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A conceptual e-health readiness assessment framework for students in higher education

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Abstract: Healthcare extends across all races, genders, ages, culture as well as geographical boundaries. Therefore, as a concern to all, to promote general development in developing countries, their healthcare needs should be tackled. This can be tackled by using modern information and communication technology (ICT) such as e-health to deliver health services to patients with limited access to care. However, readiness for e-health should be assessed first in developing countries. Although several articles have been published on e-health readiness assessment frameworks, existing e-health readiness assessment frameworks and tools have not been found to be entirely suitable for assessing e-health readiness in developing countries. Therefore, this paper proposes a context specific e-health readiness assessment framework that could be used in developing countries.

Keywords: Context, E-health, Framework, Healthcare, Higher education students, Readiness, Student

Introduction

Healthcare extends across all races, genders, ages, culture as well as geographical boundaries. Therefore, as a concern to all, to promote general development in developing countries, their healthcare needs should be tackled (Li, Land, Chattopadhyay & Ray, 2008). Developing countries have a problem of healthcare issues such as infectious and chronic diseases, lack of basic healthcare programmes, facilities as well as a shortage of skilled healthcare workers (WHO, 2006). These problems result in poor healthcare, which inhibits developing countries' prosperity and business profitability hence directly affecting the mortality rate of inhabitants of these countries (Li, et al., 2008). However, due to healthcare provider's recent movement to making sure they use modern information and communication technology (ICT) to deliver health services to patients with limited access to care, there has been a massive use of electronic and wireless technologies (Bervella & Al-Samarraie, 2019). These technologies, such as electronic health (e-health) help to manage, distribute, and share health-related information that resulted in new opportunities for patients in developing and developed countries (Bervella & Al-Samarraie, 2019). The application of e-health systems has been reported by previous studies as an effective platform in advancing healthcare services, and one of the key solutions is to aid healthcare practices (De La Torre-Díez, López-Coronado, Vaca, Aguado & de Castro, 2015).

Electronic health, shortened e-health, is a generic umbrella term referring to the use of information communication and technologies in health-related services and processes (Austrian Federal Ministry of Health Telemedicine, 2019). Furusa and Coleman (2018) also agree that the e-health concept operates in the field of medical informatics. Similarly, Busagala and Kawono (2013) also state that e-health is defined as a combination of the healthcare system

and the use of ICT to allow better health and healthcare. Put simply, World Health Organisation, WHO (2016) defined it as using ICT for health purposes. It is used worldwide and includes the use of various applications such as telemedicine related services, electronic health records, as well as electronic medicine overview (Blaya, Fraser & Holt, 2010). Mugo and Nzuki (2014) also alludes to the fact that it aims to deliver health services and information by means of the Internet and related technologies both at a local site and over a distance. In difference, Qureshi and Shah (2013) state that e-health is any electronic exchange of health information within the health sector. Similarly, Mugo and Nzuki (2014) stated that it involves several actions that use electronic means to provide health-related information, resources as well as services. Furusa and Coleman (2018) also alluded to the fact that it is viewed as the integral infrastructure that forms the foundation of information exchange amongst users of the healthcare system and is a means for improved health outcomes for all. Other authors explained that it entails the electronic processes as well as communications that support and enables healthcare practices (Oh, Rizo, Enkin & Jadad, 2005). According to Bennani, Belalia and Oumlil (2008) and Kamsu-Foguem and Foguem (2014), e-health leads to a new vision in the health system due to its improvement in cost reduction, decreasing inaccuracies, and information quality. Its main objective is to improve different medical and healthcare services despite barriers such as geographical and economic factors (Geissbuhler, Bagayoko & Ly, 2007; Hussein & Khalifa, 2012).

From various researchers, the notion of e-health can be seen as the use of various ICT forms to improve the delivery of services by the healthcare sector for the betterment of patients' health. This study adopts this definition throughout. Using e-health is increasing rapidly, and it is widely accepted as an important element which supports and sustains the challenges of delivering healthcare services, clinical decision-making, patient safety, curbing of increasing health costs, efficiency, supporting research and ultimately improving healthcare (Maunder, Williams, Walton, Ferguson, Beck & Probst, 2014). However, the potential of e-health goes past supporting the already burdened healthcare system; it has the potential of contributing to health-related behaviour modifications and also improving healthcare accessibility to both rural and remote populations (Alkhaldi, Sahama, Huxley & Gajanayake, 2014). South Africa is not left behind in taking advantage of the potential of e-health. It was seen as the leading country of Sub-Saharan Africa to implement e-health technologies for various health interventions (Bervella & Al-Samarie, 2019). However, there are several factors to be addressed in effective implementation of e-health in South Africa, such as assessment of e-health readiness and many more. Therefore, this paper presents a conceptual framework that can be used to assess e-health readiness in higher education, taking into consideration the issue of context. The rest of the paper is as follows: Background and Context, Research Motivation, followed by Problem statement, Research questions, Literature review, Theoretical framework, Conceptual framework, Methodology, Significance of the study, and Conclusion.

Background and context

It is worth situating the descriptions that define South Africa where this study will be carried out in the broader configurations. Geographically, South Africa is located in sub-Saharan Africa (Howell, 2019). The country is specifically located on the southern tip of the African continent. It shares borders with its northern neighbours Namibia, Botswana, Zimbabwe, and Mozambique (Education South Africa, 2020). South Africa covers a large area of 1 221 040 square kilometers and is home to some 59.3milion people as of Saturday, August 15, 2020 (Worldometer, 2020). In terms of the race, almost 77% are black or African, 11% white and 9% "coloured", a term used as a local label for people of mixed African, Asian and white descent (Education South Africa, 2020). South Africa has 11 officially recognized languages being Sepedi, Sesotho, Setswana, siSwati, Tshivenda, Xitsonga, Afrikaans, English, isiNdebele, isiXhosa, and isiZulu (Education South Africa, 2020). The languages are spoken across the nine provinces of South Africa which are namely Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumulanga, Northern Cape, North West, and the Western Cape.

With regards to e-health, which is at the core of this study, South Africa is regarded as one of the leading countries in Sub-Saharan Africa in terms of implementations of e-health (Bervella & Al-Samarie, 2019). South Africa started putting healthcare reforms as a priority area on the country's development agenda at the end of apartheid in 1994 (Burger & Christian, 2018). Progressive policies that reformed the centralized, healing and hospital-based public healthcare system were put in place to promote access to affordable primary healthcare (Black, Siebrits & Van der Merwe, 2011; Van Rensburg & Engelbrecht, 2012). Despite these efforts by the government to improve access to

healthcare for all by expanding healthcare facilities and user fees for primary health care, South Africans were still faced by challenges of health outcomes remaining polarized, unequal and unfair (Ataguba, Akazili & McIntyre, 2011; Ataguba, Day & McIntyre, 2014; Marten, McIntyre, Travassos, Shishkin, Longde, Reddy & Vega, 2014; Sahn, 2012). South Africa's healthcare transformation results remained disappointing compared to those of peer countries (Burger & Christian, 2018). In response to these, the government of South Africa released a white paper on national health insurance (NHI) (Burger & Christian, 2018). The NHI was to improve the quality, equity, poor performance, and coverage of the healthcare system in the country.

Although the white paper on NHI was developed, South Africa 's health system is still faced with some challenges. In an article that appeared in *Sunday Times* on 25 March 2012 titled ('Public hospitals in Gauteng sick and tired'), it was stated that hospitals were under a lot of problems as doctors, nurses, and patients were battling with shortage of linen, medicine, and food as well as broken equipment. Additionally, the article stated that there was a problem with flooded theatres and no functional telephone lines (Bailey, et al., 2012). It is within this context that, like any other developing or developed country, access to quality healthcare services has been getting attention from governments hence the proposal of implementing healthcare systems centered around technology (Furusa & Coleman, 2018). In terms of "networked readiness" which is, in short, an evaluation of the impact of ICT's at a global level and to benchmark the ICT readiness and usage in a country's economy, South Africa was rated 65th out of 139 countries in 2016 which was high compared to other African countries (Healthenabled.org, 2019; Bilbao-Osorio, Crotti, Dutta & Lanvin, 2014). Furthermore, South Africa has strong policy and regulatory, business, and innovative environments, but it rates poorly in terms of affordability, infrastructure, and skills (Healthenabled.org, 2019). Additionally, it has impressive cellphone penetration but has expensive fixed lines and mobile broadband (Healthenabled.org, 2019). However, South Africa started aiming at improving healthcare services through the concept of electronic health (e-health) systems by analysing its potential role (Weeks, 2012).

Research motivation

The use of technology by students in South Africa has been demonstrated in different studies (Oyedemi, 2012; Shambare, 2014; Makura, 2014; Thinyane 2010). However, research on e-health, e-health readiness, and e-health readiness frameworks on higher education students' need to be done. Several studies on e-health have been done in South Africa (Coleman & Coleman, 2013; Fanta & Pretorius, 2018; Coleman, 2010). For example, a study by Coleman and Coleman (2013) was to compile a Provincial E-health Framework (PEHF) based on the feedback from electronic healthcare readiness assessments conducted in selected rural and urban hospitals/clinics in the North West Province in South Africa. Another study done on e-health in South Africa by Fanta and Pretorius (2018) focused on developing a conceptual framework for sustainable e-health implementation in resource-constrained settings. Furthermore, Coleman and Coleman (2013) investigated the different e-health readiness assessment models applied in health institutions of the North-West Province of South Africa. However, these studies focused on developing e-health readiness assessment frameworks or models with a focus on hospitals/clinics. The problem is that the end users, which are patients (higher education students) have been neglected in developing frameworks that assess their e-health readiness in South Africa.

Higher education institution students are used in this study as the target population in South Africa because they are convenient to reach out to by the researcher in this COVID-19 era. Additionally, several studies have been done on students with regards to different aspects of information technology such as technology use or technology adoption or technology readiness (Moate, Chukwuere & Mavhungu, 2017; Mavhungu, Chukwuere & Gorejena, 2018; Ntseme & Chukwuere, 2017; Chukwuere & Chukwuere 2017). These studies are proof that research relating to information technology can be conducted on students as they are digital natives, fond of using information technology products and initiatives and are also familiar with web 2.0 technologies. In terms of e-health, studies on e-health adoption,acceptance and literacy by students have also been done in different countries (Feuk, 2018; Gurkan & Ayar, 2020). Additionally, in Saudi Arabia Students were generally familiar with telemedicine and electronic health records (Jabour, 2021). With the current pandemic of COVID-19 where there is movement restriction everywhere in the world, higher education institution students use online learning as a mode of learning hence most could also be using e-health initiatives to get medical assistance from various medical personnel and facilities. Using the student population enables the researcher to get opinions from a diverse group of individuals

who are natives of South Africa and other countries of the world. Furthermore, the student population narrows down as possible patients or receivers of the healthcare system services as all people in South Africa are somewhat receivers of the healthcare system services hence, they qualify to be part of the study. Additionally, this study will be carried out because existing e-health readiness assessment frameworks and tools have not been found to be entirely suitable for assessing e-health readiness in developing countries (Mauco, Scott & Mars, 2019).

Problem statement

Several researchers have come up with different e-health readiness assessment framewoks (Campbell, Harris & Hodge, 2001; Jennett, Jackson, Ho, Healy, Kazanjian, Woollard, Haydt & Bates, 2005; Wickramasinghe, Fadlalla & Geisler,2005; Mauco, Scott & Mars, 2019; Kalema & Kgasi, 2014). Although these researchers provided e-health readiness assessment frameworks, there is a problem of the absence of an e-health readiness assessment framework found to be "entirely suitable" for assessing e-health readiness in developing countries. Meaning that the already developed frameworks lacked to address issues of context, which this study fills by catering for the setting of South Africa and all the different aspects such as culture, language, political, economic, social and the political landscape they live in, which may influence or affect the e-health readiness of higher education institution students who live in South Africa. This study, therefore, fills this gap by developing a conceptual framework which is a context-specific e-health readiness assessment framework. The framework will find determinants of readiness for e-health especially in higher education institution students.

Research questions

The primary research question is;

1. How should a context specific e-health readiness assessment framework for students in higher education be developed?

The secondary research questions are;

1. How do PEST factors impact e-health readiness of higher education institution students?
2. How does the e-health readiness of the higher education institution students relate with their demographic factors?
3. How do technology acceptance factors impact the e-health readiness of the higher education institution students?
4. How does technology readiness factors influence the e-health readiness of the higher education institution students?

The following objectives were derived

1. To determine how political, economic, social and technological (PEST) factors impact e-health readiness of higher education institution students
2. To establish how the higher education institution students' e-health readiness relates with their demographics
3. To determine the way technology acceptance factors impact the e-health readiness for higher education institution students
4. To determine how technology readiness factors influence the e-health readiness of the higher education institution students

Literature review

This section provides a critique of existing frameworks in order to show gaps that this study will address. The framework of Khatun, Heywood, Ray, Hanifi, Bhuiya and Liaw (2015) called a framework for mobile health addressed the technological, motivational, and resource readiness, however, the authors did not cover any language or political factors. On the other hand, the framework of Campbell, Harris and Hodge (2001) called the readiness evaluation framework for e-health applications to investigate multiple healthcare providers' view, differed in the sense that it dealt with readiness for implementing e-health strategies on healthcare providers' view, thereby neglecting organizational, public or patient readiness for e-health. The framework of Jennett, Jackson, Healy, Ho, Kazanjian, Woollard, Haydt and Bates (2003) and Jennett, Yeo, Pauls and Graham (2004) called e-health readiness framework is comprehensive in terms of the scope it covers. Its target is e-health readiness framework for patients,

practitioners and the public. However, the framework provides little information with regards to demographics or current technological practices.

The framework of Wickramasinghe, Fadlalla and Geisler (2005) name an e-health readiness framework, touched on culture, technological access, economy, political factors as factors affecting a country's readiness to harness the most from using e-health. However, the framework did not assess the impact of native languages on a country's readiness for e-health. Mauco et al. (2019) framework, named an informed e-health readiness assessment framework addressed the governance, resources, stakeholder issues and access as the themes that could assess readiness. However, in this framework, issues of language and education were not addressed. The framework of Ntseme, Jokonya and Chukwuere (2020) named an e-health technology readiness and acceptance model, addressed the technology readiness factors and the technology acceptance factors. However, it failed to address the political, social, economic and technological factors, explained further in section 8 which forms part of the context that influences individual's readiness towards a technology (Ejiaku, 2014; Kipsoi, Chang'ach & Sang, 2012). The framework also did not take into account demographics such as age, gender, language, and academic level as some of the factors that should be taken into account when accessing e-health readiness (New African, 2008; Kutlu & Ozturan, 2012). However, the framework of Ntseme et al. (2020) provides a good basis for this study.

The critique of the existing e-health readiness assessment frameworks demonstrates that most of these studies dwell much on the components of their frameworks reflecting perspectives on healthcare providers and organizations, thereby ignoring the development of frameworks that are tailored to assess individual readiness of end-users (patients), which in this study are higher education students since they are also the receivers of healthcare services. Additionally, these frameworks do not take into account the political, economic, social, and technological factors affecting individuals' readiness for e-health in developing countries such as South Africa.

Theoretical framework

Many information systems theories and models exist such as the Technology, organization and environment (TOE), technology acceptance model (TAM), Theory of Planned behaviour (TPB), Social shaping of technology amongst others. However, in this paper this section discusses the theoretical frameworks that are specifically selected to guide this study. These are the technology readiness index by Parasuramanan (2000) as well as the technology acceptance model by Davis (1993). In terms of adopting these models, the technology readiness index has been used as a whole and in TAM, only the constructs of perceived ease of use and perceived usefulness have been adopted.

Technology acceptance model (TAM)

Venkatesh, Morris, Davis and Davis (2003) posits that the technology acceptance model (TAM) is a model which was developed to use in the information systems context. The model's aim is to predict acceptance and usage of an information technology. It uses system design features (SDF), Perceived usefulness (PU), perceived ease of use (PEU) and attitude towards using (ATU) as the factors that influences user's intention to adopt and use an information system (Davis, 1993).

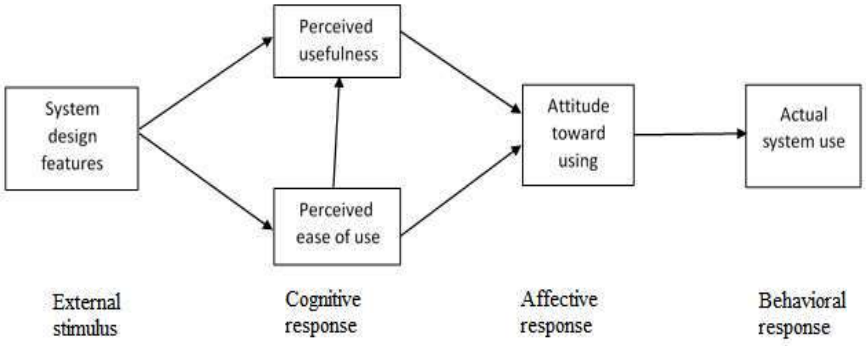

Figure 1: Technology acceptance model (TAM)
Source: Adopted from Davis (1993)

Technology readines

Technology-readiness refers to "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work" (Parasuraman, 2000: 308). Basically, it means an individual's state of mind that is caused by the enablers and inhibitors which determines an individual's position to use any new technology. Dimensions included in this model include optimism, innovativeness, discomfort and insecurity. Whereas optimism and innovativeness are enablers of technology readiness, discomfort and insecurity are inhibitors to technology readiness.

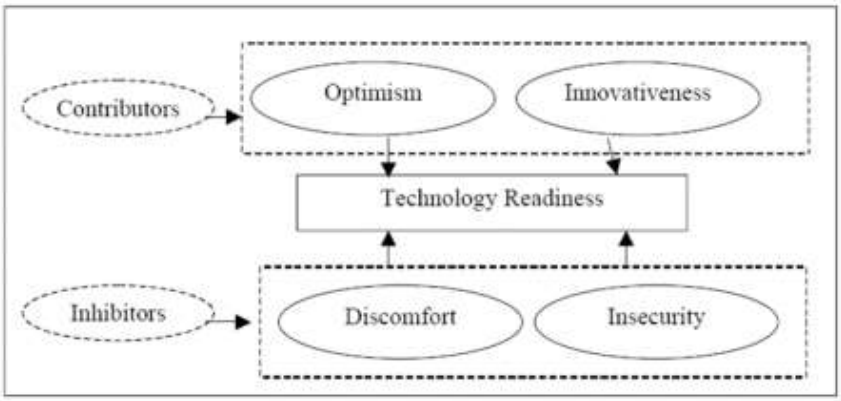

Figure 2: Technology Readiness
Source: Adopted from Parasuraman (2000)

Conceptual e-health readiness assessment framework

The study benchmarks on the information systems theoretical frameworks such as Parasuramanan (2000), and Davis (1993) as the basis to develop the e-health readiness assessment framework for a developing such as South Africa. Li, Ray, Seale and MacIntyre (2012), and Rezai-Rad, Vaezi and Nattagh (2012) recommended the importance of considering the context, while developing a model for e-health assessment in developing countries. According to Lexico.com (2020), context means circumstances forming part of a setting for an event, statement, or idea, and in terms of which it can be fully understood and assessed. Therefore context in this study means considering the setting in which this study is conducted, this meaning to cater to all the different aspects that affect people living in South Africa such as their culture, language, and the political landscape they live in when developing a model for e-health readiness assessment. In designing the conceptual framework of this study, from the TAM, this study adopts the themes of e-health perceived ease of use and e-health perceived usefulness. From the technology readiness index all the themes are adopted. New themes that covers the context aspect of this study are demographics, political, economic, social/cultural and technological (PEST) factors. There are in the model as part of the themes that can also determine readiness of end-users (higher education students) and are therefore added in the e-health readiness assessment framework for this study.

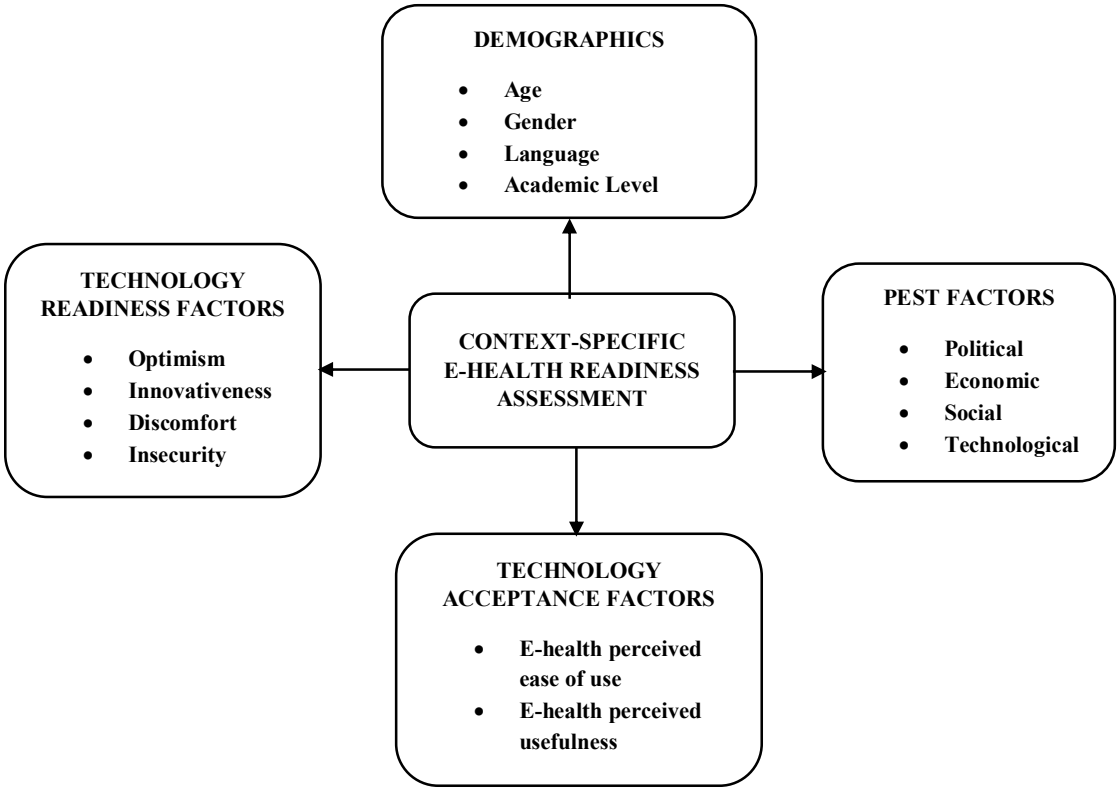

Figure 3: A context-specific e-health readiness assessment framework for patients
Adapted from Parasuramanan (2000); Davis (1993) and Ntseme et al. (2020)

Demographic

Age

Age plays an important aspect in technology readiness, adoption, and acceptance, especially in developing countries where the younger generation is technologically oriented and the older are less technologically oriented. In this study, age is defined as the length of time a person has lived from the time they were born. In the study of Kutlu and Ozturan (2012), age was seen as a significant factor that had an impact on online application usage, which is closely related to e-health technology in the way they are accessed (accessed online through the use of the Internet). The age group found to be using the online applications the most were those less than the age of 35. Although age cannot altogether hinder technology readiness, acceptance and adoption (Friederike, Maria, Andrea & Angelika, 2017), in this study, age is a determinant of readiness for e-health by higher education students.

Gender

This is defined as a personal attribute divided into male and female. It this research it may direct higher education students' consciousness and actions towards e-health readiness.

Language

Language is one other important aspect that must be considered when developing an e-health readiness assessment framework for developing countries. In this study, it is defined as a system of communication by a particular community or country. The use of African languages is an important aspect of technology (New African, 2008). Hence for every community to develop in science and technology, the use of a mother tongue, which affects the way individuals think, think of the world, and interact with others, should be taken into consideration (New African, 2008). In South Africa, 11 official languages are spread across nine provinces (Fawareh, 2013). The choice of being ready for e-health may be affected by the availability or the unavailability of indigenous language in the e-health technology, hence when assessing the e-health readiness, the issue of language must be considered in developing countries. Hence the inclusion of language in this study.

Educational Level

In this study, educational level is defined as the highest qualification obtained by an individual. According to Friederike et al. (2017) educational level of an individual enhances their positive attitude towards technology. A study by Kutlu and Ozturan (2012) alluded that education level had a unique effect on online application usage, which is related to e-health in the way they are accessed by users through the use of the internet. In developing countries, these could be the case where the level of education improves an individual's chances of being ready to use technology. Therefore, in this study, the level of education is also seen as one factor that must be looked at when one assesses the e-health readiness of higher education students.

Political, Economic, Social and Technological (PEST) factors

Political

This study adopts the definition by Friederike et al. (2017), that political factors are the policies, actions, and legislation that the government uses to guide their citizens. Therefore, the political factors provide an environment that guides citizens in acquiring access and the use of technology therefore adopting it (Ejiaku, 2014). In developing countries, research shows that there are weak or poor policies on innovative technology (Ejiaku, 2014). In this study, the political factors therefore mean the policies that have been put by the South African government to guide their citizens hence enabling them to acquire or not to acquire technology thus leading to their readiness for e-health and eventually leading to them adopting the technology.In a study carried out in Kenya by Tsuma (2011), Political interest was linked to the increase and educative role of information communication technology. Furthermore a study by Dana, Mehmood and Matloub (2021) explored the motivators of technology adoption in healthcare. In their study, they found out that government support was found to be the most relevant group of motivators to technology adoption practices in the healthcare sector in the United Arab Emirates (Dana et al., 2021).

Economic

Economic factors also affect an individual's readiness for e-health. Kipsoi, Chang'ach and Sang (2012) explained it as monetary issues that affect the buying power of an individual in terms of satisfying buying expectations. Therefore, the more the money, the more buying power and the lesser the money, the less the buying power of individuals. A study by Dana, Mehmood and Matloub (2021) indicated at that United Arab Emirates, financial support and international trade were the most influential in adopting the latest technologies in the healthcare sector. Therefore, in this study, economic factors are linked to the buying power of individuals to purchase technological gadgets that could be used in accessing e-health services, such as mobile phones to receive mobile health updates as well as purchasing tablets to allow them to consult with medical personnel over a distance.

Social/Culture

According to Friederike et al. (2017), social factors influence the adoption of technology by individuals. This influence comes in the form of societal as well as natural changes that are within an individual's environment. In this study, the social attributes such as cultural believes of an individual affects the perception and the readiness for e-health by individuals as culture forms an integral and guides social factors in developing counties.

Technological

These factors refer to the level of innovation, technological change in an environment that one lives in. When there is access or no access to technology around individuals, these may affect the individual's readiness for e-health initiatives. A study by Dana, Mehmood and Matloub (2021) found that in the United Arab Emirates, infrastructure motivated the health information technology adoption practices. Hence this factor should be considered when developing an e-health readiness assessment framework for higher education students in South Africa.

Technology readiness factors

Optimism

Optimism in this study means higher education students having a positive view of the e-health technology and believing that it will offer them increased control, flexibility and efficiency in their everyday life. With this view, Higher education students' optimism for e-health may affect their e-health readiness. Hence this factor must be taken into account when assessing the e-health readiness of higher education students.

Innovativeness

In this study, innovativeness means the tendency of higher education students being pioneers and leaders when it comes to using and accepting e-health technology in their everyday life. With this view, Higher education students' innovativeness for e-health may affect their e-health readiness. Therefore, this factor must be taken into account when assessing the e-health readiness of higher education students.

Discomfort

Discomfort in this study means higher education students having negative feelings towards the e-health technology in a way that when they use it, they have less control over it and become overwhelmed by the technology thereby using it less. Therefore, this factor must be taken into account when assessing the e-health readiness of higher education students hence its inclusion in the e-health readiness assessment framework.

Insecurity

In this study, insecurity means higher education students having challenges trusting the ability of e-health to work properly. This means the distrust they have on the functionality of e-health, hence finding it difficult to be ready for e-health. Therefore, this factor must be taken into account when assessing the e-health readiness of higher education students.

Technological acceptance factors

E-health perceived ease of use

In this study, E-health Perceived ease of use means higher education students' perceptions on the degree of effort needed to use e-health. That is, the difficulty to use e-health technology. This may affect the readiness to use e-health by higher education students hence including it as a factor in an e-health readiness assessment framework.

E-Health Perceived Usefulness

In this study, it means higher education students' perceptions on the relative advantage offered by e-health services as compared to the traditional ways of offering health services. This factor plays an important part in assessing the readiness of higher education students for e-health hence it must be included as one of the factors in the e-health readiness assessment framework.

Methodology

There are different philosophies such as positivism, critical realism, interpretivism, postmodernism, and pragmatism (Saunders, et al., 2016). This study will follow a positivism philosophy because it allows researchers to work with an observable social reality and also produce law-like generalisations. A inductive approach to theory development will also be followed to allow the researcher to develop a theory. The methodological choice in this study is therefore a mono-method quantitative study. This is because quantitative research generally associated with positivism philosophy. A survey strategy will be used to collect data from students using online survey in a cross sectional basis. A survey method is seen as an appropriate method to use because it is suitable for studies where the unit of analysis are individuals (Bhattacherjee, 2012).

Data collection techniques in this study include the use of primary and secondary data. Primary data will be collected using an online survey questionnaire. The questionnaire will be done on a self-completion basis by the students (Shambare, 2014). Similar to a study done by Alanezi (2020) this study's designed questionnaire will be accessible to students through the web,social media platforms as well as other digital platforms that are in the public domain. This also takes into consideration the current covid19 pandemic where minimal contact with people is adviced. Secondary data, on the other hand, will be acquired through a literature review from published sources that are seen as relevant to the study. In this study, the target population is 58,687 students from higher education institution in South Africa. Therefore based on Krejicie and Morgan (1970)'s sample determination table, a sample of 381 higher education students will be administered this research questionnaire.

This population is appropriate to use for this research as it has students coming from cities, semi-rural and rural areas thus making the research population representative of the diverse nature of the South African student population. However, the use of students as the target population of this study has also been justified further in

section 3 of this paper. Convenience sampling will be used to get data from a sample of students because it allows a researcher to gather information from individuals in a population who are conveniently available to provide it (Serakan & Bougie, 2013). In terms of data analysis, the researcher will apply statistical package for social science (SPSS) and Microsoft Excel to analyze the collected data. Data analysis will be done using descriptive and inferential statistical techniques through tables, frequency counts, percentages and correlations.

Contribution and significance of the study

This research will provide useful information on a context-specific e-health readiness assessment framework that can be used to assess the e-health readiness of students in higher education in a developing country such as the students in higher education institutions in South Africa to different stakeholders. Furthermore, the results of this research could be used by health care service providers and the government of South Africa as well as developers of e-health initiatives to make informed decisions on the implementation of e-health initiatives from patients (higher education students) point of view hence it will aid in avoiding the issue of failure to innovate after introducing the e-health technology to the student community.

In the field of information systems, this research provides insights on the context-specific factors affecting the e-health readiness of students in a higher education institution in South Africa. The research also adds knowledge to the research community by also reducing the disjointed research on e-health in developing countries as little research has been done on the development of e-health readiness assessment frameworks for higher education students who are treated as end-user of e-health in a developing country context such as South Africa. Other researchers could use the information from this research and do more research on e-health and extend it to do research on digital health.

Conclusion

To promote general development in developing countries, their healthcare needs should be tackled. This can be tackled by using different e-health initiatives. However, the readiness for e-health in developing countries should be taken into consideration first before rolling out any e-health initiative. Literature shows that existing e-health readiness assessment frameworks do not entirely focus on patients readiness for e-health and also lacks to address the issue of context in developing countries. This study therefore proposes a conceptual e-health readiness assessment framework which can assess readiness for patients (higher education institution students) taking into consideration the issue of context. Future work looks at operationalizing the framework, firstly by collecting empirical evidence to support the role and existence of these elements in higher education institutions in South Africa. Secondly, the framework needs to be used by developers of e-health systems.

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