Vital Skills of the Elementary Principal as a Technology Leader

Alejandro Garcia
Chuey Abrego

Abstract
This qualitative study examined the reported technology skills that a group of elementary principals in a South Texas public school district possess as technology leaders as aligned to the updated National Technology Standards for Administrators (NETS-A). An online questionnaire and face-to-face audio recorded interviews were utilized to determine technology skills of the study’s participants.

Since the late twentieth century, technology has been a dominant presence in human society. Prensky (2001) identified contemporary students, otherwise known as digital natives, as those who are fluent and comfortable in using various forms of technology. To many of the digital natives, using technology comes naturally, much like breathing. On the other hand, using technology by many of the Digital Immigrants, who are individuals that picked up technology skills later in life, is often painstaking and slow.

Slowinski (2003) explains that technology hardware has proliferated public schools as it has the rest of society. Slowinski (2003) further clarified that, "as the global economy is more dependent on technology, students and their parents will continue to expect a public education to promote the integration of computers and the Internet, within the curriculum” (p.1). Due to the large presence of instructional technology hardware and software in public schools, “school districts throughout the country increasingly demand that effective leadership in the area of instructional technology come from insightful and forward thinking school leaders” (Slowinski, 2000, p.1). It is crucial that our district and campus leaders possess contemporary technology skills (Brockmeir, Sermon, & Hope, 2005; Donlevy, 2004;).

Theoretical Framework
Social Constructivism is the qualitative framework on which this study is based. 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 its 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. Their experiences as principals are socially constructed events that in one form or another may have influenced the principals’ technology skills.
The National Technology Standards for Administrators (NETS-A) is an instrument that the principal’s technology skills are measured by. These standards were developed by the International Society for Technology in Education (ISTE) as collaborative effort in order to elaborate the qualifications and skills that students, teachers and school administrators should have regarding technology in schools. The standards for administrators otherwise known as NETS-A were updated in 2009. The NETS-A comprise the following five standards and its subcomponents: Visionary Leadership, Digital Age Learning Culture, Excellence in Professional Practice, Systemic Improvement and Digital Citizenship (ISTE, 2009).

**Purpose of the Study**

The purpose of this study was to determine which skills aligned from the National Educational Technology Standards for Administrators (NETS-A) do principals possess as campus technology leaders. Brockmeir, Sermon, and Hope (2005) noted that, “The principals influence 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)

Many principals are not prepared for their new role as technology leaders, and therefore, struggle to evaluate both the instructional and technical resources necessary to realize exemplary student achievement in their schools (Flanagan & Jacobsen, 2003; Sincar, 2013). A recent study revealed that principals continued to face the challenges of a lack-of formal in-service training. According to Sincar (2013), “All of the participants stated that they needed training about the use of technology in both administration and education” (Sincar, 2013, p. 1281). Many of school administrators have gained their instructional technology experience through self-instruction, vendors, school personnel, consultants, conferences, or regional service center trainings. Creighton (2003) stated that, “University principal preparation programs are not adequately providing the necessary skills and dispositions required of principals in this recent new role” (p.1). “Computer skills learned in isolated in-services are quickly lost if they are not readily applied in teaching, or learned in a context that facilitates instructional design and planning” (Flanagan & Jacobsen 2003,p.127). Brokmeir, Sermon, and Hope (2005) suggested that, without a thorough understanding of instructional technology’s capabilities, principals will not be ready to provide the leadership in instructional technology necessary to restructure schools. Hence, a major problem confronting many school districts is that too many principals do not have the adequate skills, dispositions, training or developmental experiences in integrating technology into the curriculum. According to West (2003), “…unless the vision from the principal is clear, implementation of technology in the classroom falls short.” If principals do not have the competencies stated in these national or state technology standards for administrators, they lack an adequate foundation in technology skills and dispositions and run the risk of making uninformed judgments. It’s accepted that they are key individuals in the adoption and integration process of computer technology and as role models (as cited in Kelley, Kinard, & Hope 1999, p. 479). “Principals must accept the challenge to create supportive conditions, which would foster innovative use of technology” (Price et. al. 1999, p. 482).

To achieve the purpose of this study, the following research question served as a guide for collection and analysis.
1. What technology skills, as aligned to the National Educational Technology Standards (NETS-A) for public school administrators, do elementary principals report they possess?

Methods

Data for this qualitative study was gathered from the following primary sources: an online questionnaire and audio-taped interviews. Subjects were recruited from elementary schools in four school districts. Sixty-seven elementary principals from these school districts were invited to participate in an online questionnaire, The Principal’s Technology Leadership Assessment, PTLA.

The PTLA thirty five item questionnaire’s purpose was to assess principal’s technology leadership’s dispositions along with obtaining levels of skill in facilitating integration of technology into teaching and learning process. Instrumentation, which utilized a 5-point Likert Scale, was based on National Educational Technology Standards for Administrators (NETS-A) 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 Post-Secondary Education (FIPSE).

Data from the PTLA questionnaire was inputted into Statistical Product and Service Solutions (SPSS) to derive a mathematical mean each of the NETS-A standards. 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.

Five of the sixteen subjects were randomly selected by a web based randomizer application. E-mails were sent to the five subjects and solicited face to face interviews consisting of seventeen questions.

All five participants were females who had eight or less years of experience as elementary principals. Principals earned a Masters of Education degree ranging from 1988 to 1999. Four out of five principals reported an average use of school computer for three hours, compared to one hour of computer use at home. Two out of five principals’ campuses had earned Exemplary ratings by the Texas Education Agency for their campuses, while the three remaining campuses were rated Recognized.

Interviews were structured to obtain information about the principal’s instructional technology experiences and beliefs. Transcribed interview data was imported into The Ethnograph, which produced numbered text format data that facilitated coding in a qualitative method. Examined line texts were coded as individual words, phases or blocks. These codes allowed the researcher to identify patterns or themes.

Results

In responding to the research question, “What instructional technology skills and, as aligned by the National Education Technology Standards (NETS-A) for public school administrators, do
elementary principals report they possess?”, an ethnographic analysis of the interview data revealed the following four skills aligned to the 2009 updated NETS-A standards: familiarity of software and hardware, utilizing information, retrieving data, communicating with stakeholders, along with planning and management of resources.

Skill 1: Familiarity with using software/hardware

The principals placed a high level of importance on the use of software and hardware in our educational system. Norma, one of the principals, said that her staff was reaching a higher level of proficiency in applying software and hardware. According to her, “As we move across the years, it’s just a matter of getting to know the software. Although, several teachers initially felt reluctant to use technology, they no longer feel this way [sic]” (Norma, 2009).

Skill 1: Familiarity with using software/hardware

Digital Age Learning Culture-A: Ensure Instructional Innovation focused on continuous improvement of digital-age learning.

Principals believed that technology had a positive effect and is an integral part of a successful education. Principals in this study strived to make updates to their campus technologies, even though their campuses continued to face obstacles in acquiring funds to purchase necessary tools. Sandy (2009) stated, “I have tried to encourage teachers to implement technology in classrooms. Kids have Gameboys and PlayStations and are eager to explore new information at a touch of a button or a mouse click. I want our teachers to integrate it into everyday learning” (Sandy, 2009). Principals provided teachers with hardware such as data video projectors, document and digital cameras, (COWS) Computers on Wheels, smart boards and student response systems.

Skill 1: Familiarity with using software/hardware

Digital Age Learning Culture-B: Model and promote the frequent and effective use of technology for learning.

By being more technology literate, Principals felt that technology has enabled them to work efficiently and effectively, thus being effective leaders and role models. “By doing tasks electronically, it makes everything much quicker [sic]” (Erica, 2009). You still have to write, but by doing it electronically you get the information out quicker” (Erica, 2009). Betty stated, “I am computer literate and feel it is important to be able to demonstrate technology skills to teachers” (Betty, 2009). According to Nancy, a campus leader must utilize technology on a daily basis and feel comfortable using technology for school and personal use. “I experiment with different software and as a leader I need to be a role model, especially if you expect teachers to use technology. School leaders must acquire knowledge of technology if you want to hold teachers accountable for using it in the classrooms” (Nancy, 2009). Nancy also stated that tools such as United Streaming, Knowledge Box and MS PowerPoint were supplements used to integrate technology in daily classroom lessons.
Skill 1: Familiarity with using software/hardware

Digital Age Learning Culture-C: Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners.

NETS-A subcomponents require principals to provide technology environments that meet the diverse needs of learners. For example Dalinda (2009) stated, “Software has been purchased to meet specific student and teacher needs established upon the recommendations from the School Based decision Making Committee (SBDM)” (Dalinda, 2009). Principals noted that it was essential for faculty to agree upon the selection of technology hardware and software. A shared vision must take place in order to move forward.

Dalinda explained that technology usage in Special Education has greatly improved over the years. Software such as Pearson Learning in computer labs has been a contributor in the success of special needs students. Dyslexic students for example utilize technology as a means of communication since their hand writing is illegible (Dalinda, 2009). To further reach subpopulations such as English Language Learners (ELLs) and Gifted and Talented (GT) students, principals encouraged technology extracurricular activities such as technology clubs and contests. Students had opportunities to demonstrate technology literacy skills while building a positive self-esteem through contests sponsored by the Region One Education Service Center, Texas Computer Education Association and Texas Library Association.

Skill 1: Familiarity with using software/hardware

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.

Principals felt that if schools did not provide opportunities to use new technologies, disadvantaged students may not otherwise utilize them. Principals expressed the importance of being well-informed of current technology updates, since many students from campus are already using them outside the classrooms. As a means to remain current, principals utilized district technology staff and Internet searches to locate important technologies. Belinda said, “I do a lot of research via the Internet in order for me to keep up with technology trends” (Belinda, 2009). Sandy also reflected, “I use the Internet all the time to look up current information” (Susana, 2009).

Susana stated that the instructional technology on campus plays an integral part on students’ success. Principals expressed hardware acquisition as hindrance in getting the essential technology tools in each classroom. Susana added that funding was available and the majority of their efforts went toward purchasing additional Document Cameras (Elmos) for each classroom and trying to get students additional laptops or computers on wheels (COWS). Erica added that the use of the web-based grade book, and web-based resources have made a difference with teachers and students. These applications, among others, have made teaching and learning more efficient and enjoyable for students and teachers alike.

Skill 1: Familiarity with using software/hardware
Systemic Improvement-A: Lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources.

Principals viewed technology as a critical management tool for monitoring and assessing students’ academic performance along with benchmark tests, language and reading assessments. They expressed that technology was an indispensable tool “at their fingertips” (Erica, 2009). Web-based applications such as the Euphoria Professional Development Appraisal System Software (PDAS), for conducting teacher appraisals and professional development, was mentioned as being a useful application. This web-based application, easily replaced the tedious manually inputted teacher appraisal forms and made the principal’s teacher management more efficient by allowing principals to share their appraisals with teachers online. Principals stated that other web-based applications that were in use by their district also made educational management more efficient. For example, principals were able to monitor their teachers’ online grade books and generate a variety of reports such as lists of failures, all “A” honor roll and UIL reports. Principals were also able to view online weekly curriculum and lesson plans.

Skill 2: Knowledge of Information and Data Retrieval

Principals viewed available technologies as valuable tool that made information and data retrieval easy. This section gives examples on how knowledge of information and data retrieval is aligned with the NETS-A, as reported by the principals.

Skill 2: Knowledge of Information and Data Retrieval
Systemic Improvement-B: Collaborate to establish metrics, collect and analyze data, interpret results, and share findings to improve staff performance and student learning.

All the principals explained that they use technology to analyze student achievement data. Norma and Dalinda expressed that these tools were instrumental in identifying the students’ weaknesses and strengths. Principals accomplished this by locating and disaggregating student achievement data from the Texas Education Agency, Region Education One Service Center websites and school district applications. Norma indicated that utilizing technology for data analysis was easier than by hand calculations. Electronic spreadsheets allowed principals to create charts and graphs for analysis that lead to improved instruction. Dalinda explained that using technology was a powerful administrative tool and “wondered how other principals survived without the use of technology” (Dalinda, 2009).

Principals depended upon data desegregation and analysis from web-based applications which allowed teachers and principals to address special populations, such as Bilingual/ELL and Special Education students. Erica indicated that data reports allowed them to group students effectively and effectively. Belinda examined data imported from the Texas Education Agency (TEA) data into charts and graphs. All the principals utilized reports from computer applications such as Instructional Learning Systems (ILS), Accelerated Reader (AR), Texas Primary Reading Inventory (TPRI), and TEJAS LEE. Susana stated, “I feel that as a principal, if I weren’t technology literate, I would be lost” (Susana, 2009). Dalinda indicated that Integrated Learning Systems (ILS) computer labs assisted the campus with monitoring student progress. Prescriptive lessons helped increase student achievement.
Erica also mentioned that she was able to run many types of reports from applications such as in the Child Protective Services online tool. She stated that, “In the past it would take anywhere from 30-35 minutes just for someone to take the information and another 45 minutes of interviewing. You now have accessibility to go online and do that” (Erica, 2009) She also explained that by using campus wireless network, she was able to carry a laptop and access campus data quickly. “These are all things that we used to dream of and now we have them readily in our hands” (Erica, 2009).

Skill 3: Communicating with Stake Holders

Another theme principals agreed upon was the importance of communicating with stakeholders. According to the International Society for Technology in Education (ISTE), essential environments important for principals to maintain are: community support, partnerships and communications with parents and businesses that support technology use within the district (ISTE, 2001). The following NETS-A describe the skills principals reported as having as it related to communication.

Skill 3: Communicating with Stake Holders

Systemic Improvement D. Establish and leverage strategic partnerships to support systemic improvement.

Principals were continually striving to improve their student’s academic achievement and therefore principals expressed the importance of developing and nurturing partnerships with the stakeholders such as with community members, parents, faculty, staff and central office administrators. According to Brooks-Young (2002), “…the key to having a successful technology program is in developing a school or district technology plan based upon input from the stakeholder” (p. 13). Principals utilized a variety of technologies such as campus webpages and newsletters to strengthen communication with stakeholders. Susana (2009) reflected that she had, “…witnessed a lot of changes in technology. Especially very rapidly between 1995 and now [sic]”. She used her Microsoft Outlook web based calendar to keep track of and share important appointments with parents, teachers and central office staff. She further stated, “…it can be very effective and I feel that it does make a big impact. I know that it does make a difference between better teaching and learning when all are involved” (Susana, 2009).

Skill 3: Communicating with Stake Holders

Excellence in Professional Practice –C: Promote and model effective communication and collaboration among stakeholders using digital age tools.

Principals made it well known that they used e-mail extensively to communicate with staff and district personnel quickly and easily, and viewed e-mail as a useful and an indispensable tool for stakeholders. Dalinda said, “I think that technology is very important for campus leaders. We use it for communication within the school, the district as well as communicating with colleagues [sic]” (Dalinda, 2009). Dalinda e-mailed her staff and expected them to daily read the e-mail messages from her and their colleagues. No excuses from the teachers or staff for not promptly reading and responding to their e-mails was accepted Belinda also agreed that her technology skills enabled her to communicate on all different levels from central office to the community.
Erica felt that communication between administration and teachers was crucial in achieving collaboration and buy in, in order to move any new initiatives forward. Norma, also felt that technology enabled her to better involve stakeholders in the decision making process.

Dalinda also utilized management tools, such as her Personal Data Assistant (PDA), for communicating with staff. Susana stated, “right now I am familiar with my handheld PDA, e-mail and laptop. I think that it’s very important to use technology. I use the PDA to do walkthroughs using the online PDAS application” (Susana, 2009).

Skill 4: Planning and management of resources

“Many schools and districts continue to begin with technology rather than the desired outcomes for students” (Brooks-Young, 2002, p.48). The NETS-A emphasizes the need for adequate planning and the management of resources. Principals must keep up with what is inside their buildings (Brooks-Young, 2002). When they fail to do so, “…they find that the equipment no longer supports new applications and instructional time is wasted as teachers try to make outdated equipment or software function” (Brooks-Young, 2002). The following section aligns the skills of planning and management of resources with the NETS-A.

Skill 4: Planning and management of resources

Schmeltzer (2001) felt that it is crucial for principals, as leaders, to develop a vision that is shared with their campus, and to recognize that leadership is a team effort rather than a solitary one and to understand that the process is sometimes more important than the product. Principals, as the technology visionaries, must make an effort to benefit from a wide assortment of resources, strategies and measures to review and evaluate the shared vision for technology within their schools (Knezek, 2002). Principals in this study budgeted for as many resources as they could. They collaborated with their faculty in assessing the needs of the students and campus. Sandy indicated that, “One of our campus goals is to plan ahead and acquire as many resources as possible. Our teachers are excited about using technology in the classroom. Sandy further stated that, “If someone suggests something to me that is researched based and practical, we will purchase it” (Sandy, 2009). Erica also expressed that she allocated additional funds for capital outlay to provide technology. She indicated that, her campus plans allotted funds for continued growth (Erica, 2009).

Skill 4: Planning and management of resources

Principal sent teachers to staff development appropriate to their level so that teachers would return to campus, share and utilize ideas in the classrooms. Belinda stated that, she trained and coached, modeled and provided teachers with support and equipment, such as document cameras and data video projectors (Belinda, 2009). Belinda informed teachers of upcoming staff development and assured that they were trained in all areas, so that no one is left behind. Norma wanted staff to become familiar and unafraid of using technology. Norma explained, “As we
move across the years, it’s just a matter of getting to know the software and having teachers become proficient” (Norma, 2009). Norma believed that once teachers become comfortable, they can heighten students’ interests by using technology. When dealing with reluctant faculty, Susana stated that even though some of the teachers were reluctant to use technology, she liked to send them to staff development that was appropriate for their level of technology integration. She felt that by doing so, it would make them familiar and comfortable with technology integration. Once they are familiar with technology integration, teachers will lose some of their inhibitions and use it frequently. According to her, the added bonus will be teacher’s transference of enthusiasm to their students. Dalinda noted that even when teachers are already technology literate, there are advanced forms of staff development that she regularly sends teachers to. Dalinda cites that the majority of the teachers underwent Intel Technology Integration Training which a high order is thinking skills training. Dalinda also expressed that she considered herself as a resource for her teachers and that she was not afraid to help her teachers.

Skill 4: Planning and management of resources
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.

Norma and the other principals encouraged teachers’ professional growth by sending them to regional, state, and national technology conferences. Dalinda stated that she regularly gave her teachers opportunities to attend technology related conferences. In addition, Norma felt that sending teachers to conferences allowed them to return with newer ideas and ability to re-think technology’s role in the classroom. She has witnessed many returning to implement new ideas and lessons. Erica kept the teachers involved by informing them of upcoming conferences and communicating closely with the campus technology contact. By doing this, Erica confirmed that everyone is keeping abreast of newer technologies and ideas. According to her, people who are technology literate are willing to take risks. These teachers, she reflected, are willing to share and to make things happen on campus (Erica, 2009).

Skill 4: Planning and management of resources
Systemic Improvement - A: Lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources.

Anderson and Dexter (2005) explained that adequate technology planning and budgeting is as a key component of technology leadership. All the principals made efforts to encourage technology integration by to budgeting necessary hardware such as computers, laptops, data video projectors, document cameras and wireless tablets. Principals believe students are able to witness and obtain experiences through the use of technology in a learning environment with adequate curriculum and planning. Sandy echoed this by stating, “Kids are now able to visualize and experience things they never have before due to availability of technology. Technology brings experiences to the classroom that have helped quite a bit” (Sandy, 2009). Susana stated that she was anxious to acquire new hardware for her students. For example, she said that she was “…itching to get smart boards on her campus” (Susana, 2009). Furthermore, she expressed
that she loves to hear about new innovations and hopes that the campus would continue to move forward in the right direction so that students would keep up to speed with newer technologies.

Principals felt that being skilled in and involved with technology made a difference in their leadership and campus goals. By planning technology resources, Erica stated that she performed a number of administrative tasks such as monitoring student grades, immunization records, and managed budgets online. This was done quicker by using technology, than previously. She described the ease of working with Child Protective Services (CPS) and noted that the process had become more streamlined, since it was all online now. Dalinda added that she saw technology as an indispensable tool that allowed her to multitask such as in communicating with colleagues, disaggregating data and submitting reports to central office.

Conclusions

Familiarity with Hardware and Software

Principals as technology leaders are actively involved in the selection of hardware and software on their campus. Principals expressed opinions about acquiring the necessary technology tools, such as hardware and software, being a priority for each classroom.

The NETS-A can go beyond suggesting that principals merely provide funds for technology hardware and software. Brooks-Young (2002) states that principals should demonstrate their technology leadership by becoming familiar with the capabilities of educational computer hardware and software. The principal often serves as a go-between when issues arise between the requests from teachers to add software programs and the need of technicians to maintain a functional and compatible computer network. Therefore, principals must be participants in the development of system-wide standards for hardware and software acquisition and support.

Principals, as technology leaders, should be able to evaluate both hardware and software for appropriateness to benefit staff and students. As instructional leaders, principals are responsible for facilitating teachers’ integration of technology into the teaching and learning process. Principals need general knowledge about hardware capabilities and how software applications can be applied to instruction (Brockmeier, Sermon, & Hope, 2005). They should be able to choose and discern the most effective equipment that will have a prolonged life and use for the campus. Beyond asking how much does hardware cost, principals need to be familiar with other factors as well. They can do so by having the knowledge and skills that will allow them to choose both hardware and software based upon capability, compatibility, modularity, ergonomics, availability, ease of use, and sustainability of the product (Picciano, 2005). As stated in the NETS-A, principals should be able to “maintain awareness of emerging technologies and their potential uses” (ISTE, 2001). Dalinda echoed this when she stated that she strived constantly to stay abreast of new hardware and software, but according to her, it seemed impossible to stay caught up.

Knowledge of Information and Data Retrieval
Principals as technology leaders use technology as a managerial tool to gather and analyze data for campus improvement. NETS-A require the principal to “use technology to collect and analyze data, interpret results and communicate findings to improve instructional practice and productivity and use data in making leadership decisions” (ISTE, 2001). The principal’s role should be that of a driver of data. Principals should be able to collect and analyze data, in order to keep a watchful eye upon the progress of the campus and allot resources that effectively manage a campus (Tucker & Codding, 2002). In the era of accountability, principals as leaders should be able to collect, interpret and use data in a number of ways. Successful school leaders should be capable enough to take the data apart and formulate a plan of action that ensures an effective school (Bottoms & O’Neill, 2001). “Future leaders need to understand how to use data as a discussion tool for reshaping the attitudes of teachers, parents and students about changing course offerings and instructional strategies” (Bottoms & O’Neill, 2001, p. 11). If schools are to make strides in continuous improvement, the campus principal should take the lead in the collection, analysis and use of a variety of data. Data, according to Bottoms and O’Neill (2001), should not necessarily be derived from a lone source; rather it should be derived from a variety of sources both informal and formal. “Leaders analyze data to uncover the root causes of problems. They also examine their schools’ curricula and instruction, classroom assessments, professional development, use of technology and academic expectations of students” (Bottoms, O’Neill, Fry & Hill, 2003, p.26).

**Communication with Stake Holders**

Communication is one venue in which all the stakeholders can be actively informed and involved. As instructional leaders, principals are called upon to become effective communicators. The NETS-A require principals to “employ technology for communication and collaboration among colleagues, staff, parents, students, and the larger community” (ISTE, 2001). According to Hines, Edmonson and Moore (2008), less than a decade ago electronic tools such as cellular telephones, electronic communication, Personal Data Assistants (PDA’s), and wireless networks were uncommon in educational settings. Today, however, they are common place and the norm for both administrators and educators. Anderson and Dexter (2000) have noted that the use of electronic communication is one indicator of the principal as being a technology leader.

The principals revealed during the interviews that they used e-mail extensively to communicate with staff and district personnel. They found that e-mail was both a useful and an indispensable tool, which allowed them quick and easy access to all stakeholders. Hampton (2003) concluded that potentially weak social ties could be improved by the use of communication technologies such as e-mail messaging to stakeholders. Hampton’s (2003) study added weight to the fact that e-mail could best serve in building and maintaining a collaborative network among stakeholders, which functioned in moving the school’s mission forward.

**Planning and Management of Resources**

Administrative leadership is the key to successful implementation of any innovation (Hess, & Kelly, 2005; Brooks-Young, 2004). Principals as technology leaders are actively involved in technology planning for campuses. The principal serves as both a manager and leader of a
campus and within the obligations of being a leader, a principal is expected to be involved with
the planning and management of campus resources. The NETS-A calls for the principal to be an
integral part of the systemic planning and management of the campus goals (ISTE, 2001).
“Buying hardware and software without having a clear idea of how it can be used effectively, or
without planning for appropriate professional development, is a waste of time and precious
resources” (Brooks-Young, 2004, p. 13).

**Implications for Practice**

Principals should possess the following vital skills: familiarity of software and hardware, using
information and data retrieval, communicating with stakeholders, and planning and
management, in order to become effective 21st century leaders.

Principals should become familiar with issues such as compatibility and replacement cycles for
software and hardware, because of the rapid changes in innovations. Without knowledge of
these issues, inadequate or soon to be obsolete technologies will be purchased and funding will
not be effectively used (Brooks-Young, 2002). According to Brooks-Young (2002) total cost of
ownership should consider “professional development, support, connectivity, software,
replacement costs and retrofitting” (p. 98). Once the principals have a firmer grasp of the total
cost of ownership, campus budgets will be utilized more efficiently, since less waste and
duplication of efforts will occur. Both software and hardware will be used to the maximum
lifespan, which will achieve optimum results for both the staff and students. Principals also
should use multiple methods to evaluate appropriate uses of technology resources for learning,
communication, and productivity. All too often, principals are anxious to acquire newer
technologies for staff and students. In the frenzy to acquire newer technologies, principals
sometimes overlook how they will evaluate the technology program’s effectiveness (Brooks-
Young (2002).

The ability to use information and retrieve data for data analysis is a second skill that principals
must possess. As effective leaders, principals should be able to lead teams of professionals in
“reviewing data, identifying goals based upon the data, prioritize the goals” collaborate develop
a plan of action and monitor the progress. (Brooks-Young, 2002, p. 21). Principals should be
familiar with a variety of existing assessment web based tools, such as The Analysis of Process
(AOP) worksheet, which assists in the identification of elements of a school program that can
help improve student achievement. Principals should base their evaluations upon “defined
outcomes and supported them through data” collected, analyzed and reported” (Brooks-Young,
2002, p. 126). When this is done, these evaluations will reveal the effects of technology upon
instruction. Once instructional technology efforts are evaluated, principals along with the
campus leadership team can realign the campus efforts and discard things that are not serving the
instructional needs of the students.

The ability to communicate effectively using technology is another vital skill and consequently,
21st century principals should be able to use communication systems in order “maintain, regular,
clear communication” with all the stakeholders. (Brooks-Young, 2002, p. 35). As effective
communicators, principals have “the potential of collaborating with committees and other
decision making groups and involving them” in many facets of campus business such as staff development and budgets. (Brooks-Young, 2002, p. 35).

Lastly principals as technology leaders must be able to be technology planners and managers. By planning and managing technology on their campus, principals, should be able to “monitor and evaluate the success of their technology implementation” (Brooks-Young, 2002, p. 23). Principals should become a resource for the funding opportunities that will support the implementation of the campus and district technology plans. As part of the planning process, principals should seek sources for providing funds for technologies on their campus. Principals should be familiar with the variety of funding sources such as E-Rate discounts, local funds and grants. Not only should principals know how to fund their technology programs, they should also know how they will apply those funds. They should know the specifics of how those funds will be applied on their campus. With this knowledge, principals should be able to discern which technologies on campus provide effectiveness, given the funding available. Principals should be key leaders that evaluate and promote appropriate technologies that will enhance and support instruction that will ultimately lead towards higher levels of student achievement.

References


Ertmer, P., Bai, H., Dong, C., Khalil, M., Park, S., & Wang, L. (2002). Technology leadership: Shaping administrators’ knowledge and skills through an online professional development course. In C. Crawford et al. (Eds.), Proceedings of Society for Information Technology and Teacher Education International Conference 2002 (pp. 482-486). Chesapeake, VA: AACE.


