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The Use of Computers by Health Occupations Teachers in Florida

Janice R. Sandiford<sup>1</sup>

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Abstract: During the past decade, the microcomputer has become a powerful teaching tool in the delivery of student instruction and in the preparation of lessons and materials. The purpose of this study was to determine the extent to which health occupations education teachers in Florida were using the microcomputer in their personal and professional lives. The study focused on: (a) the computer literacy of health occupations education teachers; (b) the types of software being used for desktop publishing, word processing, data bases, spread sheets, style/grammar checker, graphics/presentations, gradebooks, test banks, statistics and communications; (c) the types of activities facilitated by word processing, data bases, spread sheets, and communications; (d) the ways hospitals were using computers and involving students; and (e) the computer methods teachers were using with health occupations education

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students. The findings indicated that the majority of respondents were using computers for a variety of activities at home and at work. Word processing activities were the most frequent computer application. The computer most often used, both at home and at work, was the IBM compatible; the word processing program used most often was WordPerfect. While the computer was being used with students for computer assisted instruction, this use seemed to be limited.

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While the origin of the computer is often traced to prehistoric times, the modern day main-frame computer began in the 1940's with the development of the Mark I, followed closely by ENIAC, EDVAC and the Univac I (Bullough & Beatty, 1991). Early computers were large, expensive and available only to select populations, usually government agencies or large commercial corporations. Technology improved and by the late 1970's the micro-computer became available to the general public, including health care professionals and teachers.

#### Literature Review

##### Computers in Health Care

“Computers and computer-assisted systems have been used in hospital settings for more than 30 years” (Scarpa, Smeltzer & Jasion, 1992, p.73). Much has been written in the literature about the use of computers and technology in the health care industry (Ciancioto, 1990; Gardner, 1991; Geiss, 1992; Hales, 1992; O’Neil, 1990; Simpson, 1990; Stronge & Brodt, 1985; Whitehouse, 1981). Articles ranged from attitudes toward computer use to administrative uses, equipment uses, and bedside care uses, covering just about every aspect of health care. While many of the early articles dealt with attitudes toward computers,

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recent articles are directed more toward applications and cost-effectiveness issues (Johnson, 1992). Computers and technology are integral components in the health care industry, which has implications for educators and students in health care education programs.

### Computers in Education

The literature included many articles that documented educational computer use. Whole journals have been dedicated to K-12 educational programs. Some are more specific to vocational education, such as the March 1992 issue of the Vocational Education Journal. Still others are specific to health occupations education (Grem, 1992; Irving & Nubile, 1992). Yet, "our current teaching practices are alarmingly outdated in a world of technological wonders. . . . Current technological advances such as computers, laser discs, high speed printers and satellite or fiber optic telecommunication can help American educators make the transition into an era of individualized learning" (Bell & Elmquist, 1992, p.22).

The capability of being able to individualize instruction, to offer drill and practice of repetitious materials, as well as simulations of real situations without danger makes computer instruction attractive to many educators. Health occupations education (HOE) is no different. Many HOE teachers have taken advantage of opportunities to integrate computers into their programs. This use, however, is not documented in the literature.

A review of the literature revealed no studies which indicated the extent to which health occupations education teachers were using computers. In fact, a search of the ERIC data base made no mention of health occupations education and computers. Therefore, a base line

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study was needed to be able to build a case for computers in the education of new health care professionals.

### Purpose of the Study

As more teachers learned how to use the microcomputer, they began to use it for lesson preparation and development of student materials. In addition, some teachers involved their students in computer-assisted instruction (CAI). As program consultants for health occupations talked with teachers, it became evident that health occupations teachers were using computers, but the level of use and nature of specific applications were not known. In order to determine just how many health occupations teachers were using computers and to what extent, a state-wide study was conducted. The purpose of this study was to determine the extent to which health occupations education teachers in Florida were using computers. The results were intended to be used as a basis for planning state-wide educational programs and workshops, providing technical assistance to teachers, revising equipment lists, and sharing software lists.

### Methodology

#### Population

The population of this study included all of the health occupations education teachers in Florida's public school and community college programs as listed on the mailing list compiled by the Florida Educator's Information Service (FEIS). This listing of 911 HOE teachers was originally gathered from state reports and then updated annually by the director of health occupations education programs for the State Department of Education. It was the

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basis for the Directory of Health Occupations Programs published by the State Department of  
Education.

### Instrumentation

A **questionnaire** was developed by the researcher to obtain the data concerning **the** use of computers by health occupations education teachers in Florida. The questionnaire was presented to a panel of experts who reviewed it for clarity and ease of use. The instrument provided respondents an unlimited number of selections, allowing them to check all that applied as well as to write in responses. The instrument was divided into five sections: literacy, software, applications, students, and training.

### Data Collection

During the spring of 1992, a **questionnaire** was sent to each health occupations education teacher. Whenever more than one teacher was **identified** at a school, the questionnaires were sent to the school in bulk, addressed for distribution to each teacher. Due to a Limited budget, return postage was not included for the questionnaires, having some effect on the final number of returns. Teachers were instructed to combine their questionnaires with those of other teachers' and return them in bulk whenever possible, thus saving individual postage. Data are reported on responses from 262 returns from both the public school and community college health occupations education teachers. Responses represent a 29% return. No attempt was made to increase the number of returns as teachers had begun summer schedules and funds were not available for a second mailing.

### Data Analysis

Responses were aggregated to access the level of computer literacy indicated by the teachers, the software that was being used for computer applications, the types of activities health occupations teachers conducted with the various computer applications programs, the ways hospitals were using computers and the extent to which students were involved, and finally the ways teachers were using computers with health occupations education students. Of the 911 questionnaires mailed, a total of 262 were returned for a 29% return.

### Level of Computer Literacy

Respondents were asked to describe their level of computer literacy and were able to check all options that applied. A large number of health occupations teachers were using computers both at home and at work. Forty-three percent of the respondents indicated they used the computer at work for many tasks. Thirty-four percent indicated they used the computer at home for many tasks. Thirty-two percent indicated they used the computer at work occasionally, and 16 percent indicated they used the computer at home occasionally. Only 12 percent indicated they never used a computer. The most common use at home and at work was listed as word processing (25%--home, 28%--work). Table 1 lists the types of tasks performed on computers at home and at work. Many tasks were listed, but because only one or two instances were reported, they are not included. Participants were asked to identify the type of computer they used at home and at work. A variety of computers were listed by the health occupations teachers.

The IBM or IBM compatible computer was the most frequently used computer both at home and at work. At home, the health occupations teachers used an IBM (17%) or IBM compatible (23%), while at work the teachers used an IBM (37%) and IBM compatible

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Table 1

Rank Order of Types of Tasks Performed on Computer

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Task	Respondent Use at Work (%)	Respondent Use at Home (%)
Word Processing	28	25
Test Questions	23	10
Correspondence	19	15
Lecture, Lesson Plans	16	10
Gradebook	15	3
Data Base	9	6
CAI, Simulations	8	0
Student Records	8	3
Communications	7	3
Banners, Notices	6	2
Spread Sheets	6	4
Programs, Curriculum	5	2
Schedules	5	2
Handouts	5	5
Budget, Accounting	4	6
Electronic Mail	4	1
Overheads	3	2
Forms, Documents	3	2
Minutes of Meetings	3	1
Mailing Lists	2	3
Signs, Flyers	2	2
Student Resumes	2	1
Games	2	7
Graphics	2	2
Inventory	2	3
Calendars	2	3
Charts, Lists	2	0
Degree Audit	2	0
Syllabus	1	1
Class Assignments	0	5
Newsletters	0	1

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Journal of Health Occupations Education, Vol. 9 [1994], No. 2, Art. 6 (19 %). Also used at home, but less frequently, was the Apple II family of computers

(10%), the Macintosh family (5%), the Tandy (3%). At work these percents include: Apple II family (21%), Macintosh family (11%), Tandy (5 %), and none (8%). Health occupations education teachers also had Commodore, Atari, Radio Shack and other miscellaneous computers at home in limited numbers.

The final question regarding computer literacy concerned the number of hours that health occupations education teachers used their computers at home and at work. Table 2 presents the data. The majority of respondents used the computer between one and five hours per week, both at home and at work. Tables 3 through 5 present the frequency of use of word processing programs, data base programs, and spreadsheet programs.

When asked specifically what types of things they do with word processing, data bases and spread sheets, the list was exhaustive. Those teachers who used computers used them for a variety of applications. Tables 6, 7, and 8 present these data.

#### Additional Software

HOE teachers reported limited use of additional software. Forty-three percent of the teachers indicated they were not using desktop publishing programs. Those who did reported the word processing program most often used was WordPerfect (29 %), followed by Microsoft Works (10 %), then AppleWorks (9.5 %). These programs, while capable of some desktop publishing, are generally considered to be word processing programs rather than desktop publishing programs. Only 3.5% of the teachers were using Pagemaker, a common desktop publishing program. Other true desktop publishing programs such as Ventura and Quark were not used.

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Table 2

### Hours per Week of Computer Use

Amount of Time	Work (%)	Home (%)
Don't have access	8	10
< 1 hour	2	1
1-5 hours	36	28
6-10 hours	17	12
11-15 hours	6	2
16-20 hours	4	4

Table 3

### Frequency of Use of Word Processing Programs

Name of Program	Frequency	Percent (%)
WordPerfect	97	37
AppleWorks	41	16
Microsoft Works	25	10
None	35	13
Other	24	9
WordStar	14	5
Word	13	5
PC Write	12	5
Word for Windows	8	3
Professional Write	6	2
PFS Write	6	2
First Choice	5	2
FreEdWriter	4	2
DeskMate	4	2
Leading Edge	3	1

Table 4

Frequency of Use of Data Base Programs

Name of Program	Frequency	Percent (%)
None	117	55
AppleWorks	31	12
Microsoft Works	30	12
Other	28	11
dBase III	18	7
File Maker	10	4
PC File	8	3
File Express	5	2
Data Perfect	5	2
dBase IV	4	2
PFS Data Base	3	1
First Choice	3	1

Table 5

Frequency of Use of Spreadsheet Programs

Name of Program	Frequency	Percent (%)
None	142	54
Lotus 123	29	11
AppleWorks	24	9
MicroSoft Works	23	9
Other	17	7
Excel	14	5
Quattro Pro	6	2
First Choice	5	82
PFS Spreadsheet	3	1

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Table 6

Specific Uses of Word Processing

Use	Frequency	Percent (%)
Letters, Memos, Correspondence	136	52
Tests, Testbanks	79	30
Handouts, Study Guides	67	26
Lesson Plans, Lecture Prep	41	16
Nothing, None	31	12
Reports	22	8
HOSA Minutes, Meeting Minutes	20	8
Schedules	18	7
Outlines	17	7
Papers, Essays	16	6
Course Work, Self-Study	14	5
Revised Curriculum	10	4
Newsletters, Announcements	10	4
Overheads	9	3
Records	8	3
Term Papers	8	3
Lists (mailing, phone)	8	3
Agenda	7	3
Forms	7	3
Syllabus	7	3
Grades, Graphs	7	3
Calendar	6	2
Resumes	6	2
Research	6	2
Documents, Budget	5	2
Accreditation Documents	4	2

Table 7

Specific Uses of Data Bases

Use	Frequency	Percent (%)
None, Nothing, NA	134	51
No response	56	21
Student Information, Records	20	8
Mailing, Telephone Lists	13	5
Address Book	8	3
Mailing Labels	7	3
Grades	6	2
Record Keeping	5	2
Budget Requests	4	2
Test Evaluation, Test Bank	4	2
Literature Search	4	2
Survey Results	3	1
Print Shop	2	<1
Schedules	2	<1
Equipment Lists	2	<1

The majority of health occupations education teachers were not using interactive video in their classrooms. Only 28% of the teachers indicated using interactive video. Programs used were Health Series (11 %), AIDS (6%), Science Helper (1 %), BioSci (1 %), and other (10%).

Grade book programs were in limited use by health occupations education teachers in Florida. Teachers were using generic spread sheets (8.4 %), Apple **Gradebook** (3.4%), **Par Score** (3%), **Gradebook** (1.5%), **Grade Guide** (1.1 %), and other (9.5%). Test bank programs were also in limited use. A wide variety of **unidentifiable** programs (8%) were used, followed by **Microtest II** (4%), **Par Test** (2.7%), **WordPerfect** (2.3%), **MECC Teacher Utility** (1.1 %). Eighty-two percent of the teachers reported using none.

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Table 8

### Specific Uses of Spread Sheets

Use	Frequency	Percent (%)
None, Nothing, NA	98	37
No Response	68	26
Grades	36	14
Budget, Accounting	15	6
Clinical Rotation Schedules	9	3
Graphs	6	2
Lists	5	2
Statistics	4	2
<b>Administrative Tasks</b>	3	1
Charts	3	1
Records	2	<1
Reports	2	<1
Financial Statements	2	<1
Test Questions	1	<1
Faculty Loads	1	<1
Column Formatting	1	<1
Information Sheets	1	<1
Addresses	1	<1
Labels	1	< 1
Banners	1	<1
Signs	1	<1
Home Records	1	<1
Analysis of Reports, Data Trends	1	<1
Enrollment Forecasting	1	<1

Most health occupations teachers were not using writing style/grammar checking programs (83.6%), statistical packages (93.5%), or communications packages (87.4%). Those using the computer for communications were connecting to **Medline** (6%), a local **bulletin** board (3.8%), the Florida Information Resource Network (**FIRN**) (3.8%), or to the Library Users Information Service (**LUIS**) (4%), the state university's library network, Prodigy (2%) and **CompuServe** (1.9%).

Hospitals in Florida were using computers in a variety of ways according to the health occupations education teachers. Order entry was the most frequent use of the computer, followed by laboratory applications. Table 9 presents an alphabetical list of identified computer uses in Florida hospitals with respective frequencies.

While computers were being widely used in clinical agencies utilized by health occupations education students, as a general rule students were denied access to hospital computers. Many of the teachers (38%) responded that students “don’t use, “not at all, ” “none,” or “NA” when asked how students used computers at clinical sites. Among the student uses of computers were lab reports/look up lab work (n= 3 1), charting/documentation (n= 16), order entry (n= 12), data acquisition and retrieval (n=8), care plans (n=5), radiology equipment (n= 4), coding (n =4), recording reeds (n =4), and clocking in (n =2). Likewise, health occupations students were generally not issued codes to use the computers in the clinical sites as indicated by 45% of the respondents. Those that did use the computer “use student number plus password” (n= 6), “per preceptor” (n =4), “attend class and receive code” (n= 3), “use school number assigned” (n =3), “use unit secretary’s code” (n=3), “use a staff person’s code” (n =3), “use the nurse’s” (n=3), “use general codes” (n =2), “use preceptor’s code” (n=2), “use hospital personnel to make request when necessary” (n =2), “limited access” (n =2), “use instructor’s code” (n= 1), “given same security access as phlebotomy staff” (n= 1), “education coordinator requests codes” (n= 1), “given to them by supervisor” (n= 1), “up to faculty” (n= 1), “by affiiate hospital staff” (n= 1), “college affiliation agreement” (n= 1), “issued codes” (n= 1), “hospital issues temporary employee number with picture ID” (n= 1), “hospital radiology department” (n= 1), “name and student number” (n= 1).

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Table 9

Specific Uses of Computers in Hospitals

Use	Frequency
Abstracting	2
Admissions, Medical Records	16
<b>Billing</b>	28
Census	24
Care Plans	26
Charts	18
coding	3
Communications	18
Computerized Analyzers (blood gas)	3
Dental Office Functions	5
Diagnostic Equipment	2
Diagnostic Values	2
Dietary	6
Doctor Phone Lists	2
Documentation	1
Equipment	3
Everything	2
<b>Filing</b>	2
Lab Data, Results	69
Library	2
Life Support	1
Medication Sheets	10
Monitoring	1
Narcotic Control	1
Nursing Notes	5
Operating Room Schedule	1
Order Entry (diagnostic tests, dietary, labwork, medications, supplies, etc)	140
Patient Management System	3
Patient Profile	7
Patient Lists	3
Patient Records	9
<b>Payroll</b>	2
Physician Diagnostic Procedures	1
Poison Control Index	1
pulmonary Function Studies	2
<b>Payroll</b>	3
Quality Control Data	3
Radiology Examinations	9
Record Keeping	7
Reports	3
Room Location	1
Scheduling	8
Specimens	1
Staff Assignments	2
statistics	4
<b>Time Clock</b>	4
Vital Sign Sheets	2
<b>Veterinary Hospital Functions</b>	4
X-Ray	15



In general, health occupations education teachers were able to use computers with their students. Most commonly, this was done in the computer lab (88%), followed by **individually** (36.6%), as a group (25.5%), and in the classroom (21 %). Only 11% of the respondents indicated they were not able to use computers with their students.

There was a variety of responses regarding the level of student computer literacy and the major brands of computers used by students. Close to 26% of teachers believed that 76-100 % of their students used computers, while 25% believed that less than 25% used computers. Table 10 presents these data.

Table 10

Percent of Student Computer Literacy

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Level of Student Use	Respondent Percent (%)
Don't Use	15
< 25%	25
26- 50%	12
51- 75 %	7
76- 100%	26
No response	11
Unknown	2
All Students Required to Take Course	2

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Teachers indicated that **almost** all major types of computers were used by students, with the most frequent being IBM (27 %), followed by Apple **Ile** (13.7%), IBM compatible (13 %) and MAC (7%). The question relating to software used with students resulted in a long list, with the majority of items being **identified** by only one teacher. Teachers tended to

Sandiford: The Use of Computers by Health Occupations Teachers in Florida list the software by its general topic, not by the publication name, and consequently it was sometimes difficult to identify each program. Copies of this list are available from the author.

Likewise, teachers listed numerous ways they have **integrated** computers into their programs. While 13.3% of the teachers indicated they had not integrated computers into their **programs**, those that have integrated computers reported using it primarily for computer-assisted instruction (12%), computer literacy (5%), testing (5%), computer simulations (4%), resumes/application letters (3.8%), math (3.4%), word processing (3%), and special assignment (3%). Copies of the complete list are available from the author.

### Teacher Training Needs

The final section of the **questionnaire** asked teachers to indicate what types of computer training they felt they needed. Again, the responses were many. The need for basic computer literacy was present with 13.3% of the teachers indicating a need for introduction to computers. Teachers wanted instruction in spread sheets (10%), test bank programs (9.5%), data bases (7%), graphics (6%), **interactive** media (5%), **gradebook/grades** (4.5%), WordPerfect (3.8%), word processing (3%), teaching with use of computer (3%), and programming (2.7%). A brief listing of other topics includes operating systems, authoring, communications, gradebooks, desktop publishing, statistical packages, video discs, **specific** programs, forms, **networking**, hard disk management, slide shows, presentation graphics and clinical computer use.

## Conclusions and Recommendations

### Conclusions

The purpose of this study was to assess the extent to which health occupations education teachers in Florida used the microcomputer in their personal and professional lives.

The study focused on computer literacy of the teachers, software used, types of activities performed on the computer, ways hospitals were using computers, the extent to which health occupations education students were involved, and the ways teachers were using computers with their students. The study established a base-line for planning state-wide educational programs and workshops, providing technical assistance to teachers, revising equipment lists and sharing software lists. The data suggest that there continues to be a need among health occupations education teachers for computer training. This study is limited by the voluntary nature of the responses and is only applicable to health occupations education teachers in Florida.

Health occupations education teachers were using computers in their personal and professional lives, but the use was limited. Word processing was the most frequent use of computers as teachers developed their lessons, designed tests and prepared correspondence. Applications such as spreadsheet and data base programs were used by only a few of the teachers. Use of specific programs for desktop publishing, grade books, test banks, writing style/grammar checking, statistics and telecommunications was virtually non-existent.

Florida hospitals were using computers in a variety of ways but the uses seemed to be predominately in order entry, lab, admissions, billing and medical records. The radiology department was a heavy user of computer technology in diagnostic studies. None of the respondents indicated that computers were being used at the hospital bedside. Health occupations education students were generally denied access to hospital computers. Those who did have access were given access to codes, but often in ways that did not guarantee strict security of data.

In general, health occupations teachers were able to use computers with their students and indicated numerous ways that they have integrated computers into their instructional

Sandiford: The Use of Computers by Health Occupations Teachers in Florida practices. A large number of items were included in the listing of software used by students. Computer-assisted instruction (CAI) was the most frequent by cited method, but it did not appear that teachers used CAI in place of regular instruction. This might be due to their lack of knowledge of the effectiveness of CAI in instruction, lack of appropriate software, or teachers' insecurity in using computers.

The results of the study provided evidence that health occupations teachers are interested in learning more about using computers. A broad range of topics were of interest to the teachers. The fact that microcomputers have been gaining in popularity among health occupations education teachers was evident. There was also a population of health occupations education teachers that desired computer literacy courses and advanced computer training.

#### Recommendations

The health care agencies employing our graduates are using computers in a variety of ways and will expect that new graduates are skilled in computer use. Based on this study, it is recommended that health occupations education teachers be encouraged to continue and increase their use of computers both personally and professionally. Teachers should provide expanded opportunities for students to use computers in meaningful ways in their studies, and schools should continue to place computers in classrooms. As health agencies become more computerized, more effective means for students to gain access to selected levels of computer data bases will be necessary. School districts will need to provide a wide variety of instruction to teachers, ranging from introductory courses to advanced applications. Health occupations education teachers must be ready to expand their skills and make effective use of new technology.

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