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Elementary Principal's Technology Leadership Dispositions

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Abstract

This qualitative study examined the reported technology dispositions that a group of elementary principals in a South Texas public school district possess as technology leaders as aligned to the 2009 National Technology Standards for Administrators (NETS-A). An online questionnaire and open-ended audio recorded interviews were utilized to determine technology dispositions of the participants. Findings included the following five dispositions: 1) Technology?s usefulness, 2) Risk taking, 3) Self-reliance, 4) Encouragement, and 5) Role model.

Index terms—

1 I. Introduction

ith contemporary society embracing a multitude of forms of technology, technology's presence and dominance, has become ubiquitous. Willoughby (2004) observed that "? most political, administrative, or judiciary functions of society that at one time might have been relatively free of technological considerations must now carefully incorporate such considerations" (p. 13). Pfundstein **??**2003) suggested that technology has led society in a rapid transition from the Industrial Age to the Information Age. This change is expressed symbolically by the switch from analog to digital media, which has had a profound impact upon both the adult world and students as well (Prensky, 2001; **??**fundstein, 2003). Prensky (2001) for example identified contemporary students, otherwise known as digital natives, as those who are fluent and comfortable in using various forms of technology. He affirmed that, today's students are being socialized very differently from their parent's generation. Flanagan and Jacobsen (2003) further explained that, the digital gap between newer and older generations has widen with more emphasis being placed upon the digital technologies. Principals, and teachers face the vast task of updating schools and classrooms in a society that has been altered by digital technologies, and many feel overwhelmed by the obligation to integrate technology into every subject and grade (Flanagan & Jacobsen, 2003). Due to the large presence of instructional technology hardware and software in our public schools, districts have increasingly required effective technology leadership from perceptive and progressive minded principals **??**Slowinski, 2000). Jacobsen (2001) rationalized that teachers cannot and should not be required to shoulder sole responsibility for effective technology integration in schools. "The transformation of classroom technology from hardware, software and network connections into thinking tools for teaching and learning requires effective and enabling leadership by visionary and knowledgeable school administrators" **??**Jacobsen, 2001, p.1).

2 II. Purpose of the Study

The purpose of this study is to determine which technology dispositions as aligned to the 2009 National Technology Standards for Administrators (NETS-A) does the selected sample of elementary principals report as technology leaders.

3 a) Statement of the Problem

School leaders have struggled to develop the necessary skills and dispositions in order to manage human and technical resources necessary to obtain the academic outcomes called for by higher standards (Nordin, Yusof &

Jusoff, 2010). Traditionally many school leaders have gained their knowledge and skills from college courses, self-instruction, school district personnel, consultants or product vendors (Richie, 1996). As for the role of many principal preparation programs Creighton (2003) stated that, principal preparation programs are sometimes not sufficiently training our future leaders with the necessary technology dispositions and skills for principals as technology leaders. Often time courses that focus upon technology leadership are missing from university principal preparation programs (Garcia, 2009). Furthermore, several empirical studies indicate that today's school leaders are not prepared or not being prepared adequately to assume the emerging role as technology leaders within their campuses (Nordin,Yusof & Jusoff, 2010; **??**iche,1996). The role of the campus principal has changed from being the building manager to that of the instructional leader in the past few decades. In addition, the role has also adapted to that of technology leader as well (Chang, 2012). According to Chang (2012), principals and other school leaders who can welcome and adapt to newer roles as technology leaders will be prepared and lead their schools for the future. **??**nderson and Dexter (2005) also indicated that the technological leadership of the school principal has been a key influence on the effectiveness of technology integration by teachers in educational instruction.

teacher's technology literacy, which in turn influences student achievement. It is the principal's technology dispositions that further influence the "?.the implementation of an innovation and the magnitude of fidelity with which it is implemented; therefore, principals, too, are at the center of achieving the promise of technology by facilitating its integration to transform teaching and learning" **??**Brockmeir, Sermon, & Hope, 2005, p.47) III. Literature Review a) The Disconnect Between Society and Public Schools Romano (2003) observed that outside of the classroom, students have an avid fascination and agility with a wide array of technological devices. Such innovations include a myriad of digital media devices such as mp3 players, tablets, ipods, smart phones with both Internet access and instant text messaging, gaming consoles such as Play Station Portable Systems (PSP) or X-Boxes. In contrast, Romano (2003) notes that, the inside world of the classroom is far removed technologically from today's youth's digital surroundings in which they are well versed and accustomed.

For the present time, digital technologies are needed to build new structures, due to the consequences of schools becoming increasingly disconnected from society (Jacobsen, Clifford & Friesen, 2002). A lack of resources and understanding create barriers to change and improvement which weakens the relationship between school leadership and instructional technology (Thomas, 1999). However even with the existence of technology infrastructure in schools, computers in classrooms and technology standards for teachers and administrators do not guarantee that students will use and gain from technology usage (Cavanaugh, 2001).

One important area for technology leadership is the ability to critically evaluative existing and new technology. Kearsley and Lynch (1992) wrote that our school systems need leaders and educators who can think about the possible side effects, the human impact of technology and weigh these consequences in decision-making. "We do not want to have a generation of technocrats any more than we want technophobes" in our schools **??**Kearsley & Lynch, 1992 p. 56). In order to remedy the disconnect, (Dewett, & Jones, 2001) envisioned principals forming strong alliances with other leaders who can both understand the managerial tasks of procuring hardware and software for instruction and using technology administratively. In other words, as Dewett, and Jones, (2001) stated, administrators do not have to be technology gurus, but they should know how to locate and utilize expert's talents. Yet this role, according to Holland and Moore-Steward (2000), for the principal and their leadership responsibilities is all too often overlooked.

b) The Principal as an Instructional Technology Leader Donlevy (2004) observed that with the remarkable innovations in information technology of recent years, competence with technology has been accepted as an important part of professional practice for anyone who wishes to become a school administrator. Dempsey (1999) explained that change seldom occurs in schools unless the principal, the campus leader, creates a climate, which allows innovations to blossom. In order for this to occur, principals as technology leaders must, have a working knowledge of the benefits of technology in the classroom and how to assist classroom teachers in utilizing it an effective manner (Schmeltzer, 2001). MacNeil and Delafield (1998) agree that, school principals must recognize the significance of technology contributing in improving school management, teaching and learning. As instructional leaders, principals ought to encourage a school climate that permits technological innovations in the classroom by promoting risk taking by staff members (Dempsey, 1999). Principals and other administrators who, "?lack sophistication about computers will make poor decisions about hardware/software selection or implementation that limits their usefulness" **??**Kearsley, 1988, p. 66).

Instructional technology leadership is often neglected and becomes only a priority when funding is available (Flanagan & Jacobsen, 2003). Gosmire and Grady (2007) consequently, offered that as instructional leaders, principals should realize technology's importance and become responsible for guiding and supporting their teacher's integration of technology into the curriculum. Ultimately as Holland and Moore-Steward (2000) maintained, even when teachers have acquired the necessary technology skills for technology integration, effective technology implementation will not occur without strong leadership from their principal. Holland and Moore-Steward (2000) remarked that, principals, as part of their supervisory role, should understand how to support and evaluate teachers who use technology in genuine ways. Recognizing that teachers need instruction, coaching and encouragement on the effective use of technology in the classroom is a significant responsibility of the principal (Holland & Moore-Steward 2000).

Gosmire and Grady (2007) supported the view that, one of the principal's roles is to establish a vision for the

school. Technology can play a positive role in helping schools face the current challenges of student achievement, but only if principals as technology leaders have the vision and know how to control and make it part of the framework that supports teaching short, they must have a vision for education and a plan to make it happen." **??**Schmeltzer 2001, p. 16).

4 c) Technology Standards for Principals

According to Wildy, Pepper and Guanzhonz (2010) educational professionals are framed by standards, which permit for effective evaluation of principals and teachers. The aim is for these standards to assist in improvement of professional practice.

The International Society for Technology in Education (ISTE) in 2001 collaborated with a variety of educational stakeholders such as The National Association of Secondary School Principals (NASSP), The National Association of Elementary School Principals (NAESP), The American Association of School Administrators (AASA), The National School Board Association (NSBA), North Central Regional Educational Laboratory, state departments of education, and university faculty (Schrum, Galizio, & Ledesma, 2011). Eight years later, ISTE updated the technology standards for school administrators (NETS-A) in 2009, due to the rapidly changing social and technical changes that were taking place in technology world (Schrum, et al., 2011) **??**1985). These ideas dealt with the premise that social being determines consciousness. According to Berger and Luckman, (1967) the social world in all its dimensions is manmade. Mankind, as a collective whole, produces a human environment, "?with the sum of its socio-cultural and psychological formations" **??**Berger & Luckman, 1967, p. 51). Society is a human product, which has an objective reality with man being a social product. Nothing is really natural in the human world; it's all created **??**Berger & Luckman, 1967). This applies to numerous amounts of man-made creations such as language, thought, art and science **??**Kumar, 2006). This study examined man-made constructs and experiences that aided the development of the elementary principals as technology leaders. These experiences both inside and outside the university setting are socially constructed events that in one form or another may have influenced the principals' technology dispositions.

Early social constructivist held that humans invent the properties of the world rather than discover them **??**Kula, 2000). Human realities arise out of interpretation of their perceptions (Emery, 1978). "We literally create a reality that reflects our view of the world and who we are in relation to it" **??**Emery, 1978, p. 39). Lincoln and Guba (1985) also noted that, "? the construction of realities must depend upon some form of consensual language" (p. 71).

Early social constructivists held that everything affects everything else in the present (Lincoln & Guba, 1985). Kukla (2000) also suggested that reality could be constructed by our own reality and that humans could collectively invent their world rather than discover it. According to Creswell (2003), assumptions recognized in qualitative research studies hold that people try to find an understanding of the world of which they are a part. Research subjects often develop meanings from perceptions based upon their own experiences towards certain objects, as in the case of this study. Creswell (2003) affirmed that a goal of research is to depend as much as possible upon the research subjects' personal views in the circumstances being studied. As in the case of this study, the views and perceptions of the elementary principals were discovered by a questionnaire and interviews.

Constructivists' focus is upon a specific context in which people live and work, in order to understand the historical and cultural settings of the participants (Creswell, 2003). In addition, Creswell (2003) cited that the researcher's intent then is to interpret the meanings others have about the world. It is the intent of this study to uncover the dispositions of the principal as a technology leader from qualitative data.

5 V. Methods

6 a) Research Design

The following study is based upon a qualitative research design that strives to uncover the dispositions of elementary principals as technology leaders. During a qualitative study, researchers state research questions instead of predictions that involve variables or statistical tests, such as in a quantitative study (Creswell, 2003). Research questions become broad and general so that research subjects construct the meaning of a situation, which is often developed from interactions with other people. "The more open ended the questioning, the better the researcher listens carefully to what people say or do in their life setting and often these subjective meanings are negotiated socially and historically" **??**Creswell, 2003, p. 8). These questions can turn into topics explored in interviews, observations, and documents (Creswell, 2003). "The theory or general pattern of understanding will emerge as it begins with initial codes, develops into broad themes, and coalesces into a grounded theory for broad interpretation" **??**Creswell, 2003, p.182). Consequently, research questions should be framed with open ended words such as "what" or "how" instead of words such as "why", which suggests cause and effect; an approach used typically with quantitative research (Creswell, 2003).

Specific types of social research problems call for definite research approaches and when an idea or an event needs to be understood, because very little research has been conducted, there is a need for a qualitative approach (Creswell, 2003). Relevant to the nature of this study is the realization that there has been a negligible amount of inquiry about how principals have acquired technical knowledge and dispositions in order to facilitate the integration of technology into the curriculum (Hope, Kelley & Kinard, 1999; Brockmeir, Sermon, & Hope, 2005).

In addition, Creswell (2003) offered that qualitative research takes place in a natural setting such as a home or office of the participants in a research study. Being in the natural setting allows the researcher to develop a great amount of detail about a location or person in order to draw in the experiences of research subjects (Creswell (2003).

7 b) Site and Participant Selection

Elementary school principals were recruited from four school districts. These school districts and research subjects were chosen due to their proximity to a university principal preparation program, the number of elementary campuses in each school district and their superintendent's willingness to participate in the study. Approximately sixty-seven individuals currently serving as elementary principals were invited to participate in an online questionnaire, The Principal's Technology Leadership Assessment, PTLA c) Instrumentation An online questionnaire and interviews as data collection instruments were used in this study. Elementary principals first participated in taking The Principal's Technology Leadership Assessment (PTLA). This questionnaire included 35 items requesting responses on a 5-point Likert Scale. The intended purpose of this questionnaire was to assess principals' technology leadership inclinations along with obtaining the levels of expertise in facilitating the integration of technology into the teaching and learning process. This instrument based, on the National Educational Technology Standards for Administrators (NETS-A), was developed and psychometrically validated by the American Institutes for Research (2003) as part of a grant received from the United States Department of Education Fund for the Improvement of Postsecondary Education (FIPSE). Development of the instrument began with a review of NETS-A to identify specific dispositions and practices linked with each of the standards. After the data from the pilot study was collected and analyzed, the development team comprised of experts from the International Society of Technology Educators (ISTE) concluded that the PTLA instrument was highly reliable and appeared to appropriately measure the desired qualities of school technology leadership.

8 d) Data Collection

Names, E-mail addresses, and school addresses of the elementary principals were obtained through the selected district websites and telephone directories. Institutional Review Board (IRB) recruitment e-mails and letters of informed consent were sent to each of the elementary principals. The e-mails and letters summarized the nature of the study, gave instructions and the web link for the online questionnaire.

Each prospective participant's recruitment e-mail and letter informed them of included a unique number, which provided a means to locate selected participants for a follow up face-to-face interview.

Once the results of the online questionnaire were completed, the researcher downloaded a comma separated value file (CSV) containing the raw questionnaire responses. Data analysis revealed sixteen of the thirty subjects scored a mean above 3.64 out of possible 5. The cutoff value of 3.64, represented the top third of all the respondents who demonstrated higher technology leadership competencies as measured by the PTLA questionnaire. After computing ranking calculations, the researcher determined which respondents scored above the mathematical mean based upon scale values of 1 to 5, using the Statistical Package for the Social Sciences software (SPSS). This pool of respondents, who were marked by unique identifiers, were then inputted using a random sample selection program. The first five respondents were selected as potential subjects for the face-to-face audio taped interviews. The interviews were structured to obtain information about the sources and inspirations of their instructional technology experiences. After the interviews were conducted, the data was transcribed and imported into the software program, The Ethnograph v5.0 ©. **??**1967), is referred to as constant comparative analysis. Constant comparative analysis occurs as the data is compared and as categories and their properties appear combined. Constant comparative analysis aides in identifying patterns, coding data, and putting findings According to **??**attton (1990), data generated by qualitative methods are enormous with the process of sitting down and making sense out of pages of interviews and whole files of field notes can be overwhelming. Anafara, Brown and Mangione (2002), surmised that, "As data were being coded in the first iteration, the responses could be compared within categories and between categories, known as the second iteration" (p.32). The method used in this study, described in detail in the works of Glaser and Strauss in categories **??**Anafara, Brown and Mangione, 2002). Miles and Huberman (1994) suggested that "Phrases that are used repeatedly by informants ("in vivo" codes) are also good leads; they often point to regularities in the setting" (p. 61). As Bogdan and Biklin (1982) explained, particular words, phrases, patterns of behavior, subject's ways of thinking and events repeat and stand out. Seidel, Kjoiseth, and Seymour (1988) labeled the process of identifying and tagging data for later retrieval and more rigorous analysis as code mapping. In the case of this study, the transcribed audio recordings were inputted into a software program, The Ethnograph v5.0 ©. In this study, data was imported and coded and chunked together with The Ethnograph v5.0 © so that labels or codes can be accumulated. In essence, that type of coding provides the researcher with the link between data and the conceptualization (Glaser & Strauss, 1967).

9 Volume XIV Issue IX Version I

Once all codes are established, a researcher can electronically review, modify or delete the coding scheme. Searching and sorting the codes with The Ethnograph v5.0 © will then allow the researcher to locate segments of coded words. In this study, statements were coded in The Ethnograph v5.0 © in order to determine the area

of experiences which have contributed towards the elementary principals as being technology savvy leaders. The researcher accomplished this by fitting data and concepts together that formed consistent patterns or categories. In addition the researcher used the data to write memos that related to the codes, so that retrieval of any patterns could be noted in the first iteration of the coding (Bryman & Burgess, 1994).

10 VI. Research Question

What technology dispositions, as defined by the 2009 National Educational Technology Standards (NETS-A) for public school administrators, do elementary principals report they possess? a) Analysis of Data Broadly defined, a disposition is "? a prevailing tendency, mood, or inclination.., to act in a certain manner under given circumstances" (The American Heritage Dictionary, 1985, p. 487). Dispositions are affective dimensions of human personality that have a "? consistency about them.., are characterized, exemplified or typified in human behavior" (Mullin, 2003, p. 5) and include "attitudes, values, interests, selfconcept, and motivation" (Stiggins, 2001, p. 101).

After analyzing the interview data, the following dispositions emerged: 1) Technology's usefulness, 2) Risk taking, 3) Self-reliance, 4) Encouragement, and 5) Role model. These five dispositions are aligned with the following NETS-A.

The first disposition that was discovered through the data analysis from the interviews with the principals was Technology's usefulness and the role it plays in schools.

11 VII. Technology's Usefulness: First Disposition

Technology was something that all five principals in this study found to be a useful component for student achievement on their campuses. Many of them felt that it was a necessary part to incorporate it during instructional day and expected each teacher to utilize technology, since many of the student's needs and learning styles were being met by the integration of technology into the curriculum. The following table and subsequent tables provide a summary at a glance which of the National Technology Standards for Administrators (NETS-A) were aligned with each of the discovered principal technology dispositions. All of the principals in this study valued the importance of developing strategic campus improvement plans, which included sections that infused technology into the curriculum. Principal 1 emphasized that her campus was trying their best to plan and allocate as many resources that their budgets allowed. According to her, she had set aside funds to purchase badly needed software and hardware for her campus. Her teachers had expressed a strong desire to have stimulating technologies available for the students, and had often requested a variety of technologies during campus meetings. Principal 1's main criteria, in planning and implementing any new technology included the fact that it had to be researched based or in other words had a proven track record of student achievement.

b) Digital age learning culture-a: Ensure instructional innovation focused on continuous improvement of digital-age learning

As indicated in each of the principal's campus improvement plans, digital age learning was one of many components that were strategic in increasing student achievement. According to Principal 2, her teachers were fairly technology literate and loved to incorporate technology as much as possible into their lessons. Principal 1 commented that, "?the instructional technology that we have plays in integral part of our success. At this point the only problem that we have as far as funding trying to get the necessary technology tools in each classroom". Principal 1 explained that her efforts focused upon purchasing for 3 rd -5 th grades equipment such as Document Cameras, Smart Boards and Computers on Wheels laptops (COWS) for each classroom. In addition to these devices, Principal 3 explained that her teachers used also used mobile technologies such as iPads, Ipods, and Chromebooks. c) Digital age learning culture-c: Ensure effective practice in the study of technology and its infusion across the curriculum Principal 3 commented that she has witnessed quite a few changes with technology and how it has become infused within today's curriculum. She stated that many of her teachers have adjusted quite well and that few teachers are reluctant to incorporate technology. Principal 5 ensured that most of her teachers felt very comfortable infusing technology into their lessons, by sending theme to professional development such as the Intel Tech program. The Intel Teach program, aims to meet the needs of today's learners requires ongoing support for teachers as they implement new teaching practices (Martin, Culp, Gersick, & Nudell, 2003). Intel Teach also has been demonstrated to aid K-12 teachers in effectively integrating technology and promoting a student centered approach while engaging students with digital tools (Martin, Culp, Gersick, & Nudell, 2003). Principal 4 believes that it was very important to build capacity in her teachers by sending technology staff development. She stated that, "I inform them of any staff development that is upcoming and also assure that they are trained in all areas so that no one is left behind".

12 d) Digital age learning culture-d: Provide learnercentered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners

All the principals in this study felt that besides having buy-in and a well-trained staff, it was crucial for their campus to address the diverse needs of their students. They saw technology as possible tool that aided in reaching

student populations that have been typically marginalized in the past. For example, according to Principal 5, software such as Pearson Learning has been instrumental in assisting her special needs and bilingual students. She exclaimed that "It's individually prescriptive and evident that achievement occurs because you see the growth on a weekly basis. They also using in writing". She further explained that other software provided excellent tools for her dyslexic students, whose writing was sometime illegible. In additional to those tools she stated that her special education department was very supportive in recommending additional software solutions for her special needs students.

13 VIII. Risk Taking: Second Disposition

The second disposition that all principals in this study held was Risk taking. Most leaders recognize the need for change as it related to updating instruction with technology and were very willing to make those necessary steps to incorporate technology in their campuses (Brooks-Young, 2002). The NETS-A standards call upon principals to become willing to "Ensure instructional innovation focused on continuous improvement of digital-age learning" (NETS-A, 2-A). Risk taking is part of the change process for many leaders and often requires a system change in the way instruction is planned and implemented. The following table outlines the alignment of the NETS-A with Risk taking as a discovered dispensation.

14 Systemic improvement-c: Recruit and retain highly competent personnel who use technology creatively and proficiently to advance academic and operational goals

Principal 4 stated that she had noticed remarkable turnaround in her faculty's use of technology after she provided many opportunities for professional development and support. She indicated that developing the culture of risk taking was not an easy one in the age of accountability. However, she made it clear the she had to become the role model in risk taking by allowing teachers to take time to adjust to changes. She stated that "85 to 90 percent of her teachers" were now very comfortable in using the technology on a weekly basis. Principal 5 also acquired that risk taking was an important disposition for an elementary principal to have since it was part of the change process. Principal 5 believed that allowing teacher's time to practice and assist each other in the change process allowed them opportunities to implement technology into their classroom. As in any new endeavor, the principals in this study exclaimed that risking time, energy and funding into staff development, hardware and software took a leap of faith that ultimately did show results in student achievement on their campuses.

15 IX. Self-Reliance: Third Disposition

The third disposition revealed by the principals in the study was that of Self-reliance. All the principals felt confident about using technology in their professional and personal lives. Most of them expressed the desire to learn and had a spirit of self-reliance. Principal 2 felt that she had an aptitude for learning technology. She read the manual and follows directions to learn software and is not afraid to use technology. She explained that the online computer applications are fairly simple and once you look at the manual, in addition the online help features allowed her to follow directions and become familiar with application. Principal 5 said that she learned applications rather quickly and was eager to learn new things. Principal 4 also stated that once she knew one application, other applications were easier to learn, since they mostly used similar icons and commands. Principal 2 stated that, "A lot looks user friendly when you first use it and it has a lot of different icons that are very familiar due to experience with other applications." Principal 3 reflected that she tended to just jump in knowing that she was not going to break anything. She also read directions or the manual when she was stuck on a particular point. Once she knows the software application, it becomes second nature to her. **??**rincipal Table **??** provides a summary of the NETS-A that is aligned with the third disposition, Self-reliance. a) Excellence in professional practice-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

All the principals in the study indicated that they felt it to be very important to keep current with the rapidly changes in technology. They expressed concern that it was of upmost importance for them to expose their students to technologies that their low-income students might not have otherwise used or seen.

Principal 1 stated that it was very important for her to conduct research on the latest technology trends and to "?keep up with best practices and anything that is important such as new laws, new initiatives and things, recertification or our teachers and our staff". Principal 5 also agreed with the importance of keeping current with technology trends because "?technology is very important especially in the position that we are in". As a principal she felt that it was important to use the latest tools downloading and disaggregating data and providing reports for central office.

16 X. Encouragement: Fourth Disposition

The fourth disposition revealed by the principals in this study was that of Encouragement. According to Brooks-Young (2002), principals should "educate and inform stakeholders along the way" (p.26). The NETS-A calls

upon principals to "Model and promote the frequent and effective use of technology for learning" (NETS-A, IIB). By informing, modeling and promoting effective use of technology, principals are advocates that encourage their teachers and staff. Principal 3 for example, firmly believed in encouraging teachers to use technology in the classrooms. She stated that she did so because, "?in this day and age we have so many things such as iPads and Play stations. They are waiting for information at a touch of a button or a click of a mouse. Student are now so in tune with technology, so teachers should make every effort to reach their students by using technology that students are accustomed to using".

Table 4 illustrates four of the NETS-A, that are directly aligned with the disposition of Encouragement. According to the NETS-A, it's the duty of the principal as a technology leader to ensure that technology is infused across the curriculum. Principal 1 for example, relied upon researched based technology solutions and practices for her teachers and students. Principal 2 encouraged her teachers to use technology by asking them to document technology integration in their weekly lesson plans. She also provided and encourage the use of applications such as Discovery Education's United Streaming media service, and rich multimedia applications such as Knowledge-Box. b) Excellence in professional practice-a: Allocate time, resources, and access to ensure ongoing professional growth in technology fluency and integration accountable for utilizing available technologies. All with those high expectations, the principals also realized that no true technology integration was going to occur without time and effective staff development. Principal 4 was constantly promoting staff development by forwarding e-mails from her district's Curriculum and Instruction's technology department. In addition the other principals ensured that their teachers attended trainings at their local educational regional service center along with attending annual local and statewide technology conferences. She stated that "I know that teachers have come back and have implemented some of the strategies they have seen and they also have done some staff development. I as a technology leader, expect teachers to be utilizing technology throughout their lessons". c) Excellence in professional practice-b: Facilitate and participate in learning communities that stimulate, nurture and support administrators, faculty, and staff in the study and use of technology Principal 3 stated that she was an avid promoter of technology but she held everyone accountable including herself. She further explained that it was crucial to build capacity in her faculty by sending them to as much technology staff development as possible. She annually sent faculty to both a local regional educational service center technology conference and a state wide teacher technology conference. Upon return, each faculty member who attended was expected to demonstrate and share their experiences learned. Principal 3 believed that it was important to have a strong professional learning community of learners. Principal 1 also supported a community of learners by setting aside once a six week to show case with guest speakers or vendor's technologies. She felt it was important to share and reflect amongst her faculty current technology trends. d) Systemic improvement-a: Lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources

All the principals expressed that they supported innovative systemic improvement by providing enough technology and media rich resources for their students and teachers. Principal 4 indicated that she went above 5 percent allotted to her from state/local funds to provide capital outlay to purchase technologies needed by her campus. She set aside funds to provide Chromebooks, digital media projectors and additional interactive software. She also mentioned that she continued to expand by adding and replacing technology on a scheduled basis for her campus.

In addition to hardware, Principal 5 for example, stated that she provided software based upon the recommendations from her Special Education, Bilingual and Curriculum Specialists. She ensured that her students had access to a variety of applications that supported her special populations and provided rich multimedia experiences. Some of the applications she purchased with Federal funds included Knowledge Box and Discovery Education's United Streaming, which both contain multimedia content. Principal 1 stated that her "teachers are excited about it" and they were eager to utilize it in their classrooms. She stated "If someone brings something to me that I see its potential, and it's researched based we purchase it."

17 XI. Role Model: Fifth Deposition

The fifth and final disposition discovered in this study was that of principals believing in the importance of being a Role-model. The NETS-A throughout the standards expect the principal to "model and promote the frequent and effective use of technology for learning" (NETS-A, IIb,IIIc,IVb, IVc & IVd). Principal 1 for example explained that principals need to become role models in order to expect teachers to use technology. She stated that, "?otherwise I don't know if it would be possible" (Principal 1). She noted furthermore that she had noticed that her non tech savvy colleague's staff not use technology as much, since they were not provided a nurturing and a role model. Nor did they hold the teachers accountable for using technology in the classroom. Table **??** summarizes the two NETS-A, which are aligned with the disposition of being a Role model. Principal 1 explained that technology skills as a principal were very important to her because she had to interact with many different stakeholders such as central office and community members. She stated that, "It's very important for me to be able to manipulate the internet and the technology such as presentations, using the document cameras, and other equipment. I feel that I am computer literate and believe that it is important to be able to model what we are asking the teachers to do" Being a role model was crucial for her to assist her reluctant teachers and staff. She indicated that, I myself model and our technology staff models and we do have afterschool trainings we go in and

explore the different areas whether it's doing an email or going into the different websites or just the fact that they have to sign up for staff development. And if they are little shy or reluctant we do offer technical support.

Principal 1 supported her teachers and was a role model for her teachers by visiting their classrooms and providing support by giving them examples of how to use technology in the classroom. Principal 3 was also very supportive and felt that it was her major responsibility as a technology leader to be a visible role model. She explained that, For I one, as a leader I think that I should be able to utilized all the technology. I am very very [sic] in tune with the document camera, the projectors, the digital cameras. In order for teachers to want to follow you I think first of all you need to be a role model and you need to able to in order to expect it you better make sure you know how to do it. Otherwise I don't know if it would be possible otherwise. I'm seeing from my colleagues, people that who are not tech savvy more than likely will not implement it and will not hold teachers accountable.

b) Systemic improvement-b: Collaborate to establish metrics, collect and analyze data, interpret results, and share findings to improve staff performance and student learning

As most principals have expressed emphasis in student achievement and accountably, the principals in this study also communicated strongly the need to be a role model for their faculty and staff in terms of collecting, disaggregating, analyzing and acting with data. All the principals throughout their interviews discuss how technology had been a very useful tool recently in the interpretation of data. Principal 3 for example, explained that applications such as DMAC and Euphoria Aware have made administration and analysis of local benchmarks much easier for her and her faculty to interpret and act upon. According to her, the results were quickly obtained by scanning the "bubble sheets". She stated that, "Once you have that data you are able to work strategies right away a lot faster than it would be able to do with paper". Principal 5 stated that, "I think that technology is very important especially in the position that we are in. As principals we use it for communication within the school, the district [sic] as well as communicating with colleagues. I don't know how principals do not use it with their faculty. I don't know how they are able to keep up, because it's very important". Principal 4 also exclaimed that she used electronic testing and analysis with her reading program. For example her teachers used technology to determine which students need reading interventions. According to her, "?looking at the data, bringing it down [sic] assists us in grouping our students. According to where they are at **??**sic], what their needs are. A lot of these programs are very specific in letting us know what their weaknesses and strengths are".

18 XII. Discussion

School leadership is an important element that often determines whether technology is integrated with the teacher's daily lessons and curriculum. (Sandholz, Ringstaff & Dwyer, 1997; **??**cLeod, et.al, 2007; **??**ehlinger and Powers, 2002). **??**aldez (2004) noted that the use of technology by students has made learning a genuine, engaging and significant experience. Creighton (2003) showed that campus leaders are in an exclusive position to inspire a vision for technology, to assign funds and personnel to ensure teachers receive the professional development, technical support and classroom resources, which will make them successful. Baylor and Ritchie's (2002) study revealed that technology usage was affected by the strength of leadership. Consequently, researchers share the view that, principals should have the necessary technology dispositions to lead their campus (Gosmire & Grady, 2007; Bozeman, Raucher, & Spuck, 1991; Kearsley & Lynch, 1992).

As shared earlier, researchers examined which technology dispositions elementary campus principals possessed via the use of a social constructivism framework, which is the man-made constructs and experiences that help create our realities **??**Berger & Luckman, 1967; **??**umar, 2006;Emery, 1978;& Kukla, 2000). As evidenced through numerous interviews with a diverse group of campus principals, specific dispositions surfaced as to how campus leaders' human realities arose out of interpretation of their perceptions of technology. In other words, principals' understanding and application of technology, as well as serving as the campus technology leader is based on a reality constructed from multiple learning pathways -for example, learning would stem from exposure to professional learning provided via the school district, university principal preparation program and personal learning experiences. Therefore, a technology leader's view and interpretation of technology seems to influence which technology leadership dispositions will emerge in a campus leader.

After reviewing the data, specific themes were identified which helped answer the research question: What instructional technology dispositions, as defined by the National Educational Technology Standards (NETS-A) for public school administrators, do elementary principals report they possess? The themes that surfaced uncovered the following dispositions for elementary principals as technology leaders: 1) Technology's usefulness, 2) Risk taking, 3) Selfreliance, 4) Encouragement, and 5) Role model. a) Technology's usefulness: First Disposition According to Dewett and Jones (2001) principals should view technology leadership as one of the most important factors affecting the usefulness of technology in classrooms. A principal's use of technology will transmit the importance of technology to both staff members and students. Principals as technology leaders in this study recognized that technology can be an efficient and effective tool that should be used by themselves, their faculty, staff and students. Mehlinger and Powers (2001) stated, "It is no longer possible for administrators to be both naive about technology and be good school leaders" (p. 218). Becker (2000) put forth that technology can be a very useful tool for students both in their homes and in classrooms. Technology and web based applications also made educational management more efficient. b) Risk Taking: Second Disposition Principals as technology leaders are risk takers. "Effective school leaders are the key to large-scale, sustainable education reform." **??**Fullan,

2002, p.16). The idea of risk-taking must be adopted as principals become leaders for technology both for themselves and the teachers (Fullan, 1991). According to Brooks-Young (2002), leaders need to allow educators permission to take risks in order to see successful outcomes in our schools. In order to create and maintain any changes on their campuses, principals should create an atmosphere of innovative risk taking. Principals as instructional leaders could be thought of as trailblazers that move ahead of the rest.

19 c) Self-reliance: Third Disposition

The NETS-A calls upon all principals and administrators to become proficient in the selection of effective appropriate technology resources and skills. Although there are many sources for knowledge and skills, the majority of principals continue to be self-reliant in their own staff development and professional growth. "Today most administrators gain their instructional technology experience through self -instruction, vendors, school personnel, consultants, or external courses" **??**Richie, 1996, p.43). Principals as leaders of the campus should be able to inwardly reflect and draw from within themselves skills and resources that support their campus. This spirit of self-reliance is called upon in the NETS-A, by stating that principals should "engage in sustained, job-related professional learning using technology resources" (ISTE, 2001). d) Encouragement: Fourth Disposition Principals as technology leaders oversee and approve of teacher staff development. According to the NETS-A, principals should "provide for and ensure that faculty and staff take advantage of quality professional learning opportunities for improved learning and teaching with technology" **??**ISTE, 2001).

Principals are also charged with encouraging and supporting efforts for the use of technology on their campus. The NETS-A states that principals should "create and participate in learning communities that stimulate, nurture, and support faculty and staff in using technology for improved productivity" (ISTE, 2001). Principals also explained that they thought it important for both staff and students to use technology to enhance teaching and learning. Principals sent staff to professional development appropriate to their level. They promoted technology on campuses and supported teachers by allowing them opportunities for professional growth. Principals informed teachers of upcoming training events at district and Region One Education Service Center.

20 e) Role model: Fifth Disposition

In order to become effective technology leaders, principals themselves must be crucial role models in the adoption and integration of technology in classrooms. (Kelley, Kinard, & Hope 1999). "Principals must accept the challenge to create supportive conditions, which would foster innovative use" of technology (Price et. al, 1999, p. 482). Hope and Stakens (1999) suggested the following roles for today's principal: an instructional leader, an instructional technology leader, a technology role model, and visionary and supporter of technology integration. The NETS-A require principals to "model the routine, intentional, and effective use of technology and to identify, communicate, model, and enforce social, legal, and ethical practices to promote responsible use of technology" **??**ISTE, 2001).

Principals who are role models comprehend that when properly used at schools, technology will enhance teaching and learning in the classroom. These kinds of principals can provide the added support and direction teachers are looking for (Dewett, & Jones, 2001)).

21 XIII. Conclusion

responsibility for effective technology integration in schools. " The transformation of classroom technology from hardware, software and network connections into thinking tools for teaching and learning requires effective and enabling leadership by visionary and knowledgeable school administrators" **??**Jacobsen, 2001, p.1). West (2003) found that district level leadership is essential if teachers are to receive necessary support for change. According to West (2003), unless the vision from the principal is clear, implementation of technology in the classroom falls short. Researchers such as West (2003) are noting that attention of school districts should be upon those who are entrusted with instructional leadership, namely the campus principal. Principals at the helm of every campus make decisions collaboratively in the purchasing of technologies for their campus in the form of software, hardware and staff development to support instructional technology integration. Often times, making informed decisions about instructional technologies, requires specific dispositions. Such dispositions are currently addressed by National Educational Technology Standards for Administrators (NETS-A) and by the Texas Essential Knowledge and Skills for Technology Applications.

Social constructivism recognizes that as social beings we are involved in constructing our human realities and that these realities arise out of our experiences. That being the case, the researchers argue that dispositions can be learned. Therefore, in an effort to equip principals with the appropriate dispositions to effectively lead technology at the campus and district level, it is important that schools and university educational leadership preparation programs be directly involved in building technology leadership capacity. Campus and district-wide professional development and graduate principal certification programs should develop, implement and assess curriculum designed specifically to teach technology leadership dispositions to current and future campus administrators.

If principals do not have the dispositions stated in these national or state technology standards for administrators, they lack an adequate foundation and run the risk of making uninformed judgments. Principals,

521 as campus leaders, must be able to guide teachers in preparing students for using technology as a part of their academic development. [1]

Figure 1:

522

[1] Elementary Principal's Technology Leadership Dispositions

1

NETS-A Standard	Description
Visionary Leadership-b	Engage in an ongoing process to develop, implement, and communicate technology-infused strategic plans aligned with a shared vision
Digital age learning culture-a:	Ensure instructional innovation focused on continuous improvement of digital-age learning
Digital age learning culture-d	Ensure effective practice in the study of technology and its infusion across the curriculum
Digital age learning culture-c:	Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners

Figure 2: Table 1 :

Figure 3:

4

NETS-A Standard

Figure 4: Table 4 :

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