

Title**Understanding Institutional Factors Affecting First-Year Teachers' Utilization of Technology****Contact**

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Introduction

A growing interest in technology in teacher education has initiated the emergence of the field of Instructional Technology and Teacher Education (ITTE) as a discipline in teacher education (Willis, Thompson, & Sadera, 1999). Although considerable research has been devoted to the integration of technology into teacher education programs, preservice and inservice teachers' attitudes toward technology, and barriers to integrate technology, less attention has been paid to qualitative studies of teachers' utilization of technology in their first years of teaching. The purpose of this research paper is to present a study that focuses on institutional factors influencing the ways that new elementary teachers utilize technology, specifically computers and the Internet, in their first years of teaching. This paper presents how first-year elementary teachers' technology experiences in their teacher preparation programs influence the use of technology in their first years of teaching. Furthermore, the paper also identifies how technical and pedagogical support and professional development provided in the institutions affect first-year elementary teachers' use of technology in their first years of teaching.

Review of Literature

Recently there has been a growing interest in technology in teacher education. There are quite a few differences among teacher education programs, however, in terms

of ‘what’ and ‘how’ teacher education students are taught about educational technologies in their programs (Willis & Mehlinger, 1996). Russell, Bebell, O’Dwyer, and O’Conner (2003a) argue that the disparities among the findings of the studies on pre-service and in-service teachers’ technology use are present due to a lack of consensus about what counts as being a teacher who uses technology in the classroom. Furthermore, with several kinds of technology uses emerging continuously, identifying the concept of being a teacher who uses technology becomes even more problematic (Russell, Bebell, O’Dwyer, & O’Connor, 2003b).

A. Studies of Teacher Education Programs

Literature that addresses technology and teacher education programs mainly concentrates on the stand-alone computing courses, the technology infusion across teacher education programs, technology-integrated field experiences, and the faculty’s modeling.

a. The Stand-Alone Computing Course: After a survey study, Hargrave and Hsu (2000) identified that the stand-alone introductory technology course approach or the single course approach is emerging as a “dominant model” for pre-service teacher education programs. The stand-alone technology course provides basic technology skills for pre-service teachers to assist them in integrating technology in their practices (Brent et al., 2003).

b. Technology Infusion Across Teacher Education Programs: The technology infusion approach—integrated technology component—is based upon the integration of technology within each content and subject matter course in a pre-service teacher education program. The basic assumptions of the technology infusion approach are that technology needs to be experienced within the context of subject areas (Gillingham & Topper, 1999, p. 3), and that pre-service teachers need to be provided with models for integrating technology into their teaching practices by performing technology-based projects during their teacher education program (Stuhlmann, 1998).

c. Field Experiences: Several researchers have focused on the importance of field experiences in terms of the integration of technology into pre-service teacher education programs (Dawson, Pringle, & Adams, 2003; Dexter & Riedel, 2003; Willis &

Montes, 2003). In their exploratory study, Dawson et al. (2003) studied the use of microteaching as complementary to traditional field experiences regarding technology integration within a teacher education program. The researchers found that student teachers use technology themes during their microteaching activities; student teachers' main concern with using technology in their teaching is linked to classroom management issues; and student teachers use technology to reinforce or deliver traditional, instead of constructivist modes of instruction (Dawson et al., 2003).

d. Faculty Modeling: In addition to introductory technology courses and technology infusion across programs, many researchers addressed the importance of faculty, university supervisor, and mentor teacher modeling for encouraging pre-service teachers to integrate technology into their teaching and learning (Fulford & Ho, 2002; Gunter, 2001; Marra & Carr-Chellman, 1999; Roblyer & Erlanger, 1999; Willis & Mehlinger, 1996).

B. Attitude Studies

Pre-service and in-service teachers' attitudes toward the use and integration of technology in teaching and learning have been extensively studied in recent years (Dawson et al., 2003; Fulford & Ho, 2002; Gunter, 2001; Marra & Carr-Chellman, 1999; Whetstone & Carr-Chellman, 2001). Some surveys conducted on teachers' attitudes toward technology have disclosed that teachers hold optimistic attitudes about the use of technology in education, but they are not self-assured in their ability to employ technology in their classrooms (Willis & Montes, 2003; Willis & Mehlinger, 1996; Willis et al., 1999). The literature has shown that despite the growth of pre-service teachers' positive attitudes toward technology, pre-service teachers rarely transfer their technology skills into their own teaching and learning practices (Dawson & Norris, 2000; Whetstone & Carr-Chellman, 2001).

C. Barriers to Implement Technology

Mehlinger and Powers (2002) address the barriers to effective use of technology in teacher education. These barriers are lack of vision, lack of planning, inadequate support, weak human and equipment infrastructures, inadequate access to technology, lack of incentives, inadequate professional development, and lack of money. Ertmer

(1999) classifies first-order (institutional) and second-order (personal) barriers impeding teachers' technology integration attempts and discusses the connection between these barriers. The first-order barriers (lack of access to technology, inadequate time to plan technology-integrated instruction, and lack of technical and administrative support) are extrinsic to teachers, whereas second-order barriers (beliefs about teaching and learning, ideas about technology, and reluctance to change) are intrinsic to teachers (Ertmer, 1999).

D. First-Year Teaching

a. First-Year Teaching with Technology

Expected to integrate technology with little training and support, beginning teachers who are already overwhelmed in their first year of teaching may become even more stressed when they encounter computers in their classroom settings (Novak & Berger, 1991).

In their two-year survey study, Strudler et al. (1999) investigated first-year teachers' general concerns, perceived problems, and needs in a local school district. The results of the study showed that first-year teachers have positive attitudes toward technology in education and value technology for supporting teaching and learning (Strudler et al., 1999). Strudler et al. (1999) concluded that new teachers are not adequately prepared to teach with technology. As their study showed, the support for first-year teachers to use technology differs from one setting to another (Strudler et al., 1999). They argued that without sufficient support, however, even well-prepared first year teachers are not likely to assume effective implementation of technology into their curriculum.

Taking into account the importance of preparing pre-service and in-service teachers to employ technology, Russell et al. (2003a) conducted a recent survey to investigate the issues that affect teachers' capability to utilize technology in their classrooms. Russell et al. (2003b) found that teachers' beliefs about the meaning of technology in teaching and learning were the most powerful predictors of the teachers' use of technology. The beliefs about the importance of technology were followed by access and confidence. The results indicated that teachers who have access to technology

appreciate technology more than those who do not have adequate access to it (Russell et al., 2003b).

b. Standards for Technology in First-Year Teaching and Professional Development

Funded by the U.S. Department of Education's Preparing Tomorrow's Teachers to Use Technology (PT3) Grant, the International Society for Technology in Education (ISTE) has decisively created the National Educational Technology Standards (NETS) to assist both teacher education schools and school districts in establishing support systems for new teachers. Although the essential conditions refer to some personal factors, they mostly signify the institutional factors that influence new teachers' utilization of technology in their teaching. The essential conditions that are "shared vision, access, skilled educators, professional development, technical assistance, content standards and curriculum resources, student-centered teaching, assessment, community support, and support policies" (NETS-Project, 2002, p. 267) allow schools and universities to evaluate the conditions present in their institutions.

Review of the research that addresses the new teachers' experiences with technology during the first few years of their careers has demonstrated that new teachers' utilization of technology in their teaching is a relatively new and underestimated research subject. The literature notes various personal and institutional factors in new teachers' uses of technology during both their teaching in the classroom and their education in teacher education programs.

Methodology

This study was a naturalistic inquiry grounded in the Interpretivist paradigm. Marshall and Rossman (1999) argue that "in qualitative inquiry, initial curiosities for research often come from real-world observations, emerging from the interplay of the researcher's direct experience, tacit theories, political comments, interests in practice, and growing scholarly interests" (p.25). In this study, the interest in the phenomenon originated from personal experience in the observation of the preservice teachers' fieldworks and technology class and has become a personal academic interest in the field of Instructional Technology and Teacher Education (ITTE).

Throughout the study, I employed case study approach as a research methodology. I selected study participants purposefully, according to their willingness to take part in the study and their suitability for the study. The participants in this study were first-year elementary teachers who completed a formal teacher preparation program, were in their first year of independent teaching, and under contract to a school district.

I collected data via multiple data collection methods including participant observation, interviews, and document collection. During the data collection, I observed the participants in their classroom once or twice a week for three months. I took field notes using the method of participant observation involving descriptive, focused, and selective observations (Spradley, 1980). For interviews, I utilized a “semi-structured interviewing” technique for asking questions derived from my participant observations for obtaining in-depth qualitative data (Fontana & Frey, 2000, p. 652). I also collected and interpreted documents from the field, including participants’ reflective journals, e-portfolios, unit and lesson plans, praxis documentations, and newsletters. During data collection, I created and utilized a chart to organize the data that I collected. I then selected two of the cases to study and analyze in depth.

Data Analysis

I employed constructivist grounded theory as a data analysis methodology to analyze gathered data from my participant observations, the individual interviews, and the document collection (Charmaz, 2000). In this naturalistic inquiry, I selected constructivist grounded theory for data analysis, because it was the most suitable methodology to analyze the emergent and constructivist elements of this social constructivist study (Charmaz, 2000). Utilization of constructivist grounded theory provided me with a set of lucid guidelines to identify relationships amongst concepts emerging throughout the study. I also used HyperRESEARCH qualitative data analysis software for coding, searching, and sorting the data collected throughout the study.

Results

In this paper, I will present and discuss one of the four participants’ institutional factors affecting her utilization of technology in her first-year of teaching. In order to provide background information, I will first focus on the participant, Mary, and the

institutions, her M.Ed program, school district, and school. Then, I will address the institutional factors affecting her technology utilization in her first-year teaching.

Background

Mary, a first-year teacher, graduated from an Early Childhood Master of Education (M.Ed.) teacher preparation program leading to initial state teacher licensure for pre-kindergarten through third grade. To prepare tomorrow's dedicated teachers to teach with technology, Mary's M.Ed program offered a five-week introductory technology course, Media and Technology in Education, in which Mary had opportunities to "explore some of the possibilities, implications, and challenges of teaching with media and technology" (Course Syllabus). The course was taught in both lecture and lab formats and required an electronic portfolio creation to help preservice teachers gain technical skills in web development, presentation, and spreadsheet software as well as experience with online discussions, website and software evaluations, and lesson plan design and development. During her M.Ed program, Mary was also required to include her other teacher preparation course assignments, student teaching experiences, and capstone projects in her electronic portfolio.

After graduating from the M. Ed program, Mary found a first grade teaching job in a suburban school district. The school district's technology vision addresses that "the use of technology is vital to the success of our staff and students and will be used to serve as a catalyst for active, collaborative life-long learning for the community" (The School District Website). Technology available in the school district goes beyond computers and the internet connections in the classroom, to laptop carts, digital cameras, scanners, science probes, midi keyboards, and presentation projectors in the school media centers (The School District Website).

The school in which Mary teaches in was established in 2001 as a suburban community school with a mission to connect with family and community, in order to empower students to achieve their fullest potential. To attain its goals and create a nurturing climate for learning, the school is also committed to integration of computer technology in the classroom (School Website).

In her first year, Mary used technology, computers and the Internet, for personal and professional purposes including planning instructions, professional development, and communication. Mary's instructional uses of technology included integrating computer center activities into students' independent work time, during which students use software including Kid Pix, Apple Works, and Time Liner, and use Yahoo!igans to perform Internet searches and play games.

I will discuss the institutional factors affecting Mary's utilization of technology under each institution's title. Since most of the institutional factors originated from her school district and school are related to each other, although they are discussed separately they are interwoven with each other.

M.Ed Program

A. Lack of Adequate Technology Experience

Data analysis revealed that Mary's inadequate technology experience in the M.Ed program resulted in three important barriers to Mary's utilization of technology in the classroom: lack of Macintosh computer experience, lack of grade specific software experience, and lack of connections between the classroom and the e-portfolio assignments at M.Ed.

a. Lack of Macintosh Computer Experience

In her first year teaching, Mary's lack of Macintosh computer experience hindered her use of classroom computers. Mary did not feel comfortable using Macintosh computers in her classroom.

b. Lack of Software Experience

Mary's lack of software experience impeded her utilization of computers and software in her teaching. Mary felt that she lacked a sufficient child-friendly software experience in order to utilize software effectively in her first-year teaching.

c. Lack of Connections between Teaching and E-Portfolio

While discussing her M.Ed. program's approach to technology, Mary addressed that she had a great deal of experience with technology during the program. She also

mentioned that the technology experience she had in her M.Ed program, however, was not connected to her classroom teaching.

B. Inadequate Faculty Support for Technology

Technology support provided by faculty depended on the professor's individual interests. When a professor was interested in utilization of technology in teaching and learning, s/he created opportunities for preservice teachers to use technology in their methods course to introduce to them available technology and software in the subject area. Other than one professor's efforts, Mary's experience with technology in her M.Ed. mostly consisted of "writing papers" and using the Internet for "research."

The School District

A. Lack of Communication for the District Technology Vision and Guidelines

Although the district has a district technology plan and technology, the district's vision and guidelines for technology integration is not shared with new teachers coming to the school district. Since the technology guidelines and district vision for technology are not effectively communicated to Mary, she assumed the school district do not have any guidelines and vision for utilizing technology in the district classrooms.

B. Lack of Professional Development opportunities for available tech resources

As discussed in the M.Ed program section, Mary lacked some necessary technology skills to utilize computers and software in her classroom. However, Mary also was not provided any technology training by her school district to help her utilize computers and software available in her classroom. There were many technology resources in the district and district schools that seemed very interesting and beneficial to Mary, but she did not know how to use them effectively in her classroom.

C. Lack of Proper Technology Support

Although the school district has assigned technology support personnel for the schools, one technology support person is responsible for supporting three different schools in the district. In order to get technology support from the district, Mary had to plan her instruction and activities ahead of time and set up an appointment with the

technology support person during the school hours. Mary thought that it is a "big deal to set up" a support appointment.

The School

A. Inadequate Technology Support

The technology support provided by the school can be discussed under two different titles: technical support for technical problems and instructional (pedagogical) support for instruction. During her first year of teaching, Mary had a difficult time in getting enough technical support to utilize computers and software in her classroom. On the other hand, the school's instructional technology support was very beneficial for Mary when she wanted to utilize technology in her teaching.

B. Limited Equipment in Her Classroom

Mary had only five computers in the classroom. In order to use them in the work centers and equally engage her students in computer activities, she had to plan ahead and create a "computer work center" in which each student would have an opportunity to work on a computer once a week. Another limited resource that Mary frequently addressed was software. On many occasions, Mary had to ask other teachers for available software in the school. She also had to ask for their assistance in solving problems related to improperly working software.

C. Overwhelming Responsibilities

In Mary's first year, there was a large amount of paperwork to be completed, meetings to be attended, and reports to be written that affected Mary's first year experience and brought additional responsibilities for her to undertake. Mary felt overwhelmed with "extra work" and responsibilities given by the school in her first year teaching. She needed to allot more time and support for planning for instruction. However, she was expected to participate and contribute school based meetings as much as other teachers who had been teaching for many years.

D. Lack of Clear Vision for Technology Integration

The school principal was very supportive for teachers who would like to integrate technology in their teaching. Since there was not any expectation from teachers regarding

the use of computers, however, utilization of technology was choice of individual teachers. If a teacher is personally interested in utilizing technology, he or she utilizes available technology in their teaching. Otherwise, teachers are not told about the school's technology vision nor expected to integrate technology in their teaching.

Discussion

In her first year, M.Ed program's five-week technology course and electronic portfolio requirement were inadequate for Mary to utilize available technology in the classroom. Although Mary felt comfortable with her technology skills and she had some experience with technology, she became discouraged when she was given five Macintosh computers for her classroom. Moreover, she was not introduced any grade-specific software for availability in her classroom. When she had software in her classroom, therefore, she did not know how to implement it into her daily teaching activities. The software with which she was taught to design and create her electronic portfolio was not sufficient in her first grade classroom. The technology support provided by the M.Ed program faculty was also inadequate for Mary to experience effective uses of technology in teaching and learning during her program, since her technology experience in her M.Ed. program mostly consisted of typing papers and performing Internet searches.

The school district had great technology resources for achieving its technology vision in the classroom. However, "the big picture" was not shared with the teachers and the utilization of technology in the classroom became an individual endeavor for each teacher. Thus, Mary thought that teachers were not accountable for utilization of technology in the classroom. It appears that the school district assumed that when a first-year teacher is provided with technology resources in the classroom and the school media centers, she or he will utilize them in the classroom. As a first-year teacher Mary mostly had to focus on what she would be doing "the next day." Therefore, planning ahead of time to get district technology support seemed an impossible accomplishment for Mary. In her school, when Mary needed technical support with the computers and software, she had to go through a long process to put in an order for technical help and wait for it. Although she had some technology equipment in her classroom, she could not effectively utilize them due to lack of appropriate technology support when she needed it.

In addition to inadequate technology and technology support in the classroom, Mary, as a first-year teacher, asked to attend various different meetings and presentations that took the time she could use to plan and integrate computer-enhanced activities in the classroom. Although the school principal was very supportive of teachers who would like to integrate technology in their teaching, the utilization of technology was a personal choice of individual teachers. Since it was an individual decision, Mary chose not to focus on the utilization of technology in her first-year teaching.

Conclusion

The purpose of this paper was to present how first-year elementary teachers' technology experiences in their teacher preparation programs and technical and pedagogical support and professional development provided in schools and school districts affect first-year elementary teachers' use of technology in their first years of teaching. The institutional factors had considerable effects upon Mary's utilization of technology in her first year of teaching. Mary's personal factors, including her beliefs about technology integration and how technology integration should be supported, however, also had substantial influence upon her first year teaching and utilization of technology.

Both personal and institutional factors are important in a first-year teacher's technology utilization endeavors in the classroom. To support a first-year teacher in utilizing technology, the first-year teacher needs to have ongoing professional development opportunities addressing the applications and benefits of available technologies in the institutions. To address the needs of first-year teachers in their classrooms, collaboration based on formal partnerships between teacher education programs and schools and school districts for extended professional development after graduation.

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