https://doi.org/10.3329/cbmj.v13i2.75324

Integrating E-learning into Medical Education – Phase-I of MBBS Programme in Bangladesh: Prospects and Challenges for the Students, Instructors and Policy Makers

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Abstract

Over the past few decades, there has been a shift in medical education from the traditional didactic model of instruction to other modalities like online or electronic learning (e-learning). E-learning is being increasingly utilized in medical education across the globe through adaptive tutorials, audiovisual clips, simulation, and virtual models/atlas. This review aims to identify the prospects and challenges of integration of e-learning into Phase-I of MBBS Programme in Bangladesh and discuss solutions from medical educators' perspectives. E-learning has been demonstrated to be as effective as conventional teaching and learning. It allows more personalized, self-directed learning experience for the medical students. Instructors can evaluate competencies objectively through online assessments, provide personalized feedback for self-improvement to the students. For policy makers, e-learning could hold the key to success in delivering quality medical education even in those medical colleges established in the remote semi-urban areas addressing the nation's most entrenched medical teacher vacancies especially in basic subject areas like anatomy, physiology, and biochemistry. Challenges that affect the development and implementation of e-learning in medical education include lack of time and efforts, low technical skills, resource-poor infrastructure, lack of institutional strategies and support and stakeholders' negative attitude towards e-learning. Solutions to those problems may include training for professional development of the faculties with improvement of technical skills, incentives for the time and efforts in development and delivery of online content, favorable digital and tech-friendly institutional strategies and growing positive attitude towards online medical education, and above all, political commitment to ensure quality medical education.

CBMJ 2024 July: vol. 13 no. 02 P:290-297

Keywords: E-learning, medical education, MBBS programme, prospects, challenges, COVID-19 pandemic

Introduction

Due to the rapid change through integration of technologies and following trends of globalization in instructional methods in higher education opened us to newer educational practices like e-learning.[1] Over the past few decades, there has been a shift in medical education from traditional didactic model of instruction to other modalities like online or electronic learning (e-learning). E-learning is being increasingly utilized in medical education across the globe through adaptive tutorials, audiovisual clips, simulation, and virtual models / atlas.[1-3] The term "e-learning" was

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devised in 1998 by Jay Cross; electronic learning or e-learning is a popular way of developing education by technological breakthroughs. In general, the term e-learning is synonymous with online learning. E-learning becomes a new paradigm and a modern philosophy in teaching with a mission to serve as a development platform for the present-day society based on knowledge. Hence, e-learning has been defined in many ways. For example, Khan (2005) defines e-learning as "an innovative approach for delivering a well-designed, learner centred, interactive, and facilitated learning environment to anyone, anyplace, anytime".[6] According to Garrison (2011), e-learning is "electronically mediated asynchronous and synchronous communication to construct and confirm the knowledge".[7] In a broad sense, e-learning means all learning situations where there is significant use of electronic, informatics and communication resources.

In Bangladesh, a complete national lockdown was enforced between 18 March, 2020 to 25 May, 2020, which has contributed to drastic changes in medical education as online distance education became inevitable to ensure the continuity of MBBS programme but without any prior planning and preparation.[8] Faculty members and students have been suspended from face-to-face contact and have been obliged abruptly to shift from the traditional teaching and learning strategy to an unprecedented online format.[8-11]

The MBBS Programme in Bangladesh comprises five years, followed by a compulsory rotatory internship training for one year which can be opt-in any recognized hospital in the country. MBBS curriculum in Bangladesh has been divided into four phases (Table-I). All academic activities including professional examination of each phase must be completed within the specified time of the phase. During the Phase-I, the subjects selected for study are: i) Anatomy, ii) Physiology and iii) Biochemistry. Final examination under affiliated university is termed as the First Professional MBBS Examination. The total duration is one and half years. This phase is again divided into three terms (every 18 weeks).[12]

This pre-clinical phase is the major building block for the medical students in terms of acquiring basic knowledge, skills and competences in medical science.

Table-I: Phases of MBBS Programme in Bangladesh

Phase	Duration	Subjects	Examination
1st Phase	$1\frac{1}{2}$ year	Anatomy Physiology Biochemistry	First Professional MBBS
2nd Phase	1 year	Community Medicine Forensic Medicine	Second Professional MBBS
3rd Phase	1 year	Pharmacology & Therapeutics Pathology Microbiology	Third Professional MBBS
4th Phase	$1\frac{1}{2}$ year	Medicine & Allied subjects Surgery & Allied subjects Obstetrics and Gynecology	Final Professional MBBS

We, as educators of the Phase-I MBBS Programme in Bangladesh, faced the historical event of shifting online (e-learning) from our traditional face-to-face teaching and learning practice. However, abrupt closure of our medical colleges due to COVID-19 pandemic created some dramatic situation in our undergraduate medical education – both beneficial and challenging in terms of teaching strategies, use of digital technologies and assessment system. This

review aims to identify the prospects and challenges of integration of e-learning into Phase-I of MBBS Program in Bangladesh and discuss solutions from medical educators' perspectives.

Prospects

Technology is an essential element of learning in the 21st century. E-learning has the potential to make important contributions to medical education[5], not only from the view of ongoing pandemics but also from the view it from a medium of instruction. Emerging technologies open the windows of connection for instructors, students, and different stakeholders in a real-time and/or recorded basis. During the COVID-19 pandemic, e-learning was expected to maintain a balance between medical students' intended learning outcomes (i.e., theoretical knowledge and/ clinical skills and competencies) and their safety.[2,11,13,14] It was observed by the medical educators that E-learning has ensured that students are completely involved as learning takes place together with texts, videos, sounds, collaborative sharing, and interactive graphics. It may enhance the quality of teaching and learning, report the need for higher institutions for maintaining competitive advantage, and access to education and essential training.[2,4,5,13-19] The integration of available digital technologies in the form of E-learning has resulted in the reduction of students cost while improving the quality of learning and teaching.[17-19] For example, currently, low-resource contexts are faced with a lack of infrastructure, i.e., insufficient classrooms, lecture halls and dorms, and medical educators, which leads to a very limited capacity to enroll and educate students.[9,17-21] Infrastructure upscaling needs substantial investment, and staff upscaling requires a substantial investment in training. E-learning offers the possibility to quickly scale up training without the need for simultaneous resource-intensive infrastructure upscaling.[22,23] E-learning may bridge distances in rural areas for accessibility to up-to date information in medical education and reduce the need to teach theory-based, on-site classes where there are a limited number of medical teachers.[4,5,8-11,18-27] E-learning could strengthen the quantity and quality of medical education in LMICs through blended learning approaches wherein e-learning covers the theoretical and procedural training, and face-to-face training covers practical skills, for example. Since e-learning is adaptable and expandable to new technological advancements, such as artificial intelligence, once implemented, the potential of e-learning could be groundbreaking for training health care workers in LMICs.[2,4,5,8-11,14,18-27]

The role of engagement in e-learning is important for effective learning as it is not merely student-student interaction that matters.[21,22] There are six different forms of engagement that can be identified in distance learning education: (1) teacher-content (2) content-content (3) student-teacher (4) student-student (5) teacher-teacher and (6) student-content.[1] E-learning has been demonstrated to be as effective as conventional teaching and learning. It allows more personalized, self-directed learning experience for the medical students. Instructors can evaluate competencies objectively through online assessments, provide personalized feedback for self-improvement to the students.[4,5,8-10,13,18-27]

The increase in the use of technology in medical education especially during the COVID-19

pandemic had somewhat altered medical teachers' attitude as they were the main distributors of knowledge through a new and more flexible mode of online instruction comparing to the traditional face-to-face instructions. Now they are being considered more as supporters and motivators who urge and encourage students to participate and learn adopting e-learning strategies.[5,11,14,23,25-27] For an example, instructors followed some of the teaching strategies in Anatomy, Physiology and Biochemistry teaching and learning as suggested by Memon *et al.* (2021),[14] Gopalan *et al.* (2021),[28] and Nurunnabi *et al.* (2022).[29]

For policy makers, e-learning could hold the key to success in delivering quality medical education even in those medical colleges established in the remote semi-urban areas addressing the nation's most entrenched medical teacher vacancies especially in basic subject areas like anatomy, physiology, and biochemistry.[20,22,30]

Moreover, in low- and middle-income countries, online learning has the potential to (1) address faculty shortage, expanding the reach of medical educators and improving their efficiency; (2) improve access to health professions' training, increasing the number of health workers and encouraging their retention in regional units; and (3) facilitate collaboration with institutions that have more resources.[2,5,13,26,27,30]

Challenges

These challenges include academic, technological, and administrative. Challenges that affect the development and implementation of e-learning in medical education include lack of time and efforts, low technical skills, resource - poor infrastructure, lack of institutional strategies and support and stakeholders' negative attitude towards e-learning.[2,5,9-11,13,16,18,23,26, 27,30-36]

The architecture of a learning system implies a heavy task for e-learning to be integrated into a complicated system that is flexible, time scalable, and capable of lasting, even though there are many diverse tools. The learning space is left under the control of the instructors and institutions using conventional learning management system (LMS) irrespective of any external tools.[1,2,5,30] In particular, this leaves minimal space for learners to organize their digital learning space and to carry-forward their activities. Another disadvantage is maintaining motivation in an online course that online learners experience. Students who lack self-motivation and independence had reduced success rates as compared to their counterparts. Students lack motivation and can easily lose sight of their original objective, rapidly become lost within the course, and consequently withdraw from the course. Besides, online testing or assessment procedure is a major concern for many medical educators, as the in-person method has been the traditional trusted approach and the methods used in online are still to be validated.

Besides, it is obvious that not all students will choose to use an e-learning resource in the same way; hence, instructional design should have alternative approaches.[5] E-learning alone do not accomplish clinical skills competencies among medical students. Moreover, cultural barriers i.e., influence of cultural characteristics which includes individualism and collectivism in determining the perceived success of e-learning is crucial; a significant influence of individualism

and collectivism on organizational and individual impacts in teaching and learning in our medical colleges is prevailing. In the beginning of COVID-19, we had an ambiguous stand in switching to online platform from our long cherished face-to-face modalities.[1,2,5,8-11,20,35] Besides, amount of stress among medical educators and students stress has flared up due to social isolation, transition to online learning, online assessment formatting, concerns for personal health and for the health of family members.[2,5,24-27,35]

Among the technological barriers access to internet, its cost, internet speed, lack of adequate knowledge, technical competences and training of our medical educators and students on online teaching and LMS are noteworthy.[1,2,5,8-11,20,35,36]

All the above-mentioned challenges have to be considered by the different stakeholders and policy makers while propose, review, implement and analysis of the future policies on e-learning in the medical education system in a developing country like Bangladesh.

Conclusion and Recommendations

Online education or e-learning requires a change in the philosophical approach to medical education in the country. Both public and private medical colleges of Bangladesh have struggled to adapt it in the practice. Based on our literature review and personal experience, we would like to put some recommendations for future teaching and learning in medical education in the country.

1. Medical colleges need to actively engage with students to call on their ingenuity and to develop digital resources, which may benefit medical education in the long term and motivate future educators.
2. Innovation in teaching and assessment driven by the medical educators and medical students during this pandemic should continue to progress, as because it may accelerate the continuing transformation away from traditional teaching, learning, and assessment methods in medical education.
3. Provision of training for professional development of the faculties with improvement of technical skills, incentives for the time and efforts in development and delivery of online content, favourable digital and tech-friendly institutional strategies and growing positive attitude towards online medical education.
4. Further research is needed to investigate the nature and value of instructional methods, student engagement, assessment and feedback as well as their impacts on remediation.
5. Phobia among teachers and students related to e-learning platforms (i.e., using digital technologies, software, social media, privacy, misuse/abuse) needs to be addressed and mental health counselling should be in place.
6. Above all, political commitment to ensure quality medical education in the country is the core of elements needed for the future success of e-learning in medical colleges.

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