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Short Communication

Implementation of E-learning Technologies in the Classroom and the Assessment of the Medical Students' Attitude towards E-learning: A Pilot Study

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Abstract

The implementation of E-learning technologies in the classroom enhances the learning process, does not replace the lecturer or tutor. The challenges for implementation of E-learning technologies are extensive for the lecturers and the students as well. This paper discusses the issues related to the infrastructure aspects, pedagogic consideration and the need for the technology, and records the students' attitude towards implementation of E-learning in the traditional way of teaching. The study was conducted in the Department of Forensic Medicine at SSR Medical College in the year 2011. The students were asked to fill out a questionnaire online that covered a wide range of relevant attitudes and prior experience of information technology. Majority of students possess sufficient computer skills and agree that E-learning technologies could play an important role in medical teaching. To conclude, medical students could be benefited from the implementation of E-learning technologies in the traditional ways of teaching. Special measures should be taken to the students who lack computer skills.

Keywords: E-learning,Infrastructure,Implementation.

Introduction

Technology path enhances the learning process, but does not replace the lecturers/ tutors. Due to recent development of information technologies, the convention education system has crossed the boundaries to reach the unreached people through a virtual education system. In this system *i.e.* distance methods of delivery; the students get the opportunity for education through self-learning with use of technology-mediated techniques. The benefits of utilizing technology, particularly for developing online collaborative activities are well documented[1], but the many implications of implementing an E-learning program require careful consideration.

Implications and Challenges

The students and the staff both are greatly affected by the implementation of E-learning.

Issues Related to Students

1. *Adapting to a change in learning processes:* The students are greatly affected because of the shift in learning styles. Knight proposed that E-learning will be beneficial to students who are used to be 'spoon fed' because the students can no longer be passive in this type of learning.[2] Kershaw point out that the success depends on level of interaction between students and lecturers.[3] Cooper extended this fact that the students who are lacking in the skills to study independently will not react well in a virtual environment.[4] *Under such circumstances, institutions must be aware that students will react differently to the changing paradigm of learning.*

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2. *Dealing with Isolation Issue:* According Cooper, "*electronic contact cannot sustain the quality and multi-dimensional kind of tutor-student relationship which seems to be required for real learning*".[4] Michailidou *et al* claims that the development of virtual education motivates students to participate in learning by exploring and playing with lesson material.[5] It can provide an active, independent, student centered and tutor facilitated engagement which enables communication with other students and teacher which may not be always within the traditional classroom setting.
3. *Identification of Critical Success Factors:* The critical success factors in an E-learning environment are different from a traditional classroom setting. Volery *et al* remarks that students who have prior experience of using information technology will be more successful in a virtual classroom that those who do not have it. They have also reported that the technological factors such as malfunctioning hardware, software configuration, slow servers, busy signals and lack of are the barriers for the success of learning.[6] *This challenge is best met by ensuring the proper functioning of the technological infrastructure before E-learning is implemented.*
4. *The Importance of Quality Assurance:* Quality assurance is an important key in the implementation of E-learning because the students believe that the online degree is not as credible as the traditional qualification. Caudron suggests that online students have to be more disciplined and work harder to achieve their goals.[7]

Issues Related to Staff

1. *Incorporation of new teaching style: For lecturers, the major challenge is a change in teaching style.* The institutes are demanding a change in the role of university lecturers. According to McFadzean, traditional teaching and learning skills need to be changed in order to get maximum benefit from virtual learning.[8] The study carried out by Learning Peaks implies that in virtual environment the role of a lecturer focouses more on administration that teaching.[9]
2. *Accommodation of Changes in Workload:* As far as workload is concerned, there are mixed findings. Moore presented contradictory findings in his two studies. First reported that distance lecturers experienced a reduced workload, whilst second study showed that lecturers needed about twice as much time to teach an online course compared with traditional course.[10]

This study has been planned to analyze the issues related to students and to assess medical students' attitude towards the implementation of E-learning in the classroom.

Methodology

Setup of Online Classroom

An online classroom was setup for third-year medical students with the evidence of showing social presence in the classroom, giving an overview of the material, providing learning material and resources for the selected unit of work, and giving them to complete automated and authentic assessment activities based on the unit of work.

Subjects and Questionnaire Design

Twenty students (20) were selected randomly from a class of 36 students to assess the online classroom in the cyber library of SSR Medical College and complete the assignments. They were asked to express their views for the implementation of E-learing technologies in the traditional way of teaching on the basis of questionnaire distributed to them by email. The data were collected from an online survey. The participation was

Table 1: Students' Response to Question – 1 (What do you Think about the Following Statements? How Far do you Agree or Disagree?)

	Strongly agree	Agree	Disagree	Strongly disagree	Response count
E-learning technologies should play a more important role.	41.2% (7)	**52.9% (9)**	5.9% (1)	0.0% (0)	17
E-learning programs are able to replace lectures.	17.6% (3)	35.3% (6)	**41.2% (7)**	5.9% (1)	17
In medical teaching, there is no need for the use of e-learning programs.	11.8% (2)	11.8% (2)	**47.1% (8)**	29.4% (5)	17
E-learning training should be made available to supplement lectures and exercises.	**58.8% (10)**	35.3% (6)	5.9% (1)	0.0% (0)	17
E-learning should be nothing more than the distribution of notes over the internet.	0.0% (0)	11.8% (2)	**52.9% (9)**	35.3% (6)	17
I find it awkward to speak out in the classroom, but I would find it easier to participate in a discussion in an online-forum.	**64.7% (11)**	23.5% (4)	5.9% (1)	5.9% (1)	17

voluntary and anonymous. The lecturer was not able to determine who has or has not filled out the questionnaire. The questionnaire was designed by Survey Monkey and the web link *i.e.* http://www.surveymonkey.com/s/NGLKBVN was sent to participants by email. Out of 20 students, only 17 students responded. The questionnaire covers items mainly about:

1. *Attitudes towards E-learning* and
2. *Computer and Internet usage.*

Attitudes towards E-learning were determined by the students' agreement or disagreement with several statements about the importance of information and technology in medical education. Computer usages and attitudes towards E-learning were measured by using an ordinary scale.

Results

Table 1 shows students' agreement or disagreement with statements on usefulness of E-learing. Majority of students (16 out of 17) considered that E-learning technologies should play an important role in teaching and its training should be available to supplement the lectures and exercises. About 88% students found themselves awkward to speak out in the classroom, but easier to participate in a discussion over online forum. On other hand, about 50% students disagreed with the statement that E-learning programs are able to replace lectures.

Table 2 and 3 show number (%) of students having experiences with some learning

Table 2: Students' Response to Question – 2 (Different Types of Learning Programs Exist on Internet. With which of the Followings have You Already Worked?)

	Response Percent	Response count
Image repositories	52.9%	9
Hypertexts (web-based textbooks)	58.8%	10
Simulations (Patient or laboratory simulations)	23.5%	4
Quizzes	**82.4%**	**14**
crosswords	23.5%	4
Cross matching	29.4%	5
Animations	58.8%	10
Encyclopedias	**82.4%**	**14**
Forums for communicating with other students	35.3%	6
Learning management systems	0.0%	0
Other (please specify)	11.8%	2

Table 3: Students' Response to Question – 3 (Which of the Following Types do you Consider the Most Useful for Learning?)

	Response Percent	Response count
Image repositories	58.8%	10
Hypertexts (web-based textbooks)	41.2%	7
Simulations (Patient or laboratory simulations)	**76.5%**	**13**
Quizzes	47.1%	8
crosswords	11.8%	2
Cross matching	11.8%	2
Animations	58.8%	10
Encyclopedias	**76.5%**	**13**
Forums for communicating with other students	41.2%	7
Learning management systems	5.9%	1
Other (please specify)	0.0%	0

Table 4: Students' Response to Question – 5 (How Often do You Use a Computer for the Following Tasks?)

	Daily	Several times a week	Several times a month	Less often	Never	Response count
Write texts	**29.4% (5)**	**29.4% (5)**	11.8% (2)	23.5% (4)	5.9% (1)	17
Create spread sheets or perform calculations	0.0% (0)	0.0% (0)	6.3% (1)	**68.8% (11)**	25.0% (4)	16
Create or touch up images	0.0% (0)	23.5% (4)	**29.4% (5)**	**29.4% (5)**	17.6% (3)	17
Play games	17.6% (3)	**29.4% (5)**	23.5% (4)	17.6% (3)	11.8% (2)	17
Send emails	23.5% (4)	**47.1% (8)**	17.6% (3)	11.8% (2)	0.0% (0)	17
Chat	**47.1% (8)**	23.5% (4)	23.5% (4)	5.9% (1)	0.0% (0)	17
Participated in online discussion forums	5.9% (1)	11.8% (2)	5.9% (1)	29.4% (5)	**47.1% (8)**	17
Search the internet for information	41.2% (7)	**52.9% (9)**	5.9% (1)	0.0% (0)	0.0% (0)	17
Create a website or publish something on the internet	5.9% (1)	5.9% (1)	5.9% (1)	23.5% (4)	**58.8% (10)**	17

Table 5: Students' Response to Question – 6 (Do You have Ready Access to a Computer Which can be Used for Learning?)

	Response Percent	Response count
Yes, my own computer	**82.4%**	**14**
Yes, a computer shared by a family	17.6%	3
Yes, in a public computer facility	0.0%	0
No	0.0%	0

Table 6: Students' Response to Question – 7 (Does this Computer have Internet Access?)

	Response Percent	Response count
Yes, modem (telephone line)	23.5%	4
Yes, ISDN or similar	0.0%	0
Yes, ADSL or another type of broad-band	**64.7%**	**11**
Yes, LAN (public computer rooms at the institute)	0.0%	0
No	11.8%	2
Not applicable (because no computer)	0.0%	0

programs and their usefulness. The students found some programs such as simulations (76.5%) and encyclopedias (76.5%) as most useful for learning (Table 3).

Table 4 shows frequency of computer usage. Majority of students had prior experience of computer usage. The students use computer mainly to search internet for information and chat (100%), less often to participate in online discussion forums (23.5%), and never create a

Table 7: Students' Response to Question – 8 (How Often do You Use a Computer for Learning?)

	At least weekly	At least monthly	Once a term	Less often	Never	Response count
To search the internet for relevant WebPages.	64.7% (11)	23.5% (4)	5.9% (1)	5.9% (1)	0.0% (0)	17
To download notes or similar items.	35.3% (6)	29.4% (5)	17.6% (3)	17.6% (3)	0.0% (0)	16
To use a learning management system for a course.	5.9% (1)	0.0% (0)	5.9% (1)	41.2% (7)	47.1% (8)	17
To use computer or web-based learning programs (CD-ROMS, Webpages, etc.)	41.2% (7)	17.6% (3)	5.9% (1)	29.4% (5)	5.9% (1)	17

website or publish something on the internet.

Table 5 shows computer infrastructure available to students. All most all students had access to a privately owned computer either by own computer (82.4%) or shared with family members (17.6%).

Table 6 shows type of internet access to students. The great majority students had access to the internet including 64.7% *via* ADSL and 23.5% *via* modem.

Table 7 shows frequency of computer use for learning. The students often use computer for learning to search the internet for relevant pages (64.7%), web-based learning programs (41.2%) and download notes and similar items (35.3%).

In response to 'question number 4' *i.e.* at which age did you use a computer for the first time (PC, Mac or something similar)? - The average age when students began using computers for the first time was 11.5 years (9-14 years).

Discussion

The rapid development of computer and information technology in recent years has resulted in the implementation of E-learing technologies to enhance and complement traditional classroom teaching in many fields including medical science. E-learning technologies such as Learning Activity Management System (LAMS) and wiki provide more efficient and hassle-free alternatives for the preparation of teaching materials, evaluation of students' performance and management of classroom data and statistics.[11,12] Due to its emphasis on independent self-directed learning, E-learning is particularly suited for problem-based learning (PBL). PBL which is first introduced in McMaster University Medical School in 1969, is an innovative collaborative teaching and learning instructional strategy in which students solve the problems under the guidance of facilators.[13,14] This type of learning process is known to promote active participation and self-directed learning and transforms the teacher-directed learning experience to student-centered learning.

The findings of the present study suggest that a fairly large number of students have internet connections by dial-up connection. This mode of internet connection is slow and hinders the use of synchronous communication tools that require one to stay online for a long period. Preference should be given to asynchronous communication tools like forums in which teachers and students do not have to be online at the same time. This study also shows that most of our students are passive internet user and only a small number of students have experience with online discussion forum. The lack of experience with synchronous and asynchronous online communications may cause problems when using the collaboration tools included in Learning Activity Management System.[15]

Attitudes towards E-learning Technologies

Most students agree that E-learning technologies should play an important role in teaching and could serve as a supplement for the lectures and exercises. However, many students disagree that E-learning programs

could replace traditional ways of teaching. In contrast, Dørup reported a slightly greater proportion of medical students in favor of replacing traditional lectures with eLearning.[16]

Limitation of Study

This is a pilot study with a small sample size. Further researches are required on a large population to identify gender differences and to analyze the relationship between the computer use and the attitude towards E-learning. Researches show that the intensity of computer uses and previous experience with CBT/WBT have the greatest effect on students' attitude towards E-learning.[17]

Conclusion

The critical factors for the success of implementation of eLearning programs are *prior experience of using information technology, the technological infrastructure* and *the facilitator*. E-learning must be appropriate to students' level of computer expertise in order to avoid a source of frustration. Computer courses to students before implementation of E-learning technologies in classroom can improve this situation by influencing students' capabilities.

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