# Enhancing utilisation of e-learning platform in teaching and learning using one-on-one on-job training approach among teaching staff at Kenya Medical Training College

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## Abstract

**Background**: E-learning is an educational tool that facilitates teaching and learning by the application of Information Technology and Communication. Its acceptance and utilization is generalised, but some pockets of resistance to uptake still exist. The objective of this study was to assess the utilisation of an e-learning platform among teaching staff at Kenya Medical Training Colleges (KMTC) in Kenya.

**Methodology**: A quasi-experimental, single-group, pre and post-test research study was carried out among 63 selected members of the teaching staff at Lower Eastern Region Campuses of KMTC. Participating Campuses and departments were elected, and data were collected using semi-structured, researcher-administered questionnaires. Baseline data was collected, then a one-on-one, on-job training intervention was implemented immediately, followed by post-intervention data collection. Chi-square test was used to test for associations between the socio-demographic factors and levels of competence. Paired T-test was used to analyse the impact of a one-on-one approach on the utilisation of the E-learning platform among the lecturers. P-value of less than 0.05 was considered statistically significant.

**Results**: The majority of the participants (43.6%) were aged 31-40 years, held Bachelor's level degrees (60%, n=33) and taught in the nursing department (45.5%, n=25). Education level had a statistically significant association with competence in the utilisation of the e-learning platform, yielding a chi-square statistic of 20.93 with 6 degrees of freedom, and a p-value of 0.00189. A paired samples t-test revealed a statistically significant improvement in competence following the one-on-one training intervention **(**$t(54) = 12.48$, $p < 0.001$**).**

**Conclusion**: Following the intervention, nearly all (98%) of participants achieved competence and improved utilisation across all aptitude levels tested. These findings underscore the significance of personalised, one-on-one on-job training in advancing e-learning utilisation in training.

***Keywords****: e-learning; Digital Competence; Technology; Healthcare workers, Training, On-Job Training, Enhancing Utilization*

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## Introduction

Electronic learning (e-learning) is an approach to education that utilises Information and Communication Technology (ICT) to facilitate and enhance learning, allowing students to access essential educational resources and programs remotely.[1] It has become indispensable, especially in higher education, having been termed 'inevitable'.[2] As newer technological advances complement learning, adoption of ICT makes it easier for learners and educators to apply blended learning using traditional in-person learning, e-learning, online discussions, and distance learning.[3]

E-learning has increasingly become an integral part of mainstream education in Kenya, including health sciences, encompassing fields such as medicine, dentistry, public health,

nursing, and other allied health professions.[1] Institutions of higher learning acknowledge the global trend among academic institutions in leveraging ICT, and many have since progressively adopted e-learning to enhance the effectiveness and efficiency of teaching, learning, and research in these institutions. As a progressive institution training healthcare workers, the Kenya Medical Training College (KMTC) views e-learning as a valuable tool for advancing its academic standing. Moreover, e-learning creates a more flexible learning environment beyond the traditional classroom.[4]

The implementation of e-learning in KMTC supports a model where teaching staff have increased opportunities for individualised engagement with students, placing learners at the core of the educational process. This approach enables students, including those studying remotely, to participate in interactive, two-way communication with instructors. Thus, KMTC aims to align with and support its commitment to academic excellence. In support of the e-learning initiative, the management of KMTC instituted an e-learning policy, availed an E-learning platform, internet connectivity, trained the faculty on e-learning and, most importantly, installed e-learning champions across all the campuses. These efforts were to ensure that e-learning becomes part of the day-to-day teaching activities and delivery of content.

Despite all the efforts made by the institution on staff capacity building and infrastructure, the utilisation of the e-learning platform has remained inadequate in KMTC. Unfortunately, the majority of the teaching staff have not retained the knowledge and skills gained from previous training on e-learning. This has hindered the uptake of e-learning; hence, this study sought to assess the utilisation of e-learning among teaching staff at Kenya Medical Training College in Kenya. Evidence gained through this study should strengthen the implementation of e-learning in the training of healthcare workers by identifying opportunities for strengthening the teaching staff's competence in integrating e-learning in blended training.

## Methodology

### Study design and site

A quasi-experimental, single-group, pre and post-test research study design was adopted. The study was conducted at the Lower Eastern Region campuses of the Kenya Medical Training College. These would be the first interventional studies conducted on E-learning in these campuses.

### Study population

The population of interest was the teaching staff of all the KMTC Lower Eastern Region campuses. Table 1 lists all Ten Campuses in this region and the number of teaching staff in those institutions.

**Table 1**

*Number of teaching staff in the KMTC campuses in the Lower Eastern Region of Kenya.*

| No. | Name of Campus | Number of Teaching Staff |
|---|---|---|
| 1 | MKTC Meru | 14 |
| 2 | KMTC Embu | 22 |
| 3 | KMTC Kitui | 19 |
| 4 | KMTC Mwingi | 9 |
| 5 | KMTC Makueni | 15 |
| 6 | KMTC Mbooni | 2 |
| 7 | KMTC Makindu | 12 |
| 8 | KMTC Machakos | 19 |
| 9 | KMTC Manza | 12 |
| 10 | KMTC Kangundo | 5 |
| | Total | 129 |

All the teaching staff from these campuses were considered for participation in the study, except for those who had previously been trained and appointed as e-learning focal persons. Table 1.

## Sample size determination

The sample size per group was calculated using Wang et al. 's (2008) formula, as follows:

$$n = 2 \times \left(Z_{\{\frac{\alpha}{2}\}} + Z_{\{\beta\}}\right)^2 \times \frac{\sigma^2}{\delta^2}$$

Where:

n= sample size

$Z_{\{\frac{\alpha}{2}\}}$= 1.96 for a 95% Confidence level

$Z_{\{\beta\}}$= 0.84 for 80% power

σ= standard deviation of 1.4. Adopted from Al-Qbelat et al. [5]

δ = 0.7. adopted from Al-Qbelat et al. [5]

Therefore:

n= 2 x (1.96+ 0.84)2 x 1.42/0.72

n =62.72

n = 63 participants

## Sampling technique

Seven out of ten campuses were selected using a simple random sampling technique. Participants were then selected from a list of teaching staff in every department. Nine participants from each campus, and three selected randomly from various departments.

## Intervention

A one-on-one, on-job training approach was implemented among the study participants. Participants were coached on various aspects of e-learning as knowledge and skill gaps were identified. Immediate feedback was provided after the post-test data was collected.

## Data collection tool and procedure

Data were gathered using a semi-structured, researcher-administered questionnaire with checklists. The questionnaire contained Section A, capturing demographic information; Section B, a checklist of teaching staff's competencies; and Section C, the effectiveness of one-on-one on-job training intervention. Pre-test data were first collected, and then the intervention was immediately implemented. The participants were given time to practice before a post-test data collection was conducted the following day.

## Data analysis

Data analysis was conducted using SPSS version 21.0 using both descriptive and inferential statistics. Categorical variables were summarised as percentages and frequencies. Continuous variables were summarised as means and standard deviations. Different abilities across the areas tested were grouped as either 'Competent', 'Not yet competent' or 'Incompetent'. The Chi-square test was used to test for associations between the socio-demographic factors and various levels of competence. A paired t-test was conducted to test the differences before and after the intervention of online training. Data was considered statistically significant at a p-value of less than 0.05.

## Ethical considerations

Ethical approval was granted by the Institutional Research Ethics Committee (IREC) of Kenya Medical Training College. Informed consent was obtained from all participants voluntarily and with anonymity and confidentiality of data maintained.

# Results

## Socio-demographic characteristics of participants

The study achieved an 87% response rate with 55 participants' data included in the data analysis. The majority of the participants (43.6%) were aged between 31 and 40 years and taught at the nursing department (45.5%, n=25). Regarding overall performance, 21 (38.2%) were 'Competent', 27 (49.1%) 'Not Yet Competent', and 7 (12.7%) 'Incompetent'. Table 2.

On the ability to log in before intervention, 50% of respondents aged 41-50 years were competent, while all (100%, n=4) aged above 60 years were 'Not Yet Competent'. The rest of the age groups had mixed competencies of 'Competent', 'Not Yet Competent' and 'Incompetent'. There was no statistically significant relationship between the age of respondents and the ability to log into the E-learning platform (p-value=0.602).

The majority of the respondents, 60% (n=33), had Bachelor's level degrees, 23.6 (n=13) had Master's level degrees, 14.6% (n=8) had higher diplomas, and 1.8% (n=1) had other levels specified. Among those with a Master's degree, 10 out of 13 (approximately 77%) were competent in accessing the platform before training, 2 were 'Not Yet Competent', and 1 was 'Incompetent'. Among respondents with a Bachelor's degree level qualification, 10 were competent, 18 were 'Not Yet Competent', and 5 were 'Incompetent'. In the Higher Diploma group, only 1 out of 8 respondents (about 12.5%) was competent. Respondents who selected 'Others Specify' as their education level were 'Incompetent' and unable to log. There was a statistically significant association between education level and the ability to log into the e-learning platform before training (p-value=0.002).

**Table 2**

*Distribution of the Participants' Ability to Log in to the E-learning Platform before the Intervention*

| Variable | Category | Ability to Log into the E-learning Platform Before One-on-One Training | | | Total (n=55) | $\chi^2$ | df | P value |
|---|---|---|---|---|---|---|---|---|
| | | Competent | 'Not Yet Competent' | 'Incompetent' | | | | |
| **Age (years)** | 20–30 | 1 | 1 | 0 | 2 | 6.402 | 8 | 0.602 |
| | 31–40 | 8 | 12 | 4 | 24 | | | |
| | 41–50 | 10 | 8 | 2 | 20 | | | |
| | 51–60 | 2 | 2 | 1 | 5 | | | |
| | 61 and above | 0 | 4 | 0 | 4 | | | |
| **Department** | Clinical Medicine | 4 | 5 | 0 | 9 | 9.434 | 12 | 0.666 |
| | Nursing | 11 | 9 | 5 | 25 | | | |
| | Health Records | 2 | 2 | 0 | 4 | | | |
| | Environmental Health | 0 | 2 | 0 | 2 | | | |
| | Pharmacy | 1 | 2 | 0 | 3 | | | |
| | Trauma and Emergency | 0 | 2 | 0 | 2 | | | |
| | Others (Specify) | 3 | 5 | 2 | 10 | | | |
| **Education** | Masters | 10 | 2 | 1 | 13 | 20.928 | 6 | 0.002 |
| | Degree | 10 | 18 | 5 | 33 | | | |
| | Higher Diploma | 1 | 7 | 0 | 8 | | | |
| | Others Specify | 0 | 0 | 1 | 1 | | | |

**Table 3**

*Training by E-learning Point person and Ability to log into the E-learning Platform before Intervention*

| Variable | Category | Ability to Log in before One-on-One Training | | | Total | $\chi^2$ | df | P value |
|---|---|---|---|---|---|---|---|---|
| | | Competent | 'Not Yet Competent' | 'Incompetent' | | | | |
| Training by E-learning Point Person | Yes | 16 | 15 | 2 | 33 | 5.397 | 2 | 0.067 |
| | No | 5 | 12 | 5 | 22 | | | |
| Subtotal | | 21 | 27 | 7 | 55 | | | |
| Computer Training in Previous Major Training | Yes | 19 | 25 | 7 | 51 | 0.708 | 2 | 0.702 |
| | No | 2 | 2 | 0 | 4 | | | |
| Subtotal | | 21 | 27 | 7 | 55 | | | |

The majority of the respondents (60%, n=33) had been trained by the E-learning point persons, although the Pearson Chi-Square test yielded a p-value of 0.067 indicating that the association between prior training and login ability was not statistically significant.

## Computer proficiency from previous major training

Out of those with prior computer training**,** 19 were 'Competent', 25 'Not Yet Competent', and 7 'Incompetent'. Among the 4 respondents without prior computer training**,** 2 were competent and 2 'Not Yet Competent'. Prior computer training and login ability were, however, not statistically significant, p-value = 0.702**.** Almost all respondents (94.5%, n=52) had laptops, and 96.4% (n=53) had basic internet connection skills.

## Ability to utilise the e-learning platform before intervention

The majority of the respondents, 63.6% (n=35), were 'Not Yet Competent', 20% (n=11) were 'Competent', and 16.4% (n=9) were 'Incompetent' on their ability to enrol a cohort into the e-learning platform. This is represented in Figure 1.

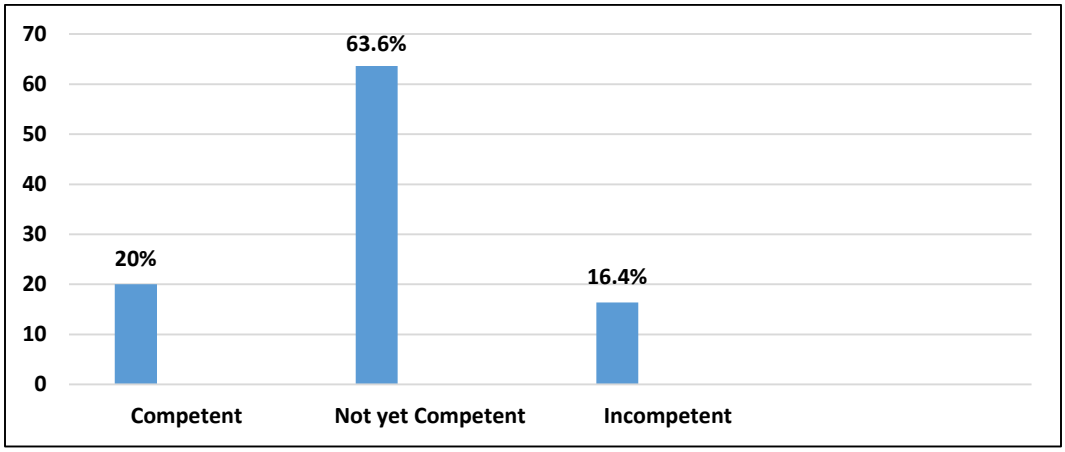


**Figure 1**

*Ability to Enrol a Cohort into the E-learning Platform before One-on-One Training*

**Table 4**

| | Before Training | | | After Training | | |
|---|---|---|---|---|---|---|
| **Competency Area** | **Competent n (%)** | **Not Yet Competent n (%)** | **Incompetent n (%)** | **Competent n (%)** | **Not Yet Competent n (%)** | **Incompetent n (%)** |
| Basic internet connection skill | 53 (96.4) | 1 (1.8) | 1 (1.8) | 54 (98.2) | 1 (1.8) | 0 (0.0) |
| Ability to log into the e-learning platform | 21 (38.2) | 27 (49.1) | 7 (12.7) | 55 (100.0) | 0 (0.0) | 0 (0.0) |
| Ability to enrol a cohort into the e-learning platform | 11 (20.0) | 35 (63.6) | 9 (16.4) | 55 (100.0) | 0 (0.0) | 0 (0.0) |
| Ability to identify the right class from the correct faculty | 15 (27.3) | 31 (56.4) | 9 (16.4) | 55 (100.0) | 0 (0.0) | 0 (0.0) |
| Ability to set up an online class for teaching | 10 (18.2) | 34 (61.8) | 11 (20.0) | 54 (98.2) | 1 (1.8) | 0 (0.0) |
| Ability to administer CATs and retrieve results from the platform | 4 (7.3) | 38 (69.1) | 13 (23.6) | 49 (89.1) | 6 (10.9) | 0 (0.0) |

### Ability to identify the right cohort

On the ability to identify the right class to teach, 56.4% (n=31) were 'Incompetent', 27.3% (n=15) were ' Competent ', and 16.4% (n=9) were 'Incompetent'. On the ability to set up an online class, 61.8% (n=34) were 'Not Yet Competent', 20% (n=11) were 'Incompetent', and 18.2% (n=10) were ' Competent '. On the ability to administer CATs and retrieve results, 69.1% (n=38) were 'Not Yet Competent', 23.6% (n=13) were 'Incompetent', and 7.3% (n=4) were 'Competent'.

### Impact of Intervention on the Utilisation of the E-learning Platform

Before the one-on-one training intervention, lecturers demonstrated high competence only in basic internet connection skills (96.4%). However, competence levels were substantially lower for key e-learning functions such as enrolling cohorts (20.0%), identifying the correct class (27.3%), setting online classes (18.2%), and administering CATs and retrieving results (7.3%).

Following the one-on-one training intervention, competence improved markedly across all domains. All lecturers (100%) became competent in logging into the e-learning platform, enrolling cohorts, and identifying the correct class. Additionally, 98.2% were competent in setting online classes, while 89.1% were competent in administering CATs and retrieving results from the platform.

### Paired T-test

A composite competence score ranging from 0 to 12 was computed by summing scores across six e-learning competency domains. Higher scores indicated greater competence in utilising the e-learning platform. The mean pre-training competence score was 7.16 ± 2.80**,** while the mean post-training competence score was 11.85 ± 0.40. The mean difference between post-training and pre-training scores was 4.69 ± 2.79**.**

A paired samples t-test revealed a statistically significant improvement in competence following the one-on-one training intervention **(**$t(54) = 12.48$, $p < 0.001$**).**

## Discussion

This study sought to assess the utilisation of e-learning platforms in teaching and learning by use of pre and post-intervention comparison among the teaching staff at Kenya Medical Training College in the lower Eastern region of Kenya. We explored the socio-demographic factors as well as the competencies in the utilisation of the E-learning platform.

According to the findings, a majority (43.6%, n=24) of participants represented a younger demographic (31-40 years). This group, despite being younger, had many who were 'Not Yet Competent' or "Incompetent" users (n=12), making it a key group for intervention. Age, however, did not show a statistically significant association with the ability to use the e-learning platform (p-value = 0.602). This finding aligns with a study on attitudes of faculty members using a learning management system in Umm Qura University, Saudi Arabia, in which age difference did not influence utilisation of a learning management system, despite an assumption that the younger staff members would show better adoptability.[6]

The findings indicate that nearly half of the respondents (45.5%, n=25) were from the nursing department. A notable finding on their overall aptitude indicated that half of the teaching staff from this department struggled with basic concepts regarding e-learning before the intervention.

**Table 5**

*Pre- and Post-Training Competence Score Comparison for Participants Following the E-Learning One-On-One On-Job Training Intervention*

| Competence Assessment | Mean Score | SD | Mean Difference | t-value | p-value |
|---|---|---|---|---|---|
| Pre-training | 7.16 | 2.8 | | | |
| Post-training | 11.85 | 0.4 | 4.69 | 12.48 | <0.001 |

This gap justifies the guided training, especially for this particular group, since approximately 1 in 8 of the participants could not achieve as much as logging in to the e-learning platform. However, belonging to a particular department did not hold any statistical significance (p-value = 0.666). This is in line with another report that found no significant difference after comparing respondents from different departments regarding the ability to use e-learning as a teaching and learning tool.[6]

According to the findings, digital competence varied meaningfully across education levels, with Master's level degree holders outperforming expectations and Higher Diploma holders underperforming. Ten (10) out of 13 Master's degree holders were competent before the training, demonstrating the highest level of digital readiness of all the groups. On the other hand, teaching staff with Higher Diplomas as their highest educational attainment demonstrated very low digital competence, with only 1 out of 8 respondents being competent. Moreover, respondents who selected 'Others Specify' as their education level were all 'Incompetent' and unable to log in at all, indicating a clear skill gap requiring targeted support. Notably, a statistically significant association was observed between education level and the ability to log into the e-learning platform before training (p-value = 0.002). On the contrary, a study out of Uganda reported average performance (59.6%) among lecturers with Master's degrees, but an even poorer digital aptitude with limited self-efficacy on online learning, among those who held PhD-level degrees (36.7%).[7] Overall, these findings justify the need for differentiated digital training interventions tailored to the user's educational background.

A majority of the respondents had been trained by the E-learning point persons (60%, n=33) and received computer training in their previous major training (92.7%, n= 51). Participants trained by e-learning point persons demonstrated better competence. Although this association was not statistically significant (p-value = 0.067), those without such training appeared to struggle more, with a higher proportion unable to log into the platform. On the other hand, more than half of the participants from the current study (51.7%) reported not enjoying online teaching, and 52% did not believe that online teaching was enhancing their teaching capacity. While these negative sentiments could potentially hinder the uptake of e-learning and blended learning, a majority of the teaching staff, 94.5% (n=52), had laptops. Possession of a laptop has been documented as one of the incentives that facilitate online learning and e-learning delivery for educators.[8]

## Competencies on the utilisation of the e-learning platform

The current findings indicate that a majority of the respondents (96.4%, n=53) had basic internet connection skills, while more than half of the participants (63.6%, n=35) were 'Not Yet Competent' in their ability to enrol a cohort into the E-learning platform. More than half (56.4%, n=31) could not identify their classes on the platform, 61.8% (n=34) could not set up an e-class, and most (69.1%, n=38) could not upload and retrieve exam results from the E-learning platform. A report from Al-Qura University in Saudi Arabia laments a skill gap among the faculty, where a lack of e-learning coordinators to strengthen the learning management skills of the faculty led to a majority being unable to even activate the e-learning platforms on their computers.[6] However, Kasule et al. report positively on lecturers' self-efficacy in conducting online classes and their digital technical competence, a difference perhaps attributable to the difference in settings.[7]

## Impact of a one-on-one training approach on the utilisation of the e-learning platform

The study found a significant improvement in lecturers' competence in utilising

the e-learning platform following a one-on-one training intervention. The mean competence score increased from 7.16 before training to 11.85 after training, representing an improvement of approximately 65.5%. This suggests that individualised training is highly effective in enhancing practical e-learning skills through personalised guidance, immediate feedback, and hands-on practice.

Barteit, Guzek [1] in Germany and Sub-Saharan Africa, who reported that targeted digital training interventions significantly improved educators' competence and confidence in the use of online learning technologies, noted that personalised support and practical demonstrations were critical in facilitating the adoption of digital teaching tools among health professions educators. Almaiah, Al-Khasawneh [2]in Jordan found that training and technical support were among the strongest determinants of successful e-learning adoption among university lecturers. Their study demonstrated that lecturers who received structured training were significantly more likely to effectively utilise e-learning systems than those without training support.

Kebritchi and Lipschuetz [3]in the United States showed that professional development programs focusing on hands-on engagement with learning management systems significantly improved instructors' competence and willingness to integrate e-learning technologies into their teaching practices. The authors emphasised that practical training opportunities enhance both technical skills and self-efficacy in online teaching. In Africa, Mtebe and Raphael [4] in Tanzania reported that inadequate skills and lack of training were major barriers to effective utilisation of e-learning platforms among higher education instructors. Following targeted capacity-building initiatives, significant improvements were observed in lecturers' ability to create online courses, upload learning materials, and manage student assessments, findings that closely mirror the improvements observed in the current study.

## Study limitations

The study was conducted within the campuses of the Kenya Medical Training College, whose model of healthcare worker training may not represent all institutions of higher learning. Further studies targeting different models of higher learning should be conducted, especially in regions with limited ICT infrastructure, to compare these findings.

## Conclusions

The one-on-one approach training intervention yielded a marked improvement in staff competence in the utilisation of e-learning. Following the intervention, nearly all (98%) participants displayed competence across all e-learning ability levels and improved ability to utilise e-learning tools. Overall, the observed improvement in competence confirms the value of one-on-one training of faculty as an important approach in strengthening uptake and optimal utilisation of e-learning.

## Recommendations

We recommend institutional implementation of one-on-one, on-job training on e-learning for faculty, particularly for those with lower than Master's level education, to enhance the efficiency of health care professionals' education. Strategically scaling up e-learning through champions will also increase the adoption and utilisation across cadres. Further research is warranted in other institutions of higher learning, including universities and mid-level colleges, to compare these findings with other settings and to support the national-level generalisation of these findings.

## Operational definitions

- E-learning platform: The KMTC official E-learning platform
- **One-on-one on-job training approach:** E-learning training that ensured teaching staff were trained through performing the tasks while at work.

## List of abbreviations

- **E-learning**: Electronic Learning

- **ICT**: Information Communication Technology
- **KMTC**: Kenya Medical Training College


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- Conceptualization was carried out by J. K. M
- Methodology was designed by J. K. M and Z.M.K.
- Data collection was performed by J. K. M and Z.M.K.
- Formal analysis was conducted by J.K.M.
- The original draft was written by T.J.O.
- Extensive review and editing provided by J.K.M. and T.J.O.


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