CAN STUDENT AND STAFF INVOLVEMENT IN QUALITY ASSURANCE AND PROMOTION BE ACHIEVED IN THE HEALTH SCIENCES THROUGH mHEALTH AND e-LEARNING? A CONCEPTUAL PLATFORM DESIGN

H. Noorbhai
Department of Sport and Movement Studies
University of Johannesburg
Johannesburg, South Africa
e-mail: habibn@uj.ac.za / https://orcid.org/0000-0001-9464-6854

ABSTRACT

With the new generation of health professionals, some skills such as diagnosing and treating an array of diseases has become complex and challenging. These health professionals also seem to portray other transferrable skills which can be embedded with future curricular through the use of e-learning. It has been reported that universities have a responsibility and an opportunity to effectively prepare future health professionals to address health related issues with evolving changes within the healthcare landscapes through enhanced student involvement. Practical activities based on local institutional creativity and regional issues can reinvigorate the links between clinical practice and the health of people, through quality assurance and promotion. One form of a practical activity that can be identified is through the use of e-learning and technology. Over the last decade, developments in e-learning and technologies are creating the groundwork for health sciences education. There may be a similar trajectory within the health sciences domain where both health sciences students and qualified health professionals frequently use their mobile phones when consulting with patients. Given the diversity of e-learning methods, there are many ways to carry out such an evaluation. However, the current literature shows us that we have yet to reach any form of consensus about which indicators to evaluate. There is a greater need for an evaluation tool or platform that is properly constructed, validated and tested within the health sciences, that can also be used to enhance student involvement and quality assurance. Given the limited success rate of e-learning within the health sciences field, this article aims to fill this gap by proposing how such an mHealth and e-learning methodology for a platform can be evaluated and established, to optimise learning (for students and academic staff), student involvement, quality assurance and healthcare (for patients) in South Africa.

Keywords: mHealth, e-learning, quality assurance, promotion, health sciences

INTRODUCTION

South Africa has a quadruple burden of disease from human immunodeficiency virus/acquired immunodeficiency syndrome and tuberculosis, diabetes, maternal and child mortality, injuries

and violence, and non-communicable diseases (NCDs; National Department of Health 2013; Bradshaw, Groenewald and Laubscher 2003; Mayosi et al. 2012; Stats SA 2014; Pillay-van Wyk, Msemsuri and Laubscher 2016). Despite the epidemic and epidemiology of these diseases globally and in South Africa, it has been postulated that if the practice of medicine is to be more than identifying and treating disease that includes a significant preventative component, then there is a need to better understand the relationships between ecosystem health and human health (Rapport et al. 2003). However, health science faculties and medical schools, particularly in Low and Middle-Income Countries (LMIC) make limited provision for teaching innovative healthcare approaches when addressing burden of diseases (Lozano, Naghavi and Foreman 2012), preventive medicine and treatment, due to the already overloaded curricula. There is, therefore, a need to find innovative solutions to supporting current and future health professionals in correctly diagnosing, treating and preventing diseases from an array of diseases. Among high-income countries, topics on health sciences education in varied faculties had embraced the challenge of widening their conventional curriculums. However, among LMIC, this has not been the case, and, as such, there is a need to fully expand the curriculum and challenge in these countries.

e-Learning in the Health Sciences

Epistemology, ontology and axiology have laid the foundations for how we, as individuals, understand the world we live in, the determinations we make about issues relating to truth, and the matters we consider to be of value to us individually, and to society at large (Edelheim 2014). In line with these foundations, we have begun to learn the five trends shaping the future of work that include: new behaviours, new technologies, the millennial workforce, mobility and globalisation (Morgan 2014). People are able to access knowledge anywhere, anytime and virtually. In the context of health sciences education, we have witnessed that such curricula has changed, in order to meet the evolving demands of the healthcare system.

One such change and evolvement in the curricula is e-learning, which is also known as web-based learning, online learning, distributed learning, computer-assisted instruction, or internet-based learning. Historically, there have been two common e-learning modes: distance learning and computer-assisted instruction. Distance learning uses information technologies to deliver instruction to learners who are at remote locations from a central site (Ruiz, Mintzer and Leipzig 2006). Computer-assisted instruction (also called computer-based learning and computer-based training) uses computers to aid in the delivery of stand-alone multimedia packages for learning and teaching (Ward et al. 2001). These two modes are categorised under e-learning because over the last two decades, the internet has become the integrating technology

for many forms and modes of learning platforms (Ruiz et al. 2006).

Almost 15 years ago, Ruiz et al., (2006) indicated that the integration of e-learning into undergraduate, graduate, and continuing health sciences education will promote a shift towards adult learning in health sciences education. This is where educators will no longer serve solely as distributors of content, but become facilitators of learning and assessors of competency. It is now an established fact that evaluating the effects of e-learning design can be complicated.

With the new generation of health professionals, some skills such as diagnosing and treating an array of diseases has become complex and challenging (Frenk et al. 2010). These health professionals also seem to portray other transferrable skills which can be embedded with future curricular through the use of e-learning. It has been reported that universities have a responsibility and an opportunity to effectively prepare future health professionals to address health related issues with evolving changes within the healthcare landscapes through enhanced student involvement (Jogerst et al. 2015). Practical activities based on local institutional creativity and regional issues can reinvigorate the links between clinical practice and the health of people, through quality assurance and promotion. One form of a practical activity that can be identified is through the use of e-learning and technology (Walpole et al. 2019).

mHealth to fill curricula gaps

Over the last decade, developments in e-learning and technologies are creating the groundwork for a revolution in education (Masic 2008). This may be a similar trajectory within health sciences education where both training doctors and qualified doctors frequently use their mobile phones when consulting with patients. This is also known as tele-education, which is also observed through health education on distance, using Information Communication Technologies (ICTs), as well as continuous education of health system beneficiaries and the use of electronic libraries, databases or electronic data with databases of knowledge (Masic 2008). In the knowledge economy that we currently reside in, and more broadly, with the rapid evolvement of research within the public health sphere (Noorbhai 2013), it can become quite challenging to streamline important information such as symptoms, exposures, treatments and prevention strategies of a disease for health sciences students and health professionals. One could argue that mobile health (mHealth) could be a solution.

More developments of mHealth, digital applications and tele-medicine has emerged, which has either been used in healthcare settings or designed for health professionals (Mosa, Yoo and Sheets 2012; Ozdalga, Ozdalga and Ahuja 2012; Wallace, Clark and White 2012; Free et al. 2013; Payne, Weeks and Dunning 2014; O'Donovan, Bersin and O'Donovan 2015; Gagnon et al. 2016). Recently, a study conducted by De La Cruz, Monroy and Mosahebi (2019)

showed that although there are further studies required to assess the impact that mobile applications have on patients' care and healthcare professional services, there is an overall positive impression of the use of perioperative mHealth applications. Yaghobian et al. (2019) elaborated that further research would need to be conducted on tele-medicine education, training implementation and knowledge, attitudes and practices of health sciences students, health professionals and resident medical doctors.

Rationale for the platform

Given the diversity of e-learning methods, there are many ways to carry out such an evaluation. However, the current literature shows us that we have yet to reach any form of consensus about which indicators to evaluate. There is a greater need for an evaluation tool or platform that is properly constructed, validated and tested within the health sciences, that can also be used to enhance student involvement and quality assurance. Given the limited success rate of e-learning within the health sciences field, this article aims to fill this gap by discussing how such an mHealth and e-learning platform can be evaluated and established, to optimise learning (for students and academic staff), student involvement, quality assurance and healthcare (for patients) in South Africa.

mHealth technologies also have the potential to greatly impact health research, healthcare, health outcomes, and learning. However, it has also been shown that the exponential growth of the technology has outpaced the science of mHealth (Nilsen et al. 2012). Due to some health sciences curricula having no room to include mHealth training, and practicing professionals do not have the time to research these approaches or mediums, further research would fill this gap and warrants the need to better understand students and the healthcare setting in the fourth industrial revolution (4IR). It also warrants the need to develop an application and platform, as well as a strong network, that will bridge this gap (between mHealth and e-learning in healthcare technology and innovation) in the health sciences fraternity. Given the unsuccessful rate of e-learning within the health sciences area (Lindenmaier et al. 2018), a virtual centre (focusing on healthcare innovation) and research project has been conceptualised to fill this void by researching how such a platform and curricula can be merged and subsequently evaluated and established, to optimise both learning and healthcare with patients, as well as quality assurance and student involvement for health sciences students.

METHODOLOGY

A mixed-methods research study should be conducted prior to the development of the platform and curricula (Figure 1). There is currently no consensus on an optimal platform and evaluation

tool that can be utilised in designing a curriculum for effective dissemination for e-learning that can be used by health sciences students, through health technology teaching (Figure 2).

Note: Figure 2 is an extension of the teaching and learning arm from Figure 1.

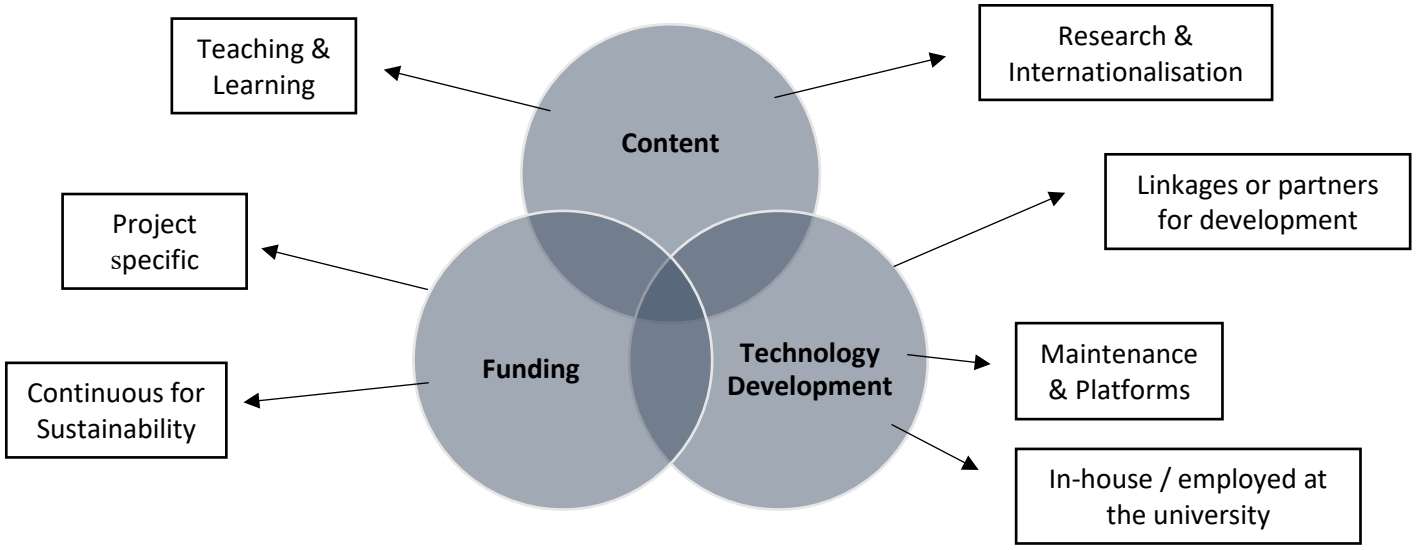

Figure 1: Three core pillars for digital health adoption: A preliminary model

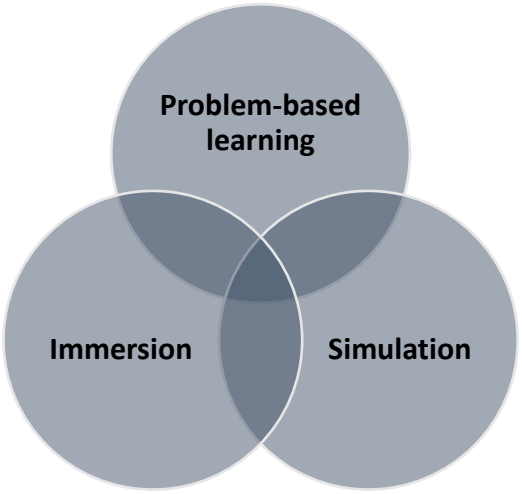

Figure 2: Overview for effective health technology teaching and quality assurance

Research design and setting

A mixed-methods study combining both qualitative and quantitative analysis is found to be more effective and invaluable for gaining insights from participants. Therefore, this study will employ a mixed-methods study design in which a survey will be utilised including both closed-ended and open-ended questions, as well as focus group discussions that will be conducted before and after the surveys takes place.

Study procedure and study participants

Focus Group Discussions (FGDs) (N = 50–100) will be conducted among both health science students (medicine, physiotherapy, biokinetics, optometry, nursing, occupational therapy, dentistry and other allied health or medical students) and staff from five universities that are regarded among the top Health Sciences Faculties in South Africa according to Times Higher Education rankings (University of Cape Town, University of the Witwatersrand, University of Johannesburg, University of Pretoria and the University of Stellenbosch) in South Africa. A survey will also be sent out to all health science students at the universities (n=500). A probability calculation indicates that 500 would be a sufficient number of study subjects. Students and universities will be contacted through internal networks as well as through the Faculty Administration Offices at the universities.

Survey questionnaire

After validation and standardisation of the survey, an online survey will be developed using GoogleForms™ which will be provided to health science students and staff. Each survey may require between 15–20 minutes for its completion. The questions asked will be both open and closed-ended questions. The online survey will also be sent to three experts in the field to have it validated, verified and piloted among a few students, prior to releasing it in order to ensure validation. Any changes suggested will be made to the survey.

Focus group discussions

The purpose of the focus group discussion (FGDs) would be to refine the survey questionnaire, recruit participants for an online survey, review the findings from the FGDs and be in a space to make further recommendations. The variety of the respondents we intend engaging with can influence the contribution our study is able to make towards the development of the survey questionnaire. As such, participants will be intentionally selected using a sampling technique described as “purposeful sampling”. The duration of the FGDs will range between 20 to 35 minutes and guide questions will be developed for the discussions. These questions aim to solicit the respondents’ perceptions with regards to mHealth and e-learning within the health sciences curricula. The responses from both focus group discussions and the surveys would allow and ensure optimal development for the mHealth and e-learning platform/application.

Quantitative data analysis

Data will be captured automatically from GoogleSheets™ and exported onto an online Microsoft Excel sheet upon submission of the students’ responses. Pearson’s correlations and chi-squared tests will be conducted to determine any significant trends and relationships in the

answers obtained from the survey. All statistical analyses will be performed using SPSS (Version 26, IBM) at a significance level of $p = 0.05$.

Qualitative data analysis

Atlast.ti will used for analysis of the open-ended data of the survey as well as for the two focus groups. Once the questionnaire is answered and after the focus group discussions are conducted, open-ended answers and transcriptions gathered from the students will be coded using a thematic coding framework. These codes will be formulated from the answers provided by the students. The results will be discussed as themes that arise from the quantitative data, which will be supported by qualitative data in the form of quotes and insights provided by the students.

Culture and considerations

Many health sciences faculties within universities in South Africa do not foster a dynamic culture of e-learning and mHealth within their health sciences curriculums. Such a culture would also assist in creating more opportunities within the healthcare landscapes for job creation. Some universities in South Africa are embedding the ethos of 4IR (such as the University of Johannesburg), but are yet to inculcate the use of e-learning within their health sciences curricula (and many of their other faculty curricula). Consistent engagement in the conception or creation of the platform whereby it will be used for health sciences curricula and e-learning benefits within the mHealth domain as well assisting health professionals when consulting patients, is lacking. One has to also take into account some of the considerations and limitations that exist when streamlining quality assurance of digital health in South Africa:

- Strength and infrastructure of internet and Wi-Fi capability at universities.
- Student projects as part of their hours/final-year degree.
- Longevity and sustainability of the use of a platform, device or project.
- Data costs and challenges in rural areas.
- Policies, governance and legalities involved need to be streamlined.
- Diverse languages.
- Designing for a wider group followed by replication in rural areas for accessibility.
- A review is needed on what devices are used in rural areas, as well as whether Android or Apple are more common for utilisation.

Furthermore, according to the WHO (2013), a report discussing the transformation and scale up of health professionals' education and training mentioned the following: "scaling up

education and training is a critical component of the strategies to strengthen the health workforce, but much of its effectiveness will be lost if it is not complemented with policies to retain the graduates, and to provide them with working conditions that will enable them to use their knowledge and skills productively". This is imperative to consider in the research methodology and development of the platform. The platform would also need to consider to foster the use of effective strategies of promotion, disease prevention, and health sciences education.

CONCLUSION

Change is inevitable. Education has evolved and adapted through the digital and electronic ages. It is only a matter of time before teaching and learning adopts changes through the technological age. Now is as desirable a time as any to streamline and adapt the health sciences curricula for the promotion of health sciences education in the current 4IR through a platform.

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