

F E A T U R E

A R T I C L E

Computer Courses in the Undergraduate Nursing Curriculum in Turkey

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Computers not only have changed how information is communicated worldwide but have also become key tools in many professions. Computer technology not only has changed education for technical disciplines but is also changing education, in general, under the “contemporary term educational technology.”¹ The purpose of this study was to survey how Turkish nursing schools have integrated computers and computer courses into their undergraduate programs.

Educators agree that computers play an important role in modern education. Most literature on the subject focuses on the Internet as a tool used by educators.

The Internet can be used as a supplement to traditional instructional methods. To complement a lecture, instructors may ask students to find specified Web sites to gain more in-depth knowledge about a particular topic. An instructor may also ask students to search the Internet for information on services offered in a particular location. In preparation for a class topic such as diversity, students may be asked to search the Internet to learn about different ethnic groups or populations at risk.²

The integration of modern computing technology into nursing curricula is particularly important. Learning the skills they need to access the Internet, gather information, and use technology is becoming

increasingly important...for nursing students.
It is essential to support their student experience

I N T E R N A T I O N A L

This study surveys computer courses in undergraduate nursing schools in Turkey. To accomplish this, the investigator gave an assignment to first-year students at the Ege University School of Nursing as part of a computer course in 2003–2004. The assignment consisted of having students use their computer skills and do research on the Internet to obtain information about computer classes at other Turkish nursing schools. The objective of this assignment was to correspond by e-mail with first-year students at these institutions. Because of this assignment, at least 70 contacts were established, and information has been exchanged between nursing students at 45 different universities in Turkey. This study shows that one method used by undergraduate nursing schools in Turkey to educate their students in modern nursing practices is to integrate computer courses in their curricula, thereby providing students important practical technology skills.

KEY WORDS

Internet and nursing education •
Nursing students and computer classes in Turkey

and also to give them the basics of the [i]nformatics skills that they will need in practice once they are qualified nurses.³

Nowhere is the need greater for nursing educators to teach computer skills to their students than in Turkey.

Turkey is a developing country and there have been many tendencies and attempts to integrate the Internet into [the] Turkish primary, secondary and higher education system since 1990. The World Bank supported two projects; named “Computer Experimental School” and “Project for Globalization in Education 2000[,]” [their] aims were to support...Turkish formal (primary

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and secondary) education through distance education with...computer-mediated communication[s] network linking. The computer companies sponsoring [the] second project provided one year of free Internet access to project schools. But, in spite of these attempts and tendencies[,] because of the slow[-]working, highly bureaucratic and centralized organization of [the] Turkish Ministry of National Education[,] in Turkey there is no infrastructure [for]...computer network[s] for primary and secondary education yet, and the educational uses of the Internet are still in the start[ing phase]...²

A BRIEF INTRODUCTION TO NURSING EDUCATION IN TURKEY

In 1997, the Turkish High Health Council decided that nursing education must occur exclusively in universities. At that time, the primary nurse-training institutions in Turkey were vocational high schools for healthcare and post-secondary schools for healthcare run by the nursing departments of government health services agencies. To comply with the Health Council's decision, these schools reorganized to become university nursing and healthcare schools in 1999. Since then, a 4-year nursing education (leading to a bachelor's degree) has taken place in university schools of nursing and university healthcare schools. In Turkey, a health higher school grants nursing, midwifery, and health technician diplomas, whereas a university school of nursing offers a nursing diploma exclusively.

There are 53 state and 24 foundation (private and nonprofit) universities in Turkey, all of which are governed by Turkish Higher Education Law No. 2547, enacted on November 4, 1981.⁴

Nursing education is provided at 92 institutions in Turkey. Fifteen universities have schools of nursing comprising eight state universities, one military university, and six private universities. A total of 77 university healthcare schools also provide nursing education; 76 are public university healthcare schools and 1 is a private university healthcare school.⁵

According to the Turkish Council of Higher Education (*Yuksekogretim Kurulu* [YOK]), in 2003, 5805 students entered nursing schools: 768 at state universities, 77 at private universities, and 4960 at university healthcare schools.⁵

Universities can determine their own curricula freely, with the exception of some courses that the YOK has made obligatory for all post-secondary schools: the history of the Turkish Revolution, the Turkish language, foreign languages, and computer courses.⁴ In its recent report, the Council (2004) listed as one of its top

five priorities that every undergraduate student must acquire basic computer skills.⁶

University-educated nurses are bound by this requirement. Unfortunately, implementing this goal has been difficult. Martyr⁷ found two types of problems hindering the use of computers in nursing education. The first problem is the lack of computer hardware and software; the second is the inexperience of the students. Not only are computer systems not widely available to nursing students, but also universities often lack specialized personnel capable of providing computer classes.

Ulker et al,⁸ in the study "Nursing in Turkey: Problems Related [to] Main Vocational Education and Human Labor and Solution Proposals," found that the number of computers in schools of nursing ranged from 3 to 50. The University of Ataturk School of Nursing, the University of Cumhuriyet School of Nursing, and the University of Gazi School of Nursing do not have any computers available for educational purposes. The number of computers at Gazi University, Gata University, and Kadir Has University was found to be insufficient for use by professors. However, all nursing schools had computers in their administrative offices. Of the schools investigated, only Gazi University School of Nursing was found not to have Internet access. More often than not, the investigators found existing computer networks insufficient in schools of nursing offering higher degree programs. Thus, their curriculum was geared basically toward a theoretical course of study.

The same study found that most university healthcare schools had between 2 and 54 computers. Twenty (27.8%) did not provide computers for student usage. Of the schools that did, students had access to between 1 and 48. Some post-secondary healthcare schools (15, 27.8%) did not have computers for professors to use. Only one university healthcare school did not have any computer; 25 schools (34.7%) had no Internet access.⁸

Kirkpatrick and Brown⁹ have noted that nurses' professional education does not provide the international and computer literacy experiences that they will need in a global healthcare system.

Students' computer competence may vary; therefore, it is worthwhile to assess their computer skills before a course proceeds. Although students must have some computer skills to effectively participate in today's teaching and learning process, not all students are computer literate. One study found that in 2000, 77.3% of students in a university school of nursing had never used a computer before taking a computer class;¹⁰ in a follow-up survey in 2001, the percentage had dropped to 64.9%.¹¹ Another investigator found that 47.6% of nursing students had never used a computer;¹² the first investigator, in a second follow-up survey, found that by 2005, the percentage had dropped

to 51.6%.¹³ Dependably, every year, the number of students entering universities with no computer experience has dropped.

Ege University, where the author of this study teaches, has required all first-year undergraduate students to take a full-year (two-term) computer course since the 1997–1998 academic years.¹⁴ The University has installed a modern computer-network infrastructure and has opened computer laboratories for faculty in all disciplines at the university. All students at the university have free e-mail and Internet access, as well as easy access to computers. The School of Nursing currently offers its computer courses in two laboratories, where each student has access to a computer. Each laboratory has 34 computers with color monitors and Internet access. All computers run on Microsoft Windows XP (Microsoft, Redmond, WA).

The three-credit-per-term computer course consists of 2 hours of theory and 2 hours of practice per week. A term is 14 weeks. Nursing students also have access to a walk-in laboratory, which is open 5 days a week, 8 hours per day, with 20 computers.

LITERATURE REVIEW

A review of the literature reveals two themes. First, researchers see a clear need for and benefits from educating student nurses to be more computer literate. Second, they agree that although the state of the curricula at schools of nursing has been deficient in this respect, for several reasons, nursing schools are moving to train student nurses in new technologies.

The Need and the Benefits

The importance of preparing nursing students to apply computers to their work as professionals has been emphasized in many publications. The ability to use information and technology effectively is an increasingly important skill for nursing students. It is essential to support their student experience and also to give them the basics of the informatics skills that they will need in practice once they are qualified nurses.¹⁵

Global collaboration among academics, researchers, clinicians, and students is now a reality. E-mail technology is now used routinely by educators as a method of communicating with faculty colleagues, researchers, and students.¹⁶

A random survey of members of the American Organization of Nurse Executives confirmed that new

graduates need a variety of technology skills and that faculty needs to integrate these technology skills into nursing curricula.¹⁷

In striving to prepare new graduates for practice, nurse educators are challenged by the need to adapt the curriculum to changes taking place in the healthcare system.¹⁸

Saba,¹⁹ envisioning the future of nursing in the 21st century, advised that computer technology must be part of professional nursing practice. Saranto and Leino-Kilpi²⁰ argued that computers and information technology should be incorporated into all nursing curricula.

The importance of including information technology knowledge and skills in nursing curricula is well supported in the nursing literature.²¹

Computers can benefit nursing students by increasing their efficiency—reducing the time they must spend documenting and communicating about their patients. Nurses can also benefit by running software applications that improve patient care, not to mention using them for nursing information systems and in nursing education.⁸ In educating nurses, the World Wide Web (Web) can certainly provide students with information resources not otherwise available to them and allow very powerful communication via e-mail.

Progress

Cole and Kelsey¹⁵ have pointed out a lack of computer training integration into nursing courses in past decades:

Armstrong (1989) conducted a national study of nurse educators about the use of computers in nurse education and found that few nursing institutions were providing students with computer courses. In the following year, Chambers and Coates (1990) concluded that a national strategy was needed to provide education in computer skills for nurses.¹⁵

In 1995, Gassert and MacDowell²² conducted a study to determine whether faculty needed to continue teaching basic computer skills to undergraduate and graduate students. They developed an instrument using students' self-reporting to assess computing skills. The authors found a low level of computer literacy and continued teaching these skills.²²

These problems continued throughout the 1990s and similar difficulties have been recorded elsewhere, particularly in Singapore (Kiat and Chia, 1999). All these studies have focused on computer literacy and less has been written about information literacy. It is clear that both types of skill are needed...¹⁵

The 2002 survey of Chastain²³ found faculty deficits in technology preparedness and in faculty comfort with integrating technology into the curriculum. McNeil et al²¹ indicated that the integration of information technology knowledge and skills into nursing education curricula has been a slow process, and no consistent curricula for nursing information technology exist in nursing education programs. In the same study, the surveyed deans of nursing schools rated their program faculty as functioning at the level of novices or advanced beginners in technology/informatics.²¹

Staggers et al²⁴ provide a complete review of empirical studies conducted in the past 15 years addressing the integration of information technology competencies and the progression of information technology in nursing education.

Faculty members need to be prepared to lead and [to] coach students for new and future settings and challenges.²⁵

Although most investigators have considered teaching computer skills to be the responsibility of the establishment providing nurse education, Graveley et al²⁶ believed that nursing educators should not teach such skills, because they thought that most future students would have acquired such skills before arriving at schools of nursing.¹⁵

Computer technology and the Internet have irreversibly changed nursing education, and more nurse educators are becoming adept at using alternative teaching methods that integrate Internet technology.²⁷ According to Austin,²⁸ university-level nursing schools are playing a major part in preparing students for computer application use, the importance of which has been stressed in many publications.

Teaching basic computer skills or nursing content/theory, faculty has responded to this era of technology by incorporating new educational methods in existing nursing programs. Nursing Informatics...teaches computer technology along with tools for the Internet and World Wide Web.²⁹

Nursing curricula may attend to computer literacy issues by including nursing informatics

components within their program. These components may be incorporated into a Nursing Informatics course that teaches computer technology along with tools for the Internet and World Wide Web. However, some programs may intersperse these components throughout the entire program.²⁹

Some strategies for developing computer literacy include exposing student nurses to the technology by setting assignments that require the use of the Internet for information retrieval and communicating about health issues with nurses worldwide.³⁰

Computer content and skills may be present in nursing curricula generally; however, it is not evident whether nursing schools in Turkey are teaching this content and these skills.

PURPOSE

The purpose of this study was to identify the undergraduate computer courses in nursing schools in Turkey and to discover what topics were covered by these courses. At the same time, it sought to promote friendships among nursing students while improving their computer skills. For these goals to be accomplished, first-year students at the Ege University School of Nursing were assigned to use the Internet to obtain information from other university nursing programs about their computer classes by using e-mail to correspond with first-year students attending other university schools of nursing and university healthcare schools in Turkey.

SETTING AND SAMPLE

The computer classes at the Ege University School of Nursing in Turkey, which are offered by two lecturers, are held in two computer laboratories, each of which has 34 computers. Students are arranged in six groups of 28 to 30 students, and three groups are allocated to each lecturer. In the 2003–2004 academic years, there were 163 first-year students at the School of Nursing.

Three groups of students, for a total of 82 students, were given this same assignment. By the assignment's end, 70 students managed to successfully communicate with other schools. Twelve students sent e-mails but dropped out of the study because they did not receive replies from their target schools.

This project involved 70 first-year baccalaureate nursing students. Most of the 70 students were women ($n = 69, 98.6\%$), while the percentage of men was 1.4%

(n = 1). The students' ages ranged from 18 to 24 years, with an average age of 20.01 years. Twenty-seven students (38.6%) had never had a pen pal or e-mail friend.

METHODOLOGY

The study used a descriptive design to assess current computer courses at undergraduate nursing schools in Turkey.

Approval for the study was given by the University of Ege School of Nursing Institutional Review Board. Consent and confidentiality procedures were explained to potential subjects in a standard letter from the director of the school.

Before the assignment began, the students had already finished a course on Microsoft Windows and Microsoft Office Suite (Word); they had learned how to access the Internet, search for information on the Web, and use e-mail to retrieve information. In all, they had already finished 56 hours of instruction by the end of the fall term. Students were provided with various proposals by their lecturers on how to advance their Internet experiences. One lecturer, the author of this study, suggested different subjects to each student group, providing them with more than one option. From these proposals, each group independently selected which option to pursue. Each group asked to join this study, and because there were enough schools of nursing in Turkey to accommodate them all, the author agreed.

Each student obtained an e-mail address from the Web to use for all subjects related to their courses. The e-mail address consisted of "www.mynet.com," followed by the students' school numbers and their names, followed by the extension "@mynet.com."

The first stage of their assignment required students to share out university schools of nursing and university healthcare schools in Turkey. Each student selected one school from the *YOK 2003*. The book is arranged in alphabetical order so that the schools they selected were taken from the book sequentially in alphabetical order. Some students asked to take a particular school where they had a friend from high school; 82 nursing schools had simultaneously given their students related assignments.³¹

The total number of undergraduate nursing schools in Turkey is 92. The students were able to contact 70 schools, or 76.1% of such schools.

A Web search was conducted to obtain names and e-mail addresses for directors of the target schools. Students conducted their search for a possible school connection through several activities: 72.9% (n = 51) used the other school's Web site, 18.6% (n = 13) used the Web but also used fax or telephone, 2.9% (n = 2) searched using fax, 2.9% (n = 2) used the telephone, and 2.9% (n = 2) had a friend attending another school.

The students sent a standard e-mail message or fax to each director of the other schools describing Ege University and the assignment and expressing their desire to correspond with students of the selected school. The letter provided contact information for further questions and included a statement explaining that survey completion constituted consent to participate.

The directors of the selected schools advised their students of the Ege University students' desire to correspond with them. Once this was done, replies began arriving from these schools. In some cases, the school directors replied by sending the e-mail addresses of their students, and in other cases, the replies came directly from the students. Some students received several replies (between one and four), whereas 12 students received no reply at all. For schools with no Internet connection, students communicated by fax.

In their first communications directed to the students from other schools, the Ege University students were provided with a form letter; they filled in the parts relating to themselves. In the e-mail, the students provided Ege University's Web page addresses and described themselves, Ege University, and the School of Nursing. They then e-mailed the letters to their new friends, asking them to answer questions about themselves. When the students had completed their correspondence, they were required to use these data to prepare a Microsoft Word document and an oral presentation to share the information they had gathered about their e-mail friends and the friends' university schools of nursing or university healthcare schools.

INSTRUMENT

Data were collected using a questionnaire developed by the researcher. Questionnaires were administered and collected after assignment completion.

The questionnaire was composed of two sections. The first part, with 17 structured and semistructured questions, contained three demographic questions focusing on the students who did the assignments (age, sex, being an e-mail friend before). Eight questions explored the activities they engaged in to finish the assignment (method used to find addresses, university with which they corresponded, name of the school, number of person to which they sent e-mails from schools, waiting time for replies, number of replies received, how easy it was to correspond, the difficulties encountered in using computers). Six questions focused on performing the assignment (where the student worked on the computer, how many hours per week, how many hours it took to complete the assignment, students' views regarding the strengths and difficulties

of the experience, what they learned, and their conclusions about the assignment).

The second section of the questionnaire related to the students at the other schools, the "e-mail friends." It included two questions about their friends' demographics (age and sex) and seven questions about the computer curricula of the schools with which they corresponded (duration of the courses, in which years of their studies they took the courses, where they take their computer classes, whether their school has a computer laboratory, whether their computer course teachers were on the faculty of their school or came from a different school or department, student-computer ratios in courses, and topics covered during their computer courses), for a total of nine open-ended questions.

DATA COLLECTION AND ANALYSIS

The author collected data over a 2-month period from participating students in the University of Ege School of Nursing. As students had completed their assignment, they filled out the study's questionnaire, and the results were analyzed using descriptive statistics. Data obtained were analyzed using SPSS v 11.0 for Windows (SPSS, Chicago, IL).

RESULTS

This assignment took students an average of 5.0 hours per week (min. 1 hour, max. 24 hours); completing the task took an average of 20.29 hours (min. 4 hours, max. 60 hours). Most of the students ($n = 68$, 97.1%) did not have a personal computer at home and therefore access the Internet from school or from Internet cafes; two students (2.9%) owned computers.

The students, on average, contacted 2.64 persons (min. 1, max. 8). Students who did not receive replies from school directors had to send their e-mails again to the school's assistant director or to one of its faculty members. Where this happened, students experienced the situation as stressful. The students sent an average of 6.54 (min. 1, max. 26) e-mails. Because some students had obtained incorrect e-mail addresses, some messages never reached the target school.

It took replies from other schools an average of 17.68 days (min. 1 day, max. 35 days) to arrive. The average number of replies that the students received from students of other schools was 1.44 students (min. 1 student, max. 4 students). The average age of the students' e-mail friends was 20.21 years (min. 18, max. 30). Sex distribution was 100.0% ($n = 70$) female.

Table 1



Computer Courses Responses From Contacted Nursing Schools

	n	%
Type of school contacted		
University school of nursing	9	12.8
University health higher school	55	78.6
Private university school of nursing	6	8.6
In which year they were required to take computer courses		
First year	24	34.6
Second year	19	27.0
Third year	19	27.0
Fourth year	6	8.6
No response	2	2.8
Length of required computer courses		
One semester	37	52.9
Two semester	30	42.9
No response	3	4.2
Where they take their computer course		
In their school	61	87.2
Another school	8	11.4
No response	1	1.4
Number of nursing schools with a computer laboratory		
Yes	52	74.3
No	18	25.7
Source of computer course teacher		
From another school	35	50.0
From their school	30	43.0
No response	5	7.0
Computer-to-student ratio in computer class		
1:1 equal	23	32.9
1:1 not equal	47	67.1
Computer course topics		
MS Office Suite (Word, Excel, Power Point) and Internet	61	87.2
MS Office Suite (Word, Excel, Power Point), Internet and other programs	6	8.6
No response	3	4.2
Total	70	100.0

The difficulties students encountered overall were long waiting times for answers, not receiving replies to the e-mails, as well as technical problems in communicating, lack of available space in the school laboratory, and anxiety related to failing to finish the work assignments ($n = 67$, 95.7%).

Most students reported having difficulties with the e-mailing stage and late replies or wrong addresses ($n = 54$, 77.1%), whereas 16 students (22.9%) reported no difficulties with their experience.

When applying computer usage to the work assignments, 32 students (45.7%) reported technical difficulties with the process itself; that is, they had problems because they lacked experience working with the

Internet. Thirty-eight students (54.3%) reported no problems in conducting their Internet operations.

Most students ($n = 67$, 95.7%) had positive feelings about the work assignments and thought they had gained useful outcomes.

The distribution of the nursing-curriculum-related computer courses with which students corresponded is shown in Table 1.

The students encountered difficulties that included long waiting times for answers, not receiving replies to the e-mails, as well as technical problems in communicating, lack of available space in the school laboratory, and anxiety related to failing to finish the work assignments.

Based on questionnaire results, oral presentations, and positive experiences expressed by the nursing students, it was concluded that the teaching methods were effective in developing a level of friendship and computer competency. The students reacted positively to the assignment. They were enthusiastic about their improved computer and Internet skills, the knowledge they gained about different school computer courses, and having nursing students in other universities as e-mail contacts.

Because of this assignment, at least 70 contacts were established, and information was exchanged between first-year nursing students attending 45 different state universities: 9 in schools of nursing and 55 in university healthcare schools, as well as 6 students attending private university schools of nursing in Turkey (12 students received no e-mails from schools).

Where the corresponding schools had computer laboratories, there were an average of 24.61 computers (min. 0 computer, max. 500 computers). Most the students kept up correspondence on various subjects apart from their assignment for this study.

There were no differences, by type of school contacted, in how many students had difficulties with this assignment ($\chi^2 = 1.403$, $df = 2$, $P = .496$). Nor were there differences by type of school in the computer-to-student ratio in computer class ($\chi^2 = 5.613$, $df = 2$, $P = .060$).

DISCUSSION

All nursing schools in Turkey have a computer course in their curriculum—an obligatory course. The schools provide these courses because the ability to use computers is considered an essential skill for nursing students.

The study of Bloom and Hough³² showed that the most frequently used technologies in schools of nursing were word processing (92.2%), the Internet (89.8%), and e-mail (78.9%).

In Turkey, Bagcikilic³³ surveyed students on how they used computers. Using a scale from one to six to assess frequency with which they used computers for various tasks, he found that students used computers most frequently for e-mail with their friends (4.80). This explained why the students in both groups reacted very positively to being asked to communicate through e-mail. The next most frequent use was word processing (4.71). Using the Internet to get information came third (4.42). The next four were all specific uses of e-mail, in decreasing order: e-mail with classmates (4.31), with teachers (4.28), with family (4.21), and with student organizations (3.19).

McNeil et al²¹ studied which computer and information technology skills were being taught by nursing faculty at schools of nursing. The investigators found that faculty members at more than half of the schools surveyed are teaching information literacy skills, such as retrieving bibliographic information from the Internet ($n = 150$, 56%), and half are using nursing faculty to teach students how to use the Internet and World Wide Web ($n = 132$, 50%). Approximately 33% of programs reported that the nursing faculty are teaching computer literacy skills related to e-mail ($n = 94$, 35%), database applications ($n = 82$, 31%), and spreadsheet applications ($n = 73$, 27%). More than 75% of nursing programs indicated that they had a “champion” information technology user.

The McNeil study, one aim of which was to discover what specific information technology knowledge and computing skills nursing education programs teach, found that baccalaureate nursing programs were focusing more on computer literacy skills than on information literacy skills.²¹

This study, based on the results from the assignment given to nursing students, as collected by means of the investigator’s follow-up questionnaire and the students’ self-reporting (in their assigned oral presentations), found that nursing students subjectively experienced their participation in this study as positive. The results also led to the conclusion that this study was effective in developing friendships among students from different nursing programs while simultaneously increasing students’ computer competency. The students reacted positively to the assignment; they were enthusiastic about their improved computer and Internet skills, the knowledge they gained about different universities and their computer classes’ practices, and having nursing students in other universities as new e-mail friends.

If for no other reason, this study proved worthwhile despite its difficulties because the skills learned by the first-year nursing students will enhance their personal and professional development in careers that increasingly depend on this rapidly developing technology.

CONCLUSION AND RECOMMENDATIONS

This study provides empirical evidence of students' difficulties accomplishing a relatively straightforward computer-based task, which illustrates the critical need to include and perhaps even extend computer courses in nursing curricula across Turkey. To answer the question of how best to accomplish this goal, further studies are needed of how nursing programs currently incorporate these tools into their curricula as they prepare nursing students for practice.

Even so, it is evident from the results of this study that undergraduate nursing schools in Turkey are serving a crucial function by integrating computer courses and technical skills into their curricula. By the time this study ended, some nursing education programs still lacked sufficient computer hardware and software to fully serve their students and faculty; still, the majority has integrated computer course into their curricula.

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