



THE ROLE OF E-LEARNING AND E-LIBRARIES IN MEDICAL EDUCATION

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ABSTRACT

The study of human medicine involves acquiring large volumes of knowledge and translating it into prevention, detection and treatment of disease. The 21st century has seen an increased integration of technology into medical education. The ease of access and cost effectiveness of Internet resources has opened the Pandora box of opportunities for learners in education field.

The increased demand of digital learning has made training of faculty in E-Learning a necessity and thus should be a part of continuous faculty development programs.

Faculty and librarians of medical institutions need to increasingly collaborate with each other to make acquisition, distribution and utilization of learning resources more effective for faculty and students. Librarians can become effective educators for students.

A competent physician in the modern world is created by the fusion of conventional and digital learning.

KEYWORDS : E-Technology, Students, Teachers, Librarian, Collaboration.

INTRODUCTION

Medical education is constantly changing which can be attributed to changing in teaching styles, changes in medical practice, the changing role of the physician, altered social expectations, continuous updates in medical science and diversity of pedagogical techniques^[1].

Information technology has become an integral part of human life. E-learning has become the key feature of 21st century education.

Students of the modern world are 'Digital Natives', who rely extensively on audio visual media and online resources for learning^[2]. Ease of access, cost effectiveness and user friendly interfaces have made major contributions in facilitating the dramatic change in learning patterns in the last few decades^[3].

'Digital literacy' is defined as: the ability to use technology, communication tools or networks to locate, evaluate, use and create information with the ability to understand and use information in multiple formats from a wide range of sources when presented via computers. It includes the ability to read and interpret media, reproduce data and images through digital manipulation and evaluate and apply new knowledge gained from digital environments^[4].

It is imperative, that medical students and health care providers be equipped with the skills of information technology systems to help acquire the latest medical knowledge, be updated with medical advances and improve quality of health care^[5,6].

CHALLENGES IN MEDICAL EDUCATION OF THE 21ST CENTURY

- Updating information on a minute to minute basis
- Developing integrated curricula focusing on knowledge and skill development while maintaining professional standards
- Promoting lifelong learning
- Meeting the growing demands of 'Digital Natives' through interactive classroom sessions supported by audio visual media

- Maximizing teaching students at all levels of learning and understanding
- Changing health care practices and patient expectations
- Optimizing patient safety

REQUIREMENT OF TECHNOLOGY IN MEDICINE

Medical education is progressing by leaps and bounds. Technology can help facilitate active learning with a lasting impact. It can also help to transform students into independent, self-motivated learners capable of collaborative learning.

A survey conducted by the Ohio State University College of Medicine identified the following aspects to be crucial in medical school training^[7];

1. Clinical problem solving
2. Acquiring knowledge from a variety of resources and being well trained in IT skills
3. Developing professional and empathetic bedside manner
4. Teamwork
5. Clinical research.

These key aspects of learning can be achieved by well-trained faculty and librarians who play a vital role in helping students use technology effectively in their career.

APPLICATIONS OF TECHNOLOGY IN MEDICAL TEACHING

Ellawy and Masters define E-Learning as 'A pedagogical approach that typically aspires to be flexible, engaging and learner-centered; one that encourages interaction (staff-staff, staff-student, student-student), collaboration and communication, often asynchronously (though not exclusively so).¹ In simple terms, any teaching method that uses technology for effective learning will be known as E-learning^[8].

There are different types of E-learning:

1. Modern Didactic lectures (flipped classroom sessions): the most common teaching method where the teacher acts as fulcrum for learning with the use of electronic resources. Study material is provided in the form of handouts, PowerPoint Presentations, Word documents, Videos, Audio clippings and Case studies. This

encourages students to read the study material, gather more information from resources in the library with the help of the librarian and then have interactive discussions with fellow students and teachers.

2. Active learning (Team based, Problem based, Scenario based learning): in this form of learning, study materials relevant to a topic are provided in advance for students to understand, gather more information and have discussions with fellow students. During the classroom session, students get to clarify concepts and ask doubts generated during their peer discussions with the faculty.
3. Interactive learning: co-learners interact and instructors act as facilitators to help in the evolution of learning^[8].
4. Synchronous E-learning: students have the convenience of learning from the comfort of their home while being in contact with their faculty and librarians via the internet.
5. Asynchronous E-Learning: students oversee their own learning with little assistance from faculty and peers.

'Blended learning' is where the faculty uses a combination of the above E-learning styles to aid in teaching. Hence, students get the benefit of both conventional and modern teaching tools.

COMMON E-LEARNING TOOLS IN MEDICAL EDUCATION

Online learning tools were classified into three categories by Bullock and Webb^[10]:

1. M-learning: smartphone apps, drug guides and medical calculators useful at the workplace
2. Simulations: help to develop technical skills and close the gap between virtual and reality learning
3. Social media sites, blogs and content communities like YouTube which provide a collaborative learning approach

Most commonly, faculty use the following teaching modalities for effective teaching:

1. Audio visual media: PowerPoint presentations, videos, animations, interactive charts and diagrams
2. Online lecture handouts and weekly quizzes
3. Online discussion forums
4. Online resources shared via group emails and social media platforms(Facebook, Twitter, YouTube, WhatsApp)
5. Active learning strategies
6. Smartphone apps: dosage calculators, growth charts, Curofy, Docplexus, SCAT, PubMed and other medical databases^[11]
7. Simulation labs for clinical skills training- helps to replicate real life scenarios and enhance practice in a safe and controlled environment. It also helps to inculcate team work^[11,12]
8. E-libraries

FACULTY DEVELOPMENT AND TRAINING

The faculty and librarians plays a crucial role in bridging the gap between learning resources and students. Being well trained with the skills of information technology has become a necessity for faculty and librarians in the modern world.

An important factor that predicts the success of faculty and librarian training is their readiness to accept and apply E-learning tools in their regular teaching.

The Recommendations and Guidelines for Medical Educators states that, competency-based teachers training and certification programs should be developed for the effective use of advanced educational technologies. These programs should teach the theoretical underpinnings of educational technology coupled with practical expertise in specific approaches^[13].

The 'ADDIE' (**A**nalyze, **D**esign, **D**evelop, **I**mplement,

Evaluate) framework is commonly used as a collaborative training strategy for faculty and librarians to help organize an educational technology project^[14].

BENEFITS AND LIMITATIONS OF E-LEARNING IN MEDICAL EDUCATION

The key benefits of digital learning in medical education, as studied by Guze^[12], are:

- Learning in controlled environments that eliminate safety risks for patients and students
- Enhanced, realistic visualization of anatomical structures
- Availability of authentic content verified by librarians
- The medium of instruction can be personalized to meet individual and group needs.
- Learners are responsible for their own educational experience.
- Increasing practice sessions to master clinical skills
- Standardization of assessment methodologies

According to the Department of Health of United Kingdom^[15], technology needs to be well regulated for effective and ethical usage. Bullock and Webb^[10] highlighted 3 important factors that faculty should be aware of when using digital teaching tools:

1. Maintaining professionalism and appropriate online etiquette at workplaces
2. Reliability of information on online educational resources
3. Increasing inattentiveness and dependency on electronic gadgets like smartphones

CHANGING ROLES OF THE LIBRARIAN IN MODERN MEDICAL EDUCATION

In a study conducted by Crum et al, it was found that health sciences librarianship has undergone radical changes over the last twenty years as more number of collections go digital and librarians become deeply involved in the provision of instruction in information literacy, medical informatics, evidence based research skills and problem-based learning^[16]. Librarians help in moving towards a collaborative, consultative practice that is more closely aligned with user needs^[17,18]. They help students learn how to gather, analyze and apply acquired information. This has moved librarians out of the and into program development centers within hospitals and teaching insitutions.

Even though librarians have started to incorporate digital media into their libraries, several questions regarding the changing role of librarians in medical education still remain unanswered. More needs to be understood about whether faculty and students have realized the above change and explored the possibility of collaborating with librarians for effective learning.

Responsibilities Of Librarians In Medical Institutions

1. Providing orientations programs to all students in the university: freshman and senior students need to informed about appropriate utilization of online resources, steps in conducting an effective research study, plagiarism and its consequences, usage of statistical tools
2. Conducting training modules for faculty, staff and students
3. Collaborating with faculty.
4. Involvement in curriculum designing and implementation ;allows the librarian to procure appropriate resources for the course

COLLABORATIONS BETWEEN FACULTY AND LIBRARIANS

Collaboration is a mutually beneficial and well defined relationship entered into by two or more organizations to achieve results they are more likely to achieve together than alone. It has three levels of progression: co-operation, co-ordination, and true collaboration^[19].

The Association of Teacher-Librarianship of Canada (1998) pointed out that the role of the teacher-librarians in the 21st Century is to provide leadership in collaborative program planning and teaching to ensure both physical and intellectual access to information and commitment to voluntarily reading^[20].

Details regarding the availability of resources should be shared with teachers who can motivate students to use them effectively.

In the State of Oregon, USA, Lance, Rodney and Hamilton-Pennell^[21] studied the effectiveness of collaboration between teachers and librarians in community schools and found that a successful teacher librarian is one who works with a classroom teacher to identify materials that best support and enrich an instructional unit to be the source of digital literacy. This statement holds true for educational institutions at all levels – from schools to universities and beyond.

Both teachers and librarians benefit from this collaboration^[22]. It helps to improve inter personal relations and sense of well-being, create a sense of accomplishment and build an exciting environment for generating creative ideas. It also enhances the commitment and desire required to improve as professionals.

CONCLUSION

E-learning has become an integral part of medical education, gaining more recognition with every passing year. Medical institutions, their faculty and librarians, must be willing to accept this change. Effective collaborations between faculty and librarians will help to acquire E-resources to enhance the learning experience for students. A well structured training program is essential to train faculty, librarians and students in skills of information and technology.

Medical educators and administrators should embrace the 'Blended approach' of teaching. This will benefit students by:

- Increasing interactions with peers, faculty and librarians
- Building team spirit and development of effective communication skills
- Enabling practice of clinical skills in safe environments with constructive feedback on performance
- Effective implementation of medical ethic
- Developing clinical decision making and critical thinking skills

Thus, technology and medical education can be integrated to achieve state of the art medical care.

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