E-Learning in Medical Education in Japan and Around the World

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1. Overview
This article will seek to address the following questions with respect to e-learning in medical education:
• What is e-learning and how is it used for educational purposes?
• What do today’s medical students demand?
• What are some examples of e-learning use in Japan?
• What are some of the e-learning practices used in international medical education?

2. Background
In order to understand how current trends in e-learning in medical education can help inform a better curriculum, it is necessary to first clarify the meaning of “e-learning” within the context and scope of this article.

2.1. The What and the How of e-learning
While e-learning is a general term which can have many different interpretations, for the purposes of this article, we will limit the meaning of e-learning to the following definition proposed by prominent e-learning researchers John Sandars and Mayur Lakhani: “the delivery of learning via any form of electronic media”\(^1\). The meaning will be limited in this article to the typical kinds of experiences that medical students engage in interactively online. Thus, this article will exclude any mention of strictly passive consumption of media for example via television or radio or some pre-recorded source on DVD. This article is also limited to the learning environment and experiences of university students.

2.2. Stand-alone e-learning
E-learning can be used as a stand-alone individual mode of education by which a single entity or organization creates content accessed by a specific set of individuals. An example of this type would be when a researcher accesses a specifically designed website on research ethics to read content presented and then be expected to answer a series of questions to check comprehension of the content. Under this model, the advantages are that the user can work at his or her own pace and they can try again as many times as necessary to achieve the minimum requirements. Two other big advantages are that there is no limit to the number of users and no limit of time or space. In other words, it would be possible to provide a stand-alone e-learning course for millions of users from anywhere in the world that they could finish over any chosen time period. The main disadvantage is that it is often boring and can feel pointless and be a waste of time for users. These negative effects can be mitigated with exciting multi-media content and discussion boards and chat rooms that allow users to interact with each other and the instructor in an albeit limited way.

2.3. Blended learning
Another approach is the “blended-learning” approach which “blends” e-learning activities together with more traditional educational environments normally found in medical schools. This approach is more limited in that it requires some in-class time where students are interacting face-to-face with each other and with the instructor. A university course, for example, can employ a blended strategy in their course design to leverage the advantages of e-learning while at the same time maintaining the advantages of the traditional classroom setting. An important ingredient which makes the traditional classroom a quintessential learning place is the group cohesiveness that exists among classmates which makes it possible to foster a sense that everyone is working together toward accomplishing a goal. When classmates do not meet on a regular basis and share experiences together simultaneously, this feeling of cohesiveness can be greatly diminished.

3. Today’s Medical Students
Today’s students are mostly Millennials (born between 1977–1995) or Generation Z (born after 1995), many of which are considered “digital natives” meaning they are more capable and comfortable with digital technologies any any previous generation. In a recent article entitled “Medical Education, technology and the millennial learner”, researchers characterize millennial medical students as being “techno-savvy, needy for feedback and collaborative”\(^2\). Millennials have sparked a revolution in education that has been driving the innovations being implemented in medical curricula all over the world. Responding to student demands for education better suited
to their characteristics means leveraging technology to create collaborative educational experiences with adequate feedback cycles which reinforce subsequent learning. While research studies exist which do not show differences in effectiveness of e-learning versus traditional passive didactic learning models\(^1\)\(^\text{,}^2\), today’s digital native medical students are embracing more active and collaborative approaches to learning.

4. E-Learning in Japan and Other Countries

To better understand how to use e-learning to improve the educational environments in our own institutions, it can be useful to first consider what is happening outside of our institutions. Let us examine some domestic and international examples.

4.1. Examples of e-learning in Japan

There is a growing interest in implementing blended strategies in Japan and indeed around the world. One such implementation is known as the “Flipped-Classroom” methodology which combines face-to-face in-class lessons with e-learning activities to be done before, during and after the class. If done well, this can increase the amount of interaction students have with each other and with their instructors during class time. One of the secrets behind the success of the “Flipped-Classroom” is that students simply know and understand more about the day’s class content before they come to the class. By knowing and understanding more before a class, they are better able to engage in meaningful discussion about that content with their classmates which leads to more enriching educational experiences in the classroom.

Among the many blended-learning strategies, Flipped-Classroom is being widely utilized by a variety of medical schools. One of the challenges facing Japanese faculty members is the lack of time and human resources devoted to the development and promotion of e-learning materials. This is in stark contrast to many other institutions worldwide.

Research into e-learning in medical education in Japan has seen substantial growth as evidenced by the number of publications over the past 25 years since 1993 as shown in Fig. 1 below. This data was obtained by entering the following search string “e-learning” “medical education” “Japan” into a Google Scholar search and recording the number of hits for each year shown. The upward trend demonstrated by the figure can be said to be evidence that there is likely an increasing number of implementations of e-learning in medical education related to Japan.

4.2. Examples of e-learning around the world

While e-learning is a standard part of the educational experience of most medical students in developed countries, there are two particular examples that will be described here to highlight the differences that exist.

At the Faculty of Medicine at the University of Birmingham in the UK, there is a team of full-time staff members devoted to the development and maintenance of e-learning material. The Faculty of Medicine at the University of British Columbia in Canada has initiated a project whereby all the lectures are being professionally recorded and stored on their servers. They are in the process of collecting all the lectures and building e-learning content based on those lectures. Students will be able to watch and review any lecture any time and engage in e-learning activities to help them reinforce their learning based on that content. Both universities provide faculty members with various services including the conversion of their PowerPoint slides into interactive e-learning content modules and consultation and advice sessions for how to better implement better e-learning strategies in their classrooms.

The University of Queensland in Australia has a requirement that all lectures must be recorded and made available online to students within 48 hours. As described on their publicly accessible website, they provide extensive support services for faculty to enhance the development of educational materials to foster an enriched educational environment for their students (https://elearning.uq.edu.au/services/core-elearning-systems/what-do-our-elearning-systems-allow-us-do). It is a growing trend around the world for universities to provide e-learning support services to help faculty create the best possible educational experiences for their students.

Similar to the results from Fig. 1 above, Fig. 2 below shows that research into e-learning in medical education worldwide has also seen substantial growth. Entering the following search string into Google Scholar, “e-learning” “medical education”, revealed the number of publications over the past 25 years since 1993 has been increasing. This is evidence that there is growing interest in e-learning in medical education which is likely a result of more institutions adopting e-learning in their curricula.
CONCLUSION

For university faculty members who constantly struggle to find new and better ways to provide the best education possible for students, leveraging e-learning strategies, including “blended-learning” in their classrooms can be well worth serious consideration. In our hectic working environments with constantly increasing pressure to produce higher and higher quality results, it is essential that we continue evolving and finding better ways to do more with less. The establishment of e-learning support services for NUSM faculty members would be a meaningful step in that direction.

References

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