The Emerging Role of Computer Literacy in Improving the Performance of Dental Students

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Abstract

Aims: The aim of this study was to investigate the current knowledge, skills, and opinions of undergraduate dental students of Qazvin University of Medical Sciences about information communication technology (ICT). A survey was carried out to investigate the capability and attitude of dental students towards computers, using questionnaire.

Materials & Methods: Questionnaires were distributed among undergraduate dental students. All students had access to computers and Internet at the university. Dental students of the second, third, fourth, fifth and sixth years of the dentistry program were asked to complete a questionnaire presented to them at the end of a lecture at the end of the second semester 2008-09.

Results: The response rate was 84.4%. As for free and unrestricted access to computers at the school of dentistry, 93.4% of the students had access to computers at home. All users were computer users. A significant number of students (57.9%) judged themselves proficient in information technology (IT) skills. There was no significant difference between the two sexes about IT. More than 90% of the student acquired their computer skills through sources other than the university. Both sexes used computer to access Internet (78.9%), for word processing (18.4%), multimedia (7.8%), presentations (18.4%), and data management (1.3%). Some students selected more than one item.

Conclusion: Our study revealed a high level of ability to use ICT facilities among dental students. Attention is required to develop interventions that can improve ICT skills. However, the educational use of ICT among Iranian students remains high.

Key words: Computer, Internet, ICT, dental students, education

Introduction

The use of computer is important in modern societies and increasing very rapidly. In the past few years have witnessed speedy improvements in Information and Communication Technology (ICT), and the occurrence of the worldwide web in daily life has important implications for education. Internet has produced remarkable changes in the work processes and in the organization of corporate structures over the past decade.[1] Studies have revealed that the use of computerized information systems by medical professionals may progress in the qualities of care, and update knowledge. In recent years, medical and dental education has been changed from a traditional instructive educational system to the one in which students plays a more active role in their education.[2,3] Information and communication technology (ICT) is becoming an important tool in all aspects of dental education increasingly. It is stated that a graduate dentist, regardless of his priorities in research, public health, teaching or clinical care must be able to use ICT for his personal and professional development.[4,5]

ICT is technology that supports activities involving information. Such activities include gathering, processing, storing and presenting data.

It can help by providing access to credible and timely information and access to knowledge on farm practices. Information and communication technology (ICT) has become, within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy. The learning environment in which ICT is used requires certain facilities and resources. Facilities include basic infrastructure such as electrical wiring, Internet access, lighting, Resources, and space. Resources include various types of technological devices from computers with peripherals, video equipment, and specialized tools like digital microscopes. Further resources include various types of software, as well as traditional tools like books, videos, and audiotapes. [31]

One of the primary factors for utilizing of ICT in dental education in higher level is obtaining the skill of applying computers among dental students as well as the academic staff.[6]

Broadly used of internet in medicine has made an impact on research, training, and patient care.[7]

In this situation, computer and internet based learning are counting as very popular educational tools.[8-10] Computer-Assisted Learning (CAL) in dental education first emerged in 1971 with its introduction at the University of Kentucky.[11] CAL make use all along with advances in information and communication technology is quickly rising.[12] The quick development in computer technology and the broad availability of personal computers together with the Internet, email, and various medical literature retrieval applications have changed both the study and the practice environments in dentistry and other disciplines.[13-15]

Electronic learning is a flexible approach for educational purpose of dental students to work on their time and pace.[16] In addition of positive features of using new technology for students, there are many other advantages including instructional methods for both the patient and the dentist, accessing to electronic records and databases, digital images, lectures.[7.16]

Computers and the Internet are revolutionizing the process of education at all levels .Not only are computers becoming a key tool in the educational process, they also make education available in places and at times in which it was previously inaccessible.[17]

It is believed that until use of the Internet and electronic resources is part of dental school curricula and commonly expected; practitioners may forgo using valuable resources for patient care.[18]

Many ICT have pointed out the importance and efficacy of the integration of ICT into teaching and learning. According to them, online learning technologies can transform and extend students' learning experiences by a significant improvement in student/student, student/lecturers, and student/material interactions.[18] Recent initiatives in the use of ICT in schools exhibit a growing range of ways in which curriculum developers approach the implementation of ICT.[20]

The dental program in Iran consists of two years of basic science theory, one year preclinical theory and a three-year clinical phase. Students have eight credits obligatory unit of IT as part of the study program, which is tailored to give an introduction to scientific work.

There are variable levels of skills in use of computers among new arrival dental students. Besides of professional theoretical and practical credits in dentistry issue, all universities offer some obligatory courses in basic computer knowledge (ICDL skills). In Qazvin University of Medical Sciences, all faculties, staff and students of access to the Internet network and they are able to use all kinds of relevant and up to dated information for their teaching and research purposes. All students are registered to use the computers and the Internet at the beginning of their study. Two courses in computer and communication skills are compulsory in the dental curriculum. The aim of this study was to examine that in how extent, students of QUMS take advantage of the Internet during their dental education and to assess their attitudes towards the ICT in general.

Materials & Methods

The questionnaire was provided with a brief description about the study. The participants of this study consisted of students from the second to sixth year enrolled at the school of dentistry at the QUMS. All study participants, received an anonymous copy of the questionnaire before lecture class began after being provided with a brief description about the aims of this survey. It took 10 minutes to be completed to conduct the study; we used questionnaire from previous surveys.[21-23] It consisting of 32 closed ended and 4 open ended questions was prepared for this study. The collected data regarding the students prefer to access dental subjects; reasons for Internet use; where they get access to the Internet; factors restraining them from using the Internet; frequency of Internet use and their ability to find dental subjects in Persian and English sites. The questionnaire also collected details regarding dental students' access, use, skills, and preferences for an array of established and emerging technologies based tools.

Data was collected from one hundred and fifty seven dental students at the end of the second semester 2008-09. The questionnaires were distributed and retrieved immediately after completion. Participation in this study was voluntary, remained unidentified. All the students present on the day of the survey were included in the study. Among 157 participants, forty six students were males

(30.3%) and one hundred and six were females (69.7%).

Statistical Analysis

The data obtained were processed and analyzed using the Statistical Package for the Social Sciences (SPSS PC Version 13). The Chi-square tests were used to compare the responses based on gender and on the basis of the students' stage of education whether it was preclinical or clinical. The level of statistical significance for all tests were set at $p<0.05$. We excluded the first-year students from the study because they were not yet involved in dental courses. Information on gender, age, and year of study were collected through the questionnaires.

Results

Out of 180 students, 157 students completed the questionnaires and the overall response rate was 84.4%. Out of 157 respondents, 30.3% (46) were males and 69.7% (106) were females. There existed a statistically significant difference in gender distribution among participants based on the study stage of each (χ^2=12.96, df=3, P=0.004).

At the time of survey, the age of the respondents' ranged from eighteen to twenty seven years, with a average age of twenty-one; 56.8% aged twenty-one years and less , 26.3% were twenty-two to twenty three years and 16.9% were twenty three to twenty seven. Significant differences were found in the knowledge, skills, and opinions of students of different ages and different study stages with respect to ICT (F=2.64, P=0.043).

The following sections summarize the students' responses to the questionnaires in relation to the following categories: computer access, computer skills and training, use of computer for academic purposes, internet access and use of the Internet for the study of dentistry.

The frequency of Internet use by dental students for general and dental subjects describes which about 33 % of users, the internet use for general subject was two or three times a week. Whereas 18% had used it for the specific topics and within 33% of student use of the internet for general proposes and 26 % use of it for the dental subject once a month (Fig 1). Places preferred by students to have access to the internet and the reasons of using it are illustrated which students accessed the Internet most commonly was in Internet cafes (10.8%). While 84.1% preferred university, 76.3% connected to the Internet from their home and 13 percent from others' computers 86.8% of the students used mailing system (Fig 2.).Students accessed the Internet most commonly was in Internet cafes (10.8%). While 84.1% preferred university, 76.3% connected to the Internet from their home and 13 percent from others' computers 86.8% of the students used mailing system. Although a similar proportion of students they use the Internet to retrieve information for general and dental topics. Table 1 described the difficulties faced by students while using internet services. There were no differences between clinical and pre-clinical students in word-processing skills (χ^2=3.61, df=3, P=0.306). No difference between male and females students in word processing (χ^2=5.7, df=4, P=0.222).

More males student used computer for their personal activities than female (χ^2=10.8, df=4, P=0.028). There were no differences between male and female use of computers for academic activities (χ^2=5.7, df=4, P=0.222). All students had access to the Internet at the university (86.6%), and 76.3 percent had access at home. A high percentage of students (82.7%) indicated they use Internet easily. Most of the students (86.8%) used email services.

Discussion

It has been demonstrated that 100% use of computer in this study, it may showed that their level of computer knowledge is predominantly seems high. That response highlights the importance of the issues at dental school in general. The results of the current study revealed. Internet use is becoming more and more common in Iran. However, presently, utilization of web- based education in dentistry is in its infancy. According to our survey and other numerous studies the information technology (IT), use of internet in dental education and their possible employ as an educational tool.[24-28] This is first study surveyed the current knowledge, skills, and opinions of dental students at the Qazvin University of Medical Sciences with respect to information and communications technology. A similar percentage was reported for dental students in the rest of Europe.[25,26] It is supposed that this education method will be entirely established in the near future.[15]

We convinced all participants in the lecture class to complete the survey, but we did not record reasons for not completing the questionnaire. But approximately 84.4% of students completed the questionnaire this study revealed that 94.7% of dental students had access to a computer at home. Although this questionnaire was used several times in the past.[27] This was the first time it was used on such a large scale and therefore the results and competence scores cannot be safely interpreted to concrete conclusions on user's actual competencies and needs. The questionnaire is not an objective examination, but rather a guided subjective investigation and as it is used in a non-threatening manner (not as an examination), it can bypass students own perceptions and therefore achieve a more objective description of the computer literacy.

There are fifteen computers with internet connection allocated for undergraduate student use in the dental school library. Even though there is an extensive central computer library in the university, it is located in close proximity to the dental school. The unlimited access of the internet in the dental school may be the probable reason for searching. One of the factors that prevented students from using the Internet was their doubt about the accuracy and quality of the information. In the present study, e-mail was the most commonly used ICT application (86.8%). This high rate of e-mail use is similar to other studies with health professions students [29, 30], but somewhat higher than what reported in the UK for dental students.[31]

There were no differences between clinical students used the Internet than preclinical students. More males than females used the Internet for general used may be its needs of personal propose. Although the results of this study reproduce the attitudes of dental students to internet use as a part of their education, multi center studies work would give a more reliable picture about the use of the Internet by dental students in Iran.

Conclusion

ICT combines information, knowledge, processes, and technology to provide a foundation for driving efficiencies and fuelling innovation. It is the key to helping organizations of all sizes to connect, collaborate and compete more effectively.[32] Continuous developments in information and communication technologies (ICT) - including the Internet, ambient devices, and intelligent computer systems - have resulted in an increasing use of these technologies in the practice of medicine and in the provision of medical care. This has led to new concerns regarding the social impact of technology in medicine.[32]

Time and accessibility were the main obstacles for using of the Internet. Dental students at the QUMS have access to substantial IT services. Within the limits of this study, the followings can be concluded:

1- At the present time, teaching the basic courses of IT as part of dental study is really felt and this demand will not probable to disappear in the near future.

2- The results of this study proved that, using the Internet as an up to dated media is a beneficial tool for the dental profession.

3- Extra planning and works will be required to evaluate the acceptance of small group of online education and the impact of faculty members in online educational dental courses.

Information literacy should be considered a mandatory skill in the training of all dental students.

ICT offer many opportunities for improving the quality of interventions and care provided to patients and for better organizing the dental care system. Information technology capacities should improve the information and communication technology skills of dental student by holding the continuing education courses and learning the use of methods to searching in Internet and electronic sources. Thus it can be increased the use of specialized electronic resources among students.

Conflict of Interest: None declared.

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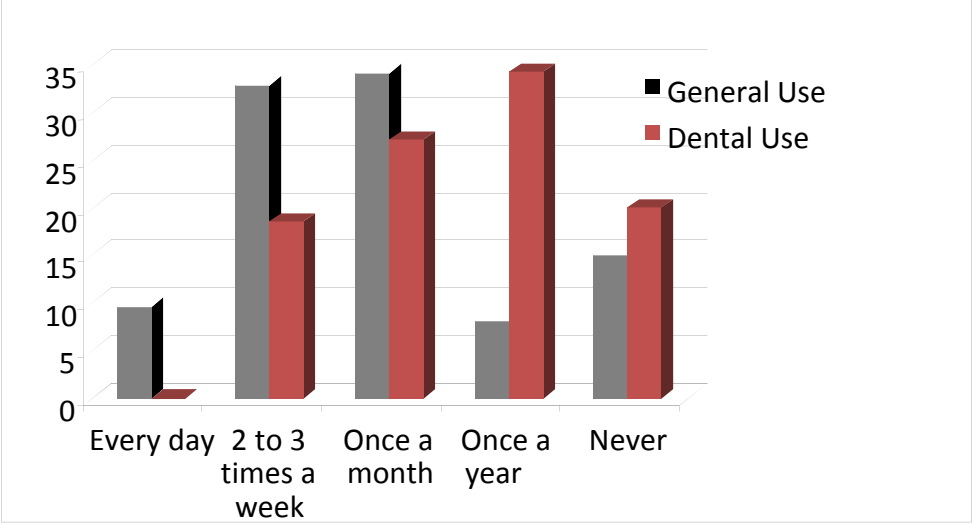

Figure 1: The frequency of Internet use by dental students for general and dental subjects

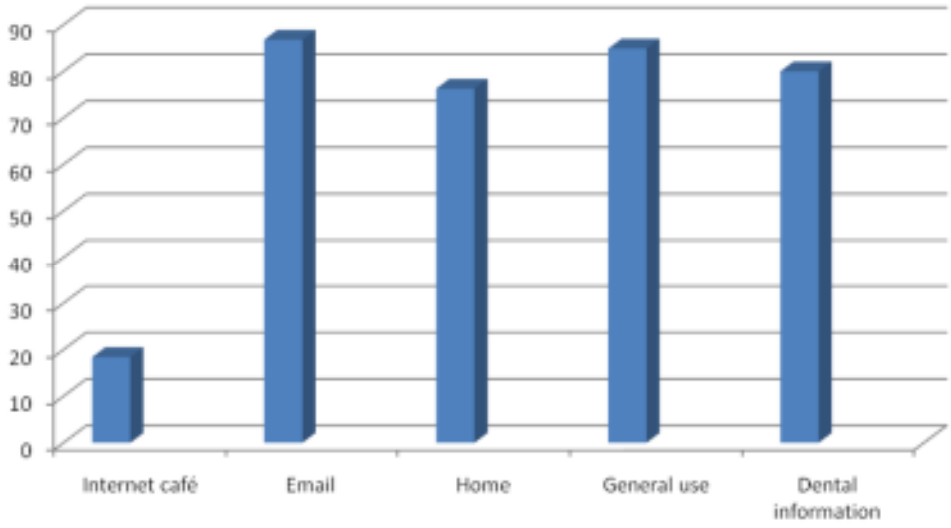

Figure 2: The place of use of internet among dental students

Table 1: The reasons for difficulty to use internet

Viruses	22.5%
Cost of use	9.8%
Time if the line is busy	73.2%
Availability of computers	18.3%
Confidence in the accuracy of information	1.4%
Confidence in the ability to use	5.6%