A PATH TO EFFECTIVE E-LEARNING IN MEDICAL EDUCATION: BARRIERS AND THEIR SOLUTION

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ABSTRACT

Online learning in medical education is a relatively new concept and one which is rapidly expanding. Recently, due to the global widespread of COVID-19 pandemic, e-learning became the mainstreaming mode of teaching all over the world. Thus, it is critical to assess and work upon the potential challenges, drawbacks and barriers of effective implementation of successful e-learning. The general barriers to e-learning are often encountered as institutional or teaching method norms and technological drawbacks and behavior change in both the learner and the instructor is essential for successful implementation of e-learning in medical education. Although online course delivery has probably eliminated certain barriers that exist in face-to-face classrooms, such as geographic location, transportation issues, architectural and physical impediments, and social contexts which lead to inaccessible learning environments. Thus, it is the responsibility of the medical educators and administrators to look into these challenges and incorporate the solutions which can make begin a new era of better teaching-learning mode of education in medical education in the future This review article analyzes the prominent barriers to e-learning and solutions amongst medical educators to the implementation of online learning in medical education.

KEYWORDS: Medical education, barriers, e-learning, learners' perspective, overcoming challenges.

INTRODUCTION

The term e-learning came into existence in the year 1999 however; there are evidences which suggest that early forms of e-learning existed as far back as the 19th century. Because it uses information technology and communication to promote learning, it is referred to as "online learning, web-based learning, internet-based learning, technology-enhanced learning, and virtual learning." (1,2). According to Ellaway& Masters (3), "e-learning encompasses a pedagogical approach that typically aspires to be flexible, engaging and learner–centered; one that encourages interaction (staff–staff, staff–student, student–student), and collaboration and communication, often asynchronously (though not exclusively so)."

Due to the global expansion of the COVID-19 pandemic, e-learning has recently become the standard style of instruction in health sciences education (HSE), including medical, public health, nursing, dentistry, and other allied healthcare education. Despite the fact that various surveys and studies evaluating the effectiveness of e-learning as a mode of education have shown that it can be just as effective as traditional methods of learning or teaching, there is still a lack of evidence as to when and how well e-learning can help improve education, and its impact on learners' performance is still debatable (4, 5)

Most of the research conducted to enhance the effectiveness of e-learning focused on factors that, when present, facilitate a greater likelihood of success of e-learning or "enablers" of e-learning. However, regardless of the various benefits of e-learning, it is critical to assess and work upon the potential challenges, drawbacks and barriers of effective implementation of successful e-learning. The general barriers to e-learning are often encountered as institutional or teaching method norms and technological drawbacks and as suggested by Rogers (6) the need for behavior change in both the learner and the instructor is essential for successful implementation of e-learning in medical education. Nonetheless, poor students face several obstacles that prevent them from reaching the full potential of e-learning. As a result, the primary goal of this research is to propose alternative paths for students to overcome such obstacles and gain access to successful e-learning.

RESEARCH CONTEXT AND METHOD

This is a qualitative interpretative case study of 150 students who were chosen for their accessibility and who had previously attended face-to-face lectures before the COVID-19 epidemic caused them to convert to e-learning. Rather of forecasting what students would experience, I utilised interpretivism to understand and describe how students make meaning of their behaviours throughout the transition period in their unique setting of the School of Education closure. Using a more explorative case study methodology, I generated a comprehensive and thorough account of students' experiences, resulting in ground-breaking ideas to overcome challenges to e-learning deployment.

As a consequence, two study questions were addressed: how do students migrate from face-to-face to online learning, and why do their experiences change when they learn online. The first question addressed the study's first aim of understanding students' transition from face-to-face to e-learning, while the second question addressed the study's second goal of uncovering elements that influenced students' experiences. This is expanded upon in the results and discussion section to give opportunities for students, particularly those from disadvantaged backgrounds, to realise or experience the benefits of e-learning.

PRESENT FINDINGS

EDUCATIONAL BARRIERS OF MEDICAL E-LEARNING

The rise of online courses has accelerated for a variety of reasons, making it necessary to study and investigate the disparities that students experience in online learning settings. Although online course delivery has probably eliminated certain barriers that exist in face-to-face classrooms, such as geographic location, transportation issues, architectural and physical impediments, and social contexts which lead to inaccessible learning environments. There are certain barriers and solutions that restrict and aid e-learning from medical educator's perspectives. Some are in brief below:

QUALITY OF INSTRUCTION AND RESOURCES

Due to a lack of models, teaching, regulation, and systematic onboarding for the creation of online courses, a lack of technical skills also creates impediments in the e-learning process. (8) along with poor infrastructure can constrain educator's preparedness for delivery of online learning (8). Due to a lack of models, teaching, regulation, and systematic onboarding for the creation of online courses, a lack of technical skills also creates impediments in the e-learning process. This leads to heavy text materials

with only written assignments with no flexibility leading to further marginalization. Garrison, Cleveland-Innes, and Fung (2004) conducted a study to validate an instrument regarding online students' role adjustment. Their findings suggest that students do see a difference in the learning process and a need for their role adjustment. The online learning should be viewed as more cognitive or internally oriented. Online learners must take more responsibility, adjust to a new climate, adjust to new context, synthesize ideas and know how to participate, synthesize ideas, apply ideas or concepts, and stimulate their own curiosity (9). In addition, Palloff & Pratt (2003) have suggested that online learners should be "open" about personal details of his or her life, work and other educational experiences; should be "flexible" and "humor" to create a warm, inviting course environment; should be "honest"; should be willing to take "responsibility" for online community formation; and should be willing to work "collaboratively"(10).

DIGITAL LITERACY

Digital literacy is the ability to utilize information and communication technologies to find evaluate, create and communicate information requiring both cognitive and technical skills. Materials, activities, readings, clarity in objectives, ease of course navigation, learning goals and evaluation, and teacher presence are all affected by a lack of expertise. Some factors are as follows (a) new media and software takes time to learn (c) Some learners need ongoing support and encouragement (d) Group discussions in online environment can be intimidating (e) Technology breakdowns and related financial and time barriers (f) Assumed digital literacy of younger generations does not account for skills and abilities required for online learning (11).

ACCESS TO MATERIALS

For remote and rural learners, as well as students with low socio-economic standing, access to materials, infrastructure and efficient internet services are continuing hurdles, and equity-seeking students may have more compounding barriers. Socioeconomic status affects computer ownership and ability to pay for internet and hardware/software. Remote and rural learners may have to travel long distances to access a computer or reliable internet. Impact of poverty affects motivation for online learning. Access to reliable Internet is a concern for remote and Indigenous communities; if internet is not stable videos and multi-media will not stream. Access to equipment for engagement such as microphones, webcams, and software limits access to materials for online learning. Access to materials is limited if not in compliance with accessibility standards (12).

It is already a challenge for medical educators to manage sufficient time for teaching, research and maintain a work life balance personal life commitments (13). Hence, inadequate time is a significant barrier towards the mastery, development and implementation of online learning tools. It was noted that the educators have to invest their crucial time from their busy schedule to become familiar with and engage with online teaching tools in order to ensure its effective use. Group works are difficult to schedule due to time conflicts. The course needs excessive reading; the forums are sluggish, and navigating takes time; the lessons are repetitive; the course is difficult to browse, is badly organized, and has a clear template; and there is a lack of tool guidance.

INFRASTRUCTURE

Lack of infrastructure and technology, such as email, sporadic internet connection, or photocopying, has been identified as a hindrance to medical education in low- and middle-income nations (14). Within a faculty and geographical context, these technology restrictions operate as a barrier to e-learning (14). Attardi& Rogers (15) observed technical challenges due to inadequate internet access in their research. In low-income countries like Cameroon, Bediang et al. (14) emphasised the impact of inadequate internet access, Wi-Fi, and physical infrastructure difficulties. Lakbala's study (14) also highlights the many challenges that health professionals and educators encounter when implementing e-learning in a low-income nation like Iran. Some of the obstacles include a lack of computer access and a lack of physical infrastructure.

ATTITUDE

Negative attitude amongst educators not willing to indulge in latest technologies and tools could contribute to the process of development and implementation of online learning. Educators have been upset by the entire process of trying with new technologies and having no tolerance for managing minor technical issues (16). When asked to commit to adopting and upgrading online learning activities, some educators may have feelings of inadequacy as a consequence of a lack of knowledge of, or sufficient training for, a certain programme.

ENABLING AN EFFECTIVE E-LEARNING METHOD: DRIVERS AND SOLUTIONS

QUALITY OF INSTRUCTION AND RESOURCES

The obstacles might be avoided by planning ahead of time for the design, captioning, and publishing of all course materials. To assist learners, particularly indigenous pupils, the teacher should provide positive inspiration, continual encouragement, and direction. Discussion forums should be closely monitored, timely feedback should be offered, responses should be acknowledged, and trending conversations should be pointed out (17).

DIGITAL LITERACY

Help learners and instructors with digital literacy by providing technological forums, tutoring, social networking sites, and virtual dialogues for peer learning to meet needs, as well as support for underserved groups (e.g. individuals with disabilities) on how to utilise the hardware and software. Make the instructional content more appealing (use a basic interface with straightforward navigation) and pace the course appropriately for students with varying levels of digital literacy. To foster digital literacy, encourage self-learning and self-organization. Provide digital learning tips and methods both before and during the training. As social cooperation and social interrelations promote digital literacy and the use of information and communication technology, it is critical to develop relationships and create a feeling of community (18).

ACCESS TO MATERIALS

Hardware requirements, technical support and software to support troubleshooting should be provided to the professionals. Support should be provided to under-served populations (e.g. people with disabilities) regarding the use of hardware and software. Tutors should also communicate to students about the supports and resources available and how to access. Free library supports should be offered to access course materials. It should be ensured that the course material should be easy to download and files are not too large. Students who do not have the facility of webcam available, the materials should be designed so that they could be access via mobile phones (10).

TIME

Time is one of the most significant tools you have, regardless of your age, gender, working status, or otherwise. In your lifetime, anything you will intend to achieve or accomplish will take some time. For those looking to learn online, this is something that is extremely important. You need to consider how to handle your time well to make enough space for your online classes and the rest of your obligations, so you're in charge of your own learning and speed. To schedule and strategize how to use your time effectively, little time commitment is expected at the beginning (19).

INFRASTRUCTURE

In an online world, the safe and productive use of technologies needs administrative assistance at all levels of the institution. Frith and Kee (2003) found

that many schools blamed the lack of students on technology dysfunction and the failure of campus support workers to navigate around challenges that frequently irritated and hindered online students from getting a good online experience.While IT workers are not faculty and do not have regular or direct interaction with students, their acts or inactions can greatly affect the success or lack of instructional programmes in an online teaching environment (20-23).

ATTITUDE

Maintaining a positive attitude in the face of e-learning tools and technology that appear to be difficult to use and time-consuming can be difficult. Educators who took part in one research agreed that it was critical to have a positive attitude. In reality, the use of these new technologies will promote an optimistic overall experience and also break down preconceived concepts; therefore, fostering a shift in expectations and behaviors is a significant approach in the growth and application of online medical education learning (21).

FUTURE PROSPECTIVE

The following attributes are essential for success of e-learning teaching mode: motivation and self-discipline; ability to study independently or schedule study time; blended teaching; user friendly packages; understanding the e–learning process; skills training; support; employers paying e-learning costs; dedicated work time and adequate equipment and dedicated work space/support. It is mandatory for medical education facilitators to better understand the barriers in the effective execution of e-learning and work upon its solutions which can change ultimately change the face of medical education to a much better and more efficient teaching-learning mode both for the facilitators and the students. Thus, it is the responsibility of the medical educators and administrators to look into these challenges and incorporate the solutions which can make begin a new era of better teaching-learning mode of education in medical education in the future.

CONCLUSION

Despite the challenges students encounter in transitioning from face-to-face to e-learning, digital divides continue to be a key stumbling barrier for students. Furthermore, while there may be a variety of barriers preventing students from realising the full potential of e-learning, alternative pathways such as free data bandwidth, free physical and online resources, and the use of a blended learning information centre, among others, appear to be the solution in the context of COVID-19. While this is a feasible alternative, students are challenged in different ways, needing continuing capacity building in the use of learning management systems and other recently accepted online learning technologies. When advocating for the use of e-learning, it's vital that university-wide teaching and learning pedagogy, instructional designers, and e-learning policy consider the potential advantages and drawbacks.

REFERENCES

1. Cook D, Levinson A, Garside S, et al. Internet-based learning in the health professions: a meta-analysis. JAMA. 2008; 300: 1181-1196.

2. Ruiz JG, Mintzer MJ, Leipzig RM. The impact of E-learning in medical education. Acad Med. 2006; 81: 207-212

3. Ellaway R, Masters K. AMEE Guide 32: E-Learning in medical education Part 1: Learning, teaching and assessment. Med Teach. 2008; 30: 455-473

4. Donnelly P, Benson J, Kirk P. How to succeed at e-learning. London: BMJ/Wiley-Blackwell; 2012

5. McCutcheon K, Lohan M, Traynor M, et al. A systematic review evaluating the impact of online or blended learning vs. face-to-face learning of clinical skills in undergraduate nurse education. J AdvNurs. 2014; 71: 255-270.

6. Rogers, P. L. Barriers to adopting emerging technologies in education', Journal of Educational Computing Research. 2000; 22(4): 455-472.

7. Niebuhr V, Niebuhr B, Trumble J, et al. Online faculty development for creating E-learning materials. Edu Health. 2014; 27(3): 255-261.

8. Dyrbye L, Cumyn A, Day H, et al. A qualitative study of physicians' experiences with online learning in a master's degree program: benefits, challenges, and proposed solutions. Med Teach. 2009; 31(2): 40-46.

9. Garrison B., Cleveland-Innes M., Fung T. Student role adjustment in online communities of inquiry: Model and instrument validation (Electronic version). Journal of Asynchronous Learning Network, 2004; 8(2): 61-74.

10. Palloff R.M., Pratt K. The virtual student. San Francisco, CA: Jossey-Bass; 2003.

11. Cannell P., Mcintyre R. Free Open Online Resources in Workplace and Community Settings-A Case Study on Overcoming Barriers. Widening Participation and Lifelong Learning. 2017; 19:1.

12. Casarez, L., Shipley G. Accessibility Through Universal Design in Online Education."

Proceedings of E-Learn: World Conference on E-Learning Washington, DC: Association for the Advancement of Computing in Education. 2016; 345-350.

13. Wilson F. Teaching by residents. Clin Orthop Relat Res. 2006; 1-4.

14. Bediang G, Stoll B, Geissbuhler A, et al. Computer literacy and e-learning perception in Cameroon: the case of Yaounde Faculty of Medicine and Biomedical Sciences. BMC Med Edu. 2013; 13(57): 1-8.

15. Attardi S, Rogers K. Design and implementation of an online systemic human anatomy course with laboratory. Anat. Sci Educ. 2015; 8: 53–62.

16. Lakbala P. Barriers in implementing E-learning in Hormozgan University of Medical Sciences. Glob J Health Sci. 2016; 8(7): 83–92.

17. NHMRC additional levels of evidence and grades for recommendations for developers of guidelines (Internet). Australian National Health and Medical Research Council. 2009 Availablefrom: https://www.nhmrc.gov.au/_files_nhmrc/file/guidelines/developers/nhmrc_le vels_grades_evidence_120423.pdf

18. Skye E, Wimsatt L, Master-Hunter T. Developing online learning modules in a family medicine residency. Fam Med. 2011; 43(3): 185–92.

19. Crouse T., Rice M. Learning to Serve Students with Disabilities Online: Teachers' Perspectives.'' Journal of Online Learning Research. 2018; 4(2):123–145.

20. Kolesinski M., E. Nelson-Weaver D. Diamond. Digital Solidarity in Education: Promoting Equity, Diversity, and Academic Excellence through Innovative Instructional Programs. E-Learn. 2013; 2228–2233.

21. Brueckner J, Gould D. Health Science Faculty Members' Perceptions of Curricular Integration: Insights and Obstacles. International Association of Medical Science Educators. 2006; 16(1)

22. Frith K. H., Kee C. C. Effect of communication on nursing student outcomes in a Web-based course. Journal of Nursing Education. 2003; 42: 350-358.

23. Skye E, Wimsatt L, Master-Hunter T. Developing online learning modules in a family medicine residency. Fam Med. 2011; 43(3): 185–192

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