PUBLIC HEALTH RESEARCH

Mobile Learning: Student-Generated Activities among Post-Graduate Students in the Field of Public Health Promotion

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ABSTRACT

Introduction	The development of technology as well as the use of smartphones has become increasingly popular among students. The majority of students entering institutes of higher education own a smartphone. However, the impact of smartphone use in the area of public health learning is under-researched. The usage of smartphones is believed to enhance the learning of public health subjects, particularly in the Malaysian context. This study was conducted to identify the opinion of students and academicians on the benefits of using smartphones in student-generated activities in Health Promotion, as one of the subjects in public health in a Malaysian university.
Methodology	Focus Group Discussions and In-depth Interviews were conducted among students and academicians. All interviews were recorded and transcribed into verbatim. The data were analysed via thematic analysis to identify key themes and patterns in the participants' responses.
Results	The results showed that the majority of students and lecturers agreed on student-generated activities in producing Health Promotion videos using mobile devices such as smartphones. They felt that such activities can be applied into other subjects based on suitability and the study outcome, as well as their career in the public health sector in the future.
Conclusions	The findings suggest that integrating smartphones into student-generated activities can enhance learning engagement and practical skill development in public health education. Such approaches may also encourage creativity and prepare students for real-world applications in their future professional roles.
Keywords	E-Learning; Health Education; Mobile Device; Video; Local Content

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INTRODUCTION

The education system is evolving with time. It started with the classroom-based learning approach, evolving to distance education and continuing further with the virtual classroom education approach. Furthermore, with the advancement of technology in the country, education is not limited to being conducted in the classroom alone. Technology is now being applied in education, starting with desktop computers, to laptops and to become more advanced with the use of the latest devices such as mobile phones, smartphones and tablets.[1] As a result of technological advances, mobile learning approaches were developed by using only wireless mobile devices.[2]

Mobile learning or better known as mLearning is a type of learning that emerged as a conclusion of the joint assessment of mobile information and the field of 'e-Learning'. The term mLearning provides access to the content of e-Learning freely in terms of location and time.[3] This type of learning creates ease for students to access and obtain any necessary information simply by using a mobile phone owned by the student.[4-6] Learning techniques through mobile learning have greatly benefitted from communication technologies such as Global System for Mobile Communications (GSM), Wireless Application Protocol (WAP), General Packet Radio Service (GPRS) and Bluetooth and Wireless Fidelity (Wi-Fi), a standard made by Institute of Electrical and Electronics Engineers which is IEEE 802.11, available in mobile devices.[7]

However, mobile learning is at an early stage in Malaysia.[8] The implementation of mobile learning at the highest level of education in Malaysia is still not as widespread, due to several factors such as cost and technological challenges.[2]

There are many benefits of mobile learning, where it can be used to support conventional learning.[3,9,10] Mobile learning in support of conventional learning, would allow the concurrent referencing of scientific books or various other references while learning. This kind of learning would be interesting for students and eases their understanding of a particular topic or issue being discussed. [11-13] Learning on mobile devices gives more people a chance to take part in education, especially those who might not have had the opportunity before due to its affordability and portability.[14]

In terms of student preparation, university students are moderately ready to accept mobile learning. Additionally, not all students are aware of the existence of mobile learning, and this has made them curious and wanting to learn about mobile learning.[15] However, students are not using mobile technology in learning sessions.[16-17] There are several issues that arise in the implementation of mobile learning, mainly being finance and there are students who are worried of high costs if mobile learning is implemented.[15]

Specifically, in medical studies such as public health, the use of mobile learning is still limited due to lack of awareness in using mobile technology. Likewise, mobile learning for public health subjects such as in Health Promotion, has not gained enough attention in the field of public health. With the use of mobile learning, it is hoped that students can increase their awareness and practices by applying the gained knowledge either in their assignments or with their careers in public health.[6, 18] This learning concept can be applied to educate the students about health promotion. Additionally, students will then be able to share their positive experience with mobile learning in other subjects too.[9] Therefore, this study was conducted to give students an opportunity to experience the implementation of mobile learning in the Health Promotion subject in a local university, as well as share their opinion on the experience and the benefits gained as a result of the implementation.

METHODOLOGY

A qualitative study was conducted at the Hospital Canselor Tuanku Muhriz, Kuala Lumpur. A total of 10 students who are pursuing a full-time master's degree were selected. Among the master's programmes involved were students from the Master of Public Health, Master of Medical Social Work and Master of Community Health Sciences programmes. Students who took the Health Promotion module were divided into 10 groups. Each group was given the task of identifying a public health issue and develop a short 5-minutes video on the topic in the form of assignments. This study used the purposive sampling approach, and the academicians/lecturer participated voluntarily in this study.[19] A group representative was also randomly selected according to the order of the names in the list of the group members to then participate in a Focus Group Discussion (FGD) session. The names were in alphabetical order.

Ethical approval was obtained from the UKM Research Ethics Committee (UKMPPI/111/8/JEP-2017-764). Data were collected through Focus Group Discussions (FGDs) with students and in-depth interviews (IDIs) with two academic representatives (lecturers), who were interviewed separately. Each in-depth interview session lasted approximately 60 to 75 minutes. NVivo software was used to facilitate the data management process. Each informant was assigned a code name, and every interview file was labelled with relevant details such as the date and time of the session.

This study has two main phases. The first phase was the Pre-Focus Group Discussion where participants are given the freedom to share their opinion on the implementation of mobile learning

in the education system in this country and their feelings about the video production tasks using only smartphones, tablets or laptops. While in the second phase, the Post-Focus Group Discussion session, participants share their opinion on the production of videos that have been assigned to them for the purpose of health promotion. There are no right or wrong statements during the Focus Group Discussion session. Each participant can discuss and share ideas and opinions in addition to the questions raised by the researcher to ensure the interview sessions run smoothly. Each Focus Group Discussion session lasted from 80 to 90 minutes.

Semi structured interviews were conducted in Malay and English languages according to the preference of the study participants. There are two sections of the semi-structured questions; semi-structured questions of the Focus Group Discussion and the semi-structured questions for the Academics or lecturer interviews, as adapted from previous study.[18] Examples of the questions are:

A) Semi-structured Questions in Pre-Focus Group Discussions:

1. Please tell us about your experience in using a mobile device as well as the applications you often use with your smartphone.
2. Are the applications adequate and what do you think about the importance of local inputs in the applications used?
3. Please describe your understanding of mobile learning.
4. What do you think about the implementation of mobile learning in Malaysia?

B) Semi-structured Questions in Post-Focus Group Discussions:

1. How do you feel after performing video production activities in Health Promotion using mobile hardware such as smartphones?
2. What are the benefits have you gained from the video production activities?
3. Are you ready for the implementation of mobile learning in the Health Promotion Directional Learning module as well as other subjects you take? Please share your thoughts on this.

C) Semi-structured Questions during Pre-In-depth Interviews with Academics:

1. Please tell us about your experience in using mobile devices such as smartphones and tablets.
2. Please tell us about your experience in using the applications and services available in mobile devices. Is the input sufficient and what do you think about the importance of input that focus on local language, culture or input?
3. What do you understand about mobile learning or m-learning?
4. Please tell us about your experience in conducting learning using a mobile device.
5. What benefits do you think are gained from learning using a mobile device?
6. What challenges do you think you will face in the implementation of mobile learning especially in the subjects you teach?
7. Can you explain about your preparation in using mobile devices or devices while teaching?

D) Semi-structured Questions in Post-discussions with Academic Representatives:

1. How do you feel as a lecturer after performing video production activities in Health Promotion using mobile devices such as smartphones?
2. What are the benefits that students in your class have gained from the video production activity?
3. Are you as a lecturer ready for the implementation of mobile learning in the Health Promotion Directional Learning module as well as other subjects you take? Please share your thoughts on this.

All sessions in the FGD and In-Depth Interviews were conducted by a third-party research assistant. The Focus Group Discussion sessions took place in a meeting room near the library, while In-Depth Interview sessions with the lecturers were held in the lecturer's room. Table 1 depicts the characteristics of the students and lecturers involved in this study. The students' ages ranged from 24 to 35-years old, with an average of 6-years working experience. All respondents were involved in the healthcare sector with working experience in the hospitals, health clinics, State Health Department and National Health Institutes. Methodology of Student-generated mobile learning process was illustrated in Figure 1.

Table 1 Characteristics of Students and Lecturer participants

No.	Course	Code	Work Experience (Years)	Occupation	Gender
1	Master Public Health	S1	6	Doctor	Male
2	Master Public Health	S2	12	Doctor	Female
3	Master Community Health Science	S3	5	Pharmacist	Female
4	Master Community Health Science	S4	7	Hospital Administrator	Male
5	Master Public Health	S5	5	Doctor	Female
6	Master Public Health	S6	6	Doctor	Male
7	Master Medical Social Work	S7	2	Tutor	Female
8	Master Public Health	S8	6	Doctor	Female
9	Master Medical Social Work	S9	10	Social Worker	Female
10	Master Public Health	S10	4	Doctor	Male
11	Lecturer A	L1	13	Medical Lecturer	Male
12	Lecturer B	L2	21	Senior Medical Lecturer	Female

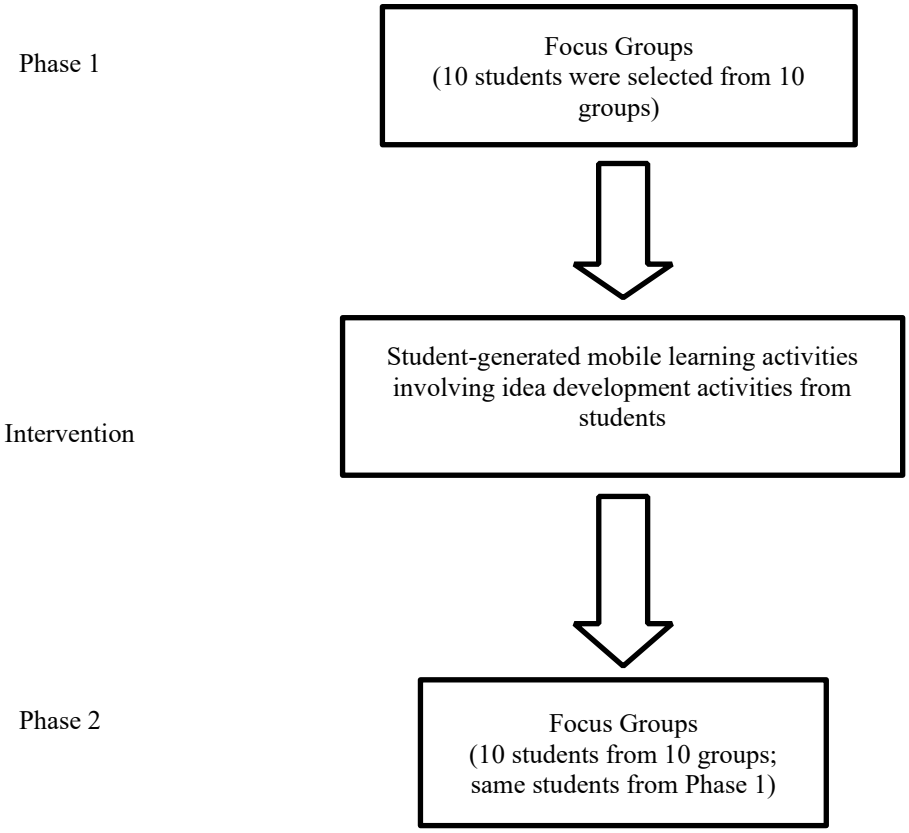

Figure 1 Methodology of Student-generated mobile learning process.

This research was conducted using an inductive approach by using the "making sense view" in the analysis of the study.[1,20] Likewise, researchers select the significant themes inductively to be interpreted. The inductive approach consists of four main phases. In the first phase, the researcher analyses all data obtained without any exceptions. Next, the data were re-analysed, compared and categorised without using hypotheses. From this analysis, generalisations were made inductively to the unification of facts and may need to be evaluated and further analysed.[20]

Thematic Process

Voice recordings were taken during the FGD and In-Depth Interview (IDI) sessions. The results of the voice recordings were transcribed in verbatim form. The study results were analysed via thematic analysis and inductive approach. Here, the results of

the interviews were analysed according to the themes appropriate to the issues discussed.

Thematic analysis is a methodology used by researchers to study data from interview and FGD activities. These themes were obtained after selecting and analysing data for the inductive thematic analysis process. Findings stated that studies on thematic analysis require researchers familiarising themselves with transcripts, implementing the coding process, and understanding data from interviews or focused discussions to be produced as themes.[21] In this study, the participants' answers were audio recorded. The audio was then transcribed into the Malay language. Several recordings had to be repeatedly listened to make sure there were accurately transcribed. Additionally, theme generation requires processes such as coding, combining encoding of small codes into larger theme groups, and redesignation of themes, if desired.[22] Similarly, coding is a non-linear process and can be repeated.[23] In this study, the thematic process resulted in changes to coding and themes that are appropriate to the context of the interview. These themes were then re-corrected based on an understanding of the data and analysis that coincides with the context of the theme.

RESULTS

Figure 2 is a conceptual framework that describes the findings of the study as well as the themes obtained from the interviews with the study participants. There are three main themes that have been the focus in the results of this study. The three themes; 1) Design of the resulting video in accordance with the local language and content, 2) Producing multimedia usage expertise and 3) Benefits gained by the students. This conceptual framework is derived from the experience of study participants from phase 1 to phase 2 in the student-generated activities in Health Promotion using smartphones.

Themes developed from the implementation of mobile learning in Health Promotion Module

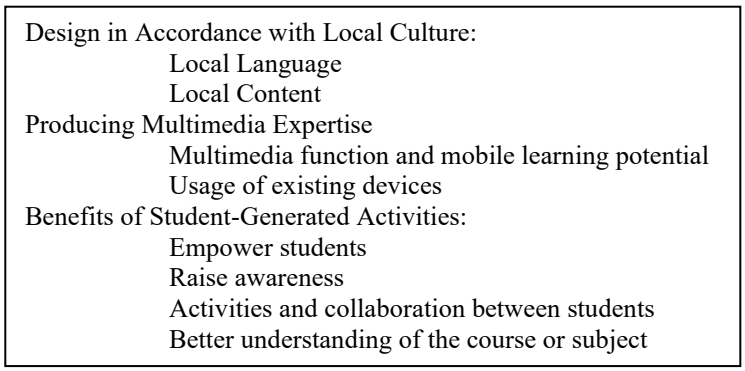

Figure 2 Conceptual framework of mobile learning implementation themes in Health Promotion.

The majority of study participants agreed to the application of the mobile learning system but did not rule out the usage of conventional approaches such as referring to scientific books as well as a more detailed planning on the implementation of the mobile learning education system. Participants also suggested that the implementation be made in accordance with the suitability of the educational approach based on the majors or courses taken by the students. Further elaborating on this point, the respondents felt that there are educational courses that are suitable for the implementation of this type of approach and vice versa. They suggested that extensive observation would be required before the implementation of mobile learning in universities or secondary and primary schools. In addition, cost constraints also need to be addressed, as there are students who come from families with financial constraints or unable to provide for all their educational needs. Therefore, around these points, the themes produced are as follows:

Design In Accordance with Local Culture

The production of videos that are interesting and meet the needs of local culture can increase the effectiveness and acceptance of the audience towards the videos produced.

Importance of Use of Local Language

Participants agreed with the use of the local language, and there is an increased public understanding of Health Promotion. According to the students, use of the local language can increase the understanding among the audience of the videos and can attract viewers to continue watching the video displayed.

> *"For example, with the use of medical terms such as 'hypertension' and 'diabetes', there were members of the public aged 50 to 60, who did not understand such medical terms. It is thus better if we use more local or layman terms such as 'darah tinggi' and 'kencing manis', so that they can better understand"* - (Student 1)

However, the presentation in the video should be appropriate to the background of the focused or targeted group in achieving the objectives of producing a video.

> "*In my opinion, it depends on the target audience. If for health promotion such as HIV and smoking, it is worth emphasising on cultural issues to ease their understanding of the objectives of the video presented. However, if the application built is for medical students, the cultural element does not affect the student because in the field of medicine, the information obtained is more comprehensive and does not focus on one country but involves all the countries in the world.*" - (Student 2)

The above opinion was favoured by other students as well, whereby, the production of videos depended on the subjects, educational background of the students as well as the use of the information in the field that the students will experience. In further elaboration, the respondents thought that there are students who will meet the community and the knowledge that will be imparted must be in line with the level of a community's acceptance. This is important for the effectiveness of the delivery of information.

> "*I agree if the term used is indeed a term used globally. However, if we follow the social context, we need to look from the angle of the cultural aspect itself, referring to the impact on social and community norms. If our focus is specifically for medical students, yes, I agree because we do look at the context and terms used by the whole world. So, in this case, it depends on the description itself, and the application intended*" - (Student 3)

Importance of Local Content

With the production of video through mobile learning, students can share ideas as well as discuss the input that can be included in the video assigned to them. The contents should be filtered according to the facts, needs and input that are appropriate and acceptable for all ages. According to the study participants, most of the information obtained from the web, such as YouTube contains facts as well as information from abroad.

> "*Most of the input found on YouTube and Google are input from abroad and not from locally*" - (Student 1 & 5)

In addition, students also thought that with the production of videos and input produced by the students themselves, it can facilitate the understanding of other students in the future. Students also suggested that the lecturer creates an application that can be accessed by the students at no cost, to increase their understanding of a subject or topic.

> "*I hope the lecturers make their own modules/apps and hope it is free and maybe add quizzes in it. With the module/apps, it will be more interesting. It is difficult to get started, but in the end, there will be many modules/apps, and it will be easier for students to make their choices from various types of local apps*" - (Student 4)

Apart from the students, the lecturers also agreed on the development of mobile learning as well as input from the context of Malaysia itself. This is thought to be an important aspect because most of the current information in the web and other resources are from abroad.

> "*I believe we should also consider cultural adaptation and must show the local context in this country. But if we look at it now, what is growing rapidly is the content from*

overseas/foreign countries" - (Lecturer A)

Producing Multimedia Expertise

Mobile learning activities in Health Promotion is an activity that can be implemented at all levels of higher education. The usage of existing devices in the production of Health Promotion videos, as well as multimedia functions available in current smartphone devices can boost mobile learning at a higher and wider level.

Multimedia Function and Mobile Learning Potential

Multimedia is a combination of several elements, specifically, text, graphics, sound, video and animation that enable the production of an amazing presentation. The student-generated activities of Health Promotion videos certainly included multimedia elements.

> "*Through this mobile learning, I learnt the functions of the smartphone itself. We can also edit videos using a mobile phone with the available applications, to create a story and interesting video. In addition, we can also transfer the video to a laptop, to explore about the production of an interesting video, in more depth*" - (Student 6)

At this stage, we can see that students were very enthusiastic and active in using mobile devices. In addition to producing an interesting video, the students are able to hone their talents and can improve their knowledge and skills in handling their existing devices more widely.

Usage of Existing Devices.

Students and lecturers do not need to buy any new equipment during the implementation of mobile learning. Furthermore, the use of existing devices is encouraged for economic reasons, as well as it can increase the level of creativity of the students in carrying out the assigned tasks, using the device available at hand.

> "*We can make the video simply by using our own mobile phone*" - (Student 2, 3, 5 & 7)

Here we can see that students are more comfortable using their own smartphones without having to spend extra to complete a given task. The features of the existing mobile devices are indeed sufficient for the implementation of this mobile learning. Additionally, students can edit videos wherever they are. Every idea that comes to mind can also be applied in the videos using a free application, that can be conveniently reached at your fingertips.

Other than students, a lecturer also similarly stated that each student can use an existing device. In terms of access to the internet, each faculty has provided free Wi-Fi for students to surf the internet to produce interesting video.

> "*It can be said that everyone has a smartphone no matter how expensive or cheap a smartphone is. There is no contradicting that even a cheap smartphone is enough to produce a video. We do not need an expensive smartphone. In terms of internet connection, I believe there is no problem because they have internet connection in dormitories, libraries and in lecture halls. Therefore, I think that this video production activity can be implemented for students*." - (Lecturer B)

The above statement proved that the lecturer understands the technical challenges. For example, the internet network problems may hinder the production of ~~a~~ video. However, with the facilities provided by the faculty and university, students are able to use the facilities provided as best as possible to produce videos. This matter is an important factor, as in today's working environment, employees are required to make use of all the provided facilities in completing their tasks.

Benefits of Student-Generated Activities

Empower Student Activities

The implementation of mobile learning can improve the students' skills to learn new things, be more independent and apply their own ideas to develop Health Promotion videos.

> "*Actually, at the beginning it was not so easy, since this is the first time we made a video in class. But it is very interesting. We learnt from the internet on how to produce the video*" - (Student 2)

In addition, these activities can also increase the cognitive level of students in understanding a piece of information and then to convey it in a more creative and critical way according to the current development of technology.

> "*What I learned from mobile learning is that I learned a new*

> *way of presenting information that is more creative and not like the former way*."
> - (Student 9)

Apart from the students, lecturers also agree with the implementation of video producing assignments in mobile learning. They believed that through the application of activities like this one, students can polish their talents and become more creative and more independent to perform a given task.

> "*Alhamdulillah… after providing guidelines and explanations on the task of producing Health Promotion videos, students themselves became very creative in the production of these videos*" - (Lecturer A)

Activities like this not only have a positive impact on students, but it can also provide a benchmark for lecturers for evaluating a student's performance, in order to improve their education to a higher level.

> "*From these activities that have been carried out, I can say that we can drive students to a level that they themselves are unaware of. This is because some of them have the experience in video production but most of them were not exposed to video production and similar activities. By having such activities, it showed them that they need to learn, and must be ready to learn. So, they succeeded to achieve what we hoped for….. searching for information by themselves*" - (Lecturer B)

From these statements, it can be concluded that some students were not given the opportunity to challenge themselves in doing new things. However, through new activities, it was proven that students were encouraged to enhance their skills and talents. Additionally, this might be one of the approaches to promote health to their classmates and further promote better well-being to the community.

Raise Awareness

The implementation of mobile learning is also able to escalate awareness among students to use smartphones more intelligently and beneficially.

> "*We can obtain information by using mobile devices such as mobile phones, tablets or laptops while we are on the move. I think it's an exciting way to learn something new that has never been done so widely before*"
> -(Student 10)

The above statement indicates that implementation of activities involving the use of mobile devices, is very beneficial to students. Other than being able to follow the current development of technology, students can also acquire additional skills and knowledge and explore a new digital platform for their success in the future.

Activities and Collaboration Between Students

Video production activities require a collaboration between group members from the planning phase, constructing and creating interesting videos. During these phases, students need to utilise their skills in communicating among group members. Students are also encouraged to express their opinion in order to produce a video that can catch the audience's attention as well as being able to achieve the objective of conveying the health promotion subject.

> "*The discussion process occurs for a maximum of less than half an hour. But the larger scope of the process is shooting and editing the video. Usually after we finish editing the video, we will ask for the opinion of the other group members and what kind of improvements do we need to make*" - (Student 3)

The above statement was agreed by other students that further stated that cooperation and respecting the work of others is essential in developing a video, as well as a forming of a successful group.

> "*What I have learnt about creating video activities was collaboration. The first was cooperation between group members and the second was appreciating the work of others. This is because everyone had tried to produce something useful for others*" - (Student 8)

The best presentation is where the audience understands and are impressed by the video presented, which subsequently may be able to change their behaviour towards being more positive

towards health related issues such as personal hygiene, and familial, community and environmental health.

Better Understanding About Health Promotion
Through mobile learning, students can deepen their understanding about the Health Promotion subject. In addition, students are able to apply the knowledge in their field of work as well as in their daily life. As the result of discussions with the students, it was discovered that students felt more enthusiastic and easily understood a subject through the various activities such as the Health Promotion video production activity. In addition, students also suggested that these activities can be implemented in other subjects according to the suitability and objectives of the subjects taught.

> "*I think if we can implement the various health promotion theory subject in the form of a 'game' or video, then it would be good. Because in the form of apps, or any form of 'game' it would be easier, and can improve understanding, ... Because some subjects are 'dry', consist of just reading, and sometimes we do not understand*." - (Student 3)

The lecturers also thought that the implementation of video production activities in Health Promotion can provide a better understanding among students. This is because Health Promotion is a subject that not only focuses on theory but has more practical applications in the daily life. Additionally, the use of theory alone is less effective in changing a person's behaviour, especially to achieve a healthier lifestyle.

> "*Not only in delivering theory, by requiring a practical response from the students. Therefore, by making a video, the activity itself allows students to show and express what they understand*"- *(*Lecturer A)

These statements elucidated that students and lecturers agree with the method of using video-related applications through mobile learning in the field of Health Promotion.

DISCUSSIONS

With the widespread development of digital technology, people are spending more of their daily time on gadgets such as televisions, smartphones, computers and tablets.[24] This study found that the use of smartphones helps to strengthen university student learning activities and increase the cooperation and understanding among them. Therefore, there is great potential to apply the mobile learning method for the Health Promotion subject.

Empowerment of Student Activities Through the Use of Smartphones
The active implementation of mobile learning in Health Promotion courses can empower students in completing assigned tasks.[6,18] The results of this study are consistent with previous findings, which showed that mobile learning not only empowers students but also enhances their overall learning experience.[19] Such activities, including video production, help develop students' multimedia-related skills while supporting the achievement of learning objectives.[25] The use of smartphones promotes student independence in learning, as they provide quick access to information and educational resources, enabling students to independently retrieve updated information anytime and anywhere.[26]

In addition, the use of high-end and sophisticated smartphones has gone beyond basic functions, becoming a necessity in modern lifestyles.[27] Smartphones are no longer limited to communication tools such as SMS and phone calls,[8] but are also widely used for entertainment, education, and work purposes through applications such as augmented reality (AR), virtual reality (VR), and mobile simulations.[27] High-end smartphones support interactive and multimedia-rich learning experiences, which enhance comprehension and engagement in complex public health topics.[14] Furthermore, frequent use of advanced smartphones contributes to the development of essential digital literacy skills, which are increasingly important for public health professionals in navigating digital health tools and data management.[28]

Cooperation between Students and Understanding Subjects
In terms of activities and cooperation between students, this research demonstrated similar data as with the studies, whereby students worked actively and creatively to produce an interesting video that is easily understood by the focus group.[8,16] This is because mobile learning often integrates bite-size material and multimedia to make the complex concepts more digestible and messages impactful.[29] By sharing opinions and thoughts among students, they were able to complete a given task that subsequently led to the product being displayed for public viewing.

Discussing the understanding about Health Promotion, the results of these activities seem to suggest that it was able to polish the students' understanding about the subject and its learning objectives. Besides the students, the lecturers also

thought that students can create the product of a given project very well and in a remarkably good multimedia quality.[1] Mobile learning promotes active learning that requires students to apply critical thinking based on their knowledge from the lesson, which is in line with constructivist principles, where students create meaning through practical exercises rather than passively absorbing information.[29,30]

The use of mobile learning approaches can also complement other learning methods, for instance, early exposure programs to the actual work environment. Examples include ward visits for doctors and nurses, peer-assisted learning and student-facilitator interaction programmes.[31] In addition to traditional early exposure programs, virtual laboratories serve as a form of mobile learning that simulates real-world work environments, allowing students to practice and refine their skills in a controlled yet realistic setting before engaging in hands-on experiences. Virtual laboratories, which is one example of mobile learning, can be an effective complement to traditional laboratory education, as it can help students to enhance their laboratory skills and provide opportunities for self-guided training.[32] Education through mobile learning can also be implemented at the undergraduate level in other subjects according to the suitability of the objectives of the subject.

Be More Open and Positive

The majority of study participants in another study agreed and were interested in the implementation of mobile learning.[10] Respondents in another study also said that through a mobile-based learning activity, they were more interested in learning more about the subject of Health Promotion and felt that mobile video learning is good for them.[16] Participants also agreed that lecturers use the mobile learning approach, in addition to the direct classroom learning.[15] However, the majority of students felt uncomfortable if they have to spend a lot of money on their phone bill as a result of mobile learning.[17] Given the existence of free Wi-Fi, most study participants felt that this type of educational approach can be implemented in the institution with smoother experience. Investing in strong Wi-Fi infrastructure from an institutional standpoint not only facilitates mobile learning but also lowers operating expenses by facilitating digital communication and administration and reducing reliance on physical materials.[33]

Apart from making and processing videos, students can also diversify mobile learning methods by using or creating game applications, as we are in the fast-paced era of the gaming industry. The students are prone and with intention of continuance use of the gamified version mobile learning application, as they find them useful, enjoyable and easy to use.[32] Most of the already existing gamified mobile learning applications use Artificial Intelligence (AI) driven algorithms, such as language learning game, Duolingo which can be tailored to individual performance, thus ensuring focus on weakness areas rather than generic to foster deeper engagement and accelerating progress of understanding.[34,35] Studies on gamification in medical education showed that it increases motivation, engagement and enjoyment of learning experience compared to the conventional method.[36,37] The development of gamification and gadget technology can also have a positive impact, for example on health and well-being, but the positive or negative psychosocial effects on screen addiction and academic performance still need to be investigated. This is to ensure that the results do not lead to unwanted effects among the younger generation.[24]

LIMITATIONS

The limitations of this study include that it was only conducted for a particular subject in a local hospital setting. Therefore, this study needs to have more samples and should include other modules to avoid generalization. Additionally, involving more participants from other institutions can provide a better understanding of the research, particularly those related to mobile learning for student generated activities in post-graduate studies. Thus, it might enhance or deepen the perspectives, particularly on mobile learning for student-generated activities in the Malaysian settings.

CONCLUSIONS

In conclusion, the study participants were favourable towards the implementation of mobile learning in Health Promotion subjects. The application of mobile learning via student-generated activities can be implemented to other modules/subjects as it has benefits to both the students and lecturers. The utilisation of such activities does not involve all existing courses but can be implemented according to the suitability and objectives of the course. The practice of mobile learning in other modules apart from Health Promotion requires more specific preparation. With the advancement of the current mobile technology, a simple smartphone can be very useful in the working life of healthcare personnel in the public health sector soon.

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