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AUTHOR McCoy, Leah P.
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ABSTRACT

This study examined the computer skills of secondary student teachers and cooperating teachers. Participants were 22 student teachers and 24 cooperating teachers from 8 high schools in 1 district. Participants completed the "Teacher Computer Skill Survey," which assessed their computer skills, focusing on: general computer use, creating written documents, organizing information, using graphics, presenting information, and Internet use. The study also involved observation of classes, interviews with participants, and examination of student teacher lesson plans and journals. Results indicate that the student teachers had significantly better computer skills than did cooperating teachers. Student teachers scored higher in all areas except general computer use. They felt confident in their ability to implement computer-based lessons but did not do so very often because they felt constrained by the physical arrangements in the schools and by the lack of encouragement from the cooperating teachers. Cooperating teachers reported frustration at the lack of district inservice programs on computer technology. The results suggest that a quality instructional technology class and a committed supervisor in a teacher education program could have a positive influence on the technology use of both student teachers and cooperating teachers. (SM)

Computer Skills and Instructional Activities of Student Teachers and Cooperating Teachers

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by

Leah P. McCoy
Wake Forest University
mccoy@wfu.edu

Objectives

As computers become more and more prevalent in our society, there is increased need for computer integration into schools. In 1995, the Office of Technology Assessment (OTA), at the request of the U.S. Congress, conducted an extensive study of technology use by K-12 teachers. They found that "a substantial number of teachers report little or no use of computers for instruction" (OTA, 1995, p. 1). They further concluded that teachers lack models of effective integration of computers and that "helping teachers use technology effectively may be the most important step to assuring that current and future investments in technology are realized" (OTA, 1995, p. 2).

The purpose of the current study was to examine the computer skills of secondary student teachers and cooperating teachers.

Perspectives

There seems to be a general weakness in computer skills in both student teachers and cooperating teachers. Recent studies have identified the need for computer inservice training for teachers (Hurst, 1994; Mehlinger, 1996). Similarly, studies of preservice

teachers have recommended a stronger computer technology component in teacher education programs (NCATE, 1997; Northrup & Little, 1996; Willis & Melinger, 1996).

A recent nationwide study (Moursund & Bielefeldt, 1999) examined the issues relating to technology and teacher education. They surveyed 416 teacher education institutions during the 1997-1998 school year. They concluded that one of the major determinants of whether student teachers effectively use technology is their cooperating teacher. The results of their survey showed that only 26-50% of cooperating teachers were able to advise and model instructional technology (p. 17). Another study of 102 cooperating teachers in Arizona in 1997 found that 71% frequently used word processing, and all other technology was used frequently by less than 50% of the teachers (Valmont, 1998).

Moursund and Bielfeldt (1999) recommended that effective technology integration in K-12 schools should be further studied and described so that student teachers and cooperating teachers may model it. NCATE (1997) and OTA (1995) have made similar recommendations. Thus, this study had two objectives, (1) to identify and compare the computer skills of student teachers and cooperating teachers, and (2) to identify and describe their technology teaching practices.

Methods and Data Sources

Subjects. Participants in this study were student teachers and cooperating teachers in the Secondary Education program at a small liberal arts university. All student teachers (n=22) and cooperating teachers (n=24) during Spring, 1999, were included in the study. The student teaching placements were at eight different high

schools, all in the same school district. Content areas included were English, Mathematics, Social Studies, Biology, Chemistry, French, and Spanish.

Instrument. *The Teacher Computer Skill Survey*, a self-report questionnaire, was used to assess the teachers' computer skills. This instrument was a slight modification of a similar survey reported by Coleman (1997). Reliability data were not available. The teacher rated his or her skills on a scale of 1 to 4 in six areas: General Computer Use, Creating Written Documents, Organizing Information, Using Graphics, Presenting Information, and Internet Use. A panel of technology teachers validated these as those areas most relevant for K-12 teachers. The scale included a description of the specific skills, and the choices for each area were (1) unable to do, (2) some skill, (3) considerable skill, and (4) able to use in a lesson. Each of the six areas was examined, as well as the total score (their sum).

Procedure.

The questionnaire was distributed to all student teachers and cooperating teachers at about the midpoint of the 10-week student teaching assignment, with instructions to return anonymously by mail. Return rate was 77% for student teachers (n=17) and 63% (n=15) for cooperating teachers. No follow up was attempted. Area scores and total scores of the two groups were analyzed using a t-test.

The second part of the study involved observations of classes, interviews with both student teachers and cooperating teachers, and examination of student lesson plans and journals. All student teachers were observed at least once, either randomly or by invitation. Interviews of twelve student teachers and nine cooperating teachers were centered on two questions, "How do you feel about using technology in instruction," and

"Describe a lesson you have taught integrating technology." Student teachers' lesson plans and journals were turned in weekly and examined throughout the semester.

Results and Conclusions

The self-reported Computer Skills of the student teachers and cooperating teachers were significantly different ($p < .05$) in total and in all areas except one (General Computer Use). General Computer Use involves being able to run software programs, such as reference CDs. There was no difference in the student teachers and cooperating teachers in this area, which is the most basic on the survey. The student teachers scored higher in the other five areas and in total. See table below.

COMPUTER SKILLS TEST RESULTS

	Stud. Teachers n=17		Coop. Teachers n=15		t	p
	Mean	s.d	Mean	s.d.		
1. General Use	3.47	0.71	2.93	1.10	1.61	.120
2. Written Docs	3.76	0.44	3.20	0.94	2.13	.046
3. Organizing Info	3.41	0.62	2.73	1.03	2.22	.037
4. Graphics	3.35	0.61	2.47	0.99	3.00	.006
5. Presenting	3.47	0.80	1.93	1.03	4.66	.000
6. Internet	3.59	0.71	2.13	0.35	7.45	.000
Total	**21.06**	**3.19**	**15.40**	**4.48**	**4.06**	**.000**

The qualitative results support and further describe the quantitative results. Interviews and journal entries of student teachers indicated that they felt confident in

their computer skill and ability to implement computer-based lessons. While only 10-26% of their lesson plans included technology components, they explained this low usage in two ways. First, they reported that they felt constrained by the physical arrangements in the schools. Students at 6 of the 8 high schools involved mentioned this problem. Computers and network connections were located in a different location, often the media center, and required prior negotiation and arrangements. Many classrooms had one computer without projection capabilities.

The second reason they had few computer-based lessons was lack of encouragement by cooperating teachers. Only two of the twelve student teachers felt that their cooperating teachers wanted them to use technology; others were neutral or actively discouraged technology use. Student teachers felt that they had to convince cooperating teachers of the effectiveness of the technology teaching methods. One student teacher said, "It was not something he wanted me to do. I had to really insist. And then afterward when it worked, he thought it was great." Ten of the twelve interviewed student teachers reported that they were more computer-skilled than their cooperating teacher was.

The cooperating teachers acknowledged their weakness in computer expertise and a few expressed their frustration at the "inadequacy of the district inservice programs." They reported that in the previous semester only 0-5% of their lessons involved technology. This is considerably lower than the 26-50% reported by Moursund & Bielefeldt (1999). However, six of the nine interviewees suggested that they did feel competent to use the computer outside of class, but that they lacked models for instructional technology implementation in classes. This interview data supports the

quantitative results, as the mean cooperating teacher scores were mostly in the 2-3 range which indicates some or considerable skill. Several cooperating teachers expressed appreciation for the computer assistance given to them by the student teachers. One teacher called her student teacher "the best technical resource in our school." Two of the nine interviewed cooperating teachers admitted to a lack of interest in learning and integrating computer skills in their teaching. It appears that they would resist any effort to update their technology-related teaching methods.

The student teachers did teach computer-based lessons in each of the six target areas. These model lesson descriptions are briefly described as follows.

General Computer Use. A biology class used a program that provided visual references for human anatomy. A history class used a world atlas on CD to obtain maps. A geometry class used a program which created on-screen tessellations.

Creating Written Documents. An English class used word processing software to produce a newsletter reporting the actions of the characters in a novel they were reading.

Organizing Information (spreadsheet and database). An algebra class used a spreadsheet to input data and calculate a regression equation. A politics class used a spreadsheet to graph current population data. A chemistry class used a database to organize data about the elements in the periodic table.

Using Graphics. Students in a Spanish class created illustrated dictionaries of Spanish words. A social studies class utilized digital photographs of their grandparents to create a genealogy model.

Presenting Information (usually *PowerPoint*). A model lesson used this tool in a constructivist mode, where the students in a history class worked in groups to identify

"the best U.S. President of the 20th Century." They then prepared a presentation to convince the class that their choice was best.

Internet Use. An English student teacher wrote a Harlem Renaissance webpage, which included text, graphics, sound, and video for students to learn about this period in literature. A social studies student teacher constructed a webpage that included extensive resources relating to the Holocaust. A French student taught a lesson where students used the Internet to shop in Paris on a budget, including conversion of currency.

Educational Importance

This study examined the computer skills of student teachers and cooperating teachers. The results show that these student teachers had significantly better computer skills than their cooperating teachers did, and there was further evidence that they taught lessons that effectively integrated computer technology. Moursund and Bielefeldt (1999) also highlighted the importance of a university supervisor who values technology. The current study provided evidence that a quality instructional technology class and a committed supervisor in a teacher education program can have a positive influence on the technology use of student teachers and cooperating teachers. There is still a need for both student teachers and cooperating teachers to continue to improve their skills in using computers and in integrating computer technology into their classes, as recommended by OTA (1995), and NCATE (1997). This study illustrates the potential of teacher education programs to facilitate teacher learning and the implementation of computer-based instruction in the schools.

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