Computer-based E-teaching (virtual Medical Teaching) or traditional teaching: A comparison between Medical and Dentistry students

*Behrooz Golchai; Nima Nazari; Fereshteh Hassani; Mohamad Hadi Bahadori

Guilan University of Medical Sciences (GUMS). Educational Vice chancellor, Shahid Azodi st. Rasht, Guilan/Iran

Abstract

Introduction: E-Learning is presented through electronic technologies and includes Internet, computer, video and so on. E-Learning creates large flexibility in learning methodology, pivotal management, simultaneous & non simultaneous interaction between trainers and students, organization of course time, lesson plans and finally assessment of students. The aim of this research is comparison of effect of E-learning in students of Guilan University of Medical Sciences.

Material & Methods: This study was performed as a clinical trial procedure. The target population was undergraduate students of medicine and dentistry entered Guilan University of Medical Sciences in 1388. A package named “virtual Medical Teaching” and devised by the researcher (have the second ranking in festival of shahid Motahhari in 1389) was used to teach medical students in the first educational term. While we used traditional method to teach dentistry students, the scores of students was analyzed by SPSS software at the end of the term.

Results: In this research 37 students in dentistry field and 75 course in medical field were included. The average scores of histology in medical students using virtual Medical Teaching was 15/45 and was 12/06 in dentistry students using traditional methods that was significantly different (P value=0/0001). The percent of failed students in histology in medicine and dentistry students were 0/02, 0/27 respectively.

Discussion: Results indicate use of package devised by the researcher named virtual Medical Teaching in histology lead to increase of level of scores in students. In a study Hugenholz and colleagues compared E-Learning and learning through oral presentation in continuing education for physicians but no significant difference was seen.

Conclusion: In this study the scores of histology of students using virtual Medical Teaching were significantly higher than students using traditional procedures. We propose other factor such as living in dormitory and being or not being native resident—which may influence student’s outcome—should be investigated.

Keywords: virtual microscopy; educational pakage; medical educatio; histology education

Introduction

Within the last decades, technology were marginalized with education and learning but recently most universities are planning for using different forms of e-learning to develop students’ learning and education [1]. Another terms called to E-learning are Web-based learning, online learning, distributed learning, computer-assisted instruction or Internet-based learning. Historically, there have been two common e-learning modes: Distance learning and computer assisted instruction. Distance learning uses information technologies to deliver instruction to learners who are at remote locations from a central site. On the other hand, computer assisted instruction (also known as computer-based learning and computer based training) applies computers to aid in the delivery of stand-alone multimedia packages
for learning and teaching [2]. These two modes are subsumed under e-learning as the Internet becomes the integrating technology. A concept closely related to e-learning but preceding the birth of the Internet is multimedia learning. Multimedia uses two or more media, such as text, graphics, animation, audio, or video, to produce engaging content that learners access via computer. Blended learning, a fairly new term in education but a concept familiar to most educators, is an approach that combines e-learning technology with traditional instructor-led training, where, for example, a lecture or demonstration is supplemented by an online tutorial [3]. Faculty, administrators, and learners find that multimedia e-learning enhances both teaching and learning processes. These advantages can be categorized as targeting either learning delivery or learning enhancement. Learning delivery is the most often cited advantage of e-learning and include increased accessibility to information, ease in updating content, personalized instruction, ease of distribution, standardization of content, and accountability [4, 5]. Accessibility refers to the user’s ability to find what is needed, when it is needed. [5, 2]. Updating electronic content is easier than updating printed material [6] because e-learning technologies allow educators to revise their content simply and quickly. Besides, learners have control over the content, learning sequence, pace of learning, time, and, often, media, which allows them to tailor their experience to meet personal learning objectives [7]. Internet technologies permit the widespread distribution of digital content to many users simultaneously anytime and anywhere. An additional strength of e-learning is that it standardizes course content and delivery; unlike, for instance, a lecture given to separate sections of the same course. Automated tracking and reporting of learners’ activities lessen faculty administrative burden. Moreover, e-learning can be designed to include outcomes assessment to determine whether learning has occurred. Advantages in learning enhancement area are poorly recognized but potentially more revolutionary aspect of e-learning are related to learning delivery. [8]. Learning enhancement permits greater learner interactivity and promotes their efficiency, motivation, cognitive effectiveness, and flexibility of learning style. Learning is a deeply personal experience: We learn because we want to learn. By enabling learners to be more active participants, a well-designed e-learning experience can motivate them to become more engaged with the content. Interactive learning shifts the focus from a passive, teacher-centered model to one that is active and learner centered, offering a stronger learning stimulus. Interactivity helps to maintain the learner’s interest and provides a tool for individual practice and reinforcement. Evidence suggests that e-learning is more efficient because learners gain knowledge, skills, and attitudes faster than through traditional instructor-led methods. This efficiency is likely to be translated into improved motivation and performance. E-learners have demonstrated increased retention rates and better utilization of content, resulting in better achievement of knowledge, skills, and attitudes. Multimedia e-learning offers learners the flexibility to select from a large menu of media options to accommodate their diverse learning styles [9]. The main objective of this study is to compare the effect of e-learning in histology course of students studying in Guilan Medical Sciences University.

Methods and materials

In this study, which is conducted through clinical trial method, the participants were students studying in medical sciences and dentistry (entry of 2009) from Guilan Medical Sciences University. The students were divided into two groups: Intervention and control. The participants of intervention group were 75 medical sciences students while the participants of control group were 37 dentistry students. The control group was subjected to traditional lecturing education in histology course while students in intervention group were instructed through e-learning lecturing method. This method was applied at the beginning of semester to educate medical students by an offline computer using an educational package called as virtual medical teaching of histology which was designed by the researcher. It is worth to mention that the method was given the second rank in the Shahid Motahari educational Festival in 2010 and the best idea of Science and Technology Park at 4th best idea festival of Science and Technology Park of giulan. To develop this educational package, first histology high resolution slides were prepared using an optical microscope installed in a Pentium 3 computer and a specialized camera. Then, the best photos, in terms of their brightness, resolution, and quality, were selected, categorized, and saved as JPEG format. In each photo, according to the study textbook (Basic Histology, L. Junquera, ver. 2005), a short description in Persian was written using paint software and after the photos were scientifically controlled by histology professors they were ready to be loaded in photo gallery of the educational software. In other section of the quiz software a non-interaction photo gallery was prepared in which the questions were written on the photos. The photo gallery and imagery quiz of this educational software was prepared using Macromedia Flash, Flash Action Script, and occasionally, C++ software packages and finally saved as .swf (shock wave format) format. Besides to make to software more user friendly, flash player 9 which is the operator software of .swf format was added to user-guide part of the software, so the users who do not
have the software can install it from guide section. The software completed with two main sections: High resolution microscopic images from the histology glass slides and non-interactional imagery quiz including 110 questions categorized into 10 quizzes, which included about 1200 microscopic photo from 57 histology glass slides. This educational package can be operated in all version Windows (XP,7), operating systems with the minimum hardware requirements without any need for internet connection. This educational software was employed in medical students (intervention group) in a way in which package was used with the lecturing and then was given to all students to use it as an additional source at home. On the other hand, to instruct dentistry students just the traditional lecturing method was used. The results of students’ scores in the similar final exam were analyzed using SPSS ver.16 software package.

Results

This research was conducted on 75 (34 female and 41 male) medical students as intervention group and 37 (20 female and 17 male) dentistry students as control group. The scores of both groups’ students at the final homogenized practical exam (out of 20) were evaluated. The average scores in the final exam of histology course for medical students who were using virtual medical teaching was 15.45 while the average score for dentistry students who were subjected to traditional education was 12.06; which were significantly different from each other (value = 0.0001). The ratio of those failed in histology course for medical students and dentistry students was 0.02 and 0.27, respectively.

Discussion

The results of this study imply that using the educational software package designed by the researcher, in histology course can lead to promotion of educational level and enhancement of score levels in students who were using the software. Besides, among the advantages of the software is its availability, user friendliness (working with this software does not require having any particular computer knowledge), the comprehension of the materials (according to the educational period references), and its design by Farsi language (since many students have difficulty in using English sources). In a study done by Desch et al using a computer-assisted instructional program it was found that this type of educational method is rather feasible and effective for medical students to learn how give efficient care services to new-born infants.[10] For instance, in a study conducted by Hugenholtz et al a comparison between e-learning and teaching through oral lecture in constant learning of the medical doctors was performed and no significant difference between them was reported in terms of learning approaches [11]. However, it is worth to mention that the last case was an online method which requires an internet line.

Conclusion

In this research, the scores gained in histology course’ by students using virtual medical teaching were significantly higher than those who did not use this method. It is recommended to investigate other factors such as living in dormitory, being residency or non-residency, constant access to computer, motivation and interest in the course, learning ability, exam anxiety, and etc. which can affect students learning process. Also, it is suggested to design such an educational package and software in other course and study efficacy of this method on other courses. A noticeable limitation of this method was difficulty of preparing the initial materials, the cost for producing the educational package for educational groups, students’ unequal constant access to computer, and gaining students and professors trust to use novel methods such as e-learning, etc.
References