

Original Research Article

DOI: <https://dx.doi.org/10.18203/2394-6040.ijcmph20234103>

Level of utilization of eLearning among students at selected KMTC campuses

Luciana N. Kaloki^{1*}, Zachary O. Ombasa¹, Urbanus M. Mutiso², Raphael N. Mutiso²,
Nicholas M. Kwinga², Jonah R. Nyachae², James Musovya², Vincent N. Kinyae²,
Gilbert K. Nguutu², Emma K. Nthei², Loise W. Mwangi²,
Lucia M. Jonah², Redempta M. Mutisya²

¹Department of Nursing, Kenya Medical Training College, Nairobi, Kenya

²Kenya Medical Training College, Nairobi, Kenya

Received: 05 December 2023

Revised: 21 December 2023

Accepted: 26 December 2023

***Correspondence:**

Luciana N. Kaloki,

E-mail: lkaloki@kmtc.ac.ke

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Technology continues to impact various spheres of life, including learning. Over the years, eLearning has experienced a steady rise in popularity. At Kenya Medical Training College (KMTC), the influence of technology on education became more noticeable due in part to a policy directive. This directive, prompted partly by the COVID-19 pandemic, emphasized adopting online teaching to address the loss of instructional hours. This study addressed a specific gap in KMTC's internal quality assurance efforts by accumulating evidence related to the extent of E-learning and user satisfaction.

Methods: The study employed a descriptive cross-sectional design, utilizing qualitative and quantitative techniques. It involved KMTC campuses conveniently selected from the Coast and Nairobi regions, with 1139 students selected through simple random, stratified, and proportionate sampling methods. A mixed questionnaire (both open and closed-ended questions) was used to collect data. Specifically, the study aimed to assess the level of eLearning utilization among students in selected KMTC campuses and identify the determinants of this utilization.

Results: Most of the respondents (89.2%) participated in online classes; 11.8% of those who did not participate cited reasons such as lack of gadgets, bundles, and poor internet connectivity, among others. Despite widespread e-learning utilization, 76.8% of learners strongly preferred face-to-face classes.

Conclusions: Key factors linked to e-learning utilization included effective instructional strategies, quality technical support, and well-conducted online classes. The choice of communication channels, particularly platforms like WhatsApp, was strongly linked to e-learning utilization. Therefore, this study recommends that KMTC should acknowledge the strong preference for face-to-face classes and offer hybrid learning options. Further, the KMTC should address accessibility challenges and competing responsibilities at home by supporting data connectivity, ensuring user-friendly online platforms, and providing flexible scheduling options for diverse learner needs.

Keywords: Determinants, eLearning, Level of utilization

INTRODUCTION

Technology continues to impact various spheres of life, including learning. In learning, eLearning has steadily increased over the years. E-learning is technology-based learning through websites, learning portals, video

conferencing, YouTube, mobile applications, and other different types of free available websites for hybrid learning tools.

Many issues need consideration for E-learning to be efficient and effective. Tarus et al found that if e-learning

is to be successfully adopted in a school, the faculty needs to be fully involved in the decision-making processes.¹ Further, the faculty and learners need to be prepared for various aspects of learning, including computer self-efficacy, navigation of the platforms, and acquisition of necessary gadgets.² Leadership and support from the administration are also critical for successfully implementing the process.³

According to King and Boyatt, infrastructure and internet connectivity are crucial pillars for e-learning to succeed in developing countries.³ Literature classifies challenges to e-learning implementation into four categories, namely 1) technological challenges, 2) individual challenges, 3) cultural challenges and 4) course challenges. These challenges are very different from one country to another, institution to institution. For example, lack of ICT knowledge, poor network infrastructure, and weak content development were the main challenges to adopting e-learning systems in developing countries.⁴

Another study revealed that system characteristics, internet experience and computer self-efficacy were the main issues that impede the successful adoption of e-learning systems in Pakistan.² A similar study conducted in Kenya identified three main e-learning challenges: inadequate ICT infrastructure, lack of technical skills and financial constraints (Tarus et al., 2015). A study by Kisanga and Ireson identified that poor interface design, inadequate technical support and lack of IT skills are the primary barriers that hinder the successful implementation of existing e-learning projects.⁵

At the onset of the COVID-19 pandemic, the closure of educational institutions caused major interruptions in teaching and learning, including assessment and examination schedules.⁵⁻⁸ To minimize the loss of study hours and the attendant stress on students, most learning institutions, including KMTC, shifted to online modes of teaching despite it being a new area for faculty and students.^{7,9}

Since then, a policy directive has been issued, integrating eLearning as one of the approaches for teaching instructions at KMTC.⁹ The KMTC internal quality assurance measures require feedback from users on its services, and therefore, their level of use and satisfaction is an important quality indicator that can identify what needs to be improved in an online program for it to succeed (Kenya Medical Training College [KMTC], 2019).

To address this Quality management system (QMS) compliance need, this paper sought feedback on the level of E-learning among students at Kenya Medical Training College and the challenges faced. Specifically, the study aimed to assess the level of eLearning utilization among students in selected KMTC campuses and identify the determinants of this utilization.

METHODS

Study design and settings

The study employed a descriptive cross-sectional design with both qualitative and quantitative techniques. The study involved KMTC campuses from the Coast region, namely KMTC Mombasa, Portreitz, Oloitoktok, and Kwale, as well as Nairobi region campuses, namely KMTC Machakos and Nairobi (Table 1).

As part of the inclusion criteria, the study included bona fide KMTC basic students who were in session between March 2022 and January 2023. Students who were in their first semester of college were excluded because they may not have had sufficient interaction with online classes, including reaching the point of taking exams and assessments.

Sample size and sampling method

Convenience sampling was used to select two regions, namely the Coast and Nairobi regions (Table 1). Simple random sampling was used to select the campuses from each region, and then stratified sampling was used to select the students to participate in the study. Proportionate sampling was then used to distribute the sample across campuses (Table 1). A total of 1139 students were selected to participate in the quantitative study. Most campuses attained more than 80% response rate, and the least reported 65%.

Table 1: Student population and sample distribution in selected campuses.

Campuses	Population	Representative sample	Actual sample obtained
Nairobi	5309	660	604
Mombasa	1066	133	86
Machakos	831	103	287
PortReitz	700	87	86
Loitoktok	502	62	42
Kwale	240	30	24
Totals	8648	1075	1139

Data collection

A mixed questionnaire (both open and closed-ended questions) was used to collect data. The closed-ended questions yielded quantitative data, while the open-ended ones yielded qualitative data. The questionnaire was administered online using the 'Survey Monkey' platform. Data was collected between January and March 2023. The questionnaire was pretested in KMTC regions outside the study areas. The necessary ethical considerations, including obtaining ethical clearances, were adhered to.

Statistical analysis

Quantitative data was analyzed using descriptive statistics (mean, mode, median, frequencies) and inferential statistics using chi-square and Fisher's exact to assess the association between the different categorical independent variables and the categorical dependent variables.

The quantitative findings are presented using tables, figures and in prose. Qualitative data was thematically analyzed and presented in prose.

RESULTS

Demographic characteristics of the students

Table 2 presents the demographics of students across various campuses. Slightly over half of the students were female (58.8%, n=666), and a majority hailed from the Nairobi campus (53.4%, n=604). Nursing made up about one-third of the sample (31.3%, n=354). Furthermore, about two-thirds (62.6%, n=696) were in year 1, semester 2 of their training.

Table 2: Demographic characteristics of the students.

Characteristic		N	%
Gender	Female	666	58.9
	Male	464	41.1
	Total	1130	100.0
Age (in years)	18-23	766	67.4
	24-29	297	26.1
	30-35	60	5.3
	36-41	7	0.6
	>42	6	0.5
	Total	1136	100.0
Which is your KMTC campus?	Nairobi	604	53.4
	Machakos	287	25.4
	Mombasa	89	7.9
	Port Reitz	86	7.6
	Loitoktok	42	3.7
	kwale	24	2.1
Course	Total	1132	100.0
	Nursing	354	31.3
	Clinical medicine	154	13.6
	Occupational therapy	90	8.0
	Pharmacology	78	6.9
	Orthopaedic and trauma medicine	64	5.7
	Health promotion and community health	64	5.7
	Medical engineering	59	5.2
	Dental technology	52	4.6
	Physiotherapy	50	4.4
	Optometry	33	2.9
	Medical laboratory sciences	27	2.4
	Medical imaging sciences	24	2.1
	Health records and information technology	24	2.1
	Community oral health	20	1.8
	Public health	19	1.7
	Nutrition and dietetics	17	1.5
	Short course	3	0.3
Year of study	Total	1132	100.0
	Year 1 SEM 2	696	62.6
	Year 2 SEM 2	144	12.9
	Year 2 SEM 1	139	12.5
	Year 3 SEM 1	77	6.9
	Year 3 SEM 2	30	2.7
	Year 4 SEM 1	26	2.3
	Total	1112	100.0%

Level of utilization of eLearning and sociodemographic characteristics

As depicted in Figure 1, the level of utilization stood at 89.2% (1012), with 10.8% (123) against. When disaggregated by campuses, the Nairobi campus accounted for 52.9% (535) in utilization. Similarly, among courses, nursing alone represented 32% (324) of those who utilized eLearning fully. Concerning the year of study, first years constituted the majority (74.2%, 751), and in terms of age, those aged between 18-23 years were the majority (67.4%, 682) in eLearning utilization. However, on cross-tabulation (Table 3), only gender demonstrated a significant association with the utilization of eLearning ($p=0.044$), while the other demographic variables did not show significance ($p>0.05$).

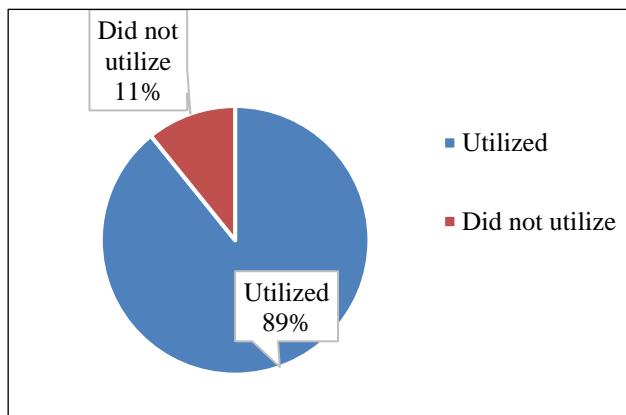


Figure 1: Proportion of learners that fully utilized eLearning.

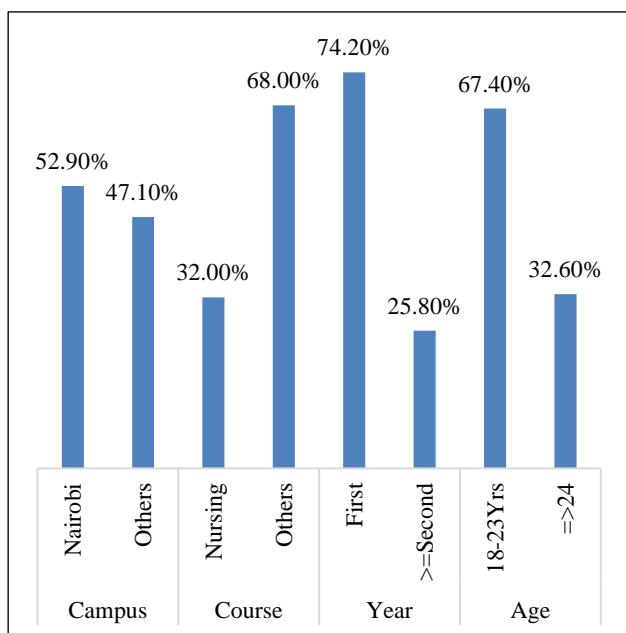


Figure 2: The student population that used eLearning disaggregated by campus, course, year, and age.

Learning modes: preferences and challenges

About 76.8% (865) of learners would prefer face-to-face classes if given a choice, while 20.3% (229) favor a blend of face-to-face and e-learning, and 2.8% (32) lean towards pure online learning (Figure 3). A follow-up question revealed that accessibility challenges, including a lack of data bundles, poor internet connectivity, residing in remote areas, and inadequate gadgets such as smartphones, were major reasons for not attending online classes. Additionally, issues like poor communication (such as delayed sharing of links) and competing responsibilities at home were commonly cited. Some learners also faced technical challenges, including difficulty navigating online platforms and accessing class materials. Here are typical excerpts from some of the learners regarding reasons for not attending online classes: 1) I was unable to have access to the link (ID 12711537079), 2) Unaware (of the online classes) and network accessibility (ID 12711954621), 3) Poor network (ID 12707914545), 4) Lack of enough airtime and lack of a good smartphone (ID 12708248391), 5) I was unable to access online classes due to a lack of network since I was in a remote area (ID 12708292498), 6) Because the e-learning had a maximum number of people and couldn't exceed the number, and the links were not communicated to all the What's App groups in KMTC (ID 12711495082, 7) I was unable to log in (ID 12711787361), 8) At home, there is a lot of work, so learning time is little (ID 12711697113).

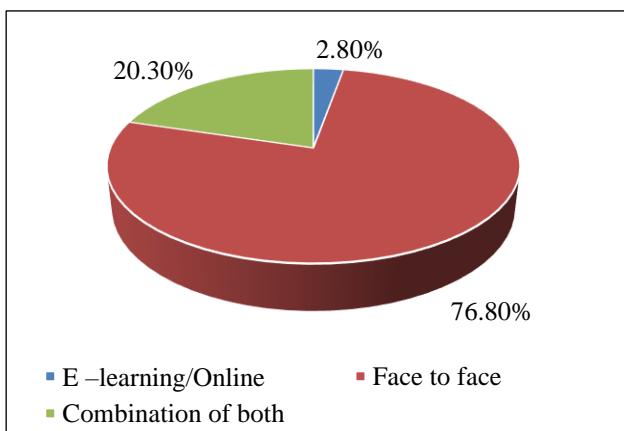
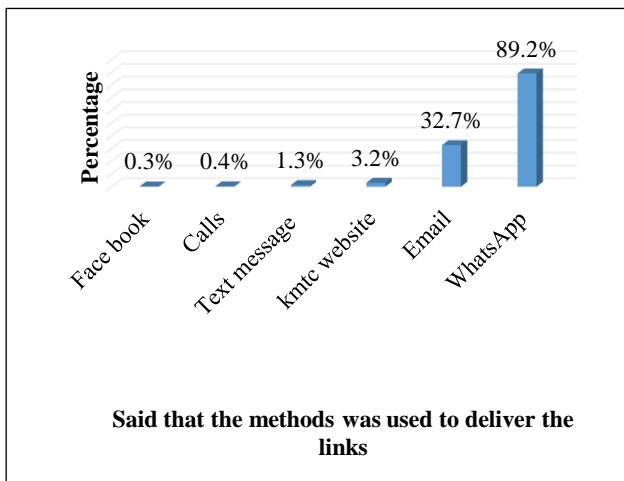
The majority preferred face-to-face learning for various reasons, such as cost savings (eliminating bundle and smartphone expenses) and avoiding technical challenges associated with online classes. They appreciated the efficiency of in-person interactions for clear explanations and questions. Physical classes also supported practical sessions, were universally accessible, and were deemed more convenient. Below are some of their responses: 1) It's a perfect method because it encourages teacher-to-student interaction. We are free to ask all questions that we would like to ask and freely ask for clarification where needed (ID 12711459707), 2) It is economical (ID 12711537079), 3) Enhances student-to-teacher interactions and more clarity from the teacher (ID 12689037050), 4) Because it is understandable and efficient and hence no network hitches (ID 12711540592), 5) Not everyone has a quality smartphone. N if we do have a smartphone, we can't always afford the data bundles (ID 12712108864), 6) It is easily accessible (ID 12707914545), 7) More convenient (ID 12686511123, 8) Because some units require practical (ID 12711551511).

Methods used to deliver links for online teaching

Online links were primarily delivered through WhatsApp, representing 89.2% (n=1016). Additionally, 32.7% (n=373) were delivered via email, 3.2% (n=36) through the KMTC website, 1.3% (n=15) through text messages, and 0.4% (n=5) through calls, as shown in Figure 4.

Table 3: Cross-tabulation of demographic characteristics by level of utilization of eLearning.

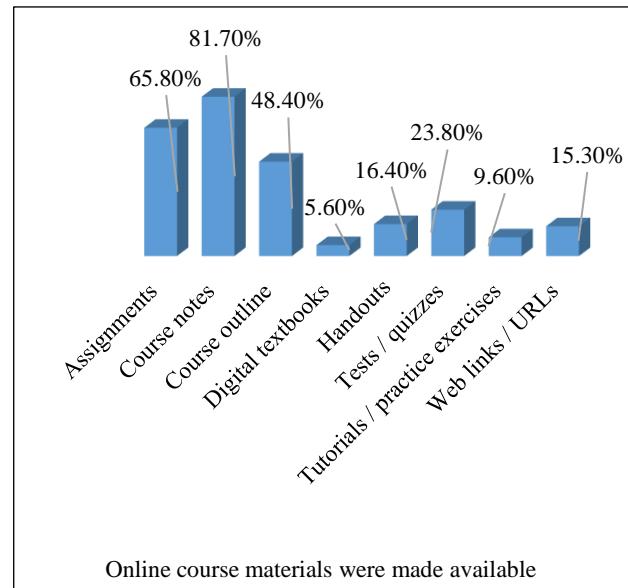
Demographic characteristic	eLearning utilized fully				Significant at $p \leq 0.05$	
	Yes		No			
	n	%	n	%		
The gender of the student	Female	601	59.9	62	50.4	$\chi^2=4.044$, df=1, p=0.044
	Male	403	40.1	61	49.6	
Age (in years)	18-23	682	67.4	82	66.7	$\chi^2=.026$, df=1, p=0.871
	≥ 24	330	32.6	41	33.3	
Campus	Nairobi	535	52.9	67	54.5	$\chi^2=.114$, df=1, p=0.736
	Others	477	47.1	56	45.5	
Course	Nursing	324	32.0	30	24.4	$\chi^2=2.971$, df=1, P=0.085
	Others	688	68.0	93	75.6	
Year	First	751	74.2	82	66.7	$\chi^2=2.971$, df=1, p=0.085
	\geq Second	261	25.8	41	33.3	

**Figure 3: A pie chart showing the most preferred mode of learning (N=1126).****Figure 4: Frequency of "Yes" responses for each online teaching link delivery method (N=1135).**

The materials made available during online learning

The frequency of receiving each course material online varied. The top four included course notes at 81.7% (930), assignments at 65.8% (749), course outlines at

48.4% (551), and tests and quizzes at 23.8% (271) (Figure 5).

**Figure 5: Frequency of "Yes" responses for each online course material availability (N=1135).**

Quality of technical support

As illustrated in Figure 6, slightly less than one-third, 32.1% (n=352) of the learners, rated the technical support received as good, while the rest described it as poor (21.4%, n=236) or fair (46.5%, n=512). One respondent stated thus: 'I was unable to log in' (ID 12711787361).

Students' perception of online class conduct

As depicted in Figure 7, only a small percentage of students (14.9%, n=166) provided a definite positive rating for the conduct of online classes. The majority, slightly more than half (52.1%, n=582), rated the way online classes were conducted as fair, while a third of the respondents (33.0%, n=369) gave a poor rating.

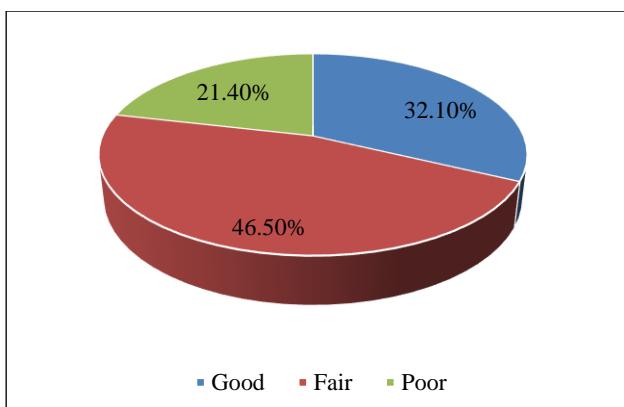


Figure 6: A pie chart showing the rating of the technical support on online teaching (N= 1135).

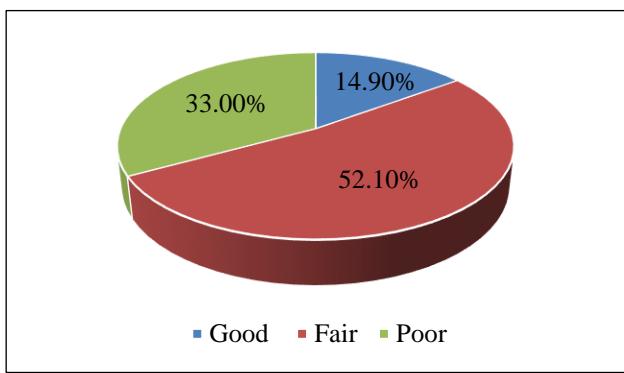


Figure 7: Students' rating of online class conduct (N=1117).

Association between various factors and e-learning utilization

The study also investigated whether the sharing of online course materials was associated with eLearning utilization. As shown in Table 4, factors strongly associated with eLearning utilization included giving assignments during online sessions ($\chi^2=21.123$, $df=1$, $p=0.000$), issuing handouts or notes ($\chi^2=7.820$, $df=1$, $p=.005$), and sharing the course outline online ($\chi^2=6.649$, $df=1$, $p=0.010$). However, the sharing of digital textbooks online was statistically insignificant in relation to eLearning utilization ($\chi^2=1.477$; $df=1$, $p=0.224$). Also, not being given tutorials or practice exercises during online sessions was significantly associated with poor online class session attendance ($\chi^2=8.157$, $df=1$, $p=.004$).

In addition, the study examined the perceived quality of online-related technical support and eLearning. A significant association was found between the perceived quality of technical support and eLearning utilization ($\chi^2=11.049$, $df=3$, $p=0.011$), with better utilization reported among students who rated technical support as 'fair' or 'good.' The study also explored the influence of the perceived quality of online teaching on eLearning utilization. It revealed a significant link between eLearning utilization and students' perception of how the classes were conducted ($\chi^2=23.999$, $df=3$, $p=0.000$). Students who underutilized eLearning often rated the online classes as either 'poor' or 'poorly' conducted.

Table 4: Cross-tabulation of various issues by eLearning utilization.

Factor	eLearning utilized fully				Significant at $p\leq 0.05$
	Yes	No	Yes	No	
	N	%	N	%	
Given: assignments	Yes	688	68.0	58	47.2
	No	324	32.0	65	52.8
Given: course notes	Yes	837	82.7	89	72.4
	No	175	17.3	34	27.6
Given: course outline	Yes	503	49.7	46	37.4
	No	509	50.3	77	62.6
Given: digital textbooks	Yes	60	5.9	4	3.3
	No	952	94.1	119	96.7
Given: tutorials/practice exercises	Yes	106	10.5	3	2.4
	No	906	89.5	120	97.6
Given: web links/URLs	Yes	158	15.6	15	12.2
	No	854	84.4	108	87.8
WhatsApp	Yes	915	90.4	97	78.9
	No	97	9.6	26	21.1
Email	Yes	338	33.4	35	28.5
	No	674	66.6	88	71.5
Text message	Yes	15	1.5	0	0.0
	No	997	98.5	123	100.0
How would you rate the way online classes were conducted?	Positive	689	69.2	56	47.9
	Negative	307	30.8	61	52.1

Continued.

Factor	eLearning utilized fully					$\chi^2=11.049, df=3, p=.011$
	Poor	206	21	29	25.5	
How would you rate the technical support given during online teaching?	Fair	206	46.6	52	45.2	
	Good	187	19	10	8.7	
	Very good	132	13.4	24	20.9	

Finally, the choice of media for sharing the link to eLearning utilization showed a significant association with the degree of utilization. Specifically, when the link was shared through WhatsApp, a high likelihood of full utilization was observed ($\chi^2=15.150, df=1, p=0.000$).

DISCUSSION

While most learners (89.2%) extensively used e-learning, a noteworthy 76.8% preferred face-to-face classes if given a choice. Only 20.3% (229) favored a blend of face-to-face and e-learning, and 2.8% (32) leaned towards pure online learning, indicating diverse preferences within the student population regarding instructional modalities. This suggests that despite the high utilization of e-learning, there remains a substantial preference for traditional in-person learning experiences among many students.⁸ The preference for face-to-face learning is driven by the desire for increased teacher-student interaction, more precise explanations, and efficient communication without technical challenges. Additionally, practical sessions, cost savings related to smartphone and bundle expenses, universal accessibility, and overall convenience, particularly with practical learning sessions, were highlighted as critical reasons for favoring in-person classes. These findings are consistent with the literature.¹⁰

Those who did not attend online sessions cited primary reasons such as accessibility challenges, including a lack of data bundles, poor internet connectivity, residing in remote areas, and insufficient gadgets like smartphones. Additionally, issues like poor communication, technical challenges in navigating online platforms, and competing responsibilities at home, such as household duties, were commonly cited by learners as hindrances to their participation in e-learning. Other factors strongly associated with e-learning utilization included motivating elements for online attendance, such as sessions involving task assignments, provision of handouts or notes, and sharing the course outline online.^{11,12} These findings are in tandem with those from elsewhere. Additionally, the perceived quality of technical support and online teaching significantly influenced e-learning utilization, with better utilization reported among students who rated technical support as 'fair' or 'good' and perceived online classes as well-conducted.

Moreover, the choice of media for sharing e-learning links, mainly through WhatsApp, demonstrated a significant association with the degree of utilization. These findings are consistent with a similar study

conducted in Kenya that identified three main e-learning challenges: inadequate ICT infrastructure, lack of technical skills, and financial constraints.¹ Likewise, a study by Kisanga and Ireson identified poor interface design, inadequate technical support, and lack of IT skills among users as the primary barriers that hinder the successful implementation of existing e-learning projects.⁵ Other studies have also arrived at comparable findings.^{11,13}

In conclusion, despite widespread e-learning utilization, 76.8% of learners strongly prefer face-to-face classes, revealing a significant inclination towards traditional, in-person learning experiences. The preference for face-to-face learning is driven by multiple factors, including the desire for increased teacher-student interaction, more precise explanations, and efficient communication without technical challenges, highlighting the importance of interpersonal dynamics and practical aspects in the learning process. The hindrances to online session attendance, such as accessibility challenges and competing responsibilities at home, underscore the critical role of addressing technological and logistical barriers to ensure equitable access to e-learning opportunities for all students. Key factors linked to e-learning utilization include effective instructional strategies, quality technical support, and well-conducted online classes. The choice of communication channels, particularly platforms like WhatsApp, plays a crucial role in enhancing engagement, emphasizing the importance of strategic dissemination methods for online resources.

Limitations of the study include its restriction to KMTC, making it challenging to generalize findings to private medical training institutions and public universities in Kenya. The use of SurveyMonkey, an online tool for questionnaire administration, poses the risk of potential response biases and limited access for individuals without internet connectivity, thereby affecting the inclusivity of the study population. Additionally, the descriptive nature of the study prevents the inference of cause-effect relationships from the findings.

CONCLUSION

Arising from the above conclusions, this study recommends that: the KMTC should acknowledge and incorporate the strong preference for face-to-face classes by offering hybrid learning options, enabling students to benefit from both traditional and e-learning experiences, and catering to diverse preferences. The KMTC College should implement initiatives to address accessibility

challenges and competing responsibilities at home, such as providing support for data connectivity, ensuring user-friendly online platforms, and offering flexible scheduling options to accommodate diverse learner needs. And the KMTC College should improve e-learning effectiveness by focusing on effective instructional strategies, robust technical support, and well-conducted online classes. Additionally, optimize communication channels, especially on platforms like WhatsApp, to strategically disseminate information and engage students in the online learning process.

ACKNOWLEDGEMENTS

We would like to thank the CEO, KMTC, for funding the study.

Funding: This study was partially funded by the CEO, KMTC and the authors

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Tarus JK, Gichoya D, Muumbo A. Challenges of implementing e-learning in Kenya: A case of Kenyan public universities. *Int Revi Resdistrib Learn.* 2015;16(1):120–41.
2. Kanwal F, Rehman M. Factors affecting e-learning adoption in developing countries—empirical evidence from Pakistan's higher education sector. *IEEE Access.* 2017;5:10968–78.
3. King E, Boyatt R. Exploring factors that influence adoption of e-learning within higher education. *Brit J Educat Technol.* 2015;46:1272–80.
4. Aung TN, Khaing SS. Challenges of Implementing e-Learning in Developing Countries: A Review. In: Zin TT, Lin JC-W, Pan J-S, et al. (eds.). *Genetic and Evolutionary Computing.* Cham: Springer International Publishing; 2016:405–411.
5. Almaiah MA, Al-Khasawneh A, Althunibat A. Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. *Educ Inf Technol.* 2020;25:5261–80.
6. Guldner G, Wells J, Ayutyanont N, Iyengar R, Sprenger S, Siegel JT, Kashyap R. COVID-19 related disruptions to medical education and perceived clinical capability of new resident physicians: a nationwide study of over 1200 first-year residents. *Medi Educat Online.* 2023;28(1):2143307.
7. Sani I, Hamza Y, Chedid Y, Amalendran J, Hamza N. Understanding the consequence of COVID-19 on undergraduate medical education: Medical students' perspective. *Annals of Medicine and Surg.* 2020;58:117–9.
8. Katmeh H, Karimaghaei D, Hewage S, Harky A. The impact of COVID-19 on medical examinations. *Acta Biomed.* 2020;91(4):e2020135.
9. Kenya Medical Training College. Kenya Medical Training College, 2019. Available at: <https://elearning.kmtc.ac.ke/>. Accessed on 18 October 2023.
10. Nikolopoulou K. Face-to-face, online and hybrid education: university students' opinions and preferences. *J Digi Educat Technol.* 2022;2(2):ep2206.
11. Achmad BF, Fitriawan AS, Kurniawan D, Kafil RF, Retnaningsih LN, Setyaningsih WA. Perceived Barriers in Online Learning among Nursing Students during the COVID-19 Pandemic in Indonesia. *Open Access Maced J Med Sci* 2021;9(G):203–10.
12. Cho S, Jang SJ. Nursing students' motivational and self-regulated learning during the COVID-19 pandemic: A cross-sectional study. *Nurs Health Sci.* 2022;24(3):699–707.
13. Nuuyoma V, Lauliso SS, Chihururu L. Perspectives of nursing students on challenges of e-learning during early stages of the COVID-19 pandemic. *Curationis.* 2023;46(1):2358.

Cite this article as: Kaloki LN, Ombasa ZO, Mutiso UM, Mutiso RN, Kwinga NM, Nyachae JR, et al. Level of utilization of eLearning among students at selected KMTC campuses. *Int J Community Med Public Health* 2024;11:20-7.