

School Based Leadership for Instructional Technology

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Abstract:

From the beginning of the electronic computer era, corporate America fully embraced the new technology and became the primary customer for the myriad of hardware vendors. Eventually microcomputers, loaded with quality software, appeared on virtually every desk throughout all American corporations. However, Technology had a much more difficult time becoming integrated into the public schools. Today schools are scrambling to catch up with the children of the X-generation who arrive in kindergarten computer literate and tech-savvy.

Having a technology leader properly certified will ensure that instructional technology is implemented and supported properly. According to the research, a state level certification credential for a school district level instructional technology leader in many states does not exist. Pennsylvania (PA) is one of the states that require such certification. The duties and responsibilities of PA technology leaders include hardware installation and troubleshooting, completing related paperwork, and managing the network infrastructure. One compelling finding was a clear division between those respondents with a technical background (technologists) who came to the school systems from the business environment, and those who were always professional educators and came to the position from the classroom.

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Introduction

Even before the Twentieth Century, the forerunner of what would become the analog computer was designed by the British engineer, Charles Babbage. His “difference engine” could do the work of a modern pocket calculator, but required 4,000 moving parts weighing a total of 2.6 tons (Swade, 2000).

The modern technological revolution had its foundation in the United States in 1911 with the merger of three mechanical time recording companies into the Computing-Tabulating-Recording Company. Just 13 years later that company, under the leadership of Thomas J. Watson, changed its name to the International Business Machine Co. (International Business Machine Co., n.d.).

Research carried out during World War II at the University of Pennsylvania created the first commercially successful electronic computer. The prototype had over 18,000 vacuum tubes and consumed 160 mega watts of power. It literally dimmed the lights of West Philadelphia when it was in use. That system was marketed by the Electronic Controls Company as the Universal Automatic Computer (UNIVAC) (Shawcross, 2003). In 1971 after 40 years of development and the introduction of the germanium chip, the era of personal computers was born in a garage when two undergraduates, Bill Fernandez and Steve Wozniak, build a computer out of spare parts and named it for the cream soda they drank. Steve Wozniak and a friend of Bill Fernandez, Steve Jobs, went on to design and sell a whimsically named personal computer in 1976, the Apple™.

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of hardware vendors. Eventually microcomputers, loaded with quality software, appeared on virtually every desk throughout all American corporations.

Technology management was a natural byproduct of the addition of the new layers of computer systems.

Technology had a much more difficult time becoming integrated into the public schools. The first attempts occurred at the start of the 1970's with projects such as the Programmed Logic for Automatic Teaching Operations (PLATO) and Time Shared Interactive Computer Controlled Information Television (TICCIT). These failed as being too expensive and requiring far more expertise to operate and maintain than was available in the public schools. They were also far too limited. PLATO only had dial-up ports available for 1,000 students to log on at any moment in time (McNeil, 2004).

Following the Apple™ revolution initiated by Wozniak and Jobs, suburban schools scrambled to have the best and newest computer hardware. Unfortunately, it tended to be kept in a locked "laboratory" where children had only an hour of "computer class" every week or so. For the most part the faculty did not want to have anything to do with the computer lab, and saw it as the province of the "computer teacher". The growth of the Internet over the last ten years ushered in a change of scene with regard to the availability and use of computers in the schools.

Today schools are scrambling to catch up with the children of the X-generation who arrive in kindergarten computer literate and tech-savvy. It has only been since the late 1980's that the various state departments of education

have begun to specify the educational standards that are needed by those who are given the job of directing the instructional technology at the school and district levels.

In late 2006 the authors attempted to contact the department of education and/or a school district in each state across the United States to ascertain whether a state level certification credential is necessary to hold a Director of Education Technology position. The individual in this leadership role will work with the teaching and administrative professionals of the district in designing technology systems which integrate well into the curriculum. This position requires that a professional educator with an appropriate background in leadership, educational innovation, and curriculum development be given supervisory responsibility for district wide educational technology (Wright & Lesisko, 2007).

Of the 50 electronic requests sent out, only 28 were returned. The department of education websites for the remaining states was then searched for the same information. Results indicate that 11 states have such a requirement for their technology director. Nevertheless, Louisiana, New Mexico, New York, North Carolina, Utah, and Vermont require a technical certificate (Education Technology) to perform director tasks. The other six require a supervisor or Principal Certificate while 39 states still do not have documented certification standards in place for those who direct instructional technology.

According to the research, a state level certification credential for a school based instructional technology leader in many states does not exist. Because of

this, many local districts across the country have placed their own requirements on this position such as Arkansas, Delaware, Florida, Idaho, Montana, Nebraska, Rhode Island, Texas, and West Virginia. It was the goal of this research to determine the background, job functions, and beliefs of school technology administrators in one state, Pennsylvania.

Methods and Results

Pennsylvania, like only six other states identified the standards for, and approved certification requirements for those who are “responsible for the planning, coordinating, evaluating, and the implementation of instructional technology in the schools” (Pennsylvania Department of Education, 1997).

A survey instrument was developed which was designed to answer the research question driving this study. After careful development the instrument was pilot tested by a panel of 17 content experts in the field who have served as school district technology leaders. Any concerns raised by that process were resolved, and the final instrument consisting of 37 items was mailed to the Pennsylvania sample in January of 2004. Two additional follow-up efforts resulted in a final return rate of 84%.

The instrument was divided into three parts, one for demographics, a Likert scale to assess attitudes, and section to collect opinions and recommendations. Cronbach’s alpha coefficient was used to determine the consistency (reliability) of the 12 items of the Likert scale. That coefficient indicated that the Likert scaled portion of the instrument had relatively high reliability ($\alpha = 0.85$).

Of the 67 counties in Pennsylvania, only 24 eastern counties were chosen because they represent a sample that contains a broad spectrum of diverse and demographically varied representatives (Lesisko, 2004). Philadelphia County was removed from the population as presenting separate cases for analysis. From this group, a sample of 102 technology coordinators working in the schools of the eastern half of Pennsylvania was contacted to serve as respondents. A total of 86 returned (84% return rate) the survey instrument in a usable condition.

Outside of the large cities, Pennsylvania is a relatively rural state composed of suburbs and small communities served by small school districts. The mean enrollment of the school systems included in this study was only 3,500. Analysis of the data from returned surveys indicated that only 30% of the technology leaders held state certification as a technology coordinator, while another 80% held Pennsylvania teacher certification. This implies that the contracted job titles for these non-certified, i.e., de facto technology administrators, include titles such as computer engineer, coordinator of computer services, technology support, information technology manager, district systems engineer, etc. All together there were a total of 45 different job titles reported by this sample of technology coordinators. Yet, these technology leaders (certified and non-certified) administered a staff of fewer than 5 people and were responsible for approximately 1,000 microcomputer systems deployed between six and nine buildings. On average these coordinators managed technology budgets in the range of \$500,000 to \$1,000,000 per year.

Only 15% of the technology coordinators were not members of a professional employees bargaining unit or administrative contract. Thus, it is clear that these technology professionals have little job security and serve at the pleasure of the Superintendent of Schools. Survey data indicate that 60% of the undergraduate degrees earned by these individuals were in computer science and/or computer management. About half of all technology coordinators were found to hold a graduate degree. Approximately, 75% of those who had earned a masters degree completed their studies in management and/or technology. Only 5% of the coordinators with graduate degrees held a masters degree in education. Interestingly, about 81% of the respondents to this survey were male. It is unfortunate that this finding reinforces the universally held stereotype of the “typical technology specialist.”

A list of the duties and responsibilities of the technology coordinators presented in order of the percent of time that is spent on various tasks was developed from the survey data. These include:

	Mean %
• Hardware Installation and Troubleshooting	15.25
• Administrative Related Paperwork	14.87
• Managing the Network Infrastructure	14.37
• Software Installation and Troubleshooting	12.97
• Acquire Technology Resources	9.14
• Informing Staff Opportunities	8.35
• Researching Emerging Technologies	6.80

- Work with Educators 5.48
- Work with Students 4.82
- Subordinate Issues 3.71
- Work with School Board Members 3.02

One compelling finding from this study was identified by the open ended items on the third part of the questionnaire. Here a clear division was noted between those respondents with a technical background (technologists) who came to the school systems from the business environment, and those who were always professional educators and came to the position from the classroom. The “technologists” expressed a concern that the “educational technology coordinators” could not think outside of the box regarding technology resources. Their belief is that the educators (technology coordinators) did not have the knowledge base needed to be flexible. Because of this lack of a business applications background, the technologists felt that educators who are technology coordinators tend to listen too much to what vendors say, and depend on expensive consultants too frequently.

For their part, the educators who became technology coordinators felt that their jobs are far too big. The belief of this group is that other staff should be in place to have responsibilities for hardware, network, and infrastructure support. The educators who turned into technology coordinators are more comfortable in developing and providing teacher in-service, budget and planning, and data management for the No Child Left Behind Act compliance.

Conclusions

The role of the leader of educational technology in the schools is still unresolved. There is evidence of a split occurring between those with strong business backgrounds and professional training from vendors such as Microsoft™, Cisco™ and Novell™, and those who view these individuals role as connecting technology to the school systems' curriculums. This latter viewpoint is the dominant one in Pennsylvania. It is clear that Pennsylvania's school administrators want technology leaders who can work with teachers, design curriculum, work with vendors, assuage board members trepidations, yet also maintain the network and wire up the microcomputers in the classrooms and laboratories. This need for a single do it all person is not realistic, and the smaller local school systems should look for more creative solutions to this dilemma.

Clearly the most obvious solution is to hire two people, one a systems manager with significant technical training and background, and the other an educator with a specialization in educational technology supervision and leadership. One way to facilitate that is through the formation of computer consortia within neighboring communities. The economy of scale may make it possible to provide both the level of service and the expertise that the local schools are seeking.

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