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Experiences in Using Technology: A Comparative Study Between Traditional and Alternative Teacher Certification Students in Business Teacher Education

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A COMPARATIVE STUDY BETWEEN TRADITIONAL AND

ALTERNATIVE TEACHER CERTIFICATION STUDENTS

IN BUSINESS TEACHER EDUCATION

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TEACHER CERTIFICATION STUDENTS IN BUSINESS TEACHER EDUCATION

Abstract

Teacher shortages have been a national challenge in American education and Alternative Certification Teacher Programs have been proved to be part of the feasible solutions. Compared with traditional students in business teacher education programs, alternative business teacher certification students enter the program with more working experience, dedication and more interpersonal skills. To become effective business teachers, however, they must keep up with the latest technological advances and learn how to use and incorporate technology in classroom instruction. The direct experiences with technologies have been found to be related to confidence, positive attitudes and self-efficacy in technology, which all contribute to more infusion of technology in classroom teaching and learning. This study intended to investigate the experiences of the alternative business teacher certification students in their use of technology as compared to traditional business teacher education students.

Introduction

According to the 2003 edition of the Organisation for Economic Co-operation and Development's (OECD) *Education at a Glance*, "teacher shortages may become a policy challenge for many OECD countries in the years to come, as student enrollment levels rise while older teachers retire and not enough younger people join the profession" (Organisation for Economic Co-operation and Development [OECD], 2003). According to the American Council of Education, a projected 2.5 million additional teachers will be needed in the United States, as indicated in the study by Mann, Henderson, and Guffy (2002). While the student enrollment in schools increased from 44.9 million in 1985 to 49.7 million in 1996, American education faced an urgent need for new teachers. In order to produce a competent workforce, knowledgeable and skilled teachers are essential to provide students with a combination of academic and technical skills to be able to survive

and perform in the global workplace as well as to keep current with ongoing

technological changes and the huge amount of information. Teachers in alternative

certification programs also shoulder this responsibility by incorporating technology in

classroom teaching and learning.

Literature Review

The ever-increasing number of student enrollment in higher education reflects the

employers' demand for a qualified, talented and skilled workforce, especially in the field

of business and information technology (Berry, 2002). This requires that business

teachers entering the profession be more prepared and proficient in using technology and

better equipped to work with business and industry. The Policies Commission for

Business and Economic Education (PCBEE), Statement 73 recommends business

teachers take an active role to ensure the importance of technologies both in teaching and

integrating learning activities into the curriculum (Policies Commission for Business and

Economic Education [PCBEE], 2003).

The *No Child Left Behind Act of 2001* (U.S. Department of Education [U.S.

DOE], n.d.) emphasizes the critical aspects of teacher quality and *Preparing Tomorrow's

Teachers to Use Technology* (PT3). The objectives of PT3 are to increase the technology

skills and proficiency of new teachers, to improve classroom instruction, and to

strengthen teacher preparation programs to provide high quality training in the use of

technology for instructional purposes (U.S. DOE, 2001). With the increasing

globalization and technological advances, business educators' role is preparing students

to become employees in the high-performance workforce. The challenge for the teacher

preparation programs is to equip current and future teachers with knowledge and skills in technology. Berry (2002) posed the question of how the teachers in the classrooms would keep up or reach the state of the art with the technical equipment requested for career preparation. The competencies in using technologies are not the equivalents of capabilities in incorporating them in teaching. In 1999, only one-third of teachers felt they were well prepared or very well prepared to use computers and the Internet for classroom instruction (U.S. DOE, 2000). Even fewer (20%) teachers reported they were well-prepared to integrate technology into classroom instruction (Moursund & Bielefeldt, 1999).

Insufficient access to new technologies and inadequate faculty training were believed to be the major causes for ineffective use of technology, and only exposure to technology has a positive, yet limited impact on future classroom practices (Powell & Lord, 1998). Regression analysis in Buhendwa's (1996) study clearly indicated that actual experience with computer technologies was a strong predicator of attitudes and self-efficacy. Smith (2001) also illustrated why mastery experiences as the result of one's own efforts and skills were the most influential source of efficacy as they were based on direct, personal experiences. Thus, the first step to help future teachers to build confidence and achieve self-efficacy in use of technology and become skillful and competent in incorporating technology in classroom teaching is to provide opportunities for direct experiences using technology.

Coyle-Rogers and Rogers (2001) found that alternative certification teachers had higher skills in accomplishing convergent and divergent tasks and had lower concerns in human relations. No studies, however, had been done to investigate the direct experiences

the alternative certified teachers have in their uses of technologies and how these experiences differ from those of the traditional teachers.

Purpose of the Study

The purpose of this study focused on business teacher education students at Southern Illinois University Carbondale (SIUC) and their experiences in using technology. This study also compared and contrasted the similarities and differences between current traditional business teacher education students and alternative business teacher certification students.

The following research questions were proposed for this study:

1. What is the current status of experiences in using technology among business teacher students?

2. What are the similarities of the experiences between current traditional business teacher education students and alternative business teacher certification students?

3. What are the differences of the experiences between current traditional business teacher education students and alternative business teacher certification students?

Methods

The participants in this study were students taking classes in the Department of Workforce Education and Development (WED) at SIUC during the academic year of 2003-2004 in the fall and spring semesters. The study was approved by the Human

Subjects Committee at SIUC. A total of 152 students from intact classes with a mix of traditional business teacher education students (traditional students), alternative business teacher certification students (alternative students), as well as students pursuing non-teacher preparation majors at SIUC participated in this study on a voluntary basis.

The following procedures were taken for the development of the instrument. Based on a comprehensive literature review regarding business teacher education, the role of technology in education, the relationship between computer self-efficacy and experience, and alternative business teacher certification students in use of technology, the researchers focused on students' experiences and competencies of technology use. According to Kemp (2000), "technological competencies include the basic use of computers and related technology such as the Internet, as well as the ability to infuse technology" (p. 10), and teachers should have technology skills "beyond basic word processing and keyboarding" (p. 11). With this rationale, survey questions were developed based on existing instruments with additional demographical information. A total of 52 items using a 5-point Likert scale focused on (1) general categories in technology use with 28 items, adapted from material presented at the National Association for Business Teacher Education Research Conference at Dallas, Texas (Waugh, 2003); (2) the spreadsheet competencies with 13 items, and (3) database competencies with 11 items, based on the article published in National Business Education Association *2002 Yearbook* (Meggison, 2002). Within the 1-5 Likert scale, the respondents were asked to rate their experiences in the fields of general categories in technology use, spreadsheet competencies and database competencies (1 = no experience, 2 = little experience, 3 = fair experience, 4 = substantial experience, and 5 = extensive

experience). Open ended questions were added to generate additional qualitative information.

Data analysis was based on the responses of only those who were in the teacher preparation programs in order to answer the research questions for this study. There were 25 traditional students and 31 alternative students (56 in total) out of the 140 useable results returned from the participants. For the analysis, SPSS Version 10.0 was used for cross tabulation to illustrate the demographics, descriptive statistics for the experiences with means and standard deviations in all three categories. Since the data collected were ordinal by nature, the non-parametric Mann-Whitney test was used for differences between the traditional business teacher education students and alternative business teacher certification students.

Findings

The reliability of the instrument was 0.98 (with a 0.94 for the general categories, 0.99 for the spreadsheet competencies and 0.97 for the database competencies).

Out of a total of 56 students, there was not much difference in numbers of students under 30 years of age between traditional students (17) and alternative students (15), while there were twice as many alternative students as traditional students over the age of 30 (8 versus 16), as shown in Table 1.

Table 1. Age of Participants.

Count

		status		Total
		Traditional teacher education student	Alternative teacher certification student	
age	<20	1		1
	20-24	10	8	18
	25-29	6	7	13
	30-39	3	5	8
	40-49	5	10	15
	>50		1	1
Total		25	31	56

As a common phenomenon, teacher education has been dominated by female students (see Table 2). As for the grade level, shown in Table 3, the majority of both the traditional and the alternative students were in the upper grade level. All the alternative students were graduate students because of the requirements of the alternative business teacher certification program in WED. Alternative business teacher certification students had to have a bachelor degree in business and a minimum of 5 years of working experience in the business fields before enrolling in this program.

Table 2. Gender of Participants.

Count

		status		Total
		Traditional teacher education student	Alternative teacher certification student	
gender	Female	21	22	43
	Male	4	9	13
Total		25	31	56

Table 3. Grade Level of Participants.

Count

		status		
		Traditional teacher education student	Alternative teacher certification student	Total
grade level	Sophomore	1		1
	Junior	2		2
	Senior	10		10
	Graduate	12	31	43
Total		25	31	56

Earlier studies indicated differences of performance on computer and computer-v related activities for variables such as gender, major, college, and prior computer experiences (Buhendwa, 1996). Age is also assumed to make a difference. In order to compare and contrast students based on their status as traditional or alternative students, rather than other variables, correlations of four demographic factors were obtained and results showed neither age nor gender was correlated with status at a significant level. Thus any differences found between the traditional and alternative students were not biased by these moderator variables.

Research Question 1: What is the current status of experiences in using technology among business teacher students? The experiences in using technology among business teacher students are shown in Table 4 below. Most of the items indicated an average or above average competency based upon calculating the statistical means of information reported by the participants.

Table 4. Levels of Technology Experience of Participants.

Range	Categories and Competencies

1-<2	Drafting, CAD, programming languages, teleconferencing system
2-<3	PDA, drawing and paint software, newsgroups, listservs, FTP, online threaded discussion, online chat, online course, e-books, Web page creation/maintenance, course management system, interactive hardware, statistical software
3-<4	Desktop publishing software, clipart, online databases, online quiz or test, computer games, classroom project hardware, presentation software, coping data with absolute/relative cell references, creating formulas for spreadsheet, printing an area of a spreadsheet, changing a cell value, summing a row or column, creating functions for spreadsheets, adding formatting to a cell, creating a chart, changing page orientation, formatting cell values, entering a record into an existing database, printing formatted reports/lists, printing labels, searching for a specific record, copying selected records from one file to another, sorting using multiple relational operators, accessing electronic database, editing an updating queries, using terminology, describing search strategies, exporting files to use with word
4-5	Operating systems, email, WWW, word processing software, entering data into an existing spreadsheet, cutting/pasting/moving cell contents, inserting/deleting a row or column

Note: Table 4 represents technology experience of participants (1 - <2 is no to little experience, 2-<3 little to fair experience, 3-<4 is fair to substantial experience, 4-5 is substantial to extensive experience).

Research Question 2: *What are the similarities of the experiences between current traditional business teacher education students and alternative business teacher certification students?* The researchers examined categories of substantial to extensive experiences and categories of no to little experiences. A mean equal to and above 4 points

was considered to be strong areas and a mean equal to and below 2 weak areas (see Table

5). For the general category, students reported to have substantial and/or extensive

experiences in Operating Systems, Email, WWW, and Word Processing Software, but no

and/or little experiences in Computer Aided Design (CAD), Programming Languages and

Teleconferencing. These findings were consistent with Kemp's (2000) report in that the

competencies of beginning and pre-service teachers in educational preparation were low

in video-conferencing and high in word processing. As for the spreadsheet competencies,

only three items requiring minimum technological skills, such as entering data,

copying/pasting/moving, and inserting/deleting a row or column were reported by both

traditional and alternative students to have been experienced substantially and/or

extensively.

Table 5. Descriptive Statistics of Categories.

	Mean	Std. Deviation
Operating Systems	4.00	1.08
Email	4.50	.79
WWW	4.61	.68
Word Processing Software	4.34	1.00
Entering data into an existing spreadsheet	4.07	1.22
Cutting/pasting/moving cell contents	4.13	1.18
Inserting/deleting a row or a column	4.25	1.10
Drafting, CAD	1.50	.91
Programming Languages	1.57	.93
Teleconferencing System	1.96	1.06

Research Question 3: What are the differences of the experiences between current

traditional business teacher education students and alternative business teacher

certification students? Results of the Mann-Whitney Test showed that nine items in two

categories of experience were statistically significantly different (see Table 6 and Table 7) between the traditional and alternative students. In all nine areas, alternative students reported that they had less experience than traditional students, among which five were in the general categories of technology use, and four in database competencies.

Table 6. Differences in Technology Experiences in General Categories.

Test Statistics[a]

	Online Quiz or Test	E-Books	Web Page Creation/ Maintenance	Course Management System (WebCT, Blackboard)	Classroom Project Hardware
Mann-Whitney U	246.000	255.000	246.500	265.500	241.500
Wilcoxon W	742.000	751.000	742.500	761.500	737.500
Z	-2.399	-2.261	-2.393	-2.096	-2.488
Asymp. Sig. (2-tailed)	.016	.024	.017	.036	.013

a. Grouping Variable: status

Table 7. Differences in Technology Experiences in Database Competencies.

Test Statistics[a]

	Copying selected records from one file to another	Sorting using multiple relational operators	Editing and updating queries	Using appropriate terminology in context
Mann-Whitney U	234.000	265.000	264.500	254.000
Wilcoxon W	730.000	761.000	760.500	750.000
Z	-2.628	-2.074	-2.085	-2.275
Asymp. Sig. (2-tailed)	.009	.038	.037	.023

a. Grouping Variable: status

Fewer experiences were expected with database by both traditional and alternative students. As observed by the researchers, traditional students taking introductory

computer classes generally started with no or little exposure to database software. Alternative students, in particular, might have difficulties with terminologies used because the introductory level computer literacy course was not a prerequisite. Analysis of correlations between the use of terminologies and other items using terminologies were significantly correlated. This might suggest that alternative students, with or without direct experiences in these specific tasks in spreadsheet and database, were not well-equipped with technical terms which they would need to incorporate technologies in course preparation and delivery.

Conclusions and Recommendations

This study found both similarities and differences between the traditional and alternative students in the business education program in WED at SIUC. The substantial and extensive experiences that students reported were all the basic computer skills. Students did not have enough experiences in the emerging and latest technologies, such as course management systems (WebCT, Blackboard), interactive hardware (SMART Board), which had been seen to be used more extensively in the last couple of years. There was a definite need for the business teachers to become aware of the technologies available and be provided access to use them so they would be more prepared in future teaching. Also, with the popularity of distance learning, teleconferencing should be given emphasis in the curriculum, which might be a more practical approach for teachers to engage in lifelong learning for their own professional development. The two areas, i.e., CAD and programming languages might not be as essential as the above-mentioned areas for the majority of the business teachers.

Based on the results of the study, there were significant differences of experiences in several areas between traditional and alternative students in their uses of technology. It was argued that alternative students might not have as much exposure to technologies as their traditional counterparts at schools and thus had fewer direct experiences. Yet, it could be too early to predict that alternative students would be much less prepared to infuse technology in classroom teaching. New teachers reported high levels of comfort with technology and use it more often for preparation, while more experienced teachers reported using technology more often in the classroom when delivering instruction or having students engage in learning activities using technology (Russell, Bebell, O'Dwyer, & O'Connor, 2003). Alterative students, with their working experiences, might have more resources of real world problems to facilitate their students' problem-solving and critical-thinking skills. Wash, Lovedahl, and Paige (2000) indicated in their study that there was no difference in the receptivity to change between traditionally certified technology education teachers and alternatively certified technology education teachers. The barriers to tap this potential are whether alternative students have enough experiences to use technology to build their confidence and self-efficacy in order to apply technologies into classroom teaching. It is not the intention of the researchers to identify which group is better, but to address what specific experiences each group has in use of technology and what is lacking so as to improve the curriculum alignment to better meet their needs and prepare them to be become more effective teachers. As suggested by Zeichner and Schulte (2001), the real issue is to gain "a better understanding of the components of good teacher education regardless of the structure model" (p. 279). The implications of the key findings of this study included the following. The curriculum in

business education should provide more exposure and direct experiences to both the traditional and the alternative students, more opportunities for alternative students for most widely used software applications, and familiarize the alternative students with specific terminologies. One possible solution is to encourage faculty to incorporate technology across the curriculum as role models, so that contexts of how to infuse technology with instructional delivery can be witnessed and evaluated.

Future Directions

More comprehensive items in direct experiences could be included in the survey questionnaire to provide information from learners' sides for future changes in curriculum. The nine domains in LINKS (Learning and Integrating New Knowledge and Skills), for example, provided a good structure: it included setup, maintenance and troubleshooting, social, legal and ethical issues as part of the technology competencies, in addition to basic computer operating skills, word processing, spreadsheets, database, networking, media communication (Gershner, Snider, Huestis, & Foster, 2000).

To investigate the direct experiences students is just the first step. Archambault, Kulikowich, Brown, and Rezendes (2002) illustrated how to develop performance assessments to measure technology competencies of teachers. Future studies can be directed towards hands-on simulation exercises to gauge students' technology competencies in addition to their self-reported experiences, so as to address both the insufficient access to direct experiences as well as the gap between the direct experiences and actual competencies in technologies.

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