

Student Perception Regarding the Utility of Information Technology as a Facilitator of Learning in Medical Education

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ABSTRACT

Introduction: Information Technology (IT) has influenced all fields including healthcare and Medical Education (ME). The present generation of students have grown up in an IT enriched atmosphere and are comfortable with most IT tools and gadgets.

Aim: To understand the perception of first year MBBS students regarding role of IT in ME.

Materials and Methods: A cross-sectional, questionnaire based study was carried out on 250 first year MBBS students from August 1st, 2019 to August 31st, 2019 over a period of one month. A questionnaire containing three sections was administered to the students before the starting of IT module in foundation year. The responses to the items of the questionnaire were assessed on the basis of the student responses on the likert scale.

Results: The study revealed that students acknowledged the utility of IT for academic purposes and were primed for its inclusion as an essential component of the medical curriculum. The students conceded to browsing internet on their computers and smartphones for social media handles. However, when it came to teaching methods, students were not comfortable with the idea of replacing traditional teaching methods with e-learning. Also, students were more comfortable in reading hard copies instead of e-books.

Conclusion: It was concluded that there is a need to amalgamate the traditional teaching methods with the innovative e-learning platforms in such a way that they become mutually inclusive and facilitate the learning process. Also, ME practices need to be continuously re-evaluated to make the educational process more effective for learners, teachers and for the society in general.

Keywords: E-learning, Questionnaire based, Students, Teaching methods

INTRODUCTION

The IT is defined as the technology involving the development, maintenance, and use of computer systems, software, and networks for the processing and distribution of data [1]. The IT has become indispensable for efficient functioning of all fields and healthcare sector is no different. The present generation of students have grown up in an IT enriched atmosphere and hence, comfortable with most forms of IT tools and gadgets. The degree of exposure and ease with the gadgets varies between the students hailing from metropolitan cities and those from small towns. Advances in information and networking technology have encouraged policy makers to reframe learning objectives and learning methods in order to integrate technological processes for educational innovations. The Medical Council of India (MCI) took cognisance of the increasing dependence of the generation on IT and its potential role in transforming healthcare. Hence, a module on IT has now been made mandatory in the foundation course of newly implemented Competency Based Medical Education (CBME) in Indian medical colleges. Therefore, this study was conducted to gauge the basic level of IT understanding of the new MBBS entrants as well as understand their perception regarding the application of IT in education tools and assess their level of comfort with usage of IT tools.

MATERIALS AND METHODS

A cross-sectional, questionnaire based study was carried out on 250 first year MBBS students from August 1st, 2019 to August 31st, 2019. Ethical approval was not required for this project as per the Institutional Ethics Committee as this was an anonymous questionnaire-based study based on ME. The study was conducted at Maulana Azad Medical College, New Delhi, India. A total of 250 first year MBBS students were given the questionnaire.

Questionnaire

The self-administered questionnaire containing three sections was administered to the students before the commencement of the IT module made mandatory in the foundation course of newly implemented CBME. The first section included questions regarding the basic understanding and usage of IT tools by the students during their pre MBBS days; the second section included statements regarding the students' perception about the usage of IT during imparting ME in the medical college whereas the last section attempted to gauge the student comprehension of terms such as e-learning, e-portfolios etc., which have now become integral part of ME. The questionnaire was validated by three senior faculty members of the institute.

The responses to the items of the questionnaire were assessed on the basis of the student responses on the likert scale for section 2 and 3. Section 1 comprised of qualitative data which was analysed in accordance with principle of qualitative data handling.

STATISTICAL ANALYSIS

The data was analysed using Statistical Package for the Social Sciences (SPSS) version 20.0 (IBM Corp., Armonk, USA).

RESULTS

A total of 198 students filled the questionnaire. Sixty three percent of students were male and 35% females, 4 students (2%) didn't fill the gender. Seventy eight percent of the students had computer rest of the students were using a smartphone. Maximum number of students had acquired computer skills through classes held in school or coaching centre. Majority of students felt that IT had an important role in healthcare and that IT training should be an essential part of curriculum. However, when it came to teaching methods, students were not comfortable with the idea of replacing traditional

teaching with e-learning and felt that resources on the internet were not a good replacement for faculty. Also, students chose reading hard copies over e-books but found online discussion boards and forums to be of much use for learning. Most of the students agreed to the fact that internet provides rapid access to information and agreed upon use of e-mails for communication instead of offline circulars. Majority of students were found to be proficient in creating and editing word file and powerpoint presentation but not excel

spreadsheets [Table/Fig-1]. Students were also asked to evaluate their skill levels in various computer applications. Students were found to be confident in only few applications like word processing, powerpoint presentations, worldwide web and social media [Table/Fig-2]. However, they were not aware about terms such as hospital information system, podcasting, e-portfolios and e-learning which is understandable due to lack of exposure to complete e-learning platforms at schools.

S. No.	Questions	0	1	2	3	4	Blank	Median	Mean
1	IT has important role in healthcare	0 (0)	1 (0.5)	9 (4.6)	70 (35.7)	116 (59.2)	2	4	3.54
2	IT training should be an essential part of curriculum	3 (1.52)	1 (0.51)	35 (17.77)	69 (35.03)	89 (45.18)	1	3	3.22
3	Internet provides rapid access to information	0 (0)	1 (1.03)	2 (2.06)	35 (36.08)	159 (60.82)	1	4	3.79
4	I prefer to read e-books than hard copies	58 (29.4)	67 (34.0)	53 (26.9)	11 (5.6)	8 (4.1)	1	1	1.21
5	E-mails can be used for student communication instead of offline circulars	8 (4.1)	11 (5.6)	53 (26.9)	72 (36.5)	53 (26.9)	1	3	2.77
6	I use computers only for social networking	60 (30.6)	69 (35.2)	44 (22.4)	16 (8.2)	7 (3.6)	2	1	1.19
7	I feel teaching should be replaced by e-learning	46 (23.5)	41 (20.9)	57 (29.1)	31 (15.8)	21 (10.7)	2	2	1.69
8	Having access to computer technology is very important for medical students academic success	6 (3.1)	8 (4.1)	37 (18.9)	79 (40.3)	66 (33.7)	2	3	2.97
9	Online discussion boards and forums are not useful in student learning	59 (29.9)	72 (36.5)	45 (22.8)	14 (7.1)	7 (3.6)	1	1	1.18
10	Resources on the internet don't make a good replacement for faculty	2 (1.0)	13 (6.6)	25 (12.7)	78 (39.6)	79 (40.1)	1	3	3.11
11	I am well versed with information about computer components	12 (6.1)	24 (12.2)	44 (22.4)	58 (29.6)	58 (29.6)	2	3	2.64
12	I am fully aware about how to edit, delete, copy, modify a word file	15 (7.6)	12 (6.1)	16 (8.1)	50 (25.4)	104 (52.8)	1	4	3.1
13	I am fully aware about how to edit, delete, copy, modify worksheets in excel	19 (9.6)	24 (12.2)	49 (24.9)	52 (26.4)	53 (26.9)	1	3	2.49
14	I am fully aware about how to edit, delete, copy, modify presentations in powerpoint	18 (9.2)	12 (6.1)	21 (10.7)	58 (29.6)	87 (44.4)	2	3	2.94

[Table/Fig-1]: Student responses on the likert scale on questions regarding utility of IT in Medical Education (ME).

0 signifies least score and 4 highest score; values described as n (%)

S. No.	Parameter	A	B	C	D	BLANK	A (%)	B (%)	C (%)	D (%)
1	Word processing	33	63	73	24	5	16.7	31.8	36.9	12.1
2	Graphic programs	120	61	11	2	4	60.6	30.8	5.6	1.0
3	Spreadsheets	81	65	41	8	3	40.9	32.8	20.7	4.0
4	Powerpoint presentations	19	54	78	43	4	9.6	27.3	39.4	21.7
5	World wide web	21	36	75	62	4	10.6	18.2	37.9	31.3
6	E-mail	5	21	98	71	3	2.5	10.6	49.5	35.9
7	Social-media applications	11	26	93	64	4	5.6	13.1	47.0	32.3
8	Chatrooms, forums	78	45	46	24	5	39.4	22.7	23.2	12.1
9	Hospital information system	171	15	2	3	7	86.4	7.6	1.0	1.5
10	Community information system	166	23	3	1	5	83.8	11.6	1.5	0.5
11	Electronic health records	151	34	7	0	6	76.3	17.2	3.5	0.0
12	Electronic medication system	151	34	7	0	6	76.3	17.2	3.5	0.0
13	e-health systems	141	45	5	0	7	71.2	22.7	2.5	0.0
14	Telehealth systems	171	20	1	0	6	86.4	10.1	0.5	0.0
15	Research software	131	48	8	4	7	66.2	24.2	4.0	2.0
16	Webcasting	157	24	4	4	9	79.3	12.1	2.0	2.0
17	Video-conferencing	46	85	45	16	6	23.2	42.9	22.7	8.1
18	Virtual-reality, simulation	110	55	15	10	8	55.6	27.8	7.6	5.1
19	Internet/Radio/Video TV	17	39	77	58	7	8.6	19.7	38.9	29.3
20	e-learning software	48	52	67	25	6	24.2	26.3	33.8	12.6
21	Cell and smartphones	7	18	85	82	6	3.5	9.1	42.9	41.4
22	Tablets	17	41	69	65	6	8.6	20.7	34.8	32.8
23	Digital camera	27	62	66	36	7	13.6	31.3	33.3	18.2
24	Educational games	33	74	57	28	6	16.7	37.4	28.8	14.1
25	Artificial intelligence	99	58	26	8	7	50.0	29.3	13.1	4.0

[Table/Fig-2]: Student baseline knowledge regarding the various IT terminologies and technologies used in ME.

A-No experience, novice

B-Some experience, Advanced beginner

C-Comfortable user, competent

D-Skilled user, proficient

DISCUSSION

The present day college and university students comprise of a generation who have grown up in a digital environment with IT becoming indispensable for daily living. Children are now proficient with smartphones even before they become verbal. Since social media and IT has become an integral part of lives in such a sweeping manner, it would really be worthwhile to utilise it for imparting education [2]. The field of IT is dynamic and evolving with newer softwares and tools being added to the enormous kitty every day. This gargantuan collection can be used to foster student-faculty interaction and facilitate self-directed learning and understanding through online classrooms, online resources and assessment tools. The IT also provides immense potential for collaborative learning and community outreach. Simulation technology is used for imparting technical skills such as laproscopic procedures, anaesthesia and surgical skills, emergency resuscitation, and management that are otherwise difficult in view of lack of resources [3,4].

Keeping these advantages in mind, e-learning was introduced in curriculum in the western world. Though it was accepted with a lot of enthusiasm by both students and teachers, a number of issues have somehow slowed its full-fledged incorporation in developing countries like India. The need for basic infrastructure such as internet connection, functional computers and computer literacy among both students and teachers in our cash strapped education branch makes it difficult to implement [5]. Moreover, the absence of emotional connects and real presence of the teacher in the virtual world leads to demotivation and isolation among the students. Nonetheless the outreach of IT cannot be neglected and the government is striving to provide infrastructure to impart e-learning to students to keep them at par with their western counterparts.

Taking all this into consideration, a questionnaire was designed to assess the perception of first year MBBS undergraduate students regarding the use of newer forms of technology in teaching methods and what forms of technology they are comfortable with using in their day to day activities. This will benefit in designing e-learning modules for them on the basis of their basic exposure and comfort level.

The present study revealed that students acknowledged the utility of IT for academic purposes and were primed for its inclusion as an essential component of our medical curriculum. The students conceded to browsing internet on their computers and smartphones for social media handles. However, when it came to teaching methods, students were not comfortable with the idea of replacing traditional teaching methods with e-learning. Majority of students were found to be proficient in creating and editing word file and powerpoint presentation but not excel spreadsheets. They also proposed for the digital dissemination of circulars. There are many reasons justifying this for example: easy accessibility, easy sharing, storage for future reference and availability of print outs as and when required [6]. In our study, students did not prefer reading e-books over hard copies. This is in agreement with the general consensus. People in general like reading hard copies [7]. The use of Online Discussion Forum (ODF) has emerged as a common tool and an effective way of engaging students in the learning process [8]. The ODF is an e-learning platform that provides students with privilege to post messages to the discussion threads, interact and receive feedback from other students and instructor, and hence, create a deeper understanding of the subject matter being discussed. In this study, the students found online discussion boards and forums useful for better understanding of the subject. However, students still felt that teachers are still required and e-learning cannot be a replacement for faculty.

Researchers have already tapped the technology savvy approach of medical students and studies have yielded encouraging results. Huang HM et al., reported the positive outlook of the learners towards the use of this form of technology as a teaching method [9]. Similarly the utility of IT in anatomy has been documented by Lim KH et al., [10]. The enhancement of learning outcomes and better participation of students in e-classrooms has been documented by Fonseca N et al., and Gulek JC and Demirtas H, respectively among others [11,12]. The practicality of using smartphones which have now become an absolute necessity in reinforcing comprehension and understanding among medical students has been documented by many researchers such as Valle J et al., Gavali MY et al., among others [13,14].

However, many report contrary results with the advent of IT on the student performance. Lewis TL et al., reported that evidence is not convincing enough regarding the applicability of mobile apps for education [15]. Another study by Malaney GD reported fall in grades owing to excessive time spent over the internet surfing for online resources [16]. Moreover, there is no supervision on their online activities which may be digressing to social media handles rather than academic web-surfing [17].

Limitation(s)

There are however certain limitations to this study. It has a relatively small sample size. Also, this was a point of time study, where the perception of students was assessed just at the beginning of their course based on whatever knowledge of IT they already had. No follow-ups were conducted.

CONCLUSION(S)

The ME practices need to be continuously re-evaluated to make the educational process more effective for learners, teachers and for the society in general. The usage of IT is increasing in all fields including healthcare and ME. Both students and teachers are exploring new options for teaching-learning activities which are easy to use, interactive and effectively impart knowledge. There is a need to amalgamate the traditional teaching methods with the innovative e-learning platforms in such a way that they become mutually inclusive and facilitate the learning process. The teacher student camaraderie and the human touch need to be kept intact to make our students empathetic towards the society and become community healers instead of repositories of knowledge obtained from multiple search engines. There exists a huge potential for future research as it can be analysed if the perception of students towards IT changed as they moved ahead in their MBBS course and got exposed to newer e-learning techniques and technology to assist them in their learning process.

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