

Original Research Article

Strengths, weaknesses, opportunities, and threats analysis on impact of e-learning in biochemistry in phase-I medical undergraduates

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Received: 25 November 2021

Revised: 13 December 2021

Accepted: 17 December 2021

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ABSTRACT

Background: The concept of strengths, weaknesses, opportunities, and threats (SWOT) analysis is to identify advantages, limitations, opportunities, and dangers of e-learning scaffolds in medical education detailed in the field of biochemistry, based upon the perception of stakeholders. It is used to assist faculties in initiating meaningful change in a program and to use the data for program improvement. The aim of the study is to identify, the strength, weaknesses, threats, and opportunities of e-learning of biochemistry to MBBS first-year students.

Methods: This educational intervention study was based on an online course, and was conducted at department of biochemistry, L. N. Medical College, Bhopal. 150 students, aged from 18 to 21 years, admitted to the MBBS phase-I, were recruited as a group I and faculties of biochemistry as group II to achieve the objectives of the study. The predesigned open questionnaire was administered to record their perception on e-learning classes.

Results: The students and facilitator considered that the online teaching learning is easily accessible and flexibility of time but it also impart feeling of loneliness and unsuitable for skill development program. Though it gives an opportunity of accessibility for higher education for every-one in a very cost effective manner and allow them to balance between their education and job.

Conclusions: The online learning is a flexible and assessable teaching learning method but its effectiveness remains subject of discussion. Hence further studies on large scale are required to justify it.

Keywords: Learners, SWOT, Facilitator, Strength, Biochemistry

INTRODUCTION

During the COVID pandemic, when the educational institutes were shut down, around the globe. Teaching and learning in medical education were searching their way to communicate. Considering the scenario, the education system has changed radically, with the idiosyncratic rise of e-learning, whereby teaching and learning come together on digital scaffolds. The facilitators organized their classes through online platforms like skype, learning management system (LMS), and video-conferencing to interact with students. Online teaching-learning modes were a new concept in India, but we are experiencing a new trend of the blended learning model gaining popularity. This will

be a first-time experience for the faculties at our institution.

Whenever new techniques are introduced and implemented, it is important to analyze the impact of the same on the learner's perception. How feasible to conduct an e-learning program by educators? To try to answer this question, this study was aimed to describe and understand the use of e-learning from student's and faculties' perceptions in terms of strengths, weaknesses, opportunities, and threats (SWOT). The objectives were: to understand the efficacy of e-learning of biochemistry from the student's perception, and to study the feasibility of e-teaching of biochemistry from faculty perceptible.

E-learning is defined as “the provision of educational services in digital or electronic format”. The successful implementation of e-learning is accomplished with the help of technology, new pedagogies, degree of participation of tutors and facilitators, nature of the courses and other demographic factors.”¹ This technique mix online acquaintance with, traditional learning and, dependency on self-reliance and digital references and collaboration, to achieve individual and organizational goals.³

By this study, we are intending to evaluate the feasibility and utility of an e-learning education system in biochemistry by structured objective instruments through students and faculties.

METHODS

This educational intervention study was conducted from April 2020 to November 2020, at department of biochemistry, Laxmi Narayan (L. N.) Medical College and Research Centre, Bhopal (Madhya Pradesh). Students included in the present study were all admitted to the MBBS phase- I to L. N. Medical College Bhopal (Madhya Pradesh). 150 subjects aged from 18 to 21 years who had given the consent, were recruited for the study. Students who had not given their consents, admitted to the phase-II or other phases, and below 18 years, were excluded from the study. Faculties and the students were priority sensitized regarding about the study. We had asked 150 MBBS first-year students to participate in this study as a group I and faculties of biochemistry as group II to achieve the objectives of the study.

A qualitative study design was adopted as a means for understanding student’s and facilitator’s values, and perceptions to improve the educational program. A predesigned open-ended questionnaire had envisaged as an instrument for recording group I and group II perception regarding the SWOT analysis of e-learning education tool. This instrument was reviewed and validated by the peers and subject experts of different institutes and administered electronically to the participants, by using Google form and the scores were recorded.

The predesigned open questionnaire was used to record their experience on e-learning classes, where students, who were willing, responded. These questions included “what was your experience taking a lecture online?” and “what could be the advantages and disadvantages of using e-learning in biochemistry? The percentage method was used as statistical tool for the calculating the recorded data for this study.

To understand the students’ and facilitators perception towards the synchronous e-learning, all the students and facilitators, were asked to fill out feedback questionnaires immediately after the class. The questionnaire contained questions regarding the learning experience, perceived value of the synchronous e-learning, course materials, teaching and learning process. The questionnaire used a 4-point Likert scale (1=strongly disagree and 4=strongly agree). Prior to administering the questionnaire, the internal consistency of the questionnaire was calculated (Cronbach’s alpha=0.784).

The approval for this study was obtained from L. N. Medical College institutional ethical committee (IEC), Bhopal, Madhya Pradesh, and consent was provided by the students.

RESULTS

Out of 150 students, 149 mode of teaching (99%) students believe that e learning is flexible, easily accessible whereas 148 students considered it as an beneficial tool for recall especially subject like biochemistry. 94 % students agreed that it gives an opportunity to one-to-one interaction, they also believe that this mode of learning was very helpful and satisfactory initiative to continue their learning process in the era of pandemic. 97 % learners emphasizes that e-learning was helpful but they had no physical interaction with their peers and facilitators which sometime demoralize them. 96% learners didn’t find the e-learning as an appropriate mode of learning especially practical’s which are focused for developing psychomotor domain/skill of the students.

Table 1: The perception of students towards e- learning program in biochemistry and their approximate frequencies.

S. no.	Student’s perception	Frequency in percentage
1	Consider this mode of teaching is flexible and easy to access	99
2	Consider e learning is a satisfactory and helpful initiative	95
3	Agreed that it gives an opportunity to one to one interaction	94
4	Consider e learning as a beneficial tool for recall especially subject like biochemistry	98
5	Missing virtual interaction	97
6	Difficult to learn practical/skill	96

Table 2: The perception of faculties towards e-teaching program in biochemistry and their approximate frequencies.

S. no.	Faculties 's perception	Frequency in percentage
1	Consider e-teaching is flexible and time saving	99
2	Consider e- teaching is a satisfactory and helpful initiative	98
3	E-teaching sessions were more interactive	99
4	E-teaching has improved the retention of knowledge for biochemistry	96
5	Encountered network glitches	80
6	Faculties confessed that they had an initial intricacy for e teaching but now they are enjoying this tool of teaching	90
7	Missing physical communication	96
8	Difficult to teach and assess psychomotor domain	98
9	Due to time limitation not able to give proper feedback	90

Majority of the facilitators of biochemistry, acknowledged that e-teaching is flexible, time saving, satisfactory and helpful initiative. They also opined that their online teaching was highly interactive. They believe due to interactive sessions the retention of knowledge for Biochemistry has improved among their learners. 80% faculties also encountered network glitches during their sessions which hampered their teaching. 90% facilitators confessed that they had an initial intricacy for e-teaching but now they are enjoying this tool. 96% teachers shares that they also misses physical interaction with their students and due to time limitation they were not able to give them proper feedback as they used to give in traditional mode of teaching. 98% strongly believe that teaching and assessing psychomotor domain/skill/practical is very difficult via online mode

DISCUSSION

Strengths of e-learning education service in biochemistry

The learners and facilitator both the groups are agreed that the e learning module in biochemistry has given the flexibility for expediency, deconstruction of the geographical boundaries, respectively mobility.^{4,5} Learners also believes that they can select and customize the tool of learning and techniques and gives a choice to learners to select or customize the tool of learning as per their preferences.⁶⁻¹² The online learning facilitate the re-creation of the process and their simulation to activate their cognitive domain of learning, among the learner.

This teaching learning mode has given the platform to the learners and facilitators to online integrate and collaborate with other groups for their studies or research. Learner those who were introverts not ready to speak, this mode of teaching and learning encourages the learner and increase their self-confidence, and progressively make them communicative and responsible in their learning journey.

Subjects like biochemistry, need lots of memorization. The sheer complexity of the biological system, metabolic pathways, enzymatic reactions make this subject highly

difficult to remember. This mode of teaching facilitates learning in a different pattern.⁶ In this platform, we can combine traditional teaching with audio or video including 3D visualization for facilitating effective learning, retention, and a better understanding of the subject.

Weaknesses of e-learning education service in biochemistry

The facilitators admitted that the in some of the techniques where they need to interact like skill development cannot be facilitated by e-learning. The participants also believes that the online teaching-learning tool provide suppleness however additionally generates entice for both facilitator and learner. It has been observed that the deprivation of corporeal communication with the faculties and friends, peers/classmates develop the feeling of solitude among students by e-learning is irreconcilable with psychological factors that persist in the learning process. Not all the learning content and methods need to be effective and efficient.⁶ Even tin online teaching learning sessions learners' assessment and faculty feedback on the same become limited.

E-learning services are unsuited for the teaching psychomotor domain in the field of medical education. E-teaching-learning tool offers information and guidance associated with the skill development sessions however the students cannot examine their outcomes, which is an essential requirement for the field of medical students.

Opportunity of e-learning education service in biochemistry

Plenty of opportunities are shaped when technology and education come together. The participants believes that it not only improvises the learning capacity but also facilitates the teaching process which matches the present requirement. The uninterrupted internet facilities hoard time and permit to balance employment with education. In this busy schedule, it becomes easy to pursue higher education while maintaining the family and employment. E-learning is convenient and very economic, to manage. The resource materials, journals, digital library, virtual

training, and conferences are easily available and it also cut down the travelling expenses. It gives an opportunity to integrate, communicate and collaborate with the thinking minds of others of nationals and global platforms. It allows the development or improvement of e-teaching and learning tools to be friendlier.

Threat of e-learning education service in biochemistry

The facilitators peril that overstating the optimistic role of technology creates pessimistic effects such as the risk of ignoring the student the possibility of producing an entire generation "of noncritical thinkers". The facilitators were worried that after some time it may happen, they lost their interest/motivation for conducting online classes. Even, due to lack of interaction, learners may also discourage to continue the online sessions.

Limitations

E-learning has limitations like: the student's subject and societal influence may cause SWOT analysis to be deceptive.

Issues like security and authorization, lack of scrutiny of students, poor and lower bandwidth, inadequate infrastructure, and many other technical glitches. The transformation of traditional learning methods to e-learning and the replacement of teachers might cause psychological effects too. It includes resistance to change, unwillingness to use technology, lack of confidence, unidentified fear, lack of control, moreover this also enhance the expenditure in implementation and training for tutors.

CONCLUSION

SWOT analysis is a high-level and critical thinking exercise for students and educators. It works as a driving force for implementing changes. According to the SWOT analysis the strength of online teaching learning (TL) is, flexible and accessible to both facilitator and learner in a very cost-effective manner. Weakness of this mode of teaching learning is feeling of solitude, the facilitator and learners are not having any physical interaction which in future may demotivate them to continue this TL mode. But at the same time, we cannot ignore the opportunities, offered like education for everyone, globalization of knowledge, and even the working person can continue their dream of learning.

ACKNOWLEDGEMENTS

Authors would like to thank the Principal and Dean of Medicine Dr. Nalini Mishra, students of MBBS BATCH 2020-21, faculties for their support and encouragement during the study data collection.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Gupta P. Strengths, weaknesses, opportunities, and threats analysis on impact of e-learning in biochemistry in phase-I medical undergraduates. Int J Res Med Sci 2022;10:221-4.