

# The Study of Usage of Online Learning Resources in Medical Courses

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**Abstract** - Medical education is a continuous process from undergraduate study of Anatomy to a specialist handling a critical case. Medicine is a field of scientific theoretical knowledge as well as manual skillful practice. Virtual study techniques and virtual patients can play a crucial role in medical education. Hence, the present study was undertaken to understand the extent to which online resources are used by medical graduates in their learning and how this can be further boosted. The study confirmed the need to integrate information technology to traditional methods of teaching for better learning outcomes. Thus, there is a need for curriculum modification and structured computer training of medical students and faculty.

**Keywords** - Medical education; online learning resources; traditional methods; integrated teaching;

## I. INTRODUCTION

Medical education is a continuous process from undergraduate study of Anatomy to a specialist handling a life threatening critical case [1]. It is lifelong learning. It also needs deliberate practice of desired outcomes in education [2]. The educational needs in medicine are multiple in form and level. They include easy, quick and in time access to content like text or photographs to inclusion of sophisticated Virtual reality systems, virtual study techniques and virtual patients aid in medical education.

There is continuous and an exponential growth in the knowledge of structure and function of human body. In many application fields, there is simultaneous rapid rise of sophisticated methods. There are many factors in the medical education which makes teaching and learning difficult. This includes shorter duration of stay in hospital, acutely ill patients and limited instructors' time. There is a shift from traditional hands-on medical actions to computer based manipulations or imagery with advances in technology. For example, instead of learning Anatomy by cadaveric dissections, Virtual Anatomy tables are developed. The Anatomage Table is the most technologically advanced anatomy visualization system in the market. It is a virtual library of human and animal cadavers. It is also a clinical diagnostic tool by visualization of any Medical CT, CBCT

or MRI scan. There is an operating table form factor, renowned radiology software and clinical content in the Anatomage Table [3, 4, 5, 6, 7].

Information Technology is now pervasive and the research and development that is taking place in IT and its allied fields has brought about a radical change in Healthcare sector too. Application of technological solutions is bringing disruptive changes and is not only increasing efficiency but also lead to more infallible outcomes. Scope of IT is limitless - inferring knowledge from complex heterogeneous patient sources, understanding unstructured clinical notes in the right context, efficiently handling large volumes of medical imaging data and extracting, potentially useful information and biomarkers, capturing the patient's behavioral data through several sensors; their various social interactions and communications.

So it is desirable that online resources and other IT tools are integrated in the medical education so that students can cope with the radically changing medical profession.

Hence, the present study was undertaken to understand the extent of usage of IT, specifically online resources in by medical students at different levels and how it can be further augmented.

## II. AIMS AND OBJECTIVES

The aim of the present study is to know the level of awareness and extent of use of online resources by medical graduates.

- To find out whether medical graduates seek for clinical information via online resources.
- To study the level of awareness about IT in medical graduates
- To find out whether they are made aware of these facilities by their professional teachers.
- To find whether medical graduates are known to the latest IT applications and facilities available for them.
- To find how much these facilitates their learning

- To find out whether the available online information is sufficient, accessible, visually appealing and reliable.
- To find out for which subject online resources are most used by the medical graduates.
- To suggest directions for future research.

### III. REVIEW OF LITERATURE

Study conducted by Nurjahan M.I., T.A. Lim, S.W. Yeong, on Utilization of Information Technology In Medical Education, concludes that a majority of their students surveyed (75.4%) had never used any electronic literature (e.g. MEDLINE) search [8].

[9, 10, 11] explore the use of learning resources in medical education. Bulu Maharana et al conducted a study on Use of Information and Communication Technology by Medical Students in VSS Medical College, Burla, India. They found that medical professionals usually use computers only once in a month. Nearly 10% never use a computer [12]. Similarly Praveen Kumar in the study of Application of ICT by medical students of Government Medical College, Chandigarh, found that that only 12.76% of the medical students use the Internet to get information for patients [13]. While the use of CD-ROM and interactive software packages have greatly contributed to dissemination of information among health care professionals, its use is still very limited in developing countries in Africa [14,15].

The Internet provides opportunities to retrieve up-to-date information on different aspects of diseases, interact with colleagues via video conferencing, and enhance communication amongst colleagues in different continents. Free access to Medline, medical journals, textbooks and the latest information on breakthroughs in medicine also encourages learning and research [16].

Clinical informatics aims to improve patient care by the intelligent application of technology and hopes to increase the effectiveness and efficiency of care, as well as patient safety [17,18]. Informatics can fulfill its promises in developing countries only if health care professionals are trained in basic computing skills and IT. Designing such training will necessitate an assessment of baseline knowledge and the utilization patterns by medical graduates involved in health care delivery which is the major thrust of this survey.

Often there is a “cultural lag” in appropriately pairing novel technology with effective use, making it essential that medical educators be confident that educational theory guides and supports their use of technology [19]. With a few notable exceptions, the bulk of educational technology research in the medical education literature has been criticized as deficient in either methodological approach, conceptual framework, or both [20, 21, 22].

### IV. METHODOLOGY

The research survey was conducted at Dr. D.Y.Patil Medical College, Nerul, Navi Mumbai, India. Dr. D.Y.Patil Medical College represents one of the largest Hospitals in

Navi Mumbai to deliver quality health care to people from all walks of life.

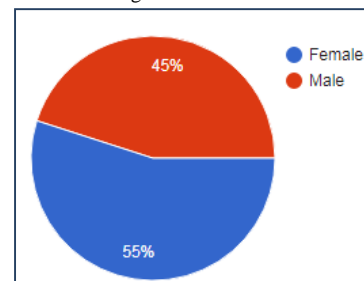
The literature review does not support sufficient data to understand the use and awareness of Information Technology amongst Medical graduates in the Indian scenario. Hence, Quantitative approach was implemented to understand the same. Survey method was used to get data. A well designed pretested questionnaire was administered amongst the respondents so as to gather knowledge, about awareness and use of IT, amongst medical students. The relevant sample size was calculated. Since the research is study of usage of online resources in medical courses, respondents from different levels were selected. The sample size of respondents was calculated as 200. To reach out to maximum number of students the survey of objective questions was designed using Google Forms and circulated via e-mails and what's app. 5-point Likert scale was used in majority of the questions.

An initial consent was acquired from the Dean to carry out the well designed survey. A written communication was sent to various departments so as to carry out the survey department wise. Before the start of the survey the respondents were made aware about the study and its relevance to them in their respective domains. Out of the sample size of 220, 111 respondents submitted information by answering the questionnaire. The respondents comprised of first, second and third MBBS Students.

### V. DEMOGRAPHICS OF THE RESPONDENTS

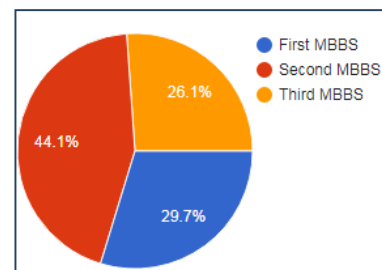
Out of 111 respondents, 45% respondents were male and 55% female.

Figure. 1: Gender



Though efforts were made to get equal number of responses from students of 1st , 2nd and 3rd year MBBS, more responses were received from 2nd year students.

Figure. 2: Current Year Level of Respondents



VI. RESULTS AND DISCUSSION

A total of 8 questions were asked to the students, the responses to which are discussed below.

As indicated in Fig. 3, it was found that 58 students (52%) refer online resources almost every day, 37 students (33%) refer frequently and 13 students (12%) often. Only 3 students (3%) rarely use online resources. Level of awareness of online resources amongst medical students is quite good and in fact that is their first preference while seeking out more information.

Figure. 3: Which resource is usually your first approach when seeking clinical information?

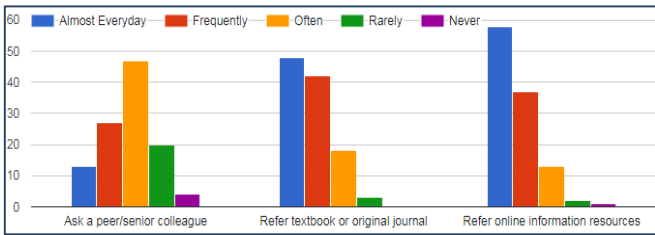
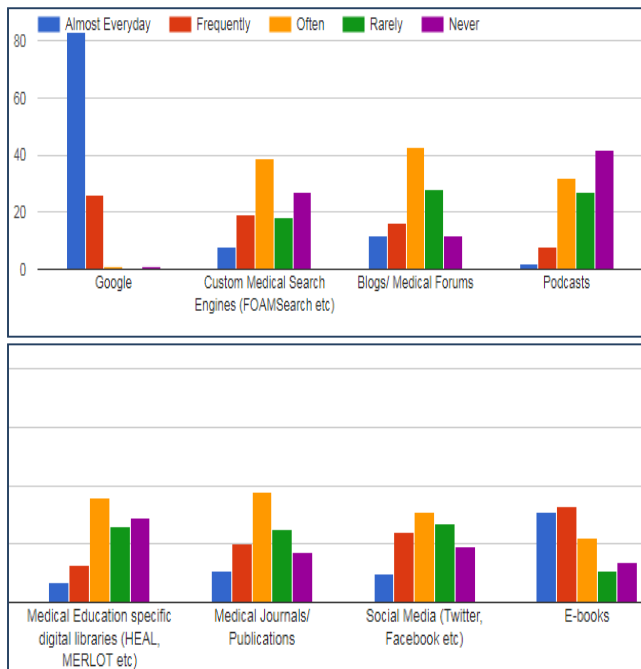


Fig. 4 shows that out of all resources available, generic search engine Google is used the most by the students, even more than custom medical search engines. 75% students use Google almost every day as compared to custom search engines usage by 7% students only. Usage of medical specific digital libraries is also low- 6% students. This indicates that usage of medical specific resources, whether it be digital libraries or medical journals is low.

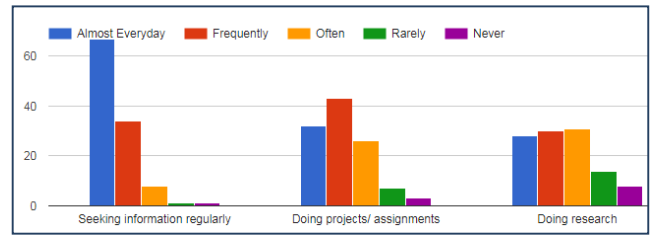
Fig. 4: Frequency of use of various online learning resources by you?



As per Fig. 5, online resources are majorly used daily by students for seeking regular information in 60% cases rather than for doing projects/ assignments (29%) or research

(25%). There is a good usage of online resources for doing projects and research, though not on a daily basis.

Figure 5: Online learning resources are used by you for –



As shown in Fig. 6, 64 % students responded that they are made aware of online resources by their professors quite frequently. This clearly indicates that medical academicians too realize the advantage of integrating usage of IT, specifically online resources in addition to the structured traditional methodology.

Figure. 6: Do your professors make you aware about these online resources?

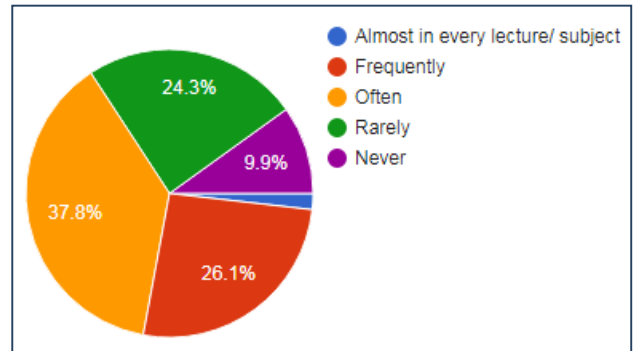


Fig. 7 tells that 71 % students are making use of online tools to collaborate for their projects and assignments. This clearly indicates that these students when they start their medical practice would be proficient in usage of IT tools that would be beneficial for them in managing their day-to-day operations, connect to their patients, create general health awareness or do collaborative research.

Figure. 7: Do you use online tools (Google docs, hangouts etc) to collaborate for your projects or assignments?

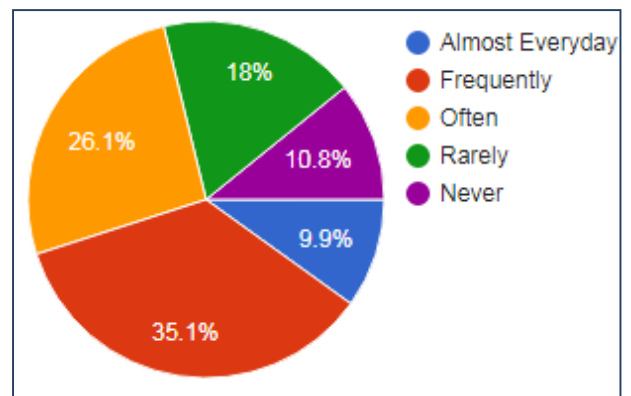
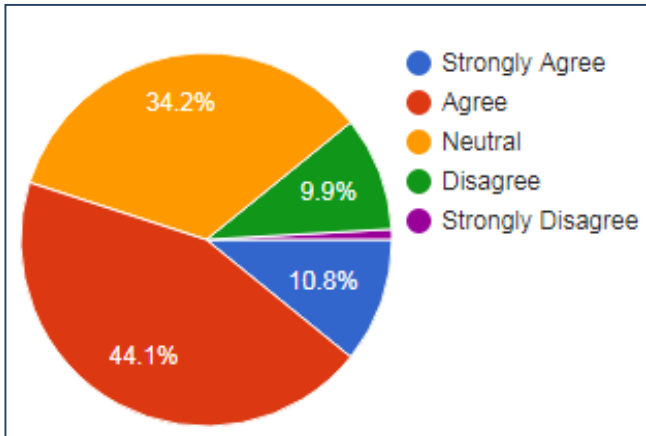


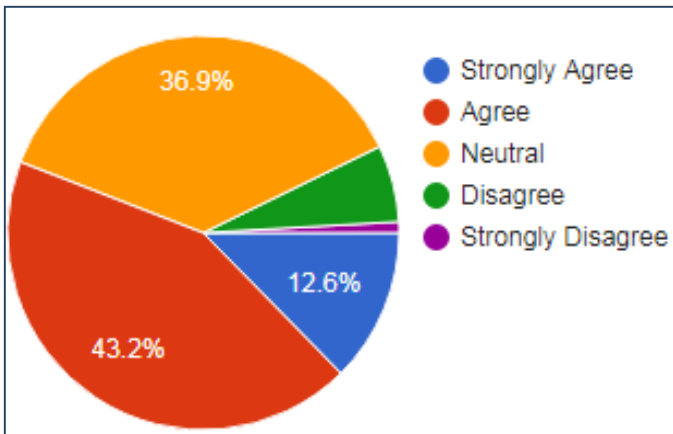
Figure. 8 tells that according to 55% students, information available satisfies all their requirements. Only 11% students feel that information available only is not sufficient, 34% students are neutral. This evidently indicates at the need of making more and relevant medical information available online.

Figure. 8: Information available online is sufficient for your purposes?



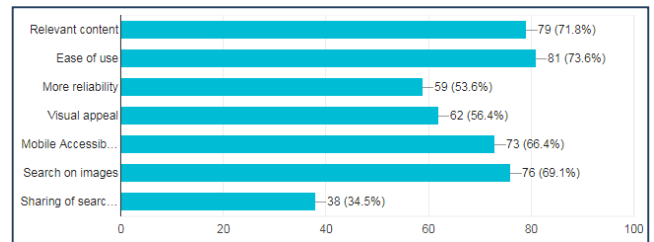
The study results in Fig. 9 showed that only 56% students felt that online resources are reliable, 40% are neutral and 7 % feel they are not reliable. This clearly depicts need of authentic platforms which provide trustworthy information.

Figure. 9: Information available online is reliable?



As shown in fig. 10, ease of use and relevant content are the most desired features in online learning resources by medical students. Sharing of search information, more reliability and visual appeal are the least wanted features.

Figure 10: Features desired by you in online learning resources (can select more than one)



To understand the level of usage and applicability of online learning resources in different subjects, we asked MBBS students of all three-1st, 2nd and 3rd year to rate their usage and preference for all subjects. Responses received from 1st, 2nd and 3rd year students are shown in fig. 11, 12 and 13 respectively. In 1st year maximum usage of online resources is in Anatomy, in 2nd in Pathology and in 3rd year in Medicine. Usage is minimum in Biochemistry, Forensic Medicine and Preventive and Social Medicine in 1st, 2nd and 3rd years respectively.

Figure. 11: In which subject do you refer to online resources the most? Responses by First year MBBS

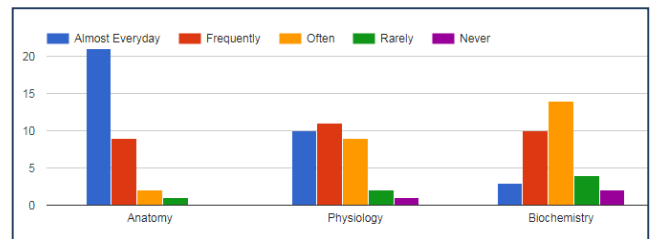


Figure. 12: In which subject do you refer to online resources the most? Responses by Second year MBBS

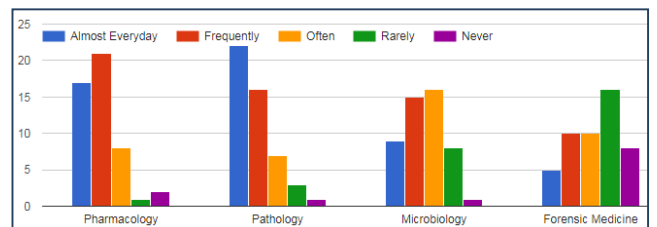
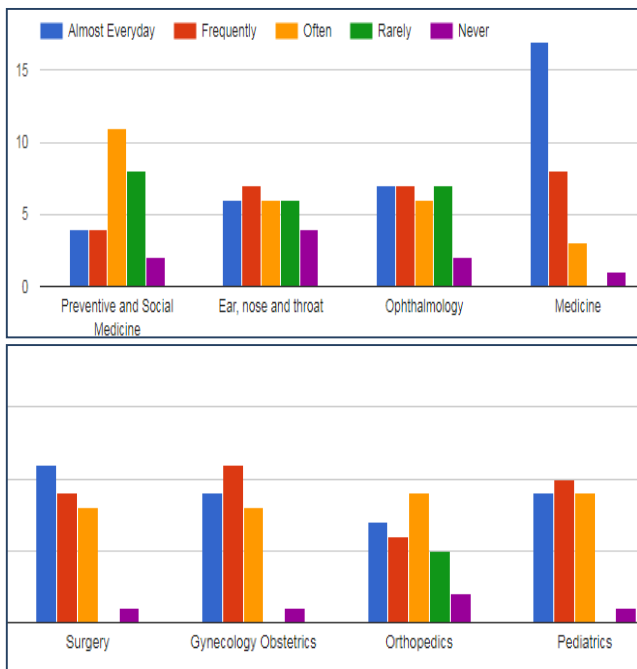


Figure 13: In which subject do you refer to online resources the most? Responses by Third year MBBS



## VII. CONCLUSION AND SUGGESTIONS

It is indicative from the results of the study (refer fig. 3, 4, 5, 6) that both students and faculty of medical courses believe that online educational resources and technologies can enhance teaching and learning in medical education. The level of awareness and usage of IT tools and online resources amongst medical graduates in a tertiary healthcare hospital in Metropolitan city like Navi Mumbai is good.

Though the usage is good in general, but that of medical specific resources like medical digital libraries, journals or podcasts is very low. The reasons for the same might be lack of relevant resources and their suitability or students are not aware of them. The reasons for it need to be further investigated. It is only then use of these resources will also increase for projects and research purposes. To achieve this it is imperative that medical professional bodies and IT professionals, together work towards provision of high quality relevant resources available to the medical fraternity.

In order to increase the level of computer literacy and the usage of IT among medical graduates it is suggested that positive steps need to be taken to introduce and implement the usage of Information Technology in the graduate and post graduate courses of Medicine. This includes measures such as increasing access to computers and formal inclusion of IT in the undergraduate medical curriculum. The results also confirmed the need to integrate IT to traditional method of teaching. Thus, there is a need for curriculum modification and structured computer training for faculty and students.

## VIII. ACKNOWLEDGEMENT

We are sincerely thankful to Dr. Surekha Patil, Dean, Dr. D.Y. Patil Medical College, Nerul, Navi Mumbai for giving us permission to conduct survey and perform the research at this Institution. We are thankful to Dr. D.Y. Patil University

and School of Medicine for providing us the necessary infrastructure and support to conduct and complete the study of research. We are thankful to all the faculty and staff members of Dr. D.Y. Patil Medical College who were directly or indirectly involved in the completion of this research work.

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