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Technology Applications in Social Studies Teacher Education: A Survey of Social Studies Methods Faculty.

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Preparing preservice teachers to be proficient in technology is a key issue for the field of education. While many states will scramble to fill as many as two million teaching positions in the next few years, the public expects teachers to be able to integrate technology into their curriculum.

New technologies are disseminated into our nation's schools at a rapid rate. To utilize these technologies effectively, teachers need not only to be proficient in technology but also well versed in the effective integration of technology into their instruction. The key in meeting this expectation is the teacher preparation methods class. In the methods class, students see their teachers modeling the use (or lack of use) of technology, and these students are likely to go on to do likewise in their future teaching (Cooper & Bull, 1997; Handler, 1993).

To this end, the *College and University Faculty Assembly (CUFA) Guidelines for Using Technology in Social Studies Teacher Education* (Mason et al., 2000) offers five principles to guide the integration of technology into teacher education.

- Extend learning beyond what could be done without technology.
- Introduce technology in context.
- Include opportunities for students to study relationships among science, technology, and society.
- Foster the development of the skills, knowledge, and participation as good citizens in a democratic society.
- Contribute to the research and evaluation of social studies and technology .

These guidelines encourage social studies teacher educators to recognize the potential of technology in reconceptualizing the social studies discipline and reforming schools.

The purpose of this study was to determine if social studies teacher educators are using technology to reform teacher education by investigating how social studies teacher

educators are using technology in their methods courses. However, before assessing how technology is being used in social studies teacher education and whether the investments in technology result in significant improvements in education, the frame of reference must be considered.

Bull, Bell, Mason, & Garofalo (2002) developed a structure that serves as the frame of reference when considering how technology is used in education (Table 1). This structure provides distinguishing markers that delineate between the use and purpose of educational technology. According to this framework, technology can be used to improve efficiency, or it can be used to reconceptualize the classroom curriculum with technology in either the foreground or background. The following discussion defines and provides examples for each of the quadrants.

Table 1: Technology in Schools

Use of Technology	Improve Efficiency	Reconceptualize Curriculum
Foreground	Computer Literacy	School Reform
Background	Computer Assisted Instruction (CAI)	Discipline-based Reforms

Using Technology to Increase Efficiency in the Classroom

The term *computer literacy*, coined by Arthur Luehrman in 1971, refers to the study of computer science as a discipline or to technology proficiency (Bull et al., 2002). The goal of computer literacy programs is to improve efficiency by using technology in the forefront. An example of computer literacy is the North Carolina Competencies for Educators. (*Editors' note:* The URL for this website and others are located in the [Resources](#) section at the end of this article.) These competencies call for teachers to be able to conduct basic technology skills, such as the following:

1. Connect a computer to a modem and telephone line for dial-in access.
2. Install and configure telecommunications software.
3. Upload a text file and send as electronic mail.

The objective of *computer-assisted instruction* is to improve efficiency; however, technology is either integrated into the curriculum or functions in the background. Tutorials, simulations, and drill-and-practice software are all examples of computer-assisted instruction. Owl and Mouse Educational Software's U.S. Map Puzzle is an example of a social studies tutorial that assists students in learning the U.S. states and capitals.

The use of technology in teacher education to improve efficiency is best understood by categorizing the use of technology on the basis of the primary user or controller of technology (see Figure 1).

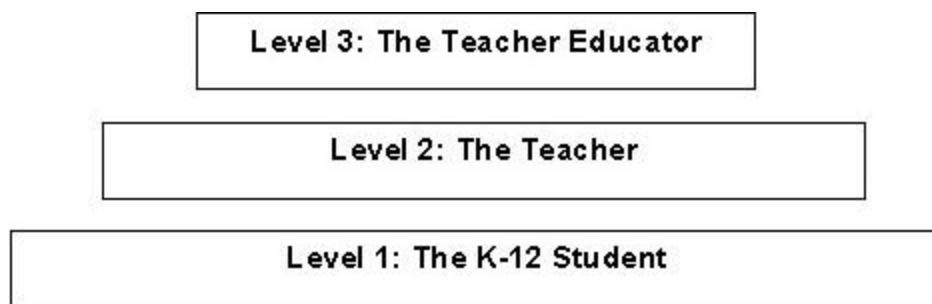


Figure 1. Levels of technology users

Teacher educators (Level 3), as the primary users of technology, might use technology to help preservice teachers analyze teaching and learning, present information, or demonstrate model lessons. The *preservice teacher* (Level 2), as primary user, might use productivity tools for word processing, grade and record keeping, web page production, and presentations, as well as using subject-specific software and websites to create presentations, lectures, lessons, and assessments. Finally, teacher education programs prepare preservice teachers to facilitate use of technology by their future K-12 students (Level 1) to investigate concepts and solve problems.

This framework of technology use in social studies methods courses helps delineate where the focus of use lies. The framework does not necessarily imply a hierarchy, but rather helps educators ascertain where agency exists. It is helpful, therefore, in understanding where social studies faculty members focus their technology use.

Using Technology to Reconceptualize the Curriculum

Technology applications that fall under the category of *School reform* seek to restructure schools through inquiry-based learning driven by technology. Hence, technology is at the forefront. The Learning in Hand: Handhelds in the Classroom website describes an example of technology-driven school reform. This fifth-grade classroom uses handheld computers to reform teaching and learning across the curriculum.

In the category *discipline-based reforms*, technology is used to reconceptualize the academic discipline. A digital resource center such as the University of North Carolina at Chapel Hill's Documenting the American South is one example of scholars and researchers using technology to rethink the nature of their discipline, which can then be translated to K-12 education.

The CUFA Guidelines (Mason et al., 2000) asserted that technology should be used both in the background and the foreground to promote discipline-based and school-based reform. However, more knowledge is needed about how technology is used in social studies teacher education practice.

Technology and Social Studies Education

There has been a precarious relationship between the social studies and technology. While some educators have been fascinated by the potential of technology to enhance teaching and learning, many schools have lagged behind in assimilating technology into instruction (Berson, 1996). Shaver (1999) expressed doubt that technology will ever incite instructional reform in the social

studies, and Pahl (1996) noted that social studies educators have been apprehensive about modifying instruction to incorporate technology. This lingering apprehension has led some researchers to conclude that the social studies has not appreciably changed as a result of technology (Martorella, 1997; White, 1997).

Instructional decision making in the social studies has been based on a limited knowledge base, and as a result, computer use among students in social studies education has often relied on basic applications of technology as a tool for word processing or accessing factual information. Yet, there is the potential for technology to be fostered as a tool that overcomes the traditional isolation of the classroom setting (Braun, 1997), provides access to expansive resources (Becker, 1999), and improves overall productivity (Saye, 1998).

To achieve the desired gains with technology, social studies methods courses must not focus only on making preservice teachers proficient at using technology, but must promote strategies to integrate technology to enhance teaching and learning (Cantu, 2000). Technology rich instruction models effective use, explores the barriers and benefits of technology integration (Keiper, Harwood, & Larson, 2000), and thereby surmounts the traditional absence of technology in methods courses (Rose & Winterfeldt, 1998).

Efforts to assist universities in modeling effective technology use include the creation of the CUFA Guidelines for integrating technology into teacher preparation programs (Mason et al., 2000). The CUFA Guidelines are organized by five principles, which enhance the infusion of technology into preservice education and support the continued focus on research and evaluation of social studies and technology.

Rationale for This Study

Little empirical data is available about the extent of preparation of social studies teachers to use technology. Most conclusions about social studies teachers' technology training must be inferred from the general literature about preservice and in-service preparation (Ehman & Glenn, 1991). There has been no systematic research investigating social studies methods faculty use of technology integration. We need to know more about the use of technology in social studies methods courses.

Research Design

This study used a longitudinal survey design with both cohort and panel components. CUFA members are being surveyed annually using the same instrument in order to establish baseline information and then obtain time series information across a 5-year period. The results highlighted in this paper focus on the baseline survey, which describes the technology practices of social studies faculty members in the methods classroom, as well as establishing agency in technology use. The annual follow-up will indicate if and how these practices are changing.

Objectives of the Research

In order to understand the relationship between technology innovation and social studies teacher education, this article presents baseline information on social studies faculty use of technology in instruction. This survey research addresses the following questions:

1. What is known about the use of technology in social studies faculty members' methods courses?

2. To what extent do social studies faculty members currently integrate technology into their instruction, especially in methods courses?
3. How is the use of technology aimed at different levels of teacher preparation (teacher educator, preservice teacher, and K-12 student)?
4. How does social studies faculty usage of technology change over time? What influences these changes?

The survey results have implications for future policy regarding technology training of faculty and the development of strategic plans aimed at encouraging technology-based innovation in teacher education programs.

METHOD

The survey (see [Appendix](#)) was sent to the membership of CUFA, and the response rate was 59%. Participants completed 101 items, including Likert scales, short-answer items, and open-ended questions. The survey was divided into four parts, with the first component focusing on demographics (17 items), the second addressing the use of technology in social studies methods courses, the third assessing personal use of technology and confidence in technology, and the fourth examining organizational support and barriers to technology integration and further information on the organizations of the respondents.

Procedure

The survey was mailed to CUFA members in March 1999. Respondents anonymously filled out a Scantron bubble sheet for most of the survey, with the data uploaded in a statistical software program. Open-ended answers were then typed into this program.

Data Analysis

Data from Likert scales and short-item responses were analyzed using descriptive statistics. A content analysis was conducted on open-ended questions. A factor analysis (using orthogonal rotation) was used to elicit components across items describing use of technology and confidence. This analysis revealed a single component that described confidence with using technology, producing a scale of confidence for each participant. The confidence and use scales were used to perform correlation and regression analyses against other variables.

RESULTS

How Is Technology Used in SS Methods Courses?

Regular use of technology is infrequent among most social studies faculty members. A little more than 2 in 5 (42%) respondents to the CUFA survey claimed to use computers occasionally in instruction, whereas only 1 in 5 (19.8%) used computers throughout the semester, and only 1 in 17 (6.2%) used computers every class session. This is consistent with Clark's (1992) and Parker's (1997) findings. Social studies faculty members, as a whole, use technology occasionally in instruction.

Based on our data analysis, the use of technology in social studies is appropriately thought to consist of two factors: digital communications and instructional technologies. A factor analysis of all the items on the survey (using Varimax rotation) revealed the following:

1. Communication via newsgroups, accessing information and lesson plans on the web, use of email, and the use of word processors, are strongly related and load strongly on one factor. We call this factor "digital communications" (this factor explains some 5% of the total variance in the sample).
2. Preparation using presentation and social studies software, use of display systems, use of spreadsheets and databases, multimedia presentations, and videoconferencing, among others, all load together to describe what we call "instructional technologies" (this factor explains some 12% of the total variance).

Use is, therefore, not a singular concept, but consists of two factors, digital communications and instructional technologies.

Digital communications are used in social studies methods courses far more often than are instructional technologies. For example, word processors were used "often" by 68.9% of the sample, and faculty often used e-mail (54.3% of the sample) to communicate with others. Conversely, instructional technologies were seldom used. Videoconferencing was used often by 3.7%, spreadsheets and databases by 5.6%, and multimedia presentations by just 2.9%. Table 2 shows which technologies are used in social studies methods courses, and how often they are used.

Table 2: Use of Various Technologies by the Course Instructor (in Percent)

	Frequency of Use		
	Often ^a	Average ^b	Seldom ^c
Digital communications:			
Preparing word processed lesson plans	68.5	8.6	21.0
Email	54.3	16.7	26.6
Accessing information from the Web	41.3	21.0	35.8
Accessing lesson plans from the Web	19.1	19.1	59.9
Instructional technologies:			
Multi-media presentations	17.9	13.6	66.6
News groups	16.7	12.3	68.5
Lesson plans using SS software	14.2	11.1	73.5
Display system	13.6	7.4	76.5
Creating web-pages	8.6	9.3	80.0
Accessing information from CD-ROM	8.0	12.3	77.8
Lesson plans using spreadsheets/ databases	5.6	8.0	58.6
Lesson plans using digital camera and scanner	5.6	8.0	84.6
Videoconferencing	3.7	4.9	88.9
Developing individual or group presentations	2.9	22.2	53.1

Note: Examples of each technology are hyperlinked from the text.

^aRepresents a summation of "throughout the semester, but not every class session" and "nearly every class session."

^bRepresents "intensively."

^cRepresents a summation of "rarely" and "occasionally."

There has been a shift in the pattern of use over time, especially in the last 4 years. We have made a comparison of the percentages of those faculty members who used technology often (for most or

all of their classes) from Parker (1997) and these results in 2000 illustrate a great increase in use of Internet and email. Table 3 contrasts Parker's (1997) findings with ours.

Table 3: Comparison Between Frequent uses of Technologies (Parker, 1997) and This Study

	Parker (1997)	Current Study (2000)
Word Processing	87%	68.5%
On-line searches	61%	41.3%
Spreadsheets	39%	5.6%
Databases	19%	5.6%
Internet or email	19%	54.3%

It should be noted that these two studies might not be reporting exactly the same thing (questions were worded differently, for example, and should not be directly compared), but the results are illustrative, at least, of a major shift toward the use of the Internet or email in instruction.

In fact, almost all use of technology in social studies methods instruction is accounted for by word processors, email, and the Internet. Besides the rise in use of email and the Internet, use is not much different from that reported by Wetzel (in Parker, 1997) 8 years ago. Parker (1997) put it this way: "Although many use computers for word processing, much smaller percentages indicate required usage of technology by students or the development of technological applications for their courses." The next section looks at how faculty members use technology. Do they get their students to use it, do they use it themselves, and is it getting through to K-12 students?

The Levels of Technology in Teacher Education

Technology use is not equivalent at the three levels of use described earlier. We analyzed responses according to the three levels, such that responses that were involved in each level were summed and averaged. Table 4 shows the averages from this analysis. The possible range of responses went from 1 (*rarely*) to 5 (*nearly every class session*). Higher means, therefore, represent more frequent use.

Table 4: Results of Level Analysis

	Mean	N	Minimum	Maximum	SD
Level 3	2.41	158	1.00	4.57	.75161
Level 2	1.78	141	.76	3.10	.49336
Level 1	1.80	147	1.00	4.25	.71591

Table 4 indicates that teacher educators use technology more frequently at Level 3 than levels 2 or 1. So, for example, *faculty* members use technology in their classes, or in preparation for their classes rather than getting their *students* to use technology in those classes. The mean of 2.41 for Level 3 still represents "occasional" use, so although use at Level 3 is more frequent, it is, nevertheless, relatively low. The means of 1.78 and 1.8 for Level 2 and Level 1, respectively, represent a combination of "rare" and "occasional" use. Technology is used infrequently overall, but relatively more often for Level 3 than for levels 1 and 2.

One caveat regarding the data: In all cases, faculty members reported this data. Their responses to how often teachers and students used technology comes from their frame of reference (Level 3). In effect, Level 3 players reported on the use of technology at their own level and down through the other two levels. There were no significant findings when we looked at how use at the three levels related to experience as a teacher or whether faculty taught elementary, middle, or secondary methods courses. The courses faculty members taught or the teaching experience they had did not seem to make a difference. Technology integration is focused at the level of the teacher educator. Teacher educators are not yet using technology in their courses in such a way that their students are integrating it and experiencing it in class.

Part of they are not yet using technology can be explained by looking at the different philosophies faculty members hold with regard to teaching with technology. Faculty members were asked whether their primary teaching role related to technology was (a) providing students with technology-integrated instruction, (b) providing students with technology skills, or (c) neither.

When it comes to philosophy of education, a higher percentage (36.4%) of faculty focused on providing students with technology skills rather than with technology-integrated instruction (30.2%). Almost as many faculty members (28%) felt that neither of these categories reflected their philosophy. Most participants thought providing students with technology-related instruction was the more important philosophy. Slightly fewer thought providing students with integrated instruction was important. Slightly fewer are unsure, or unwilling to commit to a particular philosophy.

DISCUSSION AND SUMMARY

It is apparent that faculty members are not convinced that technology use to reconceptualize the curriculum is better. They use technology far more often at Level 3, the teacher educator level, than at the student level. Perhaps this is simply a sign of the times that will change as the education climate evolves and new technologies emerge. Or perhaps teacher educator faculty members will become more comfortable with the integration of technology into their teaching and will naturally seek to use it to reform their teaching. Perhaps the students, both K-12 and methods students, will begin to expect and demand applications of educational technologies in their coursework. Perhaps emerging technologies will become so entrenched in our society that teacher educators will find it impossible to teach without technology.

Each of these conjectures is a possibility. We believe that the future holds not one of these outcomes, but a combination of them. We believe that as faculty members become more comfortable with using technology, they will naturally begin to integrate it in their instruction. We believe that students at all levels will begin expecting that technology be used for instruction and will encourage their teachers to use it. We also believe that as new technologies emerge and develop, they will become more entrenched in everyday teaching and learning.

We suggest that to promote the use of technology in social studies methods courses, a more frank and open discussion about integration be held. Practical examples of what integration looks like at the three levels of technology use in teacher education must be provided for teacher educators and research must be conducted to inform the implementation of technology in teacher education.

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Resources

Documenting the American South - <http://docsouth.unc.edu>

Learning in Hand: Handhelds in the Classroom - <http://www.mpsomaha.org/willow/p5/handhelds/index.html>

North Carolina Competencies for Educators - <http://www.dpi.state.nc.us/tap/techcomp.htm>

U.S. Map Puzzle - http://www.yourchildlearns.com/puzzle_us.htm

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