Article

Perspectives of Nurse Educators Towards Technology-based Education in Selected KwaZulu-Natal Nursing Colleges

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Abstract

Technology-centred education aims to create an interactive teaching and learning environment based on the use of computers and the Internet. It also promotes the workability of instructional processes and enables connections between academic staff and upcoming professional nurses. Academic staff has to be at the forefront of the latest transforming technology. Despite many types of technologies being accessible, lecturers at the KwaZulu-Natal College of Nursing campuses are not embracing technology-based education. The aim of this study was to describe nurse educators' attitudes and forecasts towards technology-based education in KwaZulu-Natal. A quantitative, descriptive, cross-sectional survey research design was used. Data were collected via self-administered questionnaires from nurse educators and clinical facilitators on 10 KwaZulu-Natal College of Nursing campuses using non-probability, purposive sampling. The Statistical Package for the Social Sciences (SPSS) version 25 was used to analyse the data. Descriptive statistics utilising percentages, frequencies and means were also used to analyse data. Statistical tests included t-test and/or ANOVA, Pearson's correlation analysis as well as regression analysis. Study results indicated that mean scores for attitudes to using technology ranged from 2.76 to 6.34, while the forecast to use technology in future mean scores ranged from 6.20 to 6.45. The study results highlighted that nurse educators in KwaZulu-Natal intend to employ technology to support teaching and learning, and they have positive attitudes towards technology-based education. It is recommended that nurse educators be provided with technical support and mentorship to enable them to adopt technology-based education.

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Keywords: technology-based education; nurse educator; perspective; nursing college; KwaZulu-Natal

Introduction and Background

Technology-based education is the learning of content through all types of computer-based instruction, such as online networks, intra-networks, email, television systems, audible and audio-visual tapes, webcasting and websites (Sudarsana et al. 2019). The authors explain technology-centred training as the successful usage of computerised resources in the training of student nurses. Technology-based education aims to create an interactive teaching and learning environment based on the use of computers and the Internet (Al-araibi, Mahrin, and Yusoff 2019). Technology-centred training promotes the workability of instructional processes and enables connections between academic staff and upcoming professional nurses.

According to the South African Nursing Council's (SANC) premeditated strategy for nurse preparation and practice (2012/13–2016/17) (South Africa, Department of Health 2013), a core competence required of prospective nurse educators includes knowledge of technology in education. The SANC requires that nurse educators are competent in information technology so that they can support teaching and learning processes.

Nowadays, nurses should have acquired an expertise that permits them to render care in a technology-rich clinical setting, and professional organisations have clamoured for the combination of technology and proficiencies of nurse-training programmes (Harerimana and Mtshali 2020). Smart et al. (2020) attest to this and state that nurses have a duty to be the leaders of technology-centred training; if not, they are risking a return to the days of white-capped nurses. The training of nurses has to display the growing technology requirements of registered nurses and should, therefore, train upcoming registered nurses to be drivers of the latest technology in the nursing field. The challenge is for nurse educators to deliver an optimal learning experience that is effective and appropriate for students' learning needs. Smith, Chen, and Warner-Stidham (2021) confirm that nurse educators are in the position of a novice, as they have no experience with online and technology-centred teaching. Technology-centred training promotes freedom in the provision of information and eradicates all physical or time restrictions related to old-fashioned training methods (Frazer et al. 2017).

Technology-centred training offers asynchronous instruction, teaching at a personalised speed and at the lowest price rate. Statistic characteristics such as age, sexual category, and qualifications may delay the preparedness of academic staff to embrace technology-centred training. However, preparedness is not a one-time occasion; it should be a constant process of development (Sudarsana et al. 2019). Hlagala (2015) identifies that sub-Saharan African leadership is struggling to offer Information and Communication Technology (ICT)-centred training. Sub-Saharan Africa is identified as one of the challenged continents in terms of ICT preparedness due to the underprivileged ICT

substructure and the shortage of extensive expertise, which would facilitate citizens to best operate through technological resources.

Insufficient training of lecturers in the application of computer-assisted instruction, even when it is available, remains an international challenge (Skiba 2015). Nurse educators have to incorporate technology into nursing programmes to ensure the excellent provision of the latest skills to nursing students (Edwards and O'Connor 2015). Other studies have reported various barriers with regard to the adoption of technology in nurse-training programmes (Hlagala 2015). Despite the many types of technologies available, lecturers at the KwaZulu-Natal College of Nursing campuses are not embracing technology-based education. The aim of this present study was to describe nurse educators' attitudes and their forecasts towards technology-based education in selected nursing colleges based in KwaZulu-Natal.

Research Methods

Research Approach and Design

In this study, the researchers adopted the quantitative descriptive research design to describe the nurse educators' attitudes towards technology-based education in KwaZulu-Natal. This design was chosen because they wanted to collect data in a natural setting where participants worked (Gray, Groove, and Sutherland 2017). Studies answering the research question of "what is/are" are best approached by using a descriptive design.

Setting

This study was conducted at 10 KwaZulu-Natal College of Nursing campuses that are situated within the public hospitals of KwaZulu-Natal province. Of the 10 campuses used in this study, nine offered the Diploma in Nursing (General, Psychiatric, Community) and Midwifery, while the tenth college offered a one-year post-basic Diploma in Ophthalmology Nursing Science, Critical Care Nursing Science, Operating Theatre Nursing Science, Orthopaedic Nursing Science, Midwifery and Neonatal Nursing Science, and Child Nursing Science. Five of the 10 campuses are situated in urban areas, while the other five are situated in rural areas.

Population and Sample

The population in this study included nurse educators who were working at the 10 KwaZulu-Natal College of Nursing campuses. The nurse educators were all professional nurses employed by the KwaZulu-Natal Department of Health, and all had a qualification in nursing education. A purposive, non-probability sampling method was used as the nurse educators were experts on the matter under investigation (Polit and Beck 2017). The following were the inclusion criteria: lecturers who were actively participating in the training of nursing students, either in lecture rooms or clinical areas,

had a qualification in nursing education, and were registered with the South African Nursing Council. A total of 174 nurse educators participated in this study.

Ethical Considerations

The researchers obtained ethical clearance from the Durban University of Technology (REC 74/17) and the Department of Health (341/17). All 10 principals of the campuses provided gate-keeper letters. Participants were informed that they had a right to discontinue their participation at any stage without any negative consequences. The participants' names were not written on the questionnaires to guarantee their privacy and anonymity. The answered questionnaires were kept under lock and key, and only the researchers had access to them.

Data Collection

Data for this study were collected by means of self-administered questionnaires. The researchers formally requested to use the following scales associated with the Technology Acceptance Model: "Perceived Usefulness"; "Perceived Ease of Use"; "Behavioural Intention to Use"; and "Attitude Towards E-learning." Permission was granted. The questionnaire comprised demographic details of the participants; 13 close-ended questions related to attitudes towards technology-based education; and three close-ended questions related to the forecast to use technology in future. The questions were rated on a seven-point Likert scale, where the participants had to rate the statements based on: 1) strongly disagree; 2) moderately disagree; 3) slightly disagree; 4) neutral; 5) slightly agree; 6) moderately agree; 7) strongly agree. In this study, attitudes and forecasts to use technology are defined as a demonstrated behaviour or willingness by nurse educators to employ technology to support teaching and learning. Data were collected from 1 November 2017 to 31 January 2018.

Data Analysis

The Statistical Package for the Social Sciences (SPSS) version 25 was used to analyse the data. Descriptive statistics, which involved the use of percentages, frequencies and means, were used to analyse data. The statistical analysis also included a t-test and/or ANOVA, Pearson's correlation analysis, as well as regression analysis. A p-value of less than 0.05 was considered statistically significant in showing a relationship between variables of interest to the researchers.

Validity and Reliability

An already validated tool was adopted in this study (Mishra and Panda 2007). Content validity was guaranteed by pilot testing of the data collection instrument in order to provide an initial evaluation of the internal consistency of the items. External validity was ensured by including a representative sample of the population so that the results can be generalised to the larger population (Polit and Beck 2017). The researchers piloted the questionnaire on 10 nurse educators. Questionnaires were given to them to

respond with the aim of assessing the strength of the instrument. Readability tests were performed; the Flesch reading ease score was 45.1, and the Flesch-Kincaid Grade level was 9.4. These scores indicated that the target respondents easily understood the questionnaire, so there was no need to change the questions. In respect of reliability, the tool was found to have a Cronbach Alpha reliability of 0.88. Moabi and Mtshali (2021) explain that the reliability coefficient should range from 0.8 to 0.9. With regard to the researchers' positionality, the campus where the first author was a lecturer was excluded from the study.

Results

The results are presented as follows: 1) demographic characteristics of the participants; 2) nurse educators' attitudes to using technology; and 3) forecasts to use technology in future.

Table 1: Demographic characteristics of the participants (N=174)

Item	Variable	Frequency (N)	Percentage (%)
Gender	Female	166	95.4
	Male	8	4.6
	Total	**174**	**100**
Race	Black	117	67.2
	Indian	40	23.1
	Coloured	11	6.3
	White	3	1.7
	Other	3	1.7
	Total	**174**	**100**
Level of education	Diploma	2	1.2
	Bachelor's degree	97	55.7
	Honours	22	12.6
	Masters	52	29.9
	Unspecified	1	0.6
	Total	**174**	**100**
Work experience	<3 years	8	4.6
	3–6 years	13	7.5
	7–10 years	26	14.9
	11–13 years	50	28.7
	>14 years	76	43.7
	Unspecified	1	0.6
	Total	**174**	**100**
Campus	Campus 1	27	15.5
	Campus 2	25	14.4
	Campus 3	20	11.5
	Campus 4	19	10.9
	Campus 5	17	9.8
	Campus 6	15	8.6
	Campus 7	14	8
	Campus 8	13	7.5
	Campus 9	13	7.5
	Campus 10	11	6.3
	Total	**174**	**100**

Nurse Educators' Attitudes to Using Technology

As presented in table 2, the analysis showed that nurse educators have positive attitudes to using technology. The participants agreed that e-learning could solve many of their educational problems, as indicated by the mean score of 6.04 and standard deviation (SD) of 1.24. Study participants agreed that e-learning would bring new opportunities for organising teaching and learning in their institutions, with a mean of 6.25 and an SD of 1.12. In addition, the educators found that e-learning saved time and effort, with a mean score of 6.19 and an SD of 1.31.

Positive attitudes towards the use of technology are evident, as the participants indicated that e-learning could engage learners more than other forms of learning, with a mean

score of 6.09 and an SD of 1.17. The educators agreed that e-learning increased the quality of teaching and learning because it integrated all forms of media, print, audio, video and animation, with a mean score of 6.34 and an SD of 1.12. As depicted in table 2, the educators' positive attitudes towards the use of technology are evidenced by the fact that educators appreciated e-learning, as they indicated that e-learning improved communication between them and the students, with a mean score of 6.02 and an SD of 1.36.

The nurse educators disagreed and did not feel intimidated by e-learning, with a mean score of 3.01 and an SD of 2.13. In addition, they disagreed that e-learning was not effective for student learning, with a mean score of 2.76 and an SD of 2.10, as shown in table 2. Participants from campus seven reported a more positive attitude towards the use of technology-based education, Welch (9, 57.674)=2.733, p=0.01. The participants generally displayed positive attitudes towards the use of technology-based education in KwaZulu-Natal. Table 2 shows nurse educators' attitudes toward using technology.

Table 2: Nurse educators' attitudes towards using technology (N=174)

Variable	Mean	Standard deviation (SD)	T-test	P-value
E-learning can solve many of our educational problems	6.04	1.24	t (173)=21.675	0.02
E-learning will bring new opportunities for organising teaching and learning	6.25	1.12	t (173)=26.383	0.04
E-learning saves time and effort for both teachers and students	6.19	1.31	t (173)=22.054	0.01
E-learning increases access to education and training	6.42	1.10	t (173)=28.806	0.03
E-learning will increase my efficiency in teaching	6.21	1.15	t (173)=25.217	0.02
E-learning enables collaborative learning	6.18	1.20	t (172)=23.706	0.01
E-learning can engage learners more than other forms of learning	6.09	1.17	t (173)=23.501	0.02
E-learning increases the quality of teaching and learning because it integrates all forms of media, print, audio, video, and animation	6.34	1.12	t (173)=27.424	0.02
E-learning increases the flexibility of teaching and learning	6.24	1.19	t (173)=24.701	0.04
E-learning improves communication between students and teachers	6.02	1.36	t (173)=19.624	0.01
E-learning is a dehumanising process of learning; I feel intimidated by e-learning	3.01	2.13	t (173)=-6.117	0.04
I get a sinking feeling when I think of trying to use e-learning	3.20,	2.17	t (173)=-4.883	0.04
E-learning is not effective for student learning	2.76	2.10	t (173)=-7.783	0.03

Nurse Educators' Forecast for Using Technology in Future

In table 3, the nurse educators indicated that even in the nearby future, they would still appreciate and use the technology. Participants agreed that in the future, if they had access to electronic learning, they intended to use it, with a mean score of 6.25 and an SD of 1.59. The nurse educators also indicated that in future, if they had access to electronic learning, they would use it, with a mean score of 6.20, and an SD of 1.62. They also planned to use electronic learning more often in future, with a mean score of 6.45 and an SD of 1.13. Table 3 shows the nurse educators' forecast with regard to using technology in future.

Table 3: Nurse educators' forecast for using technology in future (N=174)

Variable	Mean	Standard deviation	T-test	P-value
In future, if I have access to electronic learning, I intend to use it	6.25	1.59	t (173)=18.621	0.03
In future, if I have access to electronic learning, I predict I will use it	6.20	1.62	t (173)=17.924	0.01
In future, I plan to use electronic learning more often	6.45	1.13	t (173)=28.571	0.04

Discussion

The discussion section is presented as follows: 1) nurse educators' attitudes to using technology; and 2) nurse educators' forecast to use technology in future.

Nurse Educators' Attitudes to Using Technology

The study results indicated that nurse educators have positive attitudes towards the use of technology in nursing education. In this study, a majority of participants indicated that electronic learning could resolve many of their educational challenges. However, Tacy (2015) found that embracing and becoming proficient in technology in nursing education can be challenging and stressful. Nyangeni, Du Rand, and Van Rooyen (2015) confirm that technology is challenging and can create feelings of frustration, overload and stress. A bulk of participants indicated that electronic learning would provide chances for planning strategies for imparting information in teaching. Technology helps teaching and learning practices and also promotes ways in which nurse educators can fulfil human development goals (Mosa, Mahrin, and Ibrrahim 2016).

More than 50% of the participants confirmed that electronic learning needs less time to do the task—for both educators and student nurses. E-learning promotes accessibility in education and training. Students have access to feedback and information at any time and everywhere (Hall 2015, 25). However, Smart et al. (2020, 16) report that e-learning preparation is time-consuming and that it takes more time to teach online. Technology in education promotes access to resources and information anywhere, anytime (Mosa et al. 2016). Electronic learning is an innovative approach to the delivery of a well-designed, interactive, facilitated learning environment, and it stimulates critical thinking ability. E-learning will increase efficiency in teaching. Mosa et al. (2016) indicate that technology-based education (such as blogs, electronic mail, and video streaming) enhances efficiency in teaching and promotes lifelong learning.

The study findings highlight that more than a third of the participants indicated that e-learning enables collaborative learning. Merrill (2015) reports that social media platforms could assist nurse educators in promoting collaborative learning, as electronic

learning engages students more than other forms of learning. Technology-mediated environments engage students to take an active role in their learning. Mobile technologies allow students to communicate regardless of their location (Chang, Lai, and Hwang 2018). Van Rooyen and Wessels (2015) highlight that e-learning creates passionate learning and more involvement with the teaching process than previously, which unavoidably inspires students to acquire more information.

A majority of the participants disagreed that e-learning is a dehumanising method of learning. The American Association of Colleges of Nursing reports that nurses are the late adopters of technology, with their increasing age regarded as an important contributing factor to this delay. Orton et al. (2015) report that computer anxiety in nurses interferes with the adoption of electronic learning. Almost all of the participants disagreed that they get a sinking feeling when they think of trying to use e-learning. Skiba (2015) recommends that nurse educators must become more comfortable with using technology in the classroom, and that they should get up to speed with mobile devices, social media and other tools used in a clinical environment. Nurse educators need to seek professional development opportunities to learn more about how to be an expert inside and outside the classroom environment. Over two-thirds of participants disagreed that e-learning is not effective for student learning. Mosa et al. (2016) confirm that electronic learning stimulates operative instructional proficiency and promotes access to education. It also expands accessibility to knowledge, improves information mastery, and enhances lifetime learning.

Nurse Educators' Forecast for Using Technology in Future

Results of the current study showed that nurse educators forecast to be using technology in the future. The majority of participants indicated that in the coming future, if they had access to electronic learning, they still intended to use it. Nurses have positive attitudes in wanting to use technology, but they have challenges that hinder their ability to use technology. Some of these challenges are: access, absence of computer expertise, shortage of time, absence of support, and budgetary constraints. These challenges must be taken into consideration because they can change positive attitudes into negative attitudes and also develop resistance to the use of technology (Maharaj 2014). Over two-thirds of the participants agreed that, if provided with access to electronic learning, they predicted that they would use it. O'Connor and Andrews (2018) highlight that access to technology-based education is a valuable element; however, the sharing of limited computer resources is one of the barriers to using technology. Krau (2015) reports that frustration with slow internet speed and technical issues may cause reluctance to opt for technology.

Almost all the respondents confirmed that, in future, they planned to use electronic learning more often. Nurse educators who are competent in technology are eager to change to technology-centred instruction, and even non-competent educators are resilient to technology-centred instruction (Sudarsana et al. 2019). Mosa et al. (2016) highlight that with today's rapidly transforming technology, nurse educators are

required to be advanced, especially as training institutions are operating through technology-centred education.

Limitations

The lack of current literature from South Africa on technology-based education, especially in the nursing profession, was a limitation of this study. Most of the literature was extracted from high-income countries. The investigation was carried out through a quantitative approach, while a subsequent qualitative approach would be needed to explore the phenomenon in-depth.

Recommendations

Technical support and continual expert support should be provided to the nurse educators to facilitate and mentor them to continuously adopt technology-based education. The technology necessary for teaching and learning must be budgeted for in annual budgets and be procured to keep up with the growing importance of technological advancements in education, thereby providing nursing students with exposure to a variety of digital tools and platforms. This will boost their confidence and competitiveness in the workplace.

Conclusions

The study results highlighted that nurse educators in KwaZulu-Natal intend to employ technology to support teaching and learning, and they have positive attitudes towards technology-based education. In addition, nurse educators have formulated conscious plans to use technology in future, provided they have access to such technology. However, the KwaZulu-Natal College of Nursing campuses need to give support to facilitate this process by improving the availability of resources and facilitating conditions.

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