

Factors influencing the utilisation of e-learning among nursing learners at a college in Mombasa, Kenya

A Muema, BSN; M Mutua, BSN, MSN, PhD; M Kivuva, MSN

Department of Nursing, Faculty of Health Sciences, Kenya Methodist University, Mombasa, Kenya

Corresponding author: M Mutua (mssmt979@gmail.com)

Background. The adoption of e-learning assists educators by making lessons more effective, allowing them to maximise the potential for individual learning curves and styles within the classroom.

Objective. To determine the factors influencing the adoption of online learning among learners in the Kenya Medical Training College (KMTC) Mombasa campus.

Methods. This study adopted a descriptive, cross-sectional study design. The self-administered questionnaire had open- and closed-ended questions. Data were checked for accuracy, consistency and completeness. The data were then cleaned and coded. We analysed the data using Statistical Package for Social Sciences (SPSS) version 23.

Results. Of a total of 185 students, 148 were included in the study and final analysis. All respondents indicated that they had been trained in e-learning. Most ($n=96$, 64.9%) of the respondents had been trained four times, 29 (19.6%) had been trained once, 15 (10.1%) had been trained twice and 8 (5.4%) had been trained thrice. Most respondents ($n=53$, 35.8%) were unsure whether training on e-learning is a basic requirement for the campus to establish and adopt a new system effectively. Most respondents ($n=73$, 49.3%) were unsure whether individual characteristics influence e-learning adoption. There was no significant association between sex and attitude towards e-learning ($p=0.178$) and no significant association ($p=0.685$) was observed between the department of study and training of learners on e-learning.

Conclusion. We concluded that KMTC has not adopted e-learning fully. The study recommends that top management in this institution should offer their undivided support to the e-learning academic programmes and facilitation. This support could be in the form of extensive training, workshops, policy development and awareness.

Keywords. E-learning, nursing.

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Angela Muema has a Bachelor of Nursing degree. She graduated from the Kenya Methodist University in October 2022. She conceptualised the study during her teaching methodology clinical rotations at the college. Angela Muema is currently working as a Registered Nurse at Pandya Memorial Hospital in the Emergency Department and aspires to pursue a master's degree in medical-surgical nursing degree in the near future.

E-learning refers to teaching and learning that is web-enabled.^[1] Various methods can be employed along with e-learning.^[2] There are many strategies for delivering e-learning, including asynchronous, synchronous, hybrid instructor-led and self-paced learning.^[3] E-learning is becoming increasingly prominent in tertiary education, with universities expanding their provisions and more learners enrolling in these programmes.^[4] Globally, over 4.4 million learners are enrolled in more than 2 497 e-programmes and 18 342 courses across 27 open universities in the Commonwealth nations spanning four continents (Africa, Asia, Europe and America). This represents a 300% growth in e-learning from 1987 to 2017.^[5] In Zimbabwe, a study showed that most learners (97.5%) are engaged in open, distance

and e-learning.^[6] In Japan and China, online education in universities has increased exponentially after the COVID-19 outbreak. There was an overnight shift from traditional classrooms to e-classrooms, with both learners and educators adapting their pedagogical approach to meet the new market conditions and respond to the changing situations.^[7-9]

In Canada, the use of e-learning by learners has increased overall by 58%.^[5,8] In Thailand, e-learning has provided a crucial pathway to higher education for learners who are unable to access traditional institutions. Currently, 31 higher education institutions in Thailand use learning management systems, 23 of which are public institutions.^[10,11] E-learning in Thailand is promoted as 'education for all' as it aims to reach learners in remote areas who cannot afford conventional higher education.^[8] Similarly, a study by Tarman^[7] assessed the implementation of e-learning in Ugandan institutions of higher learning and found that e-learning was predominantly used for delivering learning material (80%), with minimal use for discussions (12%) and assessments (2%). In Nigeria, the main barriers to successful e-learning implementation include inequality of access to technology, internet connectivity issues, energy-related problems and limited expertise.^[9]

In Kenya, a study by Makokha and Mutisya^[6,7] on the status of e-learning in Kenyan public educational institutions revealed that e-learning is still in its infant stage. The universities lack senate-

approved e-learning policies to guide structured implementation of e-learning. Approximately 32% of lecturers used the e-learning systems in place, and only 10% of university programmes were offered online.^[1] Several factors influence the use of online learning among learners. Reliable internet access remains a significant determinant, with disparities in connectivity across regions.^[12,13] Economic constraints pose another challenge, as not all learners can afford devices or data plans.^[13] Cultural attitudes towards online education and traditional learning methods impact adoption rates. Additionally, the quality and accessibility of online resources, including platforms and educational materials, influence student engagement.^[14] Institutional support and policies promoting online learning play a crucial role in fostering its utilisation. Addressing these factors holistically is vital for enhancing the effectiveness and inclusivity of online education in Kenya.^[15]

Problem statement

E-learning requires a learning management system, a curriculum specifically designed for e-learning, support for educators and learners and appropriate infrastructure.^[13] Lecturers need deep content knowledge and effective instructional strategies and assessment practices tailored for online environments. Learners must possess basic technical skills, including, proficiency in word processing and navigating the internet.^[13] Despite the benefits of e-learning in educational institutions worldwide, there exists a notable gap in understanding the factors that can facilitate or hinder its successful use among Kenya Medical Training College (KMTC) nursing learners in Mombasa. While e-learning holds promise towards improving nursing education, its proper utilisation is influenced by myriads of factors including, access to technology, institution support and learners' attitudes. However the extent to which these factors influence e-learning among nursing learners at KMTC Mombasa remains insufficiently explored. This study aims to address this gap by investigating the factors that determine the utilisation of e-learning platforms among nursing learners at KMTC Mombasa. Identifying these factors will help develop strategies to optimise e-learning utilisation in nursing education, thereby improving the quality and accessibility of training for future healthcare professionals in the region.

Methods

This study employed a descriptive cross-sectional study design and was carried out at the KMTC Mombasa campus, located in Mvita constituency along the coast of the Indian Ocean in Mombasa County, south-eastern Kenya. The study population was 185 nursing learners at KMTC Mombasa.

A stratified sampling technique was used to group learners into strata according to their classes. Descriptive statistics, including mean, mode and median, were used to summarise the data. Inferential statistics were analysed using χ^2 tests. Data were presented in tables, pie charts and histograms.

Ethical considerations

Research approval was obtained from the Kenya Methodist University Department of Nursing (approval number KMSA/ND3489). Participation in the study was voluntary. Respondents were free to leave the study at any point with no victimisation. Pseudonyms were used to

improve the confidentiality of participants in the focus group discussions (FGDs). All research data were stored securely to ensure privacy. The research was guided by an overarching ethical framework based on the Belmont Report (1978) following three principles: (1) Respect of persons—the research participants had to sign an informed consent form before participating in the study. The research participants were treated with autonomy, as they were free to consent or decline to participate in the study without coercion or remuneration. Confidentiality and anonymity were maintained by ensuring that no identifying data were included in the questionnaires. (2) Beneficence—the researcher ensured that no harm befell the participants during data collection. In the study, the researcher ensured that the study participants were safe, and their opinions protected during data collection. (3) Justice—the selection of research participants was random to ensure a fair representation to answer the study problem.

Results

A total of 185 questionnaires were administered, with an 80% response rate ($n=148$). Thirty-seven questionnaires were not completed, which was attributed to delays in returning the filled questionnaires, largely due to respondents' workload and time constraints. Most respondents were female ($n=89$, 60%), while 59 (40%) were male (Fig. 1). This distribution reflects the higher proportion of female lecturers at KMTC, which can be attributed to the greater number of female nurses than male nurses (Fig. 2).

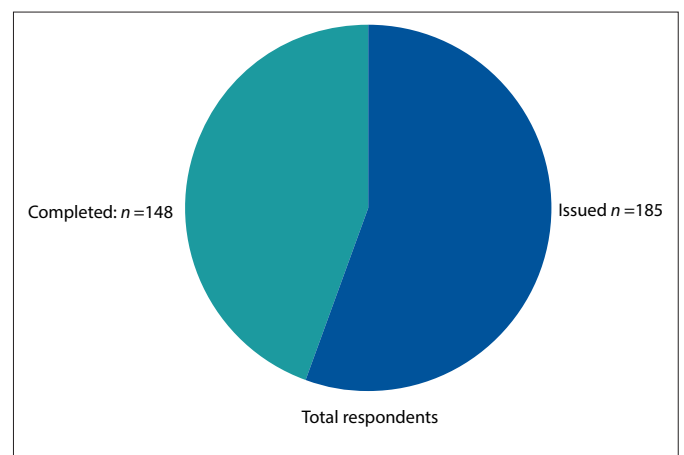


Fig. 1. Response rate.

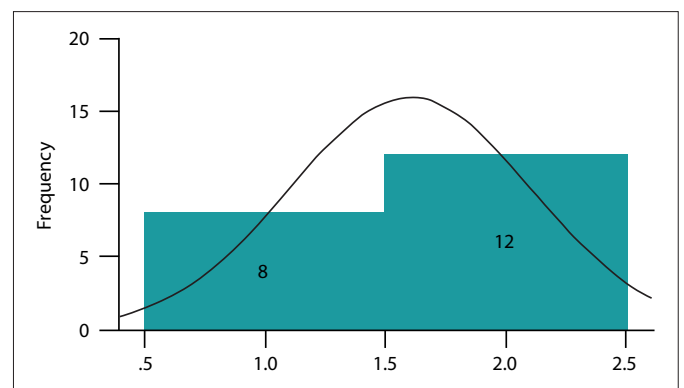


Fig. 2. Illustration depicting the sex distribution of study participants.

Department of study

Table 1 shows the distribution of respondents across the various departments. Forty-four (29.7%) respondents were from the Department of Nursing, 30 (20.3%) from the Pharmacy Department, 30 (20.3%) from the Clinical Medicine Department, 22 (14.9%) from the Occupational Health Department, 15 (10.1%) from the Radiology Department and seven (4.7%) from the Health Records Department.

Training on e-learning

Fig. 3 shows that the majority of respondents ($n=96$, 64.9%) had received training four times, 29 (19.6%) had been trained once, 15 (10.1%) had been trained twice and eight (5.4%) had been trained thrice. Therefore, the fact that most respondents had undergone training multiple times suggests that their responses will be valuable for this study.

Adoption of e-learning

The majority of respondents ($n=76$, 51.4%) said that KMTC had not adopted e-learning, while 72% (48.6%) stated that KMTC had adopted e-learning but not fully (Fig. 4).

Implementation of e-learning

Most respondents ($n=71$, 48%) agreed that the implementation of e-learning programmes and curriculum depends upon the infrastructure being firmly in place. Additionally, 42 (28.4%) respondents strongly agreed with this statement. Conversely, 21 (14.2%) disagreed and 14 (9.5%) were not sure whether the implementation of e-learning programmes and curriculum depends on the infrastructure being firmly in place.

Individual characteristics influence e-learning adoption

Table 2 shows that most of the respondents ($n=73%$, 49.3%) were not sure if individual characteristics influence e-learning adoption. Forty (27%) disagreed with the statement and 35 (23.6%) agreed that individual characteristics influence e-learning adoption (Table 3). Therefore, most respondents were uncertain about the impact of individual characteristics on e-learning adoption.

Table 3 also shows that 53 (35.8%) respondents disagreed with the statement that the personal attitudes of educators towards e-learning were a barrier to the effective adoption of e-learning, 35 (23.6%) strongly agreed and 31 (20.9%) were unsure.

A χ^2 test was performed to assess the relationship between sex and attitude towards e-learning. There was a weak positive association between sex and attitude towards e-learning ($\chi^2(12) = 16.30, p=0.178$) (Table 4).

Relationship between study department and training of learners on e-learning

To assess the association between the department of study and training of learners on e-learning, a χ^2 test was performed, revealing a test statistic of 2.276 with four degrees of freedom ($p=0.685$). There was no significance between the department of study and the training of learners on e-learning (Table 5).

Discussion

Technology is transforming various facets of society, with education being a prominent area of change. The shift from traditional teaching and learning methods has been influenced by factors such as COVID-19,

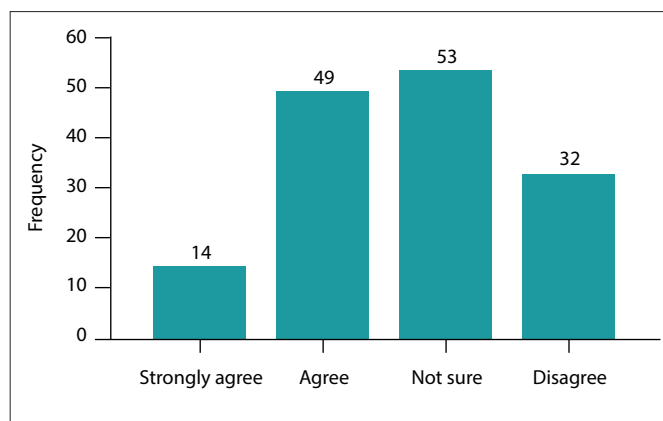


Fig. 3. Training on e-learning is a basic requirement.

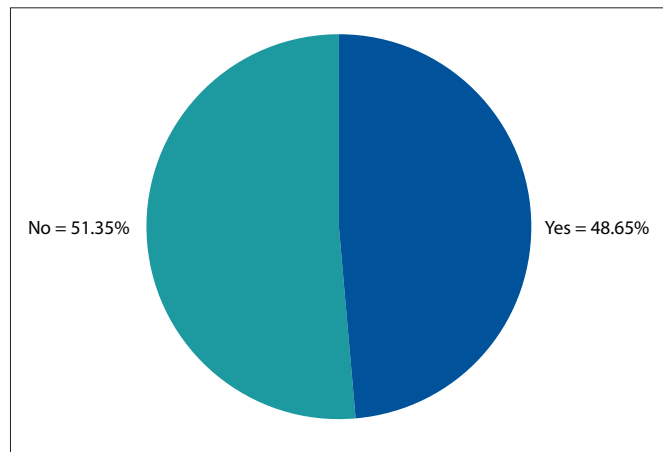


Fig. 4. Adoption of e-learning by the institution.

Table 1. Department of study of the participants

		Frequency	%	Valid %	Cumulative %
Valid	Nursing	44	29.7	29.7	29.7
	Pharmacy	30	20.3	20.3	50.0
	Health Records	7	4.7	4.7	54.7
	Occupational Therapy	22	14.9	14.9	69.6
	Clinical Medicine	30	20.3	20.3	89.9
	Radiology	15	10.1	10.1	100
	Total	148	100	100	

Table 2. Responses regarding whether individual characteristics influence e-learning

		Frequency	%	Valid %	Cumulative %
Valid	Agree	35	23.6	23.6	23.6
	Not sure	73	49.3	49.3	73.0
	Disagree	40	27.0	27.0	100
	Total	148	100	100	

Table 3. Responses regarding whether the personal attitudes of educators are a barrier to e-learning

		Frequency	%	Valid %	Cumulative %
Valid	Strongly agree	35	23.6	23.6	23.6
	Agree	29	19.6	19.6	43.2
	Not sure	31	20.9	20.9	64.2
	Disagree	53	35.8	35.8	100
	Total	148	100	100	

Table 4. Relationship between sex and attitude towards e-learning

	Value	d.f.	p-value
Pearson χ^2	16.31	12	0.178
Likelihood ratio	17.84	12	0.121
Linear-by-linear association	2.15	1	0.143
Number of valid cases	98		

d.f. = degrees of freedom.

Table 5. Relationship between participants' department of study and the level of e-learning training among learners

	Value	d.f.	p-value
Pearson χ^2	2.28	4	0.685
Likelihood ratio	2.23	4	0.693
Linear-by-linear association	1.41	1	0.234
Number of valid cases	98		

d.f. = degrees of freedom.

evolving learner characteristics, changes in educator roles and advancement in research and evidence. Nursing education has been greatly influenced by these global trends, making the adoption of e-learning inevitable.^[16] Successful e-learning implementation requires attention to several key factors: learner characteristics, educator needs, infrastructure, support and evaluation. Regulatory bodies' demands for the integration of technology in education have accelerated its adoption across various health professions programmes.^[17] The benefits of e-learning are numerous, which have established it as a leading mode of delivery in many institutions in low- and middle-income countries (LMICs). These benefits are diverse and include flexibility, enhanced teaching strategies, improved critical thinking and problem-solving skills, and increased engagement from learners for improved learning outcomes.

Personal attitudes play a significant role in the adoption of e-learning. Negative perceptions and a lack of perceived benefits can discourage

both educators and learners from using technology.^[16] For instance, 85 respondents were unsure or disagreed that e-learning is a basic requirement, while only 54 respondents strongly agreed or agreed with this statement. These negative attitudes can be induced by a lack of requisite infrastructure, knowledge, frustrating experiences in online spaces and technical know-how. Furthermore, educators might feel that e-learning is challenging and hard to implement because of the extra workload, personal inadequacies and attitudes. The perceived lack of benefits from transitioning from traditional approaches often reinforces these negative attitudes.

Training for both educators and learners is essential for the successful adoption of e-learning. Four training sessions were conducted to help users become proficient with the e-learning platform. These e-learning training activities should be developed to enhance adaptability for independent use.^[17] Training should be done systematically over time with clear guidelines to prevent knowledge overload. The challenge of training sessions is that they are geared towards theoretical knowledge while ignoring the practical knowledge essential for independent usage.^[17] A comprehensive plan that addresses all areas, including practical application, will support capacity development and facilitate the adoption of e-learning strategies.

Learner characteristics based on individual variations have a significant influence on the adoption of e-learning.^[16,17] As the end users of the programme, learners play a crucial role in the success of the e-learning implementation. Learners require orientation, guidance, practical training and infrastructure.^[12,13] The majority of e-learning interventions fail because they do not adequately train the end user; this leads to disappointment and frustration. Training should be split into manageable sessions over time and include continuous support to enhance successful adoption. The use of video resources, which can be downloaded or viewed offline, reduces the challenges associated with planning physical training sessions, which can be limited by availability and resource constraints. Simple do-it-yourself (DIY) videos can effectively address the training needs of both learners and educators. Moreover, these videos should include contact information for support staff who can be reached if further support is required.

Infrastructure plays a great part in the adoption of e-learning. Adequate physical, network and hardware resources are essential to ensure the

success of the programme.^[12] KMTC has played a great part in providing the requisite infrastructure to support e-learning. In Kenya, KENET plays a great part in delivering internet bandwidth to training institutions. This support has enabled accessibility across various parts of the country. Equipment, such as computers tablets and smartphones, is also required. Most institutions of higher learning are partnering with laptop sellers to enable learners to purchase laptops at subsidised prices. This enables universities to reduce the burden of expensive computers that eventually break down, leading to massive losses. The software demands for a learning management system (LMS) are crucial for providing a platform for teaching and student engagement. Institutions can leverage the available free LMS software to reduce the costs associated with purchasing and maintaining propriety systems.

Conclusion

Personal attitudes of learners influence the adoption of e-learning, and attitudes towards ICT influence the effective use of these technologies in teaching and e-learning. There was no association between sex and attitude towards e-learning ($p=0.178$) and no significant association between the department of study and training of learners on e-learning ($p=0.685$). These attitudes could be influenced by personal preference or previous disappointing experiences with e-learning. Basic computer training on technical skills, technical competency and computer connection should be offered to all learners. The duration of the training can be varied depending on the basic knowledge these learners possess of ICT. The study recommends that the top management in these institutions should offer their undivided support to the e-learning programmes and facilitation. The support can include extensive training, workshops, policy development and awareness programmes on ICT skills, features, their usage and benefits to help increase the faculty's use of ICT. The adoption of e-learning is dependent on a myriad of factors and successful e-learning is dependent on how these factors interplay in preparation and implementation. Each of these factors, though separate, feeds into each other and leads to the success of e-learning. Advances in artificial intelligence and the adoption of e-learning in teaching and learning will shape the future of nursing education and health professions education.

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