

COMPUTER USAGE IN FAMILY AND CONSUMER SCIENCES CLASSROOMS

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This study examined New Mexico Family and Consumer Sciences (FCS) teachers' use of computers in their classrooms. A survey instrument was developed and mailed to all New Mexico FCS teachers. Data analyses included descriptive measures, correlation coefficients, and nonparametric procedures. The majority of respondents had one computer in their classrooms. Few had classroom Internet access. Teachers did not regularly incorporate computers into their curricula. The majority used home computers regularly. Most teachers used computers professionally outside of class. The principle barriers to classroom usage were the lack of software and hardware. The teachers desired more computer training. Frequency of teachers' classroom computer usage was significantly related to hours of training, availability of classroom computers, and level of education. Implications for Family and Consumer Sciences educators included the importance of incorporating computer training in college methods courses and the necessity of cultivating alternative means for the acquisition of computer technology.

Since the advent of the personal computer, the United States has been in the midst of a computer revolution. In 1964, computers were considered a curiosity and only large companies could afford them (Juliussen & Petska-Juliussen, 1994). Schofield (1995) noted that recent changes in computer technology have been dramatic in both their magnitude and speed. Lepper (1985) drew a parallel between the computer and the automobile to illustrate this rapid development. He stated:

Had improvements in efficiency and reductions in the cost of automobiles followed patterns similar to the computer industry, each of us would be able to buy a Rolls-Royce today for roughly \$2.75; it would get nearly 3,000,000 miles to the gallon and deliver enough power to tow an aircraft carrier. Many in the computer industry predict that the computer is, at most, at the half-way point in its impact on our world (Juliussen & Petska-Juliussen, 1994). It is expected that the use of computers will continue to grow and expand in businesses, homes, and schools.

United States Department of Education personnel have established a goal of having one computer for every five students in American schools (Henry, 1997). Currently, the average ratio is one computer for every seven students. Ten years ago, there was only one computer for every 25 students (Henry, 1997). The current federal administration has also made computer integration into classrooms a main focus. Specifically, President Clinton has made a pledge to place every student on the 'information highway' (Barr, 1997).

Similarly, since 1994, New Mexico education technology policy has mandated computer competency for all students. In February 1997, the New Mexico State Department of Education

received a Technology Literacy Challenge Fund grant to equip classrooms with computers, link schools to the Internet, and train teachers in new information technologies (Barr, 1997).

Several surveys were done to ascertain the amounts and types of technology available in schools (Global Strategy Group, Inc., 1997; Quality Education Data, 1997a, 1997b; U.S. Department of Education, 1996; Office of Technology Assessment, 1995). However, little data have been gathered directly from teachers regarding how they implement computer technology and what degree of computer access is afforded individual classrooms. To get a more complete picture of what is done in the classroom, it is essential to poll teachers collectively and determine what is required to stimulate further utilization of this technology in the schools (Office of Technology Assessment, 1995). Though research has found that Family and Consumer Sciences teachers have positive attitudes towards the use of computers (Martin & Lundstrom, 1988; Mehlhoff, 1985; Pickard, 1983), research is lacking on ways they are incorporated into the classroom.

Purposes of the Study

Important goals of Family and Consumer Sciences (FCS) teachers are to prepare students for enriched home and family lives and to raise their ultimate earning power by preparing them to enter the work force. Computers play ever increasing and important roles in these arenas. In order to assist New Mexico FCS teachers in fulfilling classroom goals related to technology, it was necessary to obtain information about computer usage. The purposes of the study were to assess computer technology available in New Mexico FCS classrooms, the level of FCS teacher training in classroom computer usage, ways computers are currently incorporated into classrooms, perceived barriers to increased computer usage, and ways teachers utilize computers for their own professional use.

Literature Review

In a report, *Teachers & Technology: Making the Connection*, personnel in the Office of Technology Assessment (1995) stated, "Technology is a fact of American life" (p. 3). Microcomputer chips and boards are now found in all types of equipment ranging from microwave ovens, TVs, stereo systems, automobiles, cash registers, telephones, and toys, to military weapon systems (Juliussen & Petska-Juliussen, 1994). Technology exerts an influence on how we live, work, and play. This influence will continue to expand.

In 1997, it was estimated that 40 million adult Americans browsed the Internet with some regularity, about twice the number as one year earlier. By the end of 1997, that number had grown to more than 100 million users world-wide, including 62 million Americans. More than half (61%) of Americans access the Internet at least two or three times a week. ("Internet Traffic Growing Rapidly", 1998; "Twenty-three Percent of Americans", 1998).

Computer Usage in Homes

One manifestation of the technology explosion in the United States is the increased number of computers found in homes. Goodnow (1998) found that in 1998, 40% of all American households had computers. It is expected that by the time today's students become adults, they will use computers regularly to communicate with friends, relatives, and business associates. In the future, many people will use computers to plan vacations, shop for goods and services, balance their checkbooks, and even vote (Furger, 1998).

Bennett (1996) found students' experiences away from school are generally technology based; computers are an integral part of their lives. Playing with computer games can be beneficial since they help students develop an array of learning skills such as focusing, concentration, and problem-solving (Brzowsky, 1998). Additionally, chatting, sending e-mail, and posting messages on electronic bulletin boards can help students improve valuable communication skills and articulate their opinions on many issues (Furger, 1998).

Computer Usage in the Work Place

Computers change the way people work. It was projected that by the year 2000, 60% of all jobs would require high tech computer skills-the 'new basics' (Riley, 1998). Bennett (1996) has noted that the private sector demands a technologically-literate, skilled work force. He has stated the educational system in the United States is failing to prepare "... graduates capable of succeeding in our rapidly changing, high-tech, information-oriented society" (Bennett, 1996, p.1). Goodnow (1998) has noted that having facility with computers is now a life skill.

Youngsters who are denied the opportunity to use technology will be limited in the future job market (Walker, 1997). As future workers in American society, today's students will require familiarity with computers and the Internet.

Computer Usage in Schools

Education has been changed by the introduction of computers into the classroom. Mehlhoff (1985) contended that computer literacy is as necessary as reading, writing, and mathematics. Roblyer, Castine, and King (1993) noted that children in our society will never know schools without computers.

Roblyer et al. (1993) found that computer usage has a positive impact on both the student's attitude toward school and his/her learning. Schofield (1995) found many positive changes when computers were introduced into the classroom. One was heightened interest and involvement of the students. Others included a shift in the role of the teacher from lecturer to coach or guide in the classroom.

Starr (1996) found student outcomes in language arts, math, social studies, and science were enhanced by using technology. Computers tend to better link students and teachers with information and resources. Computers allow students to combine resources and work in novel ways. Unger (1996) stated, "Perhaps the most important teaching tool ever developed, the computer is a multimedia instructional device with the potential of bringing the entire body of world knowledge into the classroom ... at the touch of a button" ... (p. 246). As well as supplying vast quantities of knowledge, computers have the potential to mentally transport students to any time or place in history (Unger, 1996). Technology can extend and enliven education (Starr, 1996). Education Secretary Riley (1998) stated computers offer the opportunity of a lifetime. Students living in a rural areas can experience the greatest museums and libraries around the world. A recent study by Global Strategy Group, Inc. (1997) found nearly 70% of the teachers and superintendents surveyed agreed that computers contribute to improving students' skills, especially in vocational and language arts programs.

One recent report from business and education leaders (Viadero, 1997) noted only 3% of U.S. schools are effectively integrating technology. The National Center for Education Statistics found only one out of five teachers uses a computer regularly for teaching (Henry, 1997).

Barriers to Computer Usage in Schools

Many barriers exist which reduce the effective usage of computers in the classroom, including costs, resistance to non-traditional methods and concepts of conducting school business, reluctance by administrators to allow teachers more control over their professional environment, and the fear that teachers will 'misuse' technologies (Office of Technology Assessment, 1995). Schofield (1995) found teachers often avoided computers because of inertia, anxiety about technology, or the belief that computers have little or nothing to offer to the current curriculum. Other constraints teachers face include the lack of tools, the virtual absence of computer and software training, and existing time demands on teachers (Office of Technology Assessment, 1995).

Computers are of little value if teachers cannot use them effectively (Riley, 1998). Charp (1998) cited lack of time to practice as the greatest barrier to effectively using the Internet as a teaching tool. Teachers need time to attend training and workshops, experiment with equipment, explore software, and plan lessons using computer technologies.

Research Design

Overview

This study examined the computer usage of New Mexico FCS teachers. The data collected included numbers and types of computers in FCS classrooms, utilization of computers at home, and frequency of Internet access in classrooms and at home. The respondents were asked how often, in what ways, and in which content areas computers were utilized. The survey examined the types of computer applications currently used and determined computer programming and software desires of the teachers. Respondents were also asked how computers were used professionally outside of class time. Both prior and desired computer training were examined. Barriers the teachers perceived as limiting the use of computers were also identified.

The relationships between the amount of classroom computer usage and teachers' ages, prior hours of computer training, and years of teaching FCS were examined. Differences in the percentage of time teachers used computers in their classrooms were examined when teachers were classified based on highest college degree earned, urban or rural location of the school, and access to a computer and the Internet both at home and in the classroom.

Sample

The population targeted in this study included all of the 267 New Mexico secondary FCS teachers who taught in grades 6 through 12 in the public schools in 1998.

Instrumentation

A survey instrument titled "Survey of New Mexico Family and Consumer Sciences Teachers' Use of Computers in the Classroom" was developed by the researchers. The questionnaire contained closed and opened-ended questions regarding computer issues and demographics.

Content validity of the survey instrument was determined using a panel of ten experts, including authorities in computer usage, educational methodology and curriculum, and adolescence. A pilot test of the instrument was conducted using 12 FCS teachers from the El Paso School District in Texas.

The pilot test respondents were asked to complete the instrument, make comments that would improve the questions, and indicate how long it took to complete the questionnaire. In

order to determine the reliability of the questionnaire, another survey was mailed in two weeks to the pilot test teachers. After getting the test-retest results, reliability of the questionnaire was determined in consultation with a statistician by a visual comparison of the responses of the teachers on the first survey with their responses on the second survey. Based on this assessment, one question was reformatted.

Data Collection

The “Survey of New Mexico Family and Consumer Sciences Teachers’ Use of Computers in the Classroom” was mailed in April 1998 to 267 New Mexico FCS teachers at their school addresses. The first mailing included a cover letter, the survey instrument, and a postage-paid return envelope. After 11 days, postcard reminders were mailed to all non-respondents. One week later, a second survey instrument, along with another cover letter and postage-paid return envelope, were mailed out to each non-respondent.

A total of 196 surveys were completed and returned, for a 73% response rate. To control for non-response error, three of the non-respondents were selected and contacted by telephone. The responses of these three teachers, which were similar to the other respondents, were added to the 196 respondents leading to a final respondent pool of 199 or a 75% response rate.

Analysis of Data

Descriptive statistical measures such as frequencies and percentages were calculated in addition to Spearman’s rank correlation coefficient and Wilcoxon Scores (rank sums).

Findings of the Study

Almost three fourths (74%) of the teachers had at least one computer in their classrooms. The majority were older computers lacking the capacity to run current CD-ROM programs or connect to the Internet. More than three fourths (78%) of the teachers had computers at home. A vast majority (87%) of the teachers having computers at home used them at least once a week. Slightly more than half (56%) of the teachers reported having access to the Internet at home, and three fourths (79%) of them accessed the Internet at least weekly.

Less than one fourth (22%) of the teachers reported having Internet access in their classrooms; however, many indicated access was available at other locations in the school. Just over one fourth (27%) reported using the Internet as part of their classroom teaching at least monthly. Almost half (49%) of the teachers reported they never used the Internet in teaching. Lacking an Internet connection was cited as the prime reason for not using it. Teachers reported sending students to other school locations in order to use Internet resources or assigning projects for them to do at home.

The vast majority of the teachers (71%) used computers in their classroom teaching less than 13% of the time. Another 13% of the teachers used computers from 13-25% of the time in classes.

Data in Table 1 indicate that assigning word processed papers was the most frequent classroom usage of computers. Other frequently noted classroom uses were utilizing Internet resources (33%), conducting research (28%), and facilitating Family, Career, and Community Leaders of America (FCCLA) activities (22%).

Table 1

Ways Computers are Used in Family and Consumer Sciences Classrooms

Way used	N	%
Assigning work processed papers	82	41.2
Internet resources	65	32.7
Assigning research on the computer	56	28.1
Students preparing FHA/HERO materials	43	21.6
Educational games	34	17.1
Students preparing lesson materials	33	16.6
Assigning computer-generated presentations	31	15.6
Simulaton activities	30	15.1
Individualized learning packets/activities	30	15.1
Other	24	12.2
Demonstration	18	9.0
Drill and Practice	17	8.5

The most frequent FCS content areas in which teachers reported using computers are presented in Table 2. Foods and nutrition and child care and development topped the list.

Table 2

Content Areas in Which Family and Consumer Sciences Teachers Most Frequently Use Computers in Their Classrooms

Content Areas	N	%
Food and nutrition	73	57.0
Child care and development	40	31.3
Careers	16	12.5
Fashion/clothing, sewing and textiles	11	8.6
Life skills/independent living	11	8.6
Consumer economics/education	10	7.8

Word processing programs were the most common types of programs mentioned (75%) as being used. Graphics programs (14%) and Internet search tools (8%) were also used in FCS classrooms. Many teachers were unaware of the programs available for FCS. The most frequent requests for types of software were for programs on nutrition (39%), child care and development (20%), and diet analysis (18%).

An overwhelming majority of the teachers (96%) used computers for professional activities outside of class time. As noted in Table 3, the types of activities for which the teachers used computers most were preparing tests (84%), preparing assignments or lesson materials (78%), preparing curriculum (73%), and grade keeping (64%).

Table 3

Family and Consumer Sciences Teachers Professional Use of Computers Outside of Class Time

Ways Computers are Used	N	%
Preparing tests	167	83.9
Preparing student assignments/lesson materials	155	77.9
Preparing curriculum (units and lesson plans)	145	72.9
Grade keeping	127	63.8
Preparing classroom presentations	108	54.3
Research on a specific subject matter	92	46.2
Professional development	89	44.7
Preparing newsletters	75	37.7
Grant proposal writing	54	27.1
Other	29	14.6
Do not use at all	8	4.0

While some teachers had received extensive computer training, many had experienced little or no training during the past five years. Half of the teachers (54%) reported having received ten hours or less of training in that period of time. Many indicated they would like additional training in the use of computers, especially in the classroom setting. Almost three fourths of the respondents (73%) requested training to enhance their teaching of FCS.

Every respondent identified at least one barrier that limited her use of computers. As noted in Table 4, the predominant barrier respondents noted was a lack of software to use in teaching (75%). Other barriers were a lack of hardware (64%) and a lack of time (55%). They specifically mentioned needing time allocated to learn to use both the hardware and software as well as to prepare lesson plans to allow for student computer usage.

Table 4

Barriers Family and Consumer Sciences Teachers Perceive as Limiting Their Use of Computers in their Classrooms

Barriers that Limit Computer Usage	N	%
Lack of software	150	75.4
Lack of hardware	128	64.3
Lack of time	110	55.3
Lack of training in specific software	94	47.2
Lack of training in specific hardware	80	40.2
Lack of information on content of programs	76	38.2
Other	46	23.1
Lack of administrative support	40	20.1
Fear of using computers	15	7.5
No desire to utilize computers	6	3.0

There were no significant relationships between the frequency with which New Mexico FCS teachers incorporated computers into their classroom teaching and their age or years of

teaching. There was a significant relationship, however, between the frequency with which New Mexico FCS teachers incorporated computers into their classroom teaching and the number of hours of computer training they had received in the past five years. The more hours of training a teacher had received, the more likely she was to use the computer in her teaching.

No significant differences were found in the frequency with which computers were incorporated into New Mexico FCS classroom teaching when teachers were classified by rural versus urban school locations, access to a computer and/or the Internet at home, and access to the Internet in the classroom.

Significant differences were found in the frequency of computer usage when teachers were classified by highest college degree earned and access to a computer in the classroom. Teachers with Masters or doctoral degrees were more likely to utilize computers in teaching than those with Bachelors degrees. There was a greater likelihood that those having computers used them in teaching.

Conclusions and Implications

Before teachers can fully integrate computer activities into their classroom teaching, they need the hardware that enables them to do so. State and local administrators, as well as teachers, need to be proactive in the pursuit of technology for the classroom. Administrators should equitably distribute computer resources and ensure that all teachers have comparable access to available technology. Teachers need to actively pursue alternative means of funding, such as grants through corporate sponsorship and advisory council contacts, to procure classroom technology. Teachers of FCS need to make their technology needs known to their respective administrators. State administrators should guide the efforts of teachers in their quest for up-to-date computer technology.

National surveys have found that 40% of American households have computers (Goodnow, 1998). New Mexico FCS teachers are far above that average with 78% having computer access at home. Of the teachers in this study having computers at home, 87% used them at least weekly. Responses from these teachers indicated that 58% of them used the Internet at home two to three times a week. These findings indicate a familiarity with and willingness on the part of most New Mexico FCS teachers to use computer technology. It appears logical to conclude that given equipment and facilities, many of these teachers will make use of computer technology in their teaching.

The current emphasis from the U.S. Department of Education is to have Internet access for each classroom (Riley, 1998). Nationally, 27% of classrooms are connected to the Internet (Riley, 1998), but according to this survey, only 22% of New Mexico FCS teachers have classroom access. While many teachers reported Internet access located somewhere else in the school, use was not easily scheduled. Teachers are ready and willing to utilize the Internet in their teaching activities, but they lack the hardware allowing them to readily do so.

Even without Internet access in their classrooms, many New Mexico FCS teachers are incorporating the Internet into their teaching. It is expected that more teachers will utilize this technology as it becomes more readily accessible to them in their classrooms. For those teachers not able to connect computers directly to the Internet in their classrooms, administrators need to ensure that computer lab facilities allow for sufficient Internet access for both teachers and students.

Teachers should look to the businesses in their communities for additional support. Businesses will eventually hire graduates of high school programs and could be brought on board

as partners with the schools to provide funding and other technology resources. This would assist teachers in preparing students as future employees within the local economy and national or international communities.

Teachers must teach the technological skills students will need to compete for and succeed in FCS careers. It is vital that teachers communicate on a regular basis with members of their advisory committees to explore emerging technologies and business needs.

Teacher educators at the university level need to ensure that all teachers receive training in the use of computers, a basic teaching skill. Teacher educators in FCS at the university level should also incorporate teaching with computers into the methods classes students take during their teacher preparation. Secondary teachers currently using computers could be asked to make presentations in the college classroom. In light of the large percentage of teachers using computers professionally outside of class time, future teachers also need the computer skills to adequately perform many necessary professional duties.

Responses indicated that most New Mexico Family and Consumer Sciences teachers would welcome further computer training. A majority of the teachers would like a course or courses dealing with the employment of computers in teaching. Almost three fourths would like that course to be tailored towards teaching Family and Consumer Sciences. Teachers need to be informed of resources and methods of incorporating computers through workshops, bulletins, and newsletters. State vocational directors and other organization leaders need to plan workshops on using computers in the classroom.

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