

## **Technologies Used by Superintendents**

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### **Abstract**

Much time and money has been spent on technology for the public schools over the last twenty years. This study focused on how the district leader—the superintendent—uses technology, specifically which technologies are used, how superintendents perceive their technology proficiency, and in which technologies they themselves felt superintendents should have competency. Nearly 60% of the superintendents rated themselves as *proficient* users of technology. Study data indicated that technology proficiency was neither related to years of experience in public education nor to the size of the district in which the superintendent served.

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Scan the table of contents of any educational journal, and more than likely one or more articles is about the use of technology in schools or classrooms. Attend any meeting with district administrators and at any given moment, you are likely to see one or more of the participants stand up, put a mobile device to their ear, and move to the back of the room to take a call. Look

down any row of chairs and you will see superintendents responding to an email or texting. School superintendents have embraced the technologies that allow them to be in constant contact 24/7. According to Pardini (2007), “Once reluctant users, superintendents now find their hand-held devices an indispensable tool for leveraging their leadership” (p. 10).

In addition to these hand-held devices, there are numerous hardware products and software programs available for managing the other responsibilities of district leadership. While District superintendents have accepted cell phones, Blackberry, Smart Phone, and other communication devices; the research is less definitive about their engagement with other computer-based programs for managing and monitoring everything from operations to academics. Obviously, one would expect there to be more central office personnel use of these advanced technologies in larger districts due to the likelihood of one or more full-time staff members to lead the district’s technology acquisition and professional development initiatives. Rural and small school districts often do not have the support and expertise of a designated technology specialist. In these situations, this work often defaults to the superintendent, whether comfortable or competent with the task.

Time spent working with district leadership across the state of Illinois prompted this study on the technological experiences and beliefs of public school superintendents. Much attention has been given to classroom teachers’ (Becker, 2001) and principals’ use of technology (Brockmeier, Sermon, & Hope, 2005), but little attention has been given to the head instructional leader for the district—the school superintendent. Informal observations posited the hypothesis that superintendents were not using technology to the extent that would benefit their communities of learners. The purpose of this study was to identify which technologies Illinois superintendents used and which technology programs and software they perceived that superintendents needed proficiency to be successful. Three questions framed the study:

- 1) What technology programs and software are routinely utilized by public school superintendents?
- 2) What technology programs and software do public school superintendents perceive they need to be successful in today’s educational climate?
- 3) Does district enrollment size influence technology proficiency and technology use by public school superintendents?

These questions are relevant to today’s expectations that schools need to provide access to technology for students; that teachers need to utilize technology to provide instruction that better engages students in learning; that student academic and behavioral data is readily available and reported to various governmental units as well as to the public; and that technology-based management programs help districts and schools to run more efficiently. Using various technologies to efficiently manage the varied tasks of the superintendency is one indicator of an effective leader (Dweck, 2006; Streifer, 2000).

### **Instructional and Technological Leadership**

In the research on leadership, modeling expectations has been identified as an important element missing in public school administration (Kouzes & Posner, 2008). Kouzes and Posner

identified five core practices of exemplary leadership. One core practice, *Modeling the Way*, was described as setting an example for how people are expected to behave. Leaders' actions are far more important than their words. Waters and Marzano (2006) studied superintendent practices that improved student achievement. They identified “modeling understanding of instructional design” (Waters & Marzano, p. 15) as the first practice under “non-negotiable goals for achievement and instruction” (Waters & Marzano, p. 15). Exemplary leaders model expectations for their organizations. Applying the role of modeling to technology, Dweck (2006) stated that building and sustaining a district culture that has a technology mindset is the role of the leader.

In order to become that administrative role model, district administrators must do more than use mobile communication devices. However, the traditional requirements for the position have not included technology skills. According to Fletcher (2009):

Most of our school leaders have received no training whatsoever when it comes to 21<sup>st</sup> century schooling.... As a result, no movement can be made toward 21st-century learning environments. When leaders are clueless about technology and the impact it can have in classrooms, they are powerless to change their school or district into one that provides tech-enabled instruction for students. (p. 22)

### **Technology Challenges for Small and Rural Districts**

“Rural schools have viewed technology as an equalizer to the abundance of experiences, resources, and options urban and suburban students receive over their rural counterparts” (Hawkes, Halverson, & Brockmueller, 2002, p. 162). This equalizer is not without its challenges. Rural schools’ access to high speed Internet and sufficient bandwidth continues to limit streaming video, distance education, complex integrated communication, and high tech creativity (Hannum, Irvin, Banks, & Farmer, 2009; Page & Hill, 2008; United States Department of Agriculture, 2009).

Rural community values and expectations have also been found to limit the schools’ sense of urgency and or need for the use of technology. Page and Hill (2008) found that the culture of rural communities was one of fear that their children would become too information dependent and not pragmatic enough, while rural teachers struggled to stay current using new hardware, software, and instructional designs (Spires, Lee, Turner, & Johnson, 2008).

Rural school teachers identified a lack of administrator support as an obstacle to their professional growth in the areas related to technology and in implementing a 21st Century curriculum (Howley, Wood, & Hough, 2011). The combination of remoteness and its subsequent isolation (Cullen, Frey, Hinshaw, & Warren, 2004) result in a significant challenge for rural schools to provide 21st Century learning experiences for their students. “A superintendent accepting a position in a school district located in a small town faces a special kind of isolation” (Jazzar & Kimball, 2004, p. 43).

Small and rural school superintendents often find themselves fulfilling multiple and diverse types of administrative tasks (Lamkin, 2006). Lamkin suggests rural superintendents must serve in a “jack of all trades” capacity quoting one superintendent as stating, “I have to handle transportation, contracts, building facilities...” (Lamkin, 2006, p. 21). As instructional leaders, rural and small superintendents often plan and schedule professional development for

teachers, evaluation walk-throughs, curriculum meetings, technology integration, and many other tasks focused on improving teaching and student achievement. As recently as 2005, 50% of principals felt they were not perceived as the school's technology leader and felt inadequate in their ability to use computer technology for the presentation of information (Brockmeier, Sermon, & Hope, 2005). Flanagan and Jacobsen (2003) suggested that principals are required to provide leadership in areas with which they are unfamiliar. Because principals are not prepared for the role of technology leader, they struggle to develop the human and technical resources they need to achieve the technology outcomes that have been set for their goals (Anderson & Dexter, 2000). These same principals then comprise the pool of candidates from which superintendents have come in the past and who will emerge in the future. This pattern of ascension to the superintendency may contribute to superintendents' perceived deficiencies in using and modeling the use of technology.

### **Technology Proficiency**

Technology proficiency is often related to the age of the user. Terms such as *digital natives* and *digital immigrants* have come to define users of technology based on their generation (Prensky, 2000). Those who were born into a technology-rich world and consequently accept technology as part of their daily lives are the *digital natives*. Those who were not born in the digital age, but who at some point in their lives became users of technology are the *digital immigrants* (Prensky, 2000). With the average age of U. S. public school superintendents reported between 53 and 55 years (Durflinger & Hunt, 2004; Glass & Franceschini, 2007; Sutton, Jobe, McCord, Jordan, & Jordan, 2008), most of America's superintendents will fall into the category of *digital immigrants*.

There has been attention directed to the importance of having technology standards for administrators. Standards, such as the Technology Standards for School Administrators (TSSA) and the National Educational Standards for Administrators (NETS-A) are national standards that address what school administrators should know. The International Society for Technology in Education (ISTE) recently revised its National Educational Standards for Administrators in 2009. These standards include: (a) Visionary Leadership, (b) Digital Age Learning, (c) Professional Practice, (d) Systemic Improvement, and (e) Digital Citizenship (ISTE, 2009). ISTE also provides a list of "Essential Conditions" (2009) that need to be present for technology to be incorporated into the schools for students, teachers, and administrators. These "Essential Conditions" include shared vision, empowered leaders, implementation planning, consistent and adequate funding, equitable access, skilled personnel, ongoing professional learning, technical support, curriculum framework, student-centered learning, assessment and evaluation, engaged communities, support policies, and a supportive external context (ISTE). Most of the "essentials" require the superintendent's direct involvement and advocacy. These standards are also endorsed by many state boards of education.

The TSSA Collaborative (2001) developed and published a report identifying six standards for school administrators to complement the ISTE standards. The Collaborative is comprised of various educational organizations that came together to develop a national consensus of what best indicated accomplished school leadership for the comprehensive and effective use of school technology. The consensus of the TSSA Collaborative (2001) was stated:

that the Technology Standards for School Administrators identify knowledge and skills that constitute the “core”—what every P-12 administrator needs regardless of specific job role—and, then extends the core to include the specific tasks of administrators in each of three job roles: (1) superintendent and executive cabinet, (2) district-level leaders for content-specific or other district programs, and (3) campus-level leaders, including principals and assistant principals. (p. 5)

The TSAA standards are similar to the NETS-A. These standards have performance indicators that define the necessary skills and knowledge needed. Both sets of standards have rubrics or checklists that can be used to help administrators’ self-assess levels of technology. One such rubric (Johnson & Bartleson, 2001) specifies three levels of proficiency: 1) minimal use, 2) mastery, and 3) advanced use.

Inferred by the identification of administrator technology standards must be a belief that such standards are needed. Superintendents may have in the past utilized their technology directors to direct technology purchases, determine programmatic priorities, and consequently influence curriculum. However, technology directors do not always have the pedagogical expertise to assist in effective decision-making when purchasing technology; this is a leadership role for superintendents and other administrators (TSSA, 2001).

*The Horizon Report* (Johnson, Smith, Willis, Levine, & Haywood, 2011) annually identifies technological trends and technologies to watch. The report acknowledged that in 2011, collaborative projects, mobile availability, decentralized cloud technology, e-textbooks, user-created content, and online data-informed decision-making are of current importance. To stay ahead of the curve, schools will need to move toward multi-media networked presentations, augmented reality, and game-based learning. This movement will require superintendents with transformational leadership skills and attitudes, superintendents comfortable with 21st Century technology tools, instructional designs, and transformational leadership practices that stimulate teachers’ professional learning and motivation and improve school organizational conditions. Duggan (n.d.) summarizes the transformational leader as follows:

A transformational leader, using approaches that focus on helping followers develop into leaders themselves, acts as a role model to inspire, challenge and motivate team members. Transformational leaders encourage followers to think creatively and find new ways to solve problems. (Chron.com Small Business, para. 1)

### **21st Century Technology and District Leadership**

Today’s district leadership can benefit from using available technologies to effectively instruct, efficiently manage, and maximize communication outputs. As one Kentucky superintendent noted, school leaders need to, “demonstrate a deeper understanding of and appreciation for the use of technology to revolutionize the learning experience of our students [and] is critical as we strive to dramatically improve learning and teaching” (Kentucky Post, 2011, para. 9). Another superintendent stated that “an organization will only go as far as the leader’s vision will allow it to go” (Kentucky Post, 2011, para. 10). School leaders must understand the need to be on the cutting edge of the teaching and learning process and that

technology can be a contributor to that process. “The effective 21st Century administrator is a hands-on user of technology. Much of the benefit of technology is lost for administrators who rely on an intermediary to do their e-mail, manipulate critical data, or handle other technology tasks for them” (TSSA, 2001, p. 4). Today’s superintendent, now more than ever, must have the knowledge and skills needed to utilize technology to enhance the learning environment. Britten, Clausen, and Lecklider (2009) asserted that “observed student technology skills, use and access far exceed those of the teacher or administrator” (Britten, Clausen, & Lecklider, p. 32).

Since communication historically has been identified as a major, if not the number one, problem for all organizations (Guetzkow & Simon, 1955; Muchinsky, 1977; Seeger, Sellnow, & Ulmer, 2003; Boren 2009), it would benefit superintendents to use all available means to over-communicate their messages through a well-developed communication plan. Technology can empower administrators through efficient and effective use of electronic communications such as web sites, e-mail, voicemail, and cable TV to be open, honest, and direct with the community (Boren, 2009). According to Boren, technology “exponentially empowers the administrator who masters the tools and processes that allow creative and dynamic management of available information” (Boren, 2009, p. 4).

## **Methods**

### **Technology Survey**

A questionnaire was developed to explore the perceptions of public school superintendents about current issues relating to technology use and knowledge. The survey items were developed from the research on school administration and technology. Content validity was established through the use of an expert panel of reviewers. These individuals examined each item’s relevance to the study. Modifications made to the instrument included eliminating some questions that did not adhere to the focus of the study. Minor changes to the wording of two questions were made after a review of the instrument by a group of nine administrators. These administrators were consulted on the user-friendliness of the survey, their levels of understanding of question intent, and to determine if there was a common understanding of the terminology used in the survey.

The survey instrument consisted of two sections. The first section included demographic questions to collect data on district enrollment, district type, superintendent education, and years of experience as a superintendent. Item four in section one asked respondents to self-assess their level of competency with technology. The second section was comprised of questions about which software and hardware programs were used or should be used.

### **Participants**

The online survey was sent to the 866 superintendents in Illinois. One hundred ninety-three superintendents agreed to participate in the survey. Among those who agreed to take the survey, twenty-one (12.2%) of the respondents did not respond to any of the survey questions. These cases were excluded from the study yielding a response rate of 19.9%.

For the purposes of this study, school enrollment data were collected in six categories. Table 1 shows the display of data from each category of school enrollment as requested on the survey and visually describe the variance in school size across the state. The number of respondents by school enrollment categories compared to the total number of districts in each category (Illinois State Board of Education, 2011) and the percentages of respondents by category compared to the percentages of districts in Illinois in each enrollment category are reported. The representation of respondents from the various enrollment categories closely aligns with the percentage of districts in the state in the 0-500 category with slightly more variance between the percentages of respondents and percentages of districts within the state in the other five categories.

Table 1

*District Survey Respondents Compared to Total Number of Illinois Districts*

	<b>0-500</b>	<b>501-1000</b>	<b>1001-1500</b>	<b>1501-3000</b>	<b>3001-9999</b>	<b>10,000</b>
Number of Illinois Districts	275	195	117	140	116	23
Illinois Percentage of Districts	31.76%	22.52%	13.51%	16.17%	13.39%	2.66%
Illinois District Respondents	54	50	29	22	14	2
District Respondent Percentages	31.58%	29.24%	16.96%	12.87%	8.19%	1.17%

Responses to survey questions were broken down by district size into three groups: districts with enrollment less than or equal to 500 students, districts with enrollment over 500 but less than 1000 students, and districts with enrollments over 1000 students. To illustrate and compare how each group of survey respondents answered the survey questions, percent frequency was used in Table 2 to indicate the percent of respondents within each group. There are 470 Illinois districts with fewer than 1001 students and 396 districts with enrollments of 1000 or more. Similarly, there were 104 responses from superintendents whose districts had enrollments of less than 1001 students and 67 responses from superintendents whose districts had enrollments of more than 1000 students. Overall, the percentages of respondents from the two smallest enrollment categories were greater (60.8%) than from districts with enrollments greater than 1000 (39.2%) as shown in Table 2.

Table 2

*District Survey Respondents Categorized by Large and Small School Enrollments*

<b>Enrollments</b>	<b>0-500</b>	<b>501-1000</b>	<b>&gt;1000</b>
Illinois District Respondents	54	50	67
District Respondent Percentages	31.6%	29.2%	39.2%

Demographic survey data from the 169 respondents who reported their school district type indicated the following representation: 88 respondents (52.1%) were from PK-12 school districts; 70 (41.4%) were from PK-8 school districts; and 11 (6.5%) were from 9-12 school districts. The majority of the respondents (98 or 57.0%) had an Ed.S. Degree and/or superintendent certification; sixty-one (35.5%) had a doctorate; and thirteen (7.6%) indicated a Master's Degree as their highest level of education. Sixty-nine of the respondents (40.3%) had served as a superintendent for less than six years and sixty-seven of the respondents (39.2%) had been a superintendent for five to ten years. Thirteen (7.6%) had served as superintendent for twenty or more years. The respondents averaged 26.4 years of service in public education.

Respondents were asked to place themselves on a proficiency continuum of technology use. The terms, *illiterate*, *minimal competencies*, *digital immigrant*, *digital native*, *proficient*, and *expert* were used as descriptors ranging from little proficiency to skilled proficiency. *Illiterate* described the lowest end of the spectrum and *expert* described the top end. None of the respondents chose *illiterate* as a response. Fewer superintendents rated themselves as being at the ends of the scale, either having *minimal competencies* or as being an *expert*. Nearly 60% of the superintendents rated themselves as *proficient* users of technology. This self-reported assessment of technology use is shown in Table 3 as it corresponds to the number of years the superintendent respondents had been in public education. Table 3 also shows that fewer superintendents with 36-45 years of experience (6.39%) felt proficient than superintendents with sixteen to thirty-five years of experience (25.0%).

Table 3

*District Survey Respondents' Self-Reported Levels of Proficiency by Years of Experience*

Years of Experience	Percent of Respondents' Experience Levels	Minimal Competencies	Digital Immigrant	Digital Native	Proficient	Expert
1 - 5	0.58%	0.00%	0.00%	0.00%	0.58%	0.00%
6 - 10	1.16%	0.00%	0.00%	0.00%	1.16%	0.00%
11 - 15	7.56%	0.00%	0.00%	0.58%	6.98%	0.00%
16 - 20	15.70%	0.58%	1.16%	1.16%	11.63%	1.16%
21 - 25	22.09%	0.00%	2.33%	4.07%	13.37%	2.33%
26 - 30	17.44%	0.00%	6.40%	3.49%	7.56%	0.00%
31 - 35	25.58%	2.33%	4.07%	5.81%	11.63%	1.74%
36 - 40	6.98%	0.58%	1.74%	0.00%	4.65%	0.00%
41 - 45	2.91%	0.58%	0.58%	0.00%	1.74%	0.00%
<b>TOTALS</b>	<b>100%</b>	<b>4.07%</b>	<b>16.28%</b>	<b>15.12%</b>	<b>59.30%</b>	<b>5.23%</b>



The second factor that was reviewed was the impact of school district enrollment on how respondents perceived their levels of technology. Table 4 shows how superintendents in the three enrollment categories rated their level of technology proficiency. The percentage of *Digital Immigrants* was less for school districts of 501-1000 students (6.0%) and more reported themselves as *Digital Natives* (22.0%). Fewer superintendents in larger school districts of more than 1000 students indicated they were *Digital Natives* (9.0%). The percentages of those reporting *Proficient, Expert, and Minimal Competencies* were fairly similar.

Table 4

*Superintendents' Self-Reported Level of Technology Proficiency by District Size*

Technology Proficiency	0-500 Total N = 54		501-1000 Total N = 50		>1000 Total N = 67	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Illiterate	0	--	0	--	0	--
Minimal Competencies	2	3.7%	4	8.0%	1	1.5%
Digital Immigrant	10	18.5%	3	6.0%	14	20.9%
Digital Native	9	16.7%	11	22.0%	6	9.0%
Proficient	30	55.6%	30	60.0%	42	62.7%
Expert	3	5.6%	2	4.0%	4	6.0%

**Results**

**Technology Programs and Software Utilized by Superintendents**

Descriptive statistics were utilized to answer the first research question and identify which technologies and technology-related knowledge and skills are routinely utilized by public school superintendents in the state of Illinois. Survey data displayed in Table 5 shows that regardless of the size of the district, each of the three types of software utilities are used by superintendents in about the same ratio. One exception was that fewer of the superintendents in school districts with enrollments of 501-1000 (44.0%) were less likely to use a database when compared to superintendents in both larger and smaller districts. Seven superintendents representing all three school district sizes did not indicate they used any of the software utilities. Overall, 165 of the 171 respondents (96.5%) indicated they used the word processor. This was followed by 145 (84.8%) who also used the spreadsheet. Only 87 superintendents (50.9%) indicated they used a database.

Table 5

*Types of Software Utilities Used by Superintendents on a Regular Basis by School Enrollment*

<b>Software Utilities</b>	<b>0-500</b>		<b>501-1000</b>		<b>&gt;1000</b>	
	<b>Total N = 54</b>		<b>Total N = 50</b>		<b>Total N = 67</b>	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Database	29	53.7%	22	44.0%	36	53.7%
Spreadsheet	41	75.9%	44	88.0%	60	89.6%
Word Processor	53	98.1%	49	98.0%	63	94.0%

Table 6 shows the results for the survey question that asked superintendents which productivity utilities they used to help organize work and to work more efficiently. File sharing, Google Docs, and paperless options for Board communication were used by more superintendents from all three enrollment categories than were the other software utilities. File sharing was used by 53.7% of the superintendents from the larger districts, which was a substantially higher percentage than the usage at the smaller school district categories. This was also true for paperless options for Board communication with the percentage of superintendents from larger school districts using this utility almost double that of the smaller school district categories. The percentage of respondents from the larger school category who indicated “none of the above” was also half of the percentages of the superintendents from the two smaller school district categories.

Table 6

*Types of Productivity Utilities Used by Superintendents to Organize and Work Efficiently*

<b>Productivity Utilities</b>	<b>0-500</b>		<b>501-1000</b>		<b>&gt;1000</b>	
	<b>Total N = 54</b>		<b>Total N = 50</b>		<b>Total N = 67</b>	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Cloud Computing	4	7.4%	5	10.0%	10	14.9%
Evernote	3	5.6%	2	4.0%	3	4.5%
Dropbox	7	13.0%	8	16.0%	8	11.9%
File Sharing	19	35.2%	20	40.0%	36	53.7%
Google Docs	25	46.3%	21	42.0%	32	47.8%
Paperless Board Communication	16	29.6%	19	38.0%	41	61.2%
None of the Above	18	33.3%	18	36.0%	10	14.9%

Communication has long been a concern of school administrators. With social networking finding its way into the mainstream, superintendents were asked which of the social networking websites they found enhanced their ability to communicate with others and share ideas. As shown in Table 7, the Listserv was used by a larger percentage of superintendents regardless of school district size. Blogs and Facebook were used by about 25% of the superintendents from school districts with less than 501 students. Blogs and Wikis were more popular than Facebook with superintendents from schools districts with 501-1000 students. Blogs, Facebook, and Wikis were used about equally by the superintendents from large school districts. Looking at the data by superintendent reveal that 35.5% of the superintendents used at least one of the social networking websites; 26.7% used two; 9.9% used three; and 15.1% didn't use any of the websites. Those superintendents who chose *Proficient* or *Expert* as their level of technology used social networking websites more than superintendents at the other levels of technology proficiency, although one of the *Experts* did not use any of them.

Table 7

*Social Networking Websites Used by Superintendents by District Enrollment*

Productivity Utilities	Total	0-500		501-1000		>1000	
		Total N = 54		Total N = 50		Total N = 67	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Blogs	48	14	25.9%	17	34.0%	17	25.4%
Facebook	39	13	24.1%	10	20.0%	16	23.9%
Listserv	136	43	79.6%	42	84.0%	51	76.1%
Ning	11	2	3.7%	4	8.0%	5	7.5%
Wikis	42	10	18.5%	15	30.0%	17	25.4%
None of the Above	21	10	18.5%	5	10.0%	6	9.0%

The use of communication programs by superintendents in each of the three enrollment categories is shown in Table 8. The most popular with superintendents from all three school district categories was PowerPoint followed by multi-media and Publisher, with thirty to forty percent of the superintendents using multi-media or Publisher to communicate district plans to students, staff, and community. Larger school districts used more Podcasts, moving from 18.5% by superintendents with school districts with less than 501 students to 28.0% by superintendents with school districts of 501-1000 students and 37.3% by superintendents with school districts of more than 1000 students. YouTube and Twitter were the two programs used less frequently by superintendents, regardless of school district enrollment. The percentages of the “none of the above” from respondents decreased with an increase in school district size.

Table 8

*Programs Used to Communicate with Students, Staff, or Community by District Enrollment*

Communication Programs	Total	0-500		501-1000		>1000	
		Total N = 54		Total N = 50		Total N = 67	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Multi-media	73	23	42.6%	21	42.0%	29	43.3%
Podcasts	49	10	18.5%	14	28.0%	25	37.3%
PowerPoint	101	29	53.7%	34	68.0%	38	56.7%
Publisher	58	18	33.3%	19	38.0%	21	31.3%
YouTube	22	4	7.4%	4	8.0%	14	20.9%
Twitter	34	4	7.4%	15	20.0%	15	22.4%
None of the Above	30	13	24.1%	9	18.0%	8	11.9%

Only a small percentage of superintendents indicated a use of virtual meetings or online professional development programs as seen in Table 9, regardless of district size. The three programs superintendents indicated using the most were GotoMeeting, Skype, and Remote Desktop. Over 50% of the superintendents from school districts of less than 501 students or from school districts of 501-1000 students indicated they did not use any of the online meeting programs, and 34.3% of the superintendents from the large school districts also chose “none of the above” as their response.

Table 9

*Programs Used to Train Staff or Have “Virtual” Meetings*

Virtual Meeting Programs	Total	0-500		501-1000		>1000	
		Total N = 54		Total N = 50		Total N = 67	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Elluminate	9	3	5.6%	4	8.0%	2	3.0%
GotoMeeting	51	12	22.2%	14	28.0%	25	37.3%
iChat	10	2	3.7%	5	10.0%	3	4.5%
Screencasts	7	0	0.0%	2	4.0%	5	7.5%
Skype	46	11	20.4%	13	26.0%	22	32.8%
SlideShare	9	3	5.6%	2	4.0%	4	6.0%
Remote Desktop	22	6	11.1%	8	16.0%	8	11.9%
Video Chat	10	2	3.7%	5	10.0%	3	4.5%
None of the Above	78	28	51.9%	27	54.0%	23	34.3%

Superintendents were also asked which mobile technologies they used frequently to help them be more productive. Table 10 shows that the largest percentages of superintendents across the three categories of school district size selected the digital camera. Superintendents in school districts of less than 501 students and those in school districts with enrollments of 501-1000 students selected the Blackberry and then the Smart Phone next, while larger percentages of superintendents in school districts with more than 1000 students chose the Smart Phone and then the Blackberry. The iPhone was used by 32.8% of superintendents from the large school district. Superintendents in large school districts used an iPad (46.3%) compared to superintendents in school districts with less than 501 students (22.2%) and superintendents in school districts with 501-1000 students (28.0%). The Flip Camera and the iPod were both used by 20-27% of the superintendents of all three school district categories.

Table 10

*Mobile Technologies Used by Superintendents to Increase Productivity*

Mobile Technologies	0-500		501-1000		>1000	
	Total N = 54		Total N = 50		Total N = 67	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Blackberry	20	37.0%	28	56.0%	25	37.3%
Digital Camera	35	64.8%	22	44.0%	36	53.7%
Flip Camera	11	20.4%	12	24.0%	14	20.9%
iPad	12	22.2%	14	28.0%	31	46.3%
iPhone	6	11.1%	9	18.0%	22	32.8%
Livescribe (Smartpen)	2	3.7%	0	0.0%	0	0.0%
Tablet	3	5.6%	5	10.0%	9	13.4%
iPod	11	20.4%	11	22.0%	18	26.9%
PDA	9	16.7%	3	6.0%	13	19.4%
Smart Phone	19	35.2%	17	34.0%	30	44.8%
Other	5	9.3%	6	12.0%	1	1.5%

In addition to reviewing data by school size categories, the data on mobile technologies were also reviewed by the level of technology proficiency of the superintendents. Superintendents who self-assessed their technology level as *Expert* used an average of 3.8 kinds of mobile technologies. Those who self-assessed their technology level as *Proficient* used an average of 2.9 kinds of mobile technologies. *Digital Natives* averaged 2.3 mobile technologies and *Digital Immigrants* averaged 2.0 mobile technologies. Those who self-identified themselves as having *Minimal Competencies* averaged 0.3 mobile technologies.

### Technology Programs and Software Superintendents Need to Be Proficient In

The information in Tables 1 through 10 reported superintendents' responses to questions asking which kinds of technologies and utilities they used in their district position. The information in Tables 11 and 12 are in response to the second research question: What technology skillsets do public school superintendents in Illinois perceive they need to be successful in today's educational climate? Table 11 displays the superintendents' perceptions of which school management systems' proficiencies are needed by school enrollment. The top three choices across the school district enrollment categories were Analysis Using Excel (Advanced), Student Management Systems, and HR, Payroll, and Financial Software. These were followed by Curriculum Management Software and Electronic Assessment Systems.

Table 11

*Superintendents' Perceptions of School Management Systems in which Proficiency Is Needed by School District Enrollment*

School Management Systems	0-500		501-1000		>1000	
	Total N = 54		Total N = 50		Total N = 67	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Curriculum Management Software	24	44.4%	19	38.0%	23	34.3%
Analysis Using Excel (Advanced)	38	70.4%	40	80.0%	48	71.6%
Electronic Assessment Systems	21	38.9%	16	32.0%	21	31.3%
HR, Payroll, and Financial Software	29	53.7%	32	64.0%	36	53.7%
Moodle	7	13.0%	5	10.0%	8	11.9%
Student Management Systems	38	70.4%	33	66.0%	42	62.7%
None of the Above	7	13.0%	2	4.0%	3	4.5%

The second question asked superintendents which Classroom Application Programs superintendents should have proficiency. Higher percentages of superintendents across the school district enrollment categories selected technology for engaged classrooms than any of the other options. The second highest percentages of superintendents selected understanding Web 2.0 tools. More than 40% of the superintendents in school districts with 501-1000 students and those in school districts with more than 1000 students indicated that superintendents should be proficient in web page development and content analysis. Higher percentages of superintendents in school districts with less than 501 students felt that knowledge about the Illinois Virtual Schools was more important than web page development and content analysis. Nearly 33% of superintendents in school districts with more than 1000 students felt that knowledge about Credit Recovery Programs was important compared to less than 20% of superintendents in school districts with less than one thousand students.

Table 12

*Classroom Applications in which Superintendents Perceive Proficiency Is Needed by District Enrollment*

Classroom Applications	0-500		501-1000		>1000	
	Total N = 54		Total N = 50		Total N = 67	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Understanding Web 2.0 Tools	22	40.7%	27	54.0%	38	56.7%
Credit Recovery Programs	7	13.0%	9	18.0%	22	32.8%
Illinois Virtual Schools	15	27.8%	16	32.0%	21	31.3%
Technology for Engaged Classrooms	39	72.2%	36	72.0%	45	67.2%
Web Page Development & Content Analysis	14	25.9%	22	44.0%	27	40.3%

**Discussion**

The findings from this study identified the technologies—including programs, software, and web-based products—that Illinois superintendents use on a regular basis and those in which superintendents need to be proficient to be successful. Choices were made from the following five categories: software utilities, productivity utilities, social networking websites, communication programs and websites, and virtual meeting web-based products. In addition to identifying the technologies selected, data were analyzed to determine whether the size of the school were factors in the selections.

The first research question asked superintendents to identify which technologies and technology-related knowledge and skills were routinely utilized. Nearly all of the superintendents (96.5%) indicated they used word processing on a regular basis and a large percentage indicated they used a spreadsheet (84.8%). This is not particularly surprising considering the prevalence of these programs in most organizations and businesses in the United States and also considering the number of years this productivity software has been in use. Three productivity utilities were used by slightly less than half of the superintendents: file sharing, Google Docs, and paperless options for communication with the Board of Education. On average, Dropbox, Evernote, and cloud computing were used by less than 15% of the superintendents. Again, these are newer programs and not all superintendents would have been introduced to them.

Listserv was selected by substantially more superintendents than any of the other social networking websites (79.5 %). This may be attributed to the state professional organizations whose use of Listserv is a major communication venue for their membership. In terms of superintendents’ preferences for communication tools, their product of choice was PowerPoint (59.1%) followed by multi-media (42.7%). Thirty of the respondents (17.5%) indicated they did not use any of the communication programs listed. Superintendents indicated that virtual meetings were not used on a regular basis with 45.6% indicating they used “none of the above”. Of the sites listed, the most popular virtual meeting site was GoToMeeting (29.8%) followed closely by Skype (26.9%).

The second research question asked the superintendents in which technology programs and software they felt proficiency was needed for today's district leaders. As seen in the results, proficiency was important to superintendents in the following three management areas: data management analysis using Microsoft Excel (Advanced Level) followed by student management systems and then human resources, payroll, and financial software. These three systems are all organized in a spreadsheet format. This finding would be in line with the high percentage of superintendents who indicated they used spreadsheets on a regular basis. These choices would also align to the accountability requirements in public education along with good management practices.

Proficiency was also identified as being important in the areas of using technology for engaged classrooms (portable computing devices; presentation tools such as Mimios or Smart Boards; and document cameras) and Web 2.0 tools. Engaged classrooms and Web 2.0 tools are representative of the current push for superintendents taking on more of an instructional leadership role. In addition, there is a belief among educators, politicians, and community stakeholders that technology holds the key to improving schools, as well as the belief that today's students must have technology skills to be ready for college and career.

The third research question focused on identifying the demographic factors most likely to influence technology proficiency and technology use by public school superintendents. When cross-tabbing the responses according to the demographic variables, there were unexpected findings. It is anticipated that superintendents in larger districts would be more likely to have technology assistance and would thus be exposed to more technologies and ultimately more training. This was not verified in the findings. The findings suggest that district size is not an accurate predictor of the proficiency levels or of the types of technologies used by public school superintendents in the state of Illinois. However, self-reported technology proficiency indicated higher levels of technology proficiency were selected by those superintendents who had sixteen to thirty-five years of public school education experience. This would suggest that more superintendents who ranged in age from thirty-eight to fifty-seven, assuming they started their public education career at or around the age of twenty-two, felt their levels of proficiency were at one of the top three levels: *Digital Native*, *Proficient*, or *Expert*.

### **Conclusion**

Most people would concede that the position of the superintendent has become more complex and similar to CEO positions in other major organizations (Houston & Eadie, 2000; Kowalski, 1995; Leithwood, 1997; Thody, 1997). Just as technology has become integral to the private sector, today's superintendents are finding that technology is more and more becoming the standard in public education. And, like other initiatives in public education, the superintendent is responsible for modeling and implementing technology within the district.

One of the limitations of the study was that the lists of technologies were not inclusive of all the technology tools, software, programs, web-based products, and websites currently available, so superintendents may not have recognized a similar-type product to one they used. A second limitation was that definitions or descriptions of the various technologies were not provided, thus allowing individuals to self-interpret what they were. The third limitation was that data were self-reported.



With technology becoming more and more common in public education, it is important to discern how undergraduate and graduate level teachers and administrators are being trained in the effective uses of technology for classroom instruction, parent and community communication, building and district management, and data warehousing. Also, further research on a model of professional development for districts to keep pace with the ever-changing technology programs and tools is needed. Researching the possible correlation between superintendent proficiency with technology and student achievement or instructional innovation within a district will undoubtedly be of importance for accountability to local, state, and federal evaluations.

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