Is the Educational Level of Technology Coordinators Aligned with International Standards?

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IS THE EDUCATIONAL LEVEL OF TECHNOLOGY COORDINATORS ALIGNED WITH INTERNATIONAL STANDARDS?

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Abstract

School districts that employ technology coordinators have not fully implemented standards set by the International Society of Technology in Education (ISTE) for technology coordinators. This research examines the role of the technology coordinator, the ISTE standards for technology coordinators, graduate programs available to technology coordinators, and job descriptions of technology coordinators. This research also includes the results of a self-assessment survey of technology coordinators in southwest Michigan. The average proficiency of technology coordinators on select ISTE benchmarks is 2.54 on a 3.0 scale (3.0 is proficient). However, their proficiency level is considerably lower when most of their skills are attained through experience, rather than formal education. Thus, there is a need for more formal education of technology coordinators.
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Chapter 1

Problem Statement

School districts that employ technology coordinators have not accepted nor implemented the standards for technology coordinators, which were developed by the International Society for Technology in Education (ISTE). The position of technology coordinator is complex and requires mastery of technical skills, personnel leadership, and educational methodology (ISTE Standards, 1997). The term technology coordinator is defined by David Moursund (1992) as "an educator at the school level or at the school district level who works to facilitate effective use of a wide range of computer-related information technologies in instruction" (p. 2). In part because some technology administrators are not adequately prepared for the demands of their jobs, some school districts are not successfully preparing their students and staff to use and apply technology (Hoffman, 1996). When selecting technology coordinators, school districts should insist on candidates which satisfy the ISTE standards that equip technology coordinators to lead their districts through technological change.

Importance of the Study

Leading our schools successfully through technological change is essential to the future success of our students (State of Michigan Education Technology Plan, 1992). An able technology coordinator is the key to making this change successful. Bob Hoffman (1996) contends that a strong technology coordinator "leads to greater use of computers, more use of software that promotes higher order thinking skills, and greater use of computers as tools in academic activities rather than as mere drill and practice" (p. 95). Because of the importance of the technology coordinator's position,
it is important to examine the educational background and experience of current technology coordinators. At present, it is not known what experience and educational preparation most technology coordinators possess. Donn Ritchie (1996) discusses the importance of having a highly trained professional educator who is able to provide technology leadership for a school. He explains that "Educational technologies can alter how schools are run, how teachers teach and how students learn. A dedicated and enthusiastic technology leader with the power to envision, articulate, and mobilize a school's population is needed to achieve this outcome" (p. 49). Therefore, it is important to determine the educational level and experience of our schools' current technology leaders.

**Background**

The position of technology coordinator is a relatively new phenomenon. As school districts have begun to feel the pressure of technological change, they have begun to realize the importance of innovative leadership in this area. Several factors have an impact on a coordinator's ability to provide necessary leadership.

First, many districts place incredible demands on their technology coordinators. In an unpublished paper, Lynn Batchelder (1996) highlights the many demands that are placed on technology coordinators by reviewing job descriptions. She summarizes "Many school districts are creating their own job descriptions for this highly accountable position and to some extent, districts have no idea what they really want this person to do and to be responsible for" (p. 2). Many southwest Michigan schools are asking their technology coordinators to carry out numerous tasks and responsibilities (Rockford Public, 1996; East Grand Rapids, 1995). One example found in a job posting for
Executive Director of Technology for the Wyoming Public School District lists fourteen different functions and responsibilities, some of which are as follows:

1. Plans and coordinates information technology strategies for the district: its students, teachers, administrators, and collaborators.
2. Resolves technology performance problems through vendor consultation, research and problem solving.
3. Directs the study and recommends the feasibility of new or enhanced information and networking systems.
4. Supervises department staff; conducts performance and compensation appraisals for all Computer Services support staff.
5. Monitors internal training programs and coordinates common training needs and budget allowance.
6. Responsible for overall systems security and access codes.

Second, technology coordinators may have difficulty securing the necessary training and education for the technology coordinator position. Graduate degree programs are not yet widely available. In 1990 there were 200 master’s level programs in educational technology and 60 doctoral level programs throughout the United States. That number has increased, but not dramatically (Logan, 1990a; Logan, 1990b). This researcher examined the World Wide Web sites of Michigan universities in September, 1997, and found that in Michigan only the University of Michigan, Michigan State University and Wayne State University offer doctoral degrees in educational technology. Only Grand Valley State University, the University of Michigan, Michigan State University and Wayne State University offer masters degrees in educational technology.
technology. Anthony Piña (1993) explains "budding instructional technologists often face an uphill battle when trying to locate a program in their discipline" (p. 2). Piña goes on to explain that coordinators or potential coordinators are often deterred because programs are not widely recognized and because the discipline lacks a standard name.

**Statement of Purpose**

The purpose of this study is to determine the degree to which districts in southwest Michigan are applying the ISTE standards for technology coordinators.

More specifically, the study will:

1. determine the educational level and experience of current technology coordinators in southwest Michigan by conducting a survey of coordinators. The survey will ask them to report their current educational level, degree attained and skills mastered.

2. assess to what degree the current level of education and experience of technology coordinators in southwest Michigan is aligned with ISTE standards by constructing survey questions that directly measure portions of the ISTE standards. Emphasis will be placed on proficiency of strands 3.0 and 4.0 of the ISTE standards. These strands are representative of technical skills and educational applications.

A cursory review of the literature has indicated that no study of this kind has previously been conducted. This project focuses specifically on technology coordinator positions in southwest Michigan. It combines a review of educational level, job descriptions, and national standards.
The research design consisted of an email survey of technology coordinators in southwest Michigan to determine educational background and experience. The surveys were returned via email or mailed back allowing for subjects to respond anonymously. If subjects failed to respond, a follow up email was sent to ensure an adequate sample. A list of technology coordinators was compiled using the Intermediate School Districts in southwest Michigan as resources.

The success of the project was measured using the following criteria:

1. Did the survey include responses from more than 65% of the technology coordinators in southwest Michigan?
2. Did the information gathered answer whether educational level of technology coordinators is aligned with ISTE standards?

Limitations of the Project

The product of this project was a survey and analysis of the current educational level of technology coordinators in southwest Michigan. The conclusions that were drawn are only valid for southwest Michigan and are not generalizable beyond that region. Another limitation is that technology coordinators all play very different roles depending on the school district that employs them. Therefore, there was variability in responses because significantly different job descriptions and expectations exist.
Chapter 2

This section of the paper will review a variety of sources that deal with the position of technology coordinator. More specifically, the researcher will examine research and literature which has been done about the position of technology coordinator, will discuss ISTE standards for education of technology coordinators, will give an overview of several graduate study programs in educational technology which are available to current and potential technology coordinators, and will describe job postings and job descriptions for technology coordinators. The unique nature of this research calls for a combination of both formal research and unconventional resources such as job descriptions and graduate study program descriptions.

Technology Coordination

David Moursund has done extensive research on the position of technology coordinator. He published his first book on the subject *The Computer Coordinator* in 1985. He revised, updated and retitled his book *The Technology Coordinator* in 1992. In his latest book he defines a technology coordinator as “an educator at the school level or at the school district level who works to facilitate effective use of a wide range of computer-related information technologies in instruction”(p. 2). The position of technology coordinator is one with many titles as indicated by Moursund’s change in book titles. The technology coordinator can be also be referred to as a computer coordinator, a technology resource teacher (Moallem, Mory, & Rizzo, 1996), director of technology, technology curriculum specialist, technology manager, or a director of library media and technology. Although the titles may differ, the roles and
responsibilities of these positions are very similar, for the purpose of this paper, all will be collectively referred to as technology coordinator.

Moursund (1992) distinguishes between two categories of technology coordinators: the district-wide coordinator and the school coordinator. Although they carry out similar duties, the scope of their responsibilities and activities differ. According to Moursund (1992) the responsibilities of the school technology coordinator include the following: help teachers and students who are having problems with technology, work with the district technology coordinator on long-range planning, work with teachers on goals and objectives for the integration of computers into the curriculum, help teachers develop curriculum and lesson plans which integrate computers into the curriculum, train lab assistants, be responsible for school's hardware and software, maintain computer network, be responsible for school's computer budget and evaluate success of school's instructional computing program.

Research conducted by Moallem, Mory, and Rizzo (1996) also provides information about the school-based technology coordinator. Their research looks at the effectiveness of school-based technology coordinators and their impact on their school. The school coordinator duties listed by the researchers are very similar to the duties discussed by Moursund (1992). However, Moallem et. al. (1996) conclude that the role of the school technology coordinator is primarily instructional. They go on to say that the technology coordinators in their study did not conduct a formal needs assessment, did not prioritize needs, and did not have specific objectives nor planned implementation and evaluation. They believe that it is premature to determine if the
strategies coordinators use for helping teachers integrate technology into the curriculum are effective.

The position of technology coordinator is not unique to the United States. English schools also have created a position they refer to as the Information Technology Co-ordinator. The Non-statutory guidance (NSG) for Information Technology Capability (England’s nationwide educational technology plan) identifies the technology co-ordinator as key to implementing information technology throughout the school and defines the role as part of the management and policymaking team. Researcher Gavin Owen (1992) concludes that the technology co-ordinator has been relegated to the position of technician and rarely possesses the managerial clout necessary to implement strategic technology initiatives. Owen (1992) explains,

The NSG intimates that the (technology co-ordinator’s) role is concerned with whole school curriculum management with the new technologies being a resource or service that is organised (sic) to meet the evolving needs of the learning environment. Conversely the role expectation in most schools tends to be focused more on the technical issues than aspects of human resource development (p. 39).

Owen emphasizes the complexity of the technology co-ordinator’s position and the difficulty of providing technical support while trying to lead the school through technological change.

In a recent article Donn Ritchie (1996) presents a strong argument for the need for technology coordinators in schools. He advocates helping teachers achieve a level of competence with technologies as the best way to encourage integration of
technology into the classroom. He believes numerous strategies should be used to bring about this competence including training teachers and mentors, providing expert resource staff which is immediately available, providing computers for every teacher, establishing resource centers, and providing concrete examples of real world applications and lesson plans. He concludes, "Regardless of the type of training and support, a common thread in experienced technology-using sites is that substantial investments in human resources for technology integration is essential" (p. 49).

In a recent article Hoffman (1996) examines the barriers between "our visions of digital districts and the realities of classroom computing" (p. 89). Hoffman (1996) also contends that one of those barriers is the lack of technology coordinators. He explains that the coordinator's primary role is to coordinate technology planning and development for a school or school district. He goes on to argue the benefits of having a technology coordinator, saying it leads to greater use of computers, improved higher order thinking skills and more academic activities rather than drill and practice. Furthermore, he believes that the technology coordinator can help to boost teacher confidence in technology and motivation to use technology by organizing a high degree of technical support.

The role of the district-wide technology coordinator is moderately different from a school-based technology coordinator. According to Moursund (1992) the school based technology coordinator emphasizes implementation of technology and training for integration, the district wide coordinator's position emphasizes planning and supporting implementation. According to Moursund, some of the responsibilities of the district-wide technology coordinator include the following:
• taking a leadership role in developing and implementing a district plan for instructional use of computers,
• understanding and directing the district technology budget,
• developing a district technology resource center,
• developing a list of technology resource people,
• implementing and evaluating district, computer-oriented, inservice training,
• directing district acquisition of hardware and software,
• maintaining inventory of district hardware and software,
• researching and evaluating effectiveness of the district's instructional use of computers,
• disseminating computer-related information throughout the district,
• securing alternative sources of funding technology
• and maintaining technical competence.

Moursund views the technology coordinator, especially those who are district wide, as change agents for the entire district.

In her unpublished paper, "All about Technology Coordination", Lynn Batchelder, a business education instructor at the Kent County Skills Center, Kent County, Michigan, discusses the importance of developing a district strategic technology plan (1996). This strategic plan should be consistent with the State of Michigan Educational Technology Plan (1996) according to the Michigan State Board of Education.

Batchelder (1996) explains one of the primary functions of the district level technology coordinator is to ensure that the district's plan is in order and in line with the State's Technology plan.
The International Society for Technology in Education has developed a set of standards for technology coordinator training and competence. These standards are broken down into two sections - Standards for Basic Endorsement in Educational Computing and Technology Literacy (1996) and the Standards for Advanced Programs in Educational Computing and Technology Leadership (1996). The standards for the basic endorsement serve as a prerequisite for the advanced program standards.

The basic endorsement is very comprehensive and requires that candidates have (1.0) foundational knowledge, (2.0) specialty content preparation, and (3.0) professional preparation. The (1.0) foundational knowledge consists of a candidate being able to do all of the following: use computer systems to run software; access, generate and manipulate data; publish results; evaluate performance of hardware and software; and apply basic troubleshooting strategies. The candidate must also be able to use technology in communicating, collaborating, conducting research, and solving problems. The candidates will be consistently involved in lifelong learning and will promote the equitable, ethical, and legal use of computers. Candidates will effectively use computer-related technologies to support instruction in their subject area.

The (2.0) specialty content area of the basic endorsement standards requires that candidates apply legal and historical context when making technology decisions. They should also use advanced features of productivity tools and telecommunications tools to support instruction. Candidates should use computers and other technologies when conducting research, problem solving, and product development. The candidates
should use numerous different media, presentation, and authoring packages to carry out and present research.

The (3.0) professional preparation component of the basic endorsement requires a candidate to effectively plan, deliver, and assess skills of students and staff related to computer technology in all areas of the curriculum. Furthermore, the candidate will demonstrate a mastery of educational hardware/software selection, installation, and maintenance for both stand-alone computers and networks.

The Standards for Advanced Programs require that a candidate demonstrate mastery at all three levels of the Standards for Basic Endorsement but then demonstrate mastery in two additional categories (4.0) specialty content preparation for technology leadership and (5.0) professional preparation for technology leadership. The (4.0) specialty content preparation for technology leadership prepares candidates to “exhibit leadership in the identification, selection, installation, maintenance, and management of computing hardware and software and the uses of computer related technologies throughout the curriculum” (p. 1). This includes being able to identify and apply educational technology research as well as principles of instructional design when guiding the use of computers in education. The candidate should also be able to evaluate authoring and programming software which are used in the classroom and implement an information access and delivery system in the schools to support the curriculum. The candidates will be able to “install, customize, and configure the operating systems of computers and computer networks in school settings” (p. 2). They should also be able to investigate, recommend and implement both administrative and classroom software.
The (5.0) professional preparation in technology leadership will combine leadership skills and concepts with technical knowledge about the use of computers and related technologies in schools. The candidates will develop curricular plans for the use of computer technology based on local, state, and national standards and apply effective methods in teaching the use of technology tools. They will also demonstrate knowledge of issues related to staff development and will plan and design effective staff development activities. The candidate will demonstrate knowledge of facilities and resource management. They will demonstrate knowledge and ability to manage the change process in schools. The professional preparation component also requires that candidates participate in a field experience which allows them to observe the use of technology to support instruction, observe the management of technology resources, and observe the evaluation of the effectiveness of technology resources for teaching and learning, and apply technology resources to support instruction.

The standards provided by ISTE for the education of technology coordinators is extensive. They are intended to be used by educational technology degree programs as recommendations for objectives and benchmarks for proficiency.

Graduate Degree Programs in Educational Technology

There has been a considerable amount of research done on graduate degree programs in educational technology. Anthony Piña (1993) contends that there are some unique factors that affect the selection of educational technology programs. He contends that programs are not recognized or “established” like other fields such as educational psychology, elementary education, secondary education, and administration. As a result students find themselves in other departments such as
computer science. Piña also believes that it is difficult to identify educational technology programs because the discipline lacks a standard name. He reports that "the instructional technology student must wade through a myriad of names, such as instructional media technology, training and learning, instructional science, computers in communications and technology, instructional systems, and interactive technologies" (p. 3). He also believes educational technology has a unique environment in that graduates are not only employed in education but have a strong presence in business, industry, government, non-profit organizations, libraries, and the military. According to Piña these challenges are unique to educational technology graduate students and make it more difficult to identify an appropriate program.

Jenny K. Johnson (1992) examined the Graduate Curricula in Educational Communications and Technology: A Descriptive Directory for 1992. After examining this directory she drew a number of conclusions about the direction of graduate degree programs in educational technology. According to Johnson one of the outcomes of the latest survey is the evidence that 'the field does not practice what it preaches.' Only twenty percent of the faculty are doing research in computers, twenty-nine percent of the universities offer an area of concentration in computers, and seventy-two percent of programs have computer labs. "Only ten percent of the universities offer course work in a masters program via computer. Consider this analogy -- fifteenth century professors were to the printing press as the twentieth century professors are to CAI/CMI" (p. 13). Other conclusions that were drawn included outlining current (1992) trends in educational technology curriculum. Some of these trends included maintaining the status quo, hiring faculty with degrees from Indiana University,
computer research, Departments of Educational Technology, doctorates, self-instructional courses, and courses using print and lecture instead of CAI.

Other research has been done to delineate what should be included in a graduate degree program in educational technology. In a monograph, The Essential Elements of a Quality Graduate Technology Education Program compiled by John R. Wright (1991), a group of graduate faculty from around the country combines the elements of the best programs to create the ideal. One of the conclusions drawn from this research was that the type of program being offered has a great deal of impact on the faculty needed. A program that is more technically oriented and designed to produce students with supervisory responsibility should have faculty with those skills and experience. A program that is more focused on directly impacting the classroom should have faculty with classroom experience that can develop curriculum for use at elementary, middle, and secondary levels.

William Winn (1995) presents a unique thesis in his research that instructional technology graduate degree programs are too practical, explaining, "There is a heavy emphasis on 'how-to-do-it' and less on 'why-do-it'" (p. 2). According to Winn (1995) this emphasis leads to the pursuit of prescriptions for instruction which are dangerous. Therefore, Winn (1995) advocates theory-based curricula for instructional technology graduate degree programs that operate from "reasoning from first principles". These first principles for the educational technology student are the social sciences including psychology, sociology, economics, politics, and anthropology. Winn (1995) explains instructional designers need to have a "knowledge of perceptual and
cognitive theory of how people eventually acquire wisdom as cognitive processes, interact with the context in which people find themselves, and human factors" (p. 10).

In addition to the research that has been done on what should be contained in educational technology degree programs many programs are available for examination. A small group of programs have been selected for examination here and there has been no attempt made to ensure that the programs selected were a statistical sample of the whole. One of the most prestigious and well-established educational technology graduate degree programs is Indiana University's program (Johnson, 1992). Their program is referred to as an Instructional Systems Technology (IST) Master of Science in Education. It is a forty credit-hour minimum graduate degree. It consists of two levels of competencies, which include operating system basics, word processing basics, graphics basics, theoretical understanding and email for level-one competency. Level-two competency includes FTP, information retrieval, scanning, and WorldWide Web spinning. Students are tested on these competencies. Their program consists of thirteen hours of IST core courses, fifteen hours of IST major courses, and twelve hours of approved electives outside the department (Indiana University, 1995).

Another degree program available is at the University of Michigan. They offer a Ph.D. specialization in Educational Technology and a Master's Degree in the area of Educational Technology. Their master's program includes the core education courses, required courses in instructional design and technological capabilities, nine hours of educational technology electives, and nine hours of outside electives (University of Michigan, 1997). Their Ph.D. specialization requires twenty-four credits of technology core courses, twelve educational technology electives and four outside electives. In
the Ph.D. program educational technology students must specialize in Literacy, Mathematics or Science Education (University of Michigan, 1997).

Another master’s degree program in educational technology is the one provided by Grand Valley State University. This program is significant because it is the only educational technology program located in West Michigan, the geographic region to which this research project is limited. Furthermore, the researcher is currently a candidate in this program and has more familiarity with it. Grand Valley State’s graduate degree is closely tied with their library/media services program. The M.Ed. in Computer Technology Services is a thirty-three credit program. It requires nine credits of foundational education courses, fifteen credits of core technology courses, six graduate electives and a research applications course.

Technology Coordinator Job Postings and Job Descriptions

Another method of learning about the position of technology coordinator is to examine the job descriptions that are developed and published by districts. A group of job descriptions have been gathered and selected for review. No attempt has been made to ensure that they are a sample of all job descriptions for technology coordinators in southwest Michigan.

The Wyoming Public Schools (1996) job posting for an Executive Director of Technology provides an extensive lists of twelve qualifications which include minimum bachelors degree in instructional systems, management information systems, or related areas with a master’s degree preferred, operations experience with system/36, system/38, or AS/400 and micro computers, teaching certificate and teaching experience preferred, knowledge and/or experience with financial systems, student
applications and network systems, excellent communications skills, eight to ten years of work in technical setting, IS department, or a learning environment, prior experience with instructional systems and classroom technology, experience recruiting, training and supervising staff, knowledge of telecommunications, ability to organize detailed work, and experience training teachers, administrators, and support staff.

The Rockford Public Schools (1996) job posting for Director of Technology includes similar but less extensive qualifications. They require a master's degree with five years teaching experience, course work and knowledge of microcomputers, Novell and Appleshare networks, instructional software and optical media, experience training students and teachers in the use of instructional technology, ability to develop relationships with others, and ability to assume responsibility with minimal supervision.

The job description for Director of Technology in the East Grand Rapids Public Schools (1995) also has similar qualifications. The job description lists numerous position responsibilities some of which include to direct the development and implementation of the district strategic plan for technology, assist in revision and implementation of district's K-12 technology curriculum, provide leadership for district technology committee, manage technology and library media resources of the district, coordinate instructional and administrative technology acquisition and installation, assist in hiring all technology and media personnel, conduct an annual review and update district technology and library media goals.

Similar to East Grand Rapids the Okemos Public Schools (1992) job description includes supervision of the libraries. In Okemos the Director of Library Media and Technology carries many of the same duties as the Director of Technology in East
Grand Rapids. However, this position specifies supervision of cable television in the district and oversight of building level computer coordinators.

The job description for Technology Coordinator of the Grandville Public Schools (1995) describes responsibilities of their district coordinator. The performance responsibilities include to assist K-12 teachers in integrating technology into the curriculum, assist building level technology committees in implementing their technology plans, install computer software and troubleshoot computer equipment and software problems, coordinate the repair and maintenance of K-12 computer hardware and peripherals, supervise technology instructional support personnel, ensure district-wide compliance with copyright laws, and assist in procuring outside funding for technology.

The Charlotte Public Schools (1993) developed a job description for a technology coordinator but drafted it as a contract position not as an employee of the school district. However, this person would in effect be serving as the district technology coordinator carrying out duties such as Chair the District Technology Committee, coordinate purchase and installation of all hardware and software, coordinate and deliver computer in-service training to all staff members, and perform other duties as deemed appropriate by the District Technology Committee. The fact that this person would answer to the District Technology Committee and not the Superintendent is a unique arrangement.

An example of a building level technology coordinator is found in Loy Norrix High School’s (1994) job description for a Technology Curriculum Specialist. The duties of this person would include implementing the policies and procedures of the
building technology committee, promote exciting atmosphere of creativity with technology, assist and promote the use of technology in the curriculum, coordinate training of all staff in areas of hardware and software use, coordinate and train all peer tutors, network with district, Intermediate School Districts, and global resources, and disseminate technology information to appropriate staff.

Summary

It is evident from the literature that the position of technology coordinator is an important and complex one. The demands placed on technology coordinators are clearly presented through the research of Moursund (1992), Owen (1992), and Moallem et. al. (1996). These demands are extensive and require thorough preparation, education and experience as evidenced in the numerous job descriptions cited (e.g., Charlotte Public, 1993; East Grand Rapids Public, 1995; Grandville Public, 1995; Okemos Public, 1992). The ISTE standards for training and education reflect these rigorous demands and provide solid framework for educating technology coordinators (ISTE, 1996). Solid educational technology programs are available to technology coordinators who wish to further their education (e.g., Indiana University, 1995; Grand Valley State University, 1996; University of Michigan, 1997).

It is important to determine if technology coordinators are in fact adequately trained to do their job and lead their schools and districts through technological change. Chapter 3 of this paper will present the findings of a survey of technology coordinators in southwest Michigan and conclude whether they are adequately trained to do their job.
Chapter 3

School districts that employ technology coordinators have not accepted nor implemented the standards for technology coordinators, which were developed by the International Society for Technology in Education (ISTE). These standards are rigorous and provide strong benchmarks for the preparation and proficiency of technology coordinators. This chapter will explain the different components of this thesis and the activities that were necessary to complete it.

The researcher has conducted a thorough literature review and found no previous studies that measure the implementation or adoption of the ISTE standards for technology coordinators. Furthermore, the researcher has found no studies which measure the educational and skill level of technology coordinators. As a result of this apparent lack of research in this field, this researcher designed a research survey of technology coordinators.

The researcher identified a sample of eighty-five technology coordinators in southwest Michigan and distributed a survey to all of them. The survey (See Appendix) focused on the educational level and experience level of current technology coordinators, as well as the level of the coordinator's proficiency on selected ISTE benchmarks. A section of the survey included demographic data questions and another section of the survey included questions measuring proficiency on certain skills included in the ISTE benchmarks. Respondents were given a week to respond to the survey and then the data was compiled and tabulated.

The research design was straightforward. Respondents were asked to report demographic information and conduct a self-assessment. The ISTE standards served
as the blueprint for questions requiring the respondent to assess his or her own skill level.
Chapter 4

This chapter will discuss the strategies for the particular research design. This chapter will also explain the methods that were used when conducting this research. The rationale for the type of research design will be presented.

Establishing a Sample Group

The most challenging aspect of this research was identifying the survey subjects. A master list of technology coordinators in southwest Michigan does not exist. Some of the Intermediate School Districts (ISDs) and Regional Educational Media Centers (REMCs) maintain a list of district technology coordinators; others do not. School-level technology coordinators were difficult to identify. The following methods were used in identifying and contacting technology coordinators.

- All of the REMCs and ISDs in southwest Michigan were contacted directly, by both email and phone, and asked for contact information for technology coordinators.
- Statewide organizations such as Michigan Association of Computer Users in Learning (MACUL), Michigan Association for Educational Data Systems (MAEDS) an ISTE affiliate, and the Michigan Department of Education (MDE) were asked for contact information for technology coordinators.
- The researcher reviewed of each of the REMC’s web sites for school contact information.
- The researcher reviewed the Route 66 educational clearinghouse for school web sites.
• The researcher contacted all available technology coordinators through their schools' web sites.
• Many survey respondents were contacted prior to the survey being sent out and were asked if they would participate.
• The researcher asked all survey recipients to forward the survey to appropriate technology coordinators in their organization.

Using the methods stated above the researcher sent email surveys to eighty-five individual technology coordinators and to two email lists made available through REMC7 and REMC11. MACUL and MDE provided no contact information. MAEDS provided a membership directory, which was used. The respondents were asked to respond within six days. Respondents who did not respond within six days were sent a reminder and a second copy of the survey. There were no follow-up phone calls conducted. More than eighty-five surveys were sent out and thirty-two surveys (37.6%) were returned. As a result of the difficulty establishing a sample of sufficient size and securing contact information for technology coordinators, a statistically valid sample was not achieved. Thus, the survey does not include responses from sixty-five percent of the technology coordinators in southwest Michigan, the original goal stated in Chapter 1. The data that was collected will be dealt with descriptively.

Designing the Survey Instrument

The survey (See Appendix) included relevant demographic data questions including the respondent's gender, degree attained, area of degree, job title, scope of job and place of work. The survey also included thirty questions that were drawn directly from the ISTE benchmarks. The respondents were asked to rate their level of
proficiency in performing the activities that were listed. "Three" was proficient, "two" was novice, and "one" indicated the respondent was not able to perform the activity.

The surveys were distributed via email in the second and third week of November 1997. This method of collection did not present any apparent problems. No technology coordinators were located who did not have an email address. Several of the respondents were happy that they were able to complete the survey via email, because it was easy for them to respond; however, email did not provide anonymity. Respondents had to mail in their surveys if they desired anonymity. Three respondents chose to mail their surveys.

In this chapter the specifics of the survey design were provided. Problems that were encountered were discussed and adaptations were explained. In addition, a rationale was provided for the type of research methodology and the strategies that were used to conduct this survey.
Chapter 5

This chapter will present the data that was collected from this research study. The data will be analyzed and results presented. Conclusions will be made as a result of the data presented.

Demographic Results

The demographic results of the survey are as follows. Forty-three percent of technology coordinators possess a bachelor's degree and forty percent possess a master's degree. Refer to Figure 1 for educational level of all respondents. Only eighteen percent of respondents possessed a degree in a computer-related field. Most of the respondents possessed degrees in areas other than the computer fields, elementary education, and secondary education, as indicated in Figure 2. Respondents were asked to report the area of their degree if it was other than those listed. There was no pattern to the degrees that were reported in the other category. Fifty percent of the respondents have the job title of technology coordinator as indicated by Figure 3. In addition seventy-two percent of the survey respondents are responsible for technology leadership at the district level rather than the school level as is shown in Figure 4.

Skill Level Results

The results of the skill portion of the survey are as follows. Only one of the respondents indicated that he or she is proficient in all of the skills surveyed. One of the respondents only answered the questions he or she was proficient in and put an X in the rest of the questions. The average score for all respondents was 2.54 out of 3.0. Sixty-three percent of the respondents' individual average scores were above the
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average score of all respondents. Twenty-seven percent of the respondents' individual average scores were below the average score of all respondents. Theoretically, all respondents should have responded proficient to all questions that were asked. The ISTE standards discussed extensively in Chapter 2 served as the basis for all of the skill questions that were asked. These are the skills ISTE has said are necessary for educators to have in order to provide technology leadership to their schools and districts. The survey focused on four components of the ISTE standards and benchmarks; 3.1 Teaching Methodology, 3.2 Hardware/Software Selection, Installation, and Maintenance, 4.1 Research and Theories in Educational Computing and Leadership and 4.4 Operating Systems. The average score for respondents was highest on Standard 3.1 Teaching Methodology and lowest on Standard 4.1 Research Theories. Figure 5 depicts these average scores by benchmark.

There were specific skills that respondents scored lower on than the overall average. These skills were as follows:

14. Design and implement integrated technology classroom activities that involve teaming and/or small group collaboration.

16. Describe student guidance resources, career awareness resources and student support activities related to computing and technology.

17. Compare national K-12 computer/technology standards with benchmarks set by local school districts and critique each.

18. Design a set of evaluation strategies and methods that will assess the effectiveness of instructional units that integrate computers/technology.
#26 Identify and describe network software packages used to operate a computer network system.

#27 Configure all hardware related to a computer system.

#29 Summarize and apply principles and practices of educational research in educational technology.

#32 Describe social and historical foundations of education and how they relate to the use of technology in schools.

#33 Design a research project that includes evaluating the use of a specific technology in a K-12 environment.

#36 Use and manipulate networking software to effectively manage the operation of a LAN.

The average scores for each of these skills can be seen in Figure 6. A pattern exists to these questions with lower-than-average responses. Two of these questions deal with network management and troubleshooting skills. Five of these questions deal with research theories and application skills.

The last question in the survey asked the respondents to identify where they attained most of the skills mentioned in the previous questions. Respondents were able to choose from formal education, experience/self-instruction, or an equal combination of the two. No respondents answered that formal education was the primary source for gaining their skills. Figure 7 depicts that most individuals gained their skills from experience and self-instruction.

The problem initially presented was that the ISTE standards had not been adopted by school districts who employ technology coordinators and graduate degree
programs which train technology coordinators. This problem has been evidenced in the survey results. Because of problems with definition of population and sample size discussed in Chapter 4 the conclusions drawn in this chapter will not be generalizable to all of the technology coordinators in southwest Michigan.

Conclusions

The results from the survey provide a number of clues regarding the educational level and preparedness of technology coordinators. If the technology coordinators who were surveyed were truly proficient, then they would have averaged three. This was not the case. The average level of proficiency for all respondents was 2.54. So it can be concluded that as a group they were not completely proficient in the skills that were measured. More specifically, there were certain areas in which the respondents consistently rated themselves lower. These areas were research theories and application, as well as network management and troubleshooting. These two areas represent a specific deficiency in the technical area and in educational methodology of the survey respondents. The deficiency in educational research methodology is consistent with findings of Moallem et. al. (1992). Moallem et. al. (1992) concluded that the technology coordinators in their study did not conduct a formal needs assessment, did not prioritize needs, did not have specific objectives nor planned implementation and evaluation. The lack of proficiency in research and evaluation is also problematic for this survey’s respondents.

Respondents also answered surprisingly to the question of where they gained most of the skills in question. None of the respondents attributed most of their skills to formal education. Sixty-nine percent of the respondents attributed most of
their skills to experience and self-instruction. Thirty-one percent of the respondents gave equal weight to formal education and experience (See Figure 7). This is dramatic in that almost seventy percent of the respondents did not rely on formal education significantly to secure their job skills. However, those who did rely primarily on self-instruction and experience had an average proficiency level of 2.45, whereas those who relied on a combination of formal education and experience had an average proficiency level of 2.77. Although most respondents relied on self-instruction, those who combined self-instruction with formal education fared much better on mastering skills that are measured by the ISTE benchmarks. Thus, it can be concluded that technology coordinators need more formal education in order to become more proficient on the ISTE standards.

Although the data indicates the survey respondents were not fully proficient on the ISTE benchmarks, it must be noted that there is a high degree of similarity between the ISTE benchmarks and the current skills of technology coordinators in the survey. They possess many of the skills that are set forth in the ISTE standards and benchmarks. The majority of average responses by question were near the proficient level of three (See Figure 6).

This chapter has presented the data from this research survey. Possible reasons behind the data results were also provided. Conclusions were drawn based on the data presented. The most important conclusion is that technology coordinators need more formal education in order to become more proficient on the ISTE standards.
Chapter 6

This chapter will provide recommendations to other researchers for future study. It will also explain the different ways this research will be disseminated to individuals who can use this research.

This research is preliminary: further research on technology coordinator's proficiency level on the ISTE standards is necessary. In addition, research is needed on graduate degree programs in educational technology to determine if these programs are aligned with the ISTE standards. Finally, research should be done on employing school districts to determine if they are expecting job candidates for technology coordinator positions to have the skills that are set forth by the ISTE standards.

The information presented in this thesis will be valuable to technology coordinators and graduate degree programs. It will allow technology coordinators to see how they compare with some of their colleagues. It may also allow technology coordinators to identify and work on their own weaknesses more effectively. Graduate degree programs can use this information to identify some of the existing weaknesses of technology coordinators that should be targeted in their programs. It can also be used to help graduate degree programs design their programs to meet the needs of technology coordinators and align their programs with the ISTE standards.

This information will be shared with professionals in three different ways. First, the research will be posted on the researcher's web site. The web address will then be disseminated to all survey participants through email and those who wish to access the information can go to the web site. Michigan graduate degree programs in educational
technology will also be contacted via email and given the web site address. This posting will occur in December of 1997 and will remain posted for at least six months.

Secondly, the thesis will be submitted to Educational Resources Information Center (ERIC) for cataloging. It will be submitted in December of 1997. This makes this research available to a wider audience. This researcher has found that there is a very small body of knowledge available in the area of technology coordination. Submitting the thesis to ERIC will add to this body of knowledge and aid other researchers in conducting their own research.

Finally, the Grand Valley State University Library will submit the thesis to the UMI Dissertation Information Service. UMI will film, store, and list the research in a computerized database. An abstract will be published in Master's Abstracts. Grand Valley State University Library will also keep a bound copy of the thesis on Closed Reserve.

This chapter presented recommendations for future study on graduate degree programs for technology coordinators and on the expectations that are placed on technology coordinators by the districts that employ them. This chapter has also explained the methods that will be used to make this research available to other researchers and interested parties.
Figure 1

Degree Attained

- High School: 3.13%
- Associates: 6.25%
- BA: 43.75%
- MA: 40.63%
- Doctorate: 6.25%
Figure 2

Area of Degree

- Ed Tech: 3.13%
- Comp. Science: 9.38%
- Info Systems: 6.25%
- Secondary Ed: 18.75%
- Elementary Ed: 9.38%
- Other: 50.00%
Figure 3

Job Title

- Technology Coordinator: 49%
- Director of Technology: 16%
- Administrator: 13%
- Teacher: 22%
Figure 4

Scope of Responsibilities

- School: 28%
- District: 72%
Figure 5

Average Scores on ISTE Benchmarks

- Teaching Methodology 3.1: 2.59
- Hardware/Software - Selection/Installation 3.2: 2.55
- Research Theories 4.1: 2.35
- Operating Systems 4.4: 2.54
References


Okemos Public Schools. (1992). *Job Description for Director of Library Media and Technology*. Okemos, MI.


Appendix

My name is Keith Platte and I am a graduate student in Educational Technology at Grand Valley State University. I am conducting a survey of Technology Coordinators for my MA thesis. I would appreciate your response to my survey. It will only take 10-15 minutes to complete. Researchers are very skeptical of an email survey and I need a high response rate to prove that this is a valid and efficient way to conduct research. Additionally if you are a District, REMC or ISD Coordinator please respond and forward the survey to other the technology coordinators in your organization. If you are not the technology coordinator for your district or school please forward the survey to that person or persons. I have had a very difficult time locating names and email addresses of coordinators and would appreciate any help you could provide. I apologize if you received more than one copy of the survey. You will find the survey below.

Thank you for your help.

Keith Platte
kplatte@telecity.org
616-345-4103

Survey of Technology Coordinators

The following survey is based on components of the Standards for Advanced Programs in Educational Computing and Technology Leadership. They are the standards developed by the International Society for Technology in Education for technology coordinators. The purpose of this survey is to evaluate the level of education and experience of technology coordinators in southwest Michigan. The information collected from your survey will not be analyzed individually it will be evaluated collectively when compiled with other responses from technology coordinators in southwest Michigan.

In order to complete this survey via email copy the text by highlighting it and pasting it into a reply message. Put your responses on the line provided to the left of the number. If you would like to return the survey anonymously, print out the survey and send it to Keith Platte, 4105 Apple Bluff Dr., Kalamazoo, MI, 49006-1953. Thank you for participating in this survey.

I would appreciate receiving your response by Wednesday, November 19, 1997 or as soon as possible.

_____ 1. a. Male b. Female

_____ 2. Degree attained?
   a. High School b. Associates 
   c. Bachelors d. Masters e. Doctorate
3. What is your degree in? Mark all that are appropriate.
   a. Educational technology  b. Computer Science
   c. Information Systems  d. Secondary Ed.
   e. Elementary Ed.  f. other (please list)

4. Which one of the following best describes your job title?
   a. Technology Coordinator  b. Director of technology
   c. Administrator  d. Teacher

5. Are you a person at the school or district level who works to facilitate effective use of a wide range of computer-related information technologies in instruction?  a. yes  b. no

6. What is the scope of your job?
   a. district level  b. school level

7. Which school or district do you work for?

Rate your ability to perform the following activities using the scale provided.

3 = Proficient
2 = Novice (New Learner)
1 = Unable to perform activity.

Teaching Methodology

8. Design and practice methods and strategies for teaching concepts and skills related to computers and related technologies including keyboarding.

9. Design and practice methods and strategies for teaching productivity tools.

10. Design and practice methods and strategies for teaching information access and delivery tools.

11. Design and practice methods and strategies for teaching problem solving principles and skills using technology resources.

12. Practice methods and strategies for teaching technology concepts and skills in a lab setting.

13. Identify and support implementation and revision of computer/technology literacy curriculum to reflect on-going changes in technology.

14. Design an implement integrated technology classroom activities that involve teaming and / or small group collaboration.

15. Identify activities and resources to support regular professional growth related to technology.

16. Describe student guidance resources, career awareness resource and student support activities related to computing and technology.
17. Compare national K-12 computer/technology standards with benchmarks set by local school districts and critique each.

18. Design a set of evaluation strategies and methods that will assess the effectiveness of instructional units that integrate computers/technology.

Hardware/Software Selection, Installation and Maintenance

19. Develop plans to configure computer/technology systems and related peripherals in appropriate instructional arrangements.

20. Identify and describe strategies to support development of school/laboratory policies, procedures, and practices related to use of computers/technology.

21. Research, evaluate, and develop recommendations for purchasing instructional software to support and enhance the school curriculum.

22. Research, evaluate, and develop recommendations for purchasing technology systems.

23. Design and recommend procedures for the organization, management, and security of hardware and software.

24. Identify and practice strategies for troubleshooting and maintaining various hardware configurations.

25. Identify and practice strategies for troubleshooting and maintaining various software configurations.

26. Identify and describe network software packages used to operate a computer network system.

27. Configure all hardware related to a computer system.

28. Configure multiple software packages on a computer system.

Research and Theories

29. Summarize and apply principles and practices of educational research in educational technology.

30. Summarize major research findings and trends related to the use of technology in education to support integration of technology in a K-12 environment.

31. Apply theories of learning, teaching, and instructional design and their relationship to the use of technology to support learning.

32. Describe social and historical foundations of education and how they relate to the use of technology in schools.
33. Design a research project that includes evaluating the use of a specific technology in a K-12 environment.

Operating Systems

34. Identify and describe the major operating systems associated with computing platforms found in K-12 schools.

35. Identify and manipulate preferences, defaults, and other selectable features of operating systems commonly found in K-12 schools.

36. Use and manipulate networking software to effectively manage the operation of a LAN.

37. Evaluate, troubleshoot, install, and maintain computer operating systems for classrooms and laboratories.

38. How did you gain most of the skills mentioned in #8-#37?
   a. formal education   b. experience / self-instruction   c. equal combination of formal education and self-instruction