning programs that result in a positive impact on student learning

b. Design, develop, and implement technology-rich professional learning programs that model principles of adult learning and promote digital-age best practices in teaching, learning, and assessment

c. Evaluate results of professional learning programs to determine the effectiveness on deepening teacher content knowledge, improving teacher pedagogical skills and/or increasing student learning

5. Digital Citizenship

Technology coaches model and promote digital citizenship.

a. Model and promote strategies for achieving equitable access to digital tools and resources and technology-related best practices for all students and teachers

b. Model and facilitate safe, healthy, legal, and ethical uses of digital information and technologies

c. Model and promote diversity, cultural understanding, and global awareness by using digital-age communication and collaboration tools to interact locally and globally with students, peers, parents, and the larger community

6. Content Knowledge and Professional Growth

Technology coaches demonstrate professional knowledge, skills, and dispositions in content, pedagogical, and technological areas as well as adult learning and leadership and are continuously deepening their knowledge and expertise.

a. Engage in continual learning to deepen content and pedagogical knowledge in technology integration and current and emerging technologies necessary to effectively implement the NETS·S and NETS·T

b. Engage in continuous learning to deepen professional knowledge, skills, and dispositions in organizational change and leadership, project management, and adult learning to improve professional practice

c. Regularly evaluate and reflect on their professional practice and dispositions to improve and strengthen their ability to effectively model and facilitate technology-enhanced learning experiences

ISTE NETS Standards for Administrators

1. Visionary Leadership

   Educational Administrators inspire and lead development and implementation of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization.

   a. Inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital-age resources to meet and exceed learning goals, support effective instructional practice, and maximize performance of district and school leaders

   b. Engage in an ongoing process to develop, implement, and communicate technology-infused strategic plans aligned with a shared vision

   c. Advocate on local, state and national levels for policies, programs, and funding to support implementation of a technology-infused vision and strategic plan

2. Digital Age Learning Culture

   Educational Administrators create, promote, and sustain a dynamic, digital-age learning culture that provides a rigorous, relevant, and engaging education for all students.

   a. Ensure instructional innovation focused on continuous improvement of digital-age learning

   b. Model and promote the frequent and effective use of technology for learning

   c. Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners

   d. Ensure effective practice in the study of technology and its infusion across the curriculum

   e. Promote and participate in local, national, and global learning communities that stimulate innovation, creativity, and digital age collaboration

3. Excellence in Professional Practice

   Educational Administrators promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources.

a. Allocate time, resources, and access to ensure ongoing professional growth in technology fluency and integration

b. Facilitate and participate in learning communities that stimulate, nurture and support administrators, faculty, and staff in the study and use of technology

c. Promote and model effective communication and collaboration among stakeholders using digital age tools

d. Stay abreast of educational research and emerging trends regarding effective use of technology and encourage evaluation of new technologies for their potential to improve student learning

4. Systemic Improvement

Educational Administrators provide digital age leadership and management to continuously improve the organization through the effective use of information and technology resources.

a. Lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources

b. Collaborate to establish metrics, collect and analyze data, interpret results, and share findings to improve staff performance and student learning

c. Recruit and retain highly competent personnel who use technology creatively and proficiently to advance academic and operational goals

d. Establish and leverage strategic partnerships to support systemic improvement

e. Establish and maintain a robust infrastructure for technology including integrated, interoperable technology systems to support management, operations, teaching, and learning

5. Digital Citizenship

Educational Administrators model and facilitate understanding of social, ethical and legal issues and responsibilities related to an evolving digital culture.

a. Ensure equitable access to appropriate digital tools and resources to meet the needs of all learners

b. Promote, model and establish policies for safe, legal, and ethical use of digital information and technology

c. Promote and model responsible social interactions related to the use of technology and information

d. Model and facilitate the development of a shared cultural understanding and involvement in global issues through the use of contemporary communication and collaboration tools

Appendix B

Survey Instrument:

21st Century District Level Instructional Leadership

21st Century District Level Instructional Leadership

CREATING 21ST CENTURY CLASSROOMS: WHAT DISTRICT LEVEL INSTRUCTIONAL LEADERS MUST KNOW TO LEAD

Purpose of the Study:

District instructional leaders are positioned in a situation where they must know about and be able to lead teachers in developing a 21st century classroom structure and instructional practices. This study seeks to describe what district instructional leaders know about creating such a classroom and applying powerful instructional practices for the 21st century. The purpose of this study is to identify what district instructional leaders know and what they need to do in order to lead teachers in creating 21st century classrooms within their schools.

This study, part of the doctoral requirements through the University of Nebraska-Lincoln, will help clarify areas on which professional organizations, institutions of higher learning, and educational organizations can focus their attention to support the shift to 21st century classrooms and instructional practices.

Procedures:

All district instructional specialists, assistant superintendents and superintendents are invited to participate in a 10-15 minute online survey.

Risks or Discomforts:

There are no known risks or discomforts associated with this research.

Benefits:

Though participants will not receive any direct individual benefit, indirectly they will benefit professionally from the contribution to the body of knowledge concerning whether district instructional leaders have the knowledge or need more training to lead teachers in developing 21st century classrooms and utilizing 21st century instructional practices.

Confidentiality:

Your responses will be kept completely confidential. Your IP address will not be known when you respond to the Internet survey. Only the researcher will see your individual survey responses. Data used for reporting will only be presented in a manner that prevents any identification of individuals or individual responses.
Opportunity to Ask Questions:

Please feel free to ask questions regarding this survey at any time. You may contact the researcher, Jeff Arrington, at (479) 304-1214 or jdarring@hotmail.com, the advisor, Jody Isernhagen, at (402) 472-1088 or jisernhagen3@unl.edu. You may also address any questions or concerns about your rights as a research participant or this study in general to the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965

Decision to Withdraw at Any Time:

Your participation is voluntary. You are free to withdraw your participation from this study at any time. If you do not want to continue, you can simply leave this website. If you do not click on the "submit" button at the end of the survey, your answers and participation will not be recorded. Your decision to withdraw will not adversely impact you and will not result in the loss of any benefit for which you are otherwise entitled.

Consent, Right to Receive a Copy

You are voluntarily making a decision whether or not to participate in this research study. Your acceptance certifies that

21st Century District Level Instructional Leadership

you have decided to participate after having read and understood the information presented. Please print a copy of this informed consent for your records.

The researcher offers his deepest gratitude for your participation.

✳ *

◯ I agree to participate

21st Century District Level Instructional Leadership

Survey Purpose: The purpose of this study is to find out what district instructional leaders know about leading teachers in creating 21st century classrooms.

Please use the following scale to respond to the item below:

Scale:

DK = Don't Know
1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

It is important that a district instructional leader:

	DK	1	2	3	4	5
1. Models effective classroom management	○	○	○	○	○	○
2. Maintains and manages a variety of digital tools and resources for teacher and student use	○	○	○	○	○	○
3. Coaches teachers in and models use of collaborative learning networks	○	○	○	○	○	○
4. Models and promote strategies for achieving equitable access to technology-related best practices for all teachers	○	○	○	○	○	○
5. Troubleshoots basic hardware problems common in digital learning environments	○	○	○	○	○	○
6. Collaborates to evaluate digital tools and resources that enhance teaching and learning	○	○	○	○	○	○
7. Models and promote diversity	○	○	○	○	○	○
8. Stimulates creativity	○	○	○	○	○	○
9. Facilitates the use of adaptive and assistive technologies to support student learning	○	○	○	○	○	○
10. Promotes and participates in national learning communities	○	○	○	○	○	○
11. Uses digital-age communication and collaboration tools to interact with peers	○	○	○	○	○	○
12. Models digital fluency through personal tablet use in the community	○	○	○	○	○	○

21st Century District Level Instructional Leadership

Please use the following scale to respond to the item below:

Scale:

DK = Don't Know
1 = Unimportant
2 = Of Little Importance
3 = Moderately Important
4 = Important
5 = Very Important

How important is it that a teacher:

	DK	1	2	3	4	5
13. Develops and models cultural understanding by engaging with colleagues and students of other cultures using digital age communication and collaboration tools	○	○	○	○	○	○
14. Understands global societal issues and responsibilities in an evolving digital culture	○	○	○	○	○	○
15. Advocates, models, and teaches safe use of digital information and technology	○	○	○	○	○	○
16. Provides equitable access to appropriate digital tools and resources	○	○	○	○	○	○
17. Develops and models global awareness by engaging with colleagues and students of other cultures using digital age communication and collaboration tools	○	○	○	○	○	○
18. Uses learner-centered strategies	○	○	○	○	○	○
19. Provides access to personal sites utilized by the community	○	○	○	○	○	○
20. Promotes and models digital etiquette related to the use of technology and information	○	○	○	○	○	○
21. Understands local societal issues and responsibilities in an evolving digital culture	○	○	○	○	○	○
22. Advocates, models, and teaches respect for copyright and intellectual property	○	○	○	○	○	○

21st Century District Level Instructional Leadership

Please use the following scale to respond to the item below:

Scale:

DK = Don't Know
1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

As a district instructional leader, I must be able to:

	DK	1	2	3	4	5
23. Model collaborative learning strategies	○	○	○	○	○	○
24. Maximize teacher and student access to technology-rich learning environments	○	○	○	○	○	○
25. Coach teachers in and model use of online and blended learning.	○	○	○	○	○	○
26. Model and facilitate ethical uses of digital information and technologies	○	○	○	○	○	○
27. Select adaptive and assistive technologies to support student learning	○	○	○	○	○	○
28. Collaborate to select digital tools and resources that enhance teaching and learning	○	○	○	○	○	○
29. Model and promote digital citizenship	○	○	○	○	○	○
30. Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners	○	○	○	○	○	○
31. Troubleshoot basic software problems common in digital learning environments	○	○	○	○	○	○
32. Model and promote strategies for achieving equitable access to digital tools and resources	○	○	○	○	○	○
33. Promote and participate in local learning communities	○	○	○	○	○	○
34. Select appropriate topics for teachers to discuss in learning teams	○	○	○	○	○	○
35. Use digital-age communication and collaboration tools to interact with parents	○	○	○	○	○	○
36. Model and facilitate understanding of legal issues related to an evolving digital culture	○	○	○	○	○	○
37. Promote, model and establish policies for legal use of digital information and technology	○	○	○	○	○	○
38. Model and facilitate involvement in global issues	○	○	○	○	○	○

21st Century District Level Instructional Leadership

Please use the following scale to respond to the item below:

Scale:

DK = Don't Know
1 = Unimportant
2 = Of Little Importance
3 = Moderately Important
4 = Important
5 = Very Important

As it relates to teaching students 21st century skills, how important is it for a teacher to:

	DK	1	2	3	4	5
39. Enable all students to pursue their individual curiosities	○	○	○	○	○	○
40. Develop technology-enriched learning environments	○	○	○	○	○	○
41. Establish structures to promote conformity of student products	○	○	○	○	○	○
42. Provide students with multiple and varied formative assessments	○	○	○	○	○	○
43. Align assessments with content standards	○	○	○	○	○	○
44. Use assessment results to inform learning and teaching	○	○	○	○	○	○
45. Customize and personalize learning activities	○	○	○	○	○	○
46. Utilize digital tools and resources to address students' diverse learning styles	○	○	○	○	○	○
47. Enable all students to participate in setting their own educational goals	○	○	○	○	○	○
48. Provide students with multiple and varied summative assessments	○	○	○	○	○	○
49. Incorporate digital tools and resources to promote student creativity	○	○	○	○	○	○
50. Align assessments with technology standards	○	○	○	○	○	○
51. Enable all students to assess their own progress	○	○	○	○	○	○

21st Century District Level Instructional Leadership

Please use the following scale to respond to the item below:

Scale:

1 = Very Limited or No Knowledge
2 = Limited Knowledge Level
3 = Moderate Knowledge Level
4 = High Knowledge Level
5 = Very High Knowledge Level or Expert

Please assess your own knowledge level of the following topics:

	1	2	3	4	5
52. Maximizing teacher and student use of digital tools and resources	◯	◯	◯	◯	◯
53. Using digital-age communication and collaboration tools to interact with students	◯	◯	◯	◯	◯
54. Expanding opportunities and choices for online professional development for teachers and administrators	◯	◯	◯	◯	◯
55. Modeling and promoting diversity global awareness	◯	◯	◯	◯	◯
56. Troubleshooting basic connectivity problems common in digital learning environments	◯	◯	◯	◯	◯
57. Selecting and evaluating digital tools and resources compatible with the school technology infrastructure	◯	◯	◯	◯	◯
58. Using digital communication and collaboration tools to communicate globally	◯	◯	◯	◯	◯
59. Ensuring effective practice in the study of technology and its infusion across the curriculum	◯	◯	◯	◯	◯
60. Promoting and participating in global learning communities	◯	◯	◯	◯	◯
61. Modeling and facilitating understanding of ethical issues related to an evolving digital culture	◯	◯	◯	◯	◯
62. Evaluating the use of adaptive and assistive technologies to support student learning	◯	◯	◯	◯	◯
63. Coaching teachers in and modeling use of digital content	◯	◯	◯	◯	◯
64. Stimulating digital age collaboration	◯	◯	◯	◯	◯
65. Promoting, modeling and establishing policies for ethical use of digital information and technology	◯	◯	◯	◯	◯
66. Modeling and facilitating the development of a shared cultural understanding in global issues	◯	◯	◯	◯	◯
67. Using contemporary communication and collaboration tools to develop a shared cultural understanding and involvement in global issues	◯	◯	◯	◯	◯

21st Century District Level Instructional Leadership

Please use the following scale to respond to the item below:

Scale:

DK = Don't Know
1 = Unimportant
2 = Of Little Importance
3 = Moderately Important
4 = Important
5 = Very Important

Digital Citizenship includes:

	DK	1	2	3	4	5
68. Exhibiting a positive attitude toward using technology that supports collaboration	O	O	O	O	O	O
69. Advocating for the responsible use of technology and information	O	O	O	O	O	O
70. Practicing safe use of technology and information	O	O	O	O	O	O
71. Demonstrating commitment to prior beliefs and personal cultural predispositions	O	O	O	O	O	O
72. Advocating for the safe and legal use of technology and information	O	O	O	O	O	O
73. Exhibiting a positive attitude toward using technology that supports learning	O	O	O	O	O	O
74. Demonstrating personal responsibility for lifelong learning	O	O	O	O	O	O
75. Practicing legal and responsible use of technology and information	O	O	O	O	O	O
76. Exhibiting a positive attitude toward using technology that supports productivity	O	O	O	O	O	O

21st Century District Level Instructional Leadership

77. Please identify skills that 21st century students, teachers and instructional leaders all three must possess.

78. Please identify practices that should be present in a 21st century classroom.

79. Please identify what district instructional leaders must know in order to lead teachers in creating a 21st century classroom and utilizing 21st century instructional practices.

21st Century District Level Instructional Leadership

80. In which Area do you work?

○ Americas   ○ Europe   ○ Pacific

81. What is your current position?

○ Superintendent   ○ Assistant Superintendent   ○ Instructional Systems Specialist (ISS)

82. How many years has it been since you were last a classroom teacher?

83. How many years were you a classroom teacher?

84. How many years ago did you take your last post-secondary course?

85. How many years ago did you take your last technology related course?

Appendix C

Invitation Email to Instructional Specialist, Superintendents and Assistant

Superintendents

Superintendents, Assistant Superintendents and Directors are invited to participate in the research survey identified below. Please also forward this message to instructional specialists in your area of responsibility. Thank you.

Dear Instructional Leader:

I am seeking your assistance as I study the topic of what instructional leaders know about leading teachers in the development of 21st century classrooms and the use of 21st century instructional practices. As a doctoral student at the University of Nebraska-Lincoln, I am investigating this topic as a part of my program of study and as an instructional leader like you, I desire to find out how and where to focus professional endeavors to address any need for growth or development. This survey is online and should take you only about 10 to 15 minutes to complete. It will open on December 1, 2013 and close on January 1, 2014.

All instructional specialist, superintendents and assistant superintendents are invited to take this online survey. I will provide any of you, upon request, the results of this survey. An informed consent question will be provided at the beginning of this survey. This informed consent will explain your rights as a research participant and discuss the purpose and intent of the survey. Please read the informed consent thoroughly before deciding to take the survey.

Please feel free to ask questions regarding this survey at any time. You may contact the researcher, Jeff Arrington, at (479) 304-1214 or jdarring@hotmail.com and the advisor, Jody Isernhagen, at (402) 472-1088 or jisernhagen3@unl.edu. You may also address any questions or concerns about your rights as a research participant or this study in general to the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965. Thank you in advance for your participation.
Click here to access the informed consent and survey website.

Sincerely,

Jeff Arrington
PO BOX 8743
Agat, Guam 96928
(479) 304-1214
jdarring@hotmail.com

Appendix D

Reminder Email to Instructional Specialist, Superintendents and Assistant

Superintendents

This is a reminder email for Superintendents, Assistant Superintendents and Directors. You are invited to participate in the research survey identified below. Please also forward this message to instructional specialists in your area of responsibility. Thank you.

Dear Instructional Leader:

This email is to follow up on my previous communication inviting you to participate in an online survey. The survey is intended to identify what instructional leaders know about leading teachers in the development of 21st century classrooms and the use of 21st century instructional practices and should take you only about 10 to 15 minutes to complete. Your participation is very important, greatly appreciated and your contributions may provide valuable feedback for leading teachers in making that shift to a 21st century classroom and instruction. This survey opened on December 1, 2013 and will close on January 1, 2014.

Please click on the link below now to access the survey.

Click here to access the informed consent and survey website.

Thank you, again, in advance for your participation.

Sincerely,

Jeff Arrington
PO BOX 8743
Agat, Guam 96928
(479) 304-1214
jdarring@hotmail.com

Appendix E

Table of Elements and Items

Element #	Item #	Type	Item #	Type	Item #	Type
1	1	5 Point Scale	12	5 Point Scale	46	5 Point Scale
	2	5 Point Scale	39	5 Point Scale	47	5 Point Scale
	3	5 Point Scale	40	5 Point Scale	48	5 Point Scale
	5	5 Point Scale	41	5 Point Scale	49	5 Point Scale
	6	5 Point Scale	42	5 Point Scale	50	5 Point Scale
	8	5 Point Scale	43	5 Point Scale	51	5 Point Scale
	9	5 Point Scale	44	5 Point Scale	77	Open-ended
	10	5 Point Scale	45	5 Point Scale	78	Open-ended
2	23	5 Point Scale	33	5 Point Scale	59	5 Point Scale
	24	5 Point Scale	34	5 Point Scale	60	5 Point Scale
	25	5 Point Scale	35	5 Point Scale	62	5 Point Scale
	27	5 Point Scale	54	5 Point Scale	63	5 Point Scale
	28	5 Point Scale	56	5 Point Scale	64	5 Point Scale
	30	5 Point Scale	57	5 Point Scale	77	Open-ended
	31	5 Point Scale	58	5 Point Scale	79	Open-ended
3	68	5 Point Scale	73	5 Point Scale	75	5 Point Scale
	69	5 Point Scale	74	5 Point Scale	76	Open-ended
	70	5 Point Scale	72	5 Point Scale	78	Open-ended
	71	5 Point Scale				
4	13	5 Point Scale	17	5 Point Scale	21	5 Point Scale
	14	5 Point Scale	18	5 Point Scale	22	5 Point Scale
	15	5 Point Scale	19	5 Point Scale	77	Open-ended
	16	5 Point Scale	20	5 Point Scale	78	Open-ended
5	4	5 Point Scale	36	5 Point Scale	65	5 Point Scale
	7	5 Point Scale	37	5 Point Scale	66	5 Point Scale
	11	5 Point Scale	38	5 Point Scale	67	5 Point Scale
	26	5 Point Scale	55	5 Point Scale	77	Open-ended
	29	5 Point Scale	61	5 Point Scale	79	Open-ended
	32	5 Point Scale				
6	80	Demographics	82	Demographics	84	Demographics
	81	Demographics	83	Demographics	85	Demographics
7	12	Distractor	34	Distractor	71	Distractor
	19	Distractor	41	Distractor		

Appendix F

Detailed Table of Elements and Items

Element #	Item #	Item	Type
1	1	Models effective classroom management	5 Point Scale
	2	Maintains and manages a variety of digital tools and resources for teacher and student use	5 Point Scale
	3	Coaches teachers in and models use of collaborative learning networks	5 Point Scale
	5	Troubleshoots basic hardware problems common in digital learning environments	5 Point Scale
	6	Collaborates to evaluate digital tools and resources that enhance teaching and learning	5 Point Scale
	8	Stimulates creativity	5 Point Scale
	9	Facilitates the use of adaptive and assistive technologies to support student learning	5 Point Scale
	10	Promotes and participates in national learning communities	5 Point Scale
	39	Enable all students to pursue their individual curiosities	5 Point Scale
	40	Develop technology-enriched learning environments	5 Point Scale
	42	Provide students with multiple and varied formative assessments	5 Point Scale
	43	Align assessments with content standards	5 Point Scale
	44	Use assessment results to inform learning and teaching	5 Point Scale
	45	Customize and personalize learning activities	5 Point Scale
	46	Utilize digital tools and resources to address students' diverse learning styles	5 Point Scale
	47	Enable all students to participate in setting their own educational goals	5 Point Scale
	48	Provide students with multiple and varied summative assessments	5 Point Scale
	49	Incorporate digital tools and resources to promote student creativity	5 Point Scale
	50	Align assessments with technology standards	5 Point Scale
	51	Enable all students to assess their own progress	5 Point Scale
	77	Please identify skills that 21st century students, teachers and instructional leaders all three must possess.	Open-ended
	78	Please identify practices that should be present in a 21st century classroom.	Open-ended

Element #	Item #	Item	Type
2	23	Model collaborative learning strategies	5 Point Scale
	24	Maximize teacher and student access to technology-rich learning environments	5 Point Scale
	25	Coach teachers in and model use of online and blended learning,	5 Point Scale
	27	Select adaptive and assistive technologies to support student learning	5 Point Scale
	28	Collaborate to select digital tools and resources that enhance teaching and learning	5 Point Scale
	30	Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners	5 Point Scale
	31	Troubleshoot basic software problems common in digital learning environments	5 Point Scale
	33	Promote and participate in local learning communities	5 Point Scale
	35	Use digital-age communication and collaboration tools to interact with parents	5 Point Scale
	52	Maximizing teacher and student use of digital tools and resources	5 Point Scale
	54	Expanding opportunities and choices for online professional development for teachers and	5 Point Scale
	56	Troubleshooting basic connectivity problems common in digital learning environments	5 Point Scale
	57	Selecting and evaluating digital tools and resources compatible with the school technology infrastructure	5 Point Scale
	58	Using digital communication and collaboration tools to communicate globally	5 Point Scale
	59	Ensuring effective practice in the study of technology and its infusion across the curriculum	5 Point Scale
	60	Promoting and participating in global learning communities	5 Point Scale
	62	Evaluating the use of adaptive and assistive technologies to support student learning	5 Point Scale
	63	Coaching teachers in and modeling use of digital content	5 Point Scale
	64	Stimulating digital age collaboration	5 Point Scale
	77	Please identify skills that 21st century students, teachers and instructional leaders all three must possess.	Open-ended
	79	Please identify what instructional leaders must know in order to lead teachers in creating a 21st century classroom and utilizing 21st century instructional practices.	Open-ended

Element #	Item #	Item	Type
3	68	Exhibiting a positive attitude toward using technology that supports collaboration	5 Point Scale
	69	Advocating for the responsible use of technology and information	5 Point Scale
	70	Practicing safe use of technology and information	5 Point Scale
	72	Advocating for the safe and legal use of technology and information	5 Point Scale
	73	Exhibiting a positive attitude toward using technology that supports learning	5 Point Scale
	74	Demonstrating personal responsibility for lifelong learning	5 Point Scale
	75	Practicing legal and responsible use of technology and information	5 Point Scale
	76	Exhibiting a positive attitude toward using technology that supports productivity	5 Point Scale
	78	Please identify practices that should be present in a 21st century classroom.	Open-ended

Element #	Item #	Item	Type
4	13	Develops and models cultural understanding by engaging with colleagues and students of other cultures using digital age communication and collaboration tools	5 Point Scale
	14	Understands global societal issues and responsibilities in an evolving digital culture	5 Point Scale
	15	Advocates, models, and teaches safe use of digital information and technology	5 Point Scale
	16	Provides equitable access to appropriate digital tools and resources	5 Point Scale
	17	Develops and models global awareness by engaging with colleagues and students of other cultures using digital age communication and collaboration tools	5 Point Scale
	18	Uses learner-centered strategies	5 Point Scale
	20	Promotes and models digital etiquette related to the use of technology and information	5 Point Scale
	21	Understands local societal issues and responsibilities in an evolving digital culture	5 Point Scale
	22	Advocates, models, and teaches respect for copyright and intellectual property	5 Point Scale
	77	Please identify skills that 21st century students, teachers and instructional leaders all three must possess.	Open-ended
	78	Please identify practices that should be present in a 21st century classroom.	Open-ended

Element #	Item #	Item	Type
5	4	Models and promote strategies for achieving equitable access to technology-related best practices for all teachers	5 Point Scale
	7	Models and promote diversity	5 Point Scale
	11	Uses digital-age communication and collaboration tools to interact with peers	5 Point Scale
	26	Model and facilitate ethical uses of digital information and technologies	5 Point Scale
	29	Model and promote digital citizenship	5 Point Scale
	32	Model and promote strategies for achieving equitable access to digital tools and resources	5 Point Scale
	36	Model and facilitate understanding of legal issues related to an evolving digital culture	5 Point Scale
	37	Promote, model and establish policies for legal use of digital information and technology	5 Point Scale
	38	Model and facilitate involvement in global issues	5 Point Scale
	53	Using digital age communication and collaboration tools to interact with students	5 Point Scale
	55	Modeling and promoting diversity global awareness	5 Point Scale
	61	Modeling and facilitating understanding of ethical issues related to an evolving digital culture	5 Point Scale
	65	Promoting, modeling and establishing policies for ethical use of digital information and	5 Point Scale
	66	Modeling and facilitating the development of a shared cultural understanding in global issues	5 Point Scale
	67	Using contemporary communication and collaboration tools to develop a shared cultural	5 Point Scale
	77	Please identify skills that 21st century students, teachers and instructional leaders all three must possess.	Open-ended
	79	Please identify what instructional leaders must know in order to lead teachers in creating a 21st century classroom and utilizing 21st century instructional practices.	Open-ended

Element #	Item #	Item	Type
	80	In which Area do you work?	Demographics
	81	What is your current position?	Demographics
	82	How many years has it been since you were last a classroom teacher?	Demographics
6	83	How many years were you a classroom teacher?	Demographics
	84	How many years ago did you take your last post-secondary course?	Demographics
	85	How many years ago did you take your last technology related course?	Demographics

Element #	Item #	Item	Type
	12	Models digital fluency through personal tablet use in the community	Distractor
	19	Provides access to personal sites utilized by the community	Distractor
7	34	Select appropriate topics for teachers to discuss in learning teams	Distractor
	41	Establish structures to promote conformity of student products	Distractor
	71	Demonstrating commitment to prior beliefs and personal cultural predispositions	Distractor

Appendix G

Table of Elements and Descriptions

Title	Element #	Category	Description
Digital Age Learning	1	Teacher	Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS·S.
	2	Instructional Leader	District instructional coaches create and support effective digital-age learning environments to maximize the learning of all students and create, promote, and sustain a dynamic, digital-age learning culture that provides a rigorous, relevant, and engaging education for all students.
Digital Citizenship	3	Digital Citizen	Digital citizens understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
	4	Teacher	Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.
	5	Instructional Leader	District instructional leaders model and promote digital citizenship and model and facilitate understanding of social, ethical and legal issues and responsibilities related to an evolving digital culture.
Demographics	6	Demographics	Information gathered to identify the subsets of population in the study
Distractor	7	Distractor	Items in the survey that are not part of the knowledge that the district instructional leader needs to lead in the 21st century