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AN ANALYSIS OF READINESS OF EDUCATION STUDENTS IN THE USE OF TECHNOLOGY AT MISSISSIPPI STATE UNIVERSITY



Vahid Motamedi^{a*}

^a*Kharazmi (Tarbiat Moallem) University, Mofateh Avenue, Tehran 15614, Iran*

Abstract

The purpose of this study was to analyze the readiness of pre-service teacher education graduates at Mississippi State University (MSU) in the use of technology. The design of this study was a survey approach. Data from the completed survey instruments was coded onto data sheets and was entered into the Statistical Package for the Social Sciences. Description statistics were used initially on the data to answer the research question. Chi-square was selected as a statistical tool because the data for the study was nominal and ordinal. The focus of the study promoted one major question and three sub-questions. The major question was: Are undergraduate teacher education graduates at MSU adequately prepared to teach with technology? The three sub-questions were: (a) which students seem to be the most and the least prepared to use technology in the classroom? (b) what are the differences between students who are prepared and those who are not? and (c) which experiences do the most prepared students have that the others do not? The analyses of the data indicated that students with a higher skill level had been exposed to teachers/instructors who used technology in teaching, whether in student teacher placement, practicum placement, or during the last two years of classes. The analyses of the data showed the courses student teachers took did not seem to make them more proficient in the use of technology. The study showed that there were student teachers who did not have exposure to the use of technology in courses they took. The findings of this study indicated that pre-service teacher education graduates were inadequately prepared in the use of technology.

Keywords: Readiness, Education students, technology teaching

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*Corresponding author.

E-mail address: vmotamedi@tmu.ac.ir

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1. Introduction

One of the long-term objectives of education is to further the student's ability to master ideas and skills, as well as, to form an opinion. Education is concerned with progress. Education increases the productive ability of the work force. Its purpose is to make knowledge widely available, to help students develop competencies and learning skills (Carlson, 1998), and to help them gain new insights and make exciting discoveries (Beane, 1998). Technology programs need to be implemented to bring about a more effective type of teaching in all subjects – a type of teaching that will combine thinking effort with learning effort, and thus develop thinking ability while implanting knowledge (Motamedi, 1994). The use of technology in the classroom can be the answer. According to Bell (2001) preparing technology-proficient education is a critical educational challenge. Ozturk, Demir, and Dokme (2011) pointed out that educational objective of many countries include the integration of computer technologies into educational programs.

However, if successful, integrating the use of technology throughout teacher education programs can do more than develop proficiency in the use of the technology. It can also increase students' perception of the world, strengthen their skills in using information, help them to sharpen their teaching skills, and lessen the isolation and anxiety that are felt during initial teaching experiences (Hunt, 1997). According to Eyyam, Menevis, and Dogruer (2010) "Instruction with technology provides students a learning environment that helps them improve their thinking, decision-making, problem-solving, and reasoning skills" (p. 88). As stated by Oh and French (2004), today's schools are challenged by the increased visibility, roles and cost of computers. They argued that a modern classroom would not be complete without computers, software, internet connections, projectors, and a variety of other high-tech devices.

Even though computers are more frequently used in today's classrooms, teachers still do not feel that they are adequately prepared to use them in their teaching. Saracaloglu, Serin, Serin, and Serin (2010) claimed that majority of the teachers do not use computers and do not benefit from it efficiently. According to Summak, Baglibel, and Samancioglu (2010), integrating technology into teaching and learning is a complicated process which requires readiness and could face a number of challenges. They referred to these challenges as "lack of computers, lack of time, technical difficulties, poor funding, resistance to change, poor administrative support, low levels of computer literacy, technology misaligned with the curriculum, lack of incentives, poor training opportunities, and lack of vision as to how

integrate technology into learning processes and, teacher related difficulties such as negative attitudes, beliefs, and unwillingness towards technology” (p. 2671).

Lack of teacher training is an obstacle to integrating technology into the classroom curriculum. Teachers need training to successfully integrate technology into their classrooms. Hurst (1994) claimed that adequate, individualized, and flexible in-service training programs should be provided for the teacher in order to use technology effectively. Hurst further stated that teachers receive positive in-service training but training sessions are too short and infrequent.

Saracalolu, Serin, Serin, and Serin (2010) argued, “Few teachers can benefit from limited amount of computers on the classroom because of lack of equipment and they feel themselves incapable of using computer” (p. 3495).

Training and efficient use of computers in school settings are very important for the development of students and teachers alike. According to Chin and Hortin (1993), training helps teachers to view computers as a professional tool. Aksan and Enyilmaz (2011) argued that using tools and equipments in education creates an effective teaching and learning atmosphere. Comprehension of new technologies is difficult and often confusing whether teachers are poorly informed or not informed. Chin and Hortin further stated, “Many educators believe existing computers in schools are used poorly, and educational opportunities are lost because teachers do not understand how computers can be used in instructional settings” (p. 317).

Though the number of computers in schools is increasing, the concern for the lack of teacher training remains. This lack of training can lead to insufficient use of computers in schools. Consequently, students are unprepared for the challenge of the technological age

2. Problem Statement

The problem for this study is that, in general, teachers are not teaching with technology. While the literature indicates there may be many reasons for this, the question for this study becomes whether pre-service teacher education graduates are being prepared to teach with technology. More specifically, this investigation attempted to answer the question: Are undergraduate teacher education graduates at Mississippi State University adequately prepared to teach with technology.

3. Research Questions

Whether pre-service teacher education graduates are being prepared to teach with technology.

Question 1

Which students seem to be the most and the least prepared to use technology in the classroom?

Question 2

What are the differences between students who are prepared and those who are not?

Question 3

Which experiences do the most prepared students have that the others do not?

4. Purpose of the Study

The purpose of this study was to analyze the preparation of pre-service teacher education graduates at Mississippi State University in the use of technology. It is important to know whether pre-service teacher education graduates consider themselves prepared to use technology in teaching. The study will provide the basis of understanding pre-service teachers' perceptions about their preparation to use technology in schools. With increased advancement in computer technology, how pre-service teachers feel about their preparation to use computer technology should be of interest and importance to officials in state departments of education and school districts, to school trustees, to staff in faculty of education, and to the general public.

5. Research Methods

5.1. Research design

The design of this study was a survey approach used to explore the preparation in use of technology among pre-service teacher education graduates of spring, 1999 at Mississippi State University. According to Babbie (1995), survey research involves the following: (a) questionnaire construction; (b) sample selection; and (c) data collection, through either interviewing or self-administered questionnaires. Dillman (1978) stated that even with short questionnaires, mail surveys have many problems such as low response rates. Dillman (1978) suggested that the total design method which rewards by giving positive complements; reduces costs by making the task appear brief; and establishes trust by providing a token of appreciation in advance would help to minimize the problems of response quantity and quality. According to Dillman (1978), this process would identify each aspect that may affect the quantity or

quality of the response. Dillman (1978) stated that the implementation of this method is based on the fact that some people respond to the questionnaires and others do not.

5.2. Subjects

The subjects for study were pre-service teacher education graduates (n = 241) from Mississippi State University. These students completed their program and graduated in spring, 1999. All survey recipients voluntarily participated in this study and were assured that their responses were confidential. All of these students have received their Bachelor of Science degree in Education from the College of Education at Mississippi State University. The areas of student program specialization are varied and include agriculture extension education, business technology, elementary education, human sciences education, music, physical education, secondary education – English, secondary education – Foreign languages (French, Spanish), secondary education – mathematics, secondary education – science education (Biology, Chemistry/Physics, General science), secondary education – social studies, secondary education – speech, and special education.

5.3. Instrumentation

A survey was developed to determine whether pre-service teacher education graduates of spring, 1999 at Mississippi State University were adequately prepared to teach with technology. The survey instrument was an 11-page questionnaire composed of three sections. Section A sought information on survey recipients' skill attainment. Section B sought information on survey recipients' level of technology use in their classes. Section C sought background information about survey recipients. Section A consisted of 13 questions; section B consisted of 7 questions; and section C consisted of 18 questions.

Section A presented survey recipients with 13 questions (4 items per question) concerning their current level of skills and competencies with computer technologies. Based on the literature review, the following areas were addressed: (a) basic computer operation; (b) file management; (c) word processing; (d) spreadsheet use; (e) database use; (f) graphics use; (g) Internet use; (h) telecommunication use (e-mail); (i) ethical use understanding; (j) information searching; (k) video production; (l) presentation skills; and (m) technology integration. In this section for each question survey recipients were asked to choose one response from a four-point scale where: 1 = level 1; 2 = level 2 (lowest); 3 = level 3; and 4 = level 4 (highest).

In section B, survey recipients were asked about their supervising teachers' use of computers, their practicum teachers' use of computers, and their instructors' use of computers

during their last two years of college. They were also asked their opinions about how Mississippi State University could have better prepared them in the use of computer technology.

In Section C, survey recipients were asked to describe their previous computer training. Other information requested includes: concentration of study, computer ownership, and estimation of the amount of time they spend using a computer during a typical work week, importance of technology in their career as a teacher, operation of technology related equipment (scanner, printer, digital camera, and computer projection system), knowledge of the use of computers, gender, and age. This instrumentation was designed to determine computer competency, instructional experience, and the background that had shaped pre-service teacher education graduates. It assisted in addressing the level of knowledge pre-service teacher education graduates possessed concerning the use of technology in the field of education.

5.4. Data collection

The researcher requested a list of the names and addresses of pre-service teacher education graduates of spring, 1999 from the Registrar's Office. To collect data for this study, a package of materials consisting of a cover letter explaining the purpose of the study, questionnaires, and a self-addressed stamped envelope were mailed to each survey recipient. The content of the cover letter (except personalized salutations) and questionnaires were the same for all participants. Each letter had a real signature with individual salutations. The questionnaire was mailed to all 241 pre-service teacher education graduates of spring, 1999. The package was mailed upon approval of the survey by the Mississippi State University Institutional Review Board for the Protection of Human Subjects in Research. A deadline of two weeks was established for return of the questionnaire. In order to improve response rates, follow-up procedures were followed. According to Gall et al., (1996), a few days after the time that were set to receive the questionnaire, it is desirable to send a follow-up letter along with another copy of the questionnaire to individuals who have not responded. About 10 days after the initial mailing, a reminder postcard was mailed to non-respondents. A second cover letter and a copy of the survey instrument were delivered to the remaining non-respondents about 10 days after the postcard is mailed. If the response rate was not satisfactory, those who did not respond were contacted by telephone. Out of possible 241 responses, 10 did not receive their survey due to an incorrect address. A total of 68 were returned for a response rate of 30%.

5.5. Data analysis

Data from the completed survey instruments were coded onto data sheets and were entered into the Statistical Package for the Social Sciences, SPSS for Windows 95 (version 8.00). Data were analyzed to answer the research question posed for the study – Are undergraduate teacher education graduates at Mississippi State University adequately prepared to teach with technology? Descriptive statistics were used initially on the data to answer the research question. Further statistical procedures were required to determine why students may or may not be prepared

6. Findings

6.1. Description of the population

The College of Education at Mississippi State University had a total of 241 teacher education graduates in the spring of 1999. Most teacher education graduates were female, Caucasian, specializing in elementary education, and were from Mississippi.

6.2. Background variables

The total number of participants responding to the instrument was 68. The survey showed that 87% of respondents were female and 65% of all the respondents were under 25 years of age. The survey revealed that the majority (60%) of the students were in elementary education. The remaining 40% were approximately evenly distributed in other areas of certification. Most of the students (88%) had transferred credit hours from junior/community College and/or four-year College. Forty-seven percent of the students transferred the equivalent of two years (60 to 75) credit hours. The majority of the students (53%) transferred less than two years credit hours with 33% transferring the equivalent of one semester or less.

There were fewer respondents, who transferred credit hours from a four-year college, but the trend was similar (less than half transferred the equivalent of two years, and the majority was still those who transferred a semester or less). However, most of the students (65%) responded that they took most or all of their computer classes at Mississippi State University. To fulfill their basic computer requirement, virtually half (49%) took TKT 4273 (currently TKT 1273) Microcomputers in Education, 40% took CS 1013 Basic Computer Concepts and Applications, and 11% took BIS 1013 Introduction to Business Computer Systems. Two-thirds of the students indicated that their training in computer technology courses was adequate. Most (63%) stated that they would have been better prepared in a computer literacy course in their discipline. An overwhelming majority (82%) have their own

computer. The majority (71%) did not wish to be required by the College of Education to purchase their own computer. The majority (71%) spend 1 to 10 hours a week using a computer. An overwhelming majority (96%) think computers are important in their careers. Most of the students indicated they were able to operate scanners (71%) and printers (96%), but lacked training/knowledge in the use of digital cameras and computer projection systems.

The majority (82%) of the students felt they were adequately prepared in the use of terminology related to computers and technology. About half (49%) indicated they had the ability to design, deliver, and assess student learning activities that integrate computers /technology for a variety of teaching and learning strategies and for diverse student populations. Only 19% had knowledge of the use of adaptive assistive devices for students with special needs, but 3% of respondents had a Special Education concentration. Most of the students (72%) felt they were moderately prepared in the application of technology to classroom instruction. However, half felt they were prepared to use instructional technology in their classroom.

6.3. Technology Use in the Classroom

In question 1 and 2 most students (63%) indicated that their supervising teachers during their student teaching used computers for word processing (57%). The next highest category was the Internet (38%). In questions 3 and 4, the majority of students (53%) indicated that their teachers in their practicum experience did not use computers. In questions 5 and 6, when asked whether the instructors who taught their classes during their junior and senior years used computers, the overwhelming majority (81%) responded yes. Use was highest for word processing (44%), the Internet (43%), and telecommunications (40%).

In all three cases, teachers/instructors did not often make use of spreadsheets, databases, or graphics although they were more often used by their instructors than by the teachers in schools. Word Processing and the Internet had the most use. Question 7 indicated that half of the students felt they would be better prepared in the use of computer technology if more computer courses were required in Technology and Education. Over one-third of the students felt they would be better prepared if more elective computer courses in Technology and Education were offered.

6.4. Current Level of Skills with Computer Technologies

Students were asked to assess their level of competencies. Level 1 and 2 are considered low and level 3 and 4 are considered high. In question 1 (Basic Computer Operation), more students (37%) indicated they could use the computer to run a few specific, pre-loaded

programs (level 2) than any other level. Some (35%) indicated they could troubleshoot successfully when basic problems with computer or printer occur, and they can run two programs simultaneously and have several windows open at the same time. For this question no one marked level 1 and the most frequent category checked was 2 followed closely by 4. In this question, the average is close to 3. In question 2 (File Management), level 2 was the most frequently category chosen (46%). The average student score is somewhat between levels 2 and 3. In question 3 (Word Processing), the most frequently category chosen was level 3. That means most (65%) indicated they are able to use a word processing program for nearly all written professional work. The mean and median indicate the presence of relatively high level scores. In question 4 (Spreadsheet Use) and question 5 (Database Use), a very few number of students were able to use spreadsheets and databases. Most (47%) and (52%) respectively are at level 2. In question 6 (Graphics Use), the most frequently chosen category was level 2 which means most students (47%) are at level 2. Nearly two-third (65%) is at level 1 or level 2. In question 7 (Internet Use), the mean indicates that half of the students are at level 3. They can use lists of Internet resources and make profitable use of Web search engines to explore educational resources. We can conclude that no one is at level 1. Nearly 8 in 10 students (79%) indicate they are at higher (3 or 4) levels. In question 8 (Telecommunications Use), most students (74%) are at level 2. They can send messages using e-mail. The mean indicates that most students are at levels 1 and 2. Only 21% are at higher (3 or 4) levels. In question 9 (Ethical Use Understanding), slightly less than half (46%) of the students are at level 2. They know that some copyright restrictions apply to computer software. The rest of the students are evenly divided between the other categories. In question 10 (Information Searching), slightly more than half (54%) are at level 2. That means they can conduct simple search with electronic encyclopedia and library software for major topics. Because the mean is slightly above 2 it indicates that more students are above 2 than below 2. Less than one-third (31%) are at higher (3 or 4) levels. In question 11 (Video Production), slightly more than half (56%) of the students are at level 2. That means they can create original video tapes for home or school projects. Only one student is at level 4 which means he or she can use computer programs to edit video tape presentation. The mean indicates that more students are below 2 than above 2. Fewer than one in ten students (7%) are at higher levels. In question 12 (Presentation Skills), half of the students are at level 1. They do not use computer presentation program. Only 25% are at level 2, and the remaining 25% are at levels 3 or 4. In question 13 (Technology Integration), nearly half of the students are at level 2. That means they will be able to understand the district technology plan supports integration of technology into classroom activities. The mean shows that more are above 2 than below 2. However, only one-

third is at levels 3 or 4. When we look at everything that we think students should be able to do, we find that their average – the mean – is 2.43, the median score is 2.27, and the mode – the most frequently occurring score – is only 2. The majority (59%) are at level 1 or 2. What this illustrates is that at Mississippi State University, the College of Education students have some basic skills, but they do not possess higher level skills.

The result shows students are knowledgeable in some areas of technology, but they are not knowledgeable in other areas of technology. They do not have a desired level of proficiency or desired level of preparation.

6.5. Research Questions

6.5.1. Question 1

Which students seem to be the most and the least prepared to use technology in the classroom?

The means of section A (current computer skills) and section B (the use of technology in classrooms) were computed. The means for question B1 (Did your supervising teacher during students teaching use computers?), question B3 (Did the teacher in your practicum experience use computers?), and question B5 (Did the instructors of the last two years of college/university use computers in teaching?) were computed. These means were then compared. It was found that in each case, except one (B1 – Video Production), the students who indicated that their teachers had used technology had a higher personal use of technology.

This demonstrates that if a classroom teacher uses technology, it is more likely that students have a higher use of technology. These students are the most prepared to use the technology in the classroom. The students who are the least prepared are those whose teachers did not use technology in the classroom. Students who have the highest scores in their current level of skills with computer technologies are also the students whose supervising teachers, whose teachers in their practicum experience, and whose instructors of the last two years of their university courses used computers. There is no attempt here to establish a causal relationship, but it certainly indicates there is some relationship: students who use computers are in classes with teachers/instructors who use computers.

6.5.2. Question 2

What are the differences between students who are prepared and those who are not?

A statistical procedure using a cross tabulation was conducted to make a comparison. No matter where the students took their courses, whether at junior/community College or at Mississippi State University, they did not generally indicate a high level use of technology.

Junior/community college or university courses do not benefit the students in the use of technology in teaching. What is important seems to be exposure to teachers/instructors who use technology in teaching, whether in student teacher placement, practicum placement, or during the last two years of college/university. Not everyone was performing well in the use of spreadsheets, databases, graphics, telecommunications, ethics, information searching, video production, presentation skills, and technology integration. Both students at junior/community College and Mississippi State University scored equally poorly. Neither junior/community College nor Mississippi State University prepared students to be able to use technology effectively in teaching.

One might think the institution attended would make a difference in the level of preparation a student has to use technology in the classroom. However, the results of the research indicated that this is not the case. Still, the only difference between the students who are prepared and the students who are not depends upon previous exposure to the use of technology in the classroom.

6.5.3. Question 3

Which experiences do the most prepared students have that the others do not?

A statistical procedure using a cross tabulation was conducted to make a comparison. The results of the survey show that the majority of the students (49%) who took their technology courses at Mississippi State University were taking TKT 4273 (now TKT 1273) (Microcomputers in Education). However, most of the students who took TKT 4273 showed a higher level of performance (level 3 and 4) only on Basic Computer Operation, File Management, Word Processing, and Internet Use. They indicated a lower level of performance (level 1 or 2) on other computer skills. Students taking BIS 1013 (Introduction to Business Computer Systems) and CS 1013 (Basic Computer Concepts and Applications), did as well in these four areas. Although most of the students (66%) were satisfied with their computer technology courses, they did not gain the skills needed for the use of technology in the classroom. There is no appreciable difference between the courses students take at Mississippi State University. Students who took TKT 4273 perform about the same as students who took BIS 1013 or CS 1013. While students are satisfied with TKT 4273, they still indicate that they lack the skills required for an effective use of technology. Students report they are not well prepared to apply technology in teaching. They are not able to use spreadsheets, databases, graphics, Telecommunications, ethics, information searching, video production, presentation skills, and technology integration with competence. This lack of knowledge/training may portray that teaches/instructors do not cover the pertinent information such as spreadsheet or

database. This pertinent information is important for effective use of computer technology. If this is what we value, and if this is what we want our students to know, then the results of the research indicate that students are not learning the required skills for the use of computer technologies or they indicate they cannot use them at high levels. It seems that TKT 4273 is not any better or worse than either BIS 1013 or CS 1013, the other two courses offered. Students who took the TKT 4273 indicated that they have a lower level of skills in such areas as spreadsheets or databases.

One might think that it would be the computer class taken that prepares the students for the use of technology. However, the results of this survey indicate that the use of technology in the classroom is based only on students' previous exposure to the use of technology. Therefore, the most prepared students have the experiences of being exposed to the use of technology in the classroom.

7. Conclusions

This study reveals that the pre-service teacher education graduates at Mississippi State University are not adequately prepared to use technology in classrooms. It is apparent from the data that most pre-service teacher graduates had a low level use of computer technology. The use of technology by teachers/instructors in the regular classroom setting was shown to be ineffective for promoting the use of technology by student teachers. When student teachers were required to use technology, they indicated a higher level of use. The most common overall uses of the computer are word processing, the Internet, and telecommunications. The least common uses include creating databases and spreadsheets, understanding ethical use, searching for information, producing videos, presenting information, and integrating technology.

Classroom situations in which teachers/instructors use technology seem to have a greater impact on the retention and use of technology skills among teacher education students than the actual computer classes. The findings indicated that exposure to a technological environment has a greater effect on the technological competency of students than the technology courses themselves. Students who attended classes where the instructor used technology indicated higher use than those students who attended classes where the instructor did not use technology. The College of Education does not have an understanding or a statement specifically about what it expects student teachers to be able to do using technology.

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