COMMONWEALTH of LEARNING

Baseline Study on Technology-Enabled Learning at the University of Kabianga

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The Commonwealth of Learning (COL) is an intergovernmental organisation created by Commonwealth Heads of Government to promote the development and sharing of open learning and distance education knowledge, resources and technologies.

Acknowledgements

This report was prepared by Dr Florence W. Kamonjo, Dr David Ngatia, Dr Benedicta Tabot and Professor Paul Onsare of the University of Kabianga, under the guidance of Dr Sanjaya Mishra, Director: Education, Commonwealth of Learning, Canada.

The authors are grateful for support from Professor Elijah Omwenga, Deputy Vice-Chancellor Academic and Student Affairs, University of Kabianga, as well as TEL Champions (lecturers and ICT personnel) and students at the university.

Published by:
Commonwealth of Learning
4710 Kingsway, Suite 2500
Burnaby, British Columbia
Canada V5H 4M2
Telephone: +1 604 775 8200
Fax: +1 604 775 8210
Web: www.col.org
Email: info@col.org

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Acronyms

COL	Commonwealth of Learning
ICT	information and communication technologies
MOOC	massive open online course
OER	open educational resources
UoK	University of Kabianga

Executive Summary

This report presents the findings of a baseline study conducted at the University of Kabianga (UoK), Kenya. The study's aim was to establish the status of access to and use of information and communication technologies (ICT) for teaching and learning at UoK. The research purpose was to assess the university's readiness to implement technology-enabled learning (TEL) by adopting a systematic approach of policy formulation, capacity building and infrastructure improvement. The survey's findings will aid in identifying the gaps in the TEL skills of UoK's students and lecturers, as well as inform and support UoK's TEL policy development process.

The baseline study consisted of three surveys: a questionnaire on faculty use of technology for teaching and learning, a questionnaire on learners' use of technology and a questionnaire to assess the current TEL environment and enabling policies. These tools were developed by the Commonwealth of Learning (COL) and are available in the *Technology-Enabled Learning Implementation Handbook* (Kirkwood & Price, 2016). The three surveys were administered with the use of LimeSurvey. The numbers of respondents were 640 learners and 61 lecturers.

The baseline study established that UoK had a total score of 120 on institutional preparedness, which represents emerging preparedness. It was observed that UoK had low scores on Policy, Strategic Plan and Documentation, making these priority areas for the university to implement TEL. UoK provides Internet access to both instructors and learners in some areas of the university. However, learners felt they should have Internet access in more places, including their hostels, to improve the TEL experience. Learners had positive perceptions about using technology in their learning, but they indicated the need for greater bandwidth and for more desktop computers to be available in non-ICT courses. In addition, they desired more learning support from the ICT departments and lecturers. The study also established that lecturers have positive attitudes towards the use of TEL. However, they have concerns about a lack of faculty training on TEL and a lack of time to develop courses for delivery using technology.

Although the university has a reasonable ICT infrastructure, only 60% of lecturers are using blended learning. In addition, despite the university providing Internet access, and a significant percentage of learners having smartphones, only 60% of learning at UoK is blended.

Overall, this report analyses the current situation at UoK for TEL implementation and identifies gaps among instructors and students. These gaps can be addressed through TEL training for lecturers and students, as well as the development of a TEL policy and implementation strategy. Key findings, conclusions and recommendations are provided in Chapter 5.

Chapter 1: Introduction

1.1 About the University of Kabianga

The University of Kabianga (UoK) is located in the Kabianga Division of Kericho West District, Kenya. It is situated in the renowned, lush tea-growing highlands of Kericho at the south-western end of the Rift Valley Province. UoK is a Public Chartered University. It became a campus of Moi University in 2007 and was elevated to constituent college level in 2009. In 2013, it became a fully fledged university and was granted a charter. At that time, it had five schools. Currently, UoK has three campuses, five schools, 15 departments and five directorates.

Table 1: UoK vision, mission and philosophy

Vision	To be a leading university in scientific innovation for the betterment of humanity.
Mission	To create, preserve and transfer knowledge and technology through quality and entrepreneurial education, research, extension, and partnership with governance, industry and non-state actors whilst ensuring a sustainable environment.
Philosophy	To foster intellectual development, excellence, creativity and innovation, academic freedom, equity, integrity, peace and sustainability through the relentless search for truth.

The university offers courses and programmes at different levels, summarised in Table 2.

Table 2: Number of programmes at UoK

School	PhD	Master's	Undergraduate	Diploma	Certificate	Totals
Agricultural Sciences and Natural Resources	2	7	7	2	0	18
Business and Economics	1	2	5	3	1	12
Education Arts and Social Sciences	4	11	6	5	1	7
Health Sciences	0	0	5	2	0	7
Science and Technology	9	27	31	15	4	22
Total	**9**	**27**	**31**	**15**	**4**	**46**

1.2 Technology-Enabled Learning: Current Status at UoK

Before the Covid-19 pandemic, all teaching at UoK was delivered face to face. When Covid-19 disrupted learning in 2020, UoK quickly set up the online learning management system (LMS) Moodle. Lecturers received some internal training in online and blended teaching, but learners did not. Online content was developed; most courses are now available on the e-learning platform, and blended learning has been adopted. However, all of this was done in a hurry and would require substantial improvement if UoK is to offer quality online and distance electronic learning (ODEL).

Two information and communication technologies (ICT) laboratories are now available at UoK. Modest strides have been made to expand and integrate ICT in teaching and learning. ICT usage at the university has increased, but the infrastructure requires significant improvement.

An online learning policy was developed in 2020 to help guide lecturers with respect to instructional procedures so they can deliver quality e-learning. The policy shall help stakeholders approach distance learning activities in alignment with the university's mission to create, preserve and transfer knowledge and technology through quality and entrepreneurial education.

Training of Staff and Students for E-learning

Lecturers were introduced to e-learning at UoK in 2020 through basic training. A case study by Ngatia, Kamonjo and Goshtasbpour (2022) on UoK lecturers indicated they need further structured training on online teaching and learning. In another study with learners, Kamonjo and Ngatia (2022) found learners were in dire need of training in online training and blended learning.

The university's collaboration with the Commonwealth of Learning (COL) for TEL implementation has come at the right time to cater for the training needs on open, blended and distance learning for both students and lecturers. The programme will also help improve the university's infrastructure for ODEL, in preparation for UoK to establish an ODEL institute.

1.3 Objectives of the Report

This report's overarching purpose is to document UoK's preparedness to systematically integrate ICT in teaching and learning. The findings underpin recommendations to support the development of a TEL policy and TEL implementation strategy at UoK. These are the report's objectives:

1. To determine the availability of infrastructure at UoK that can support TEL implementation.
2. To establish the accessibility of TEL resources to learners and lecturers at UoK.
3. To determine the level of skills that the university's teachers require to integrate ICT into their teaching–learning practices.
4. To establish learners' and teachers' perceptions of ICT for teaching and learning.
5. To determine learners' and teachers' levels of motivation to use ICT in learning and teaching.

Methodology

This study used the survey method to collect data via the questionnaires provided by COL (Kirkwood & Price, 2016).

Two online survey instruments were administered to lecturers and learners. UoK also conducted a self-review of its technology-related institutional facilities. Questionnaires were distributed via email.

The target populations of the project were all lecturers and learners at UoK. Table 3 provides the populations, samples and response rates for the study.

Table 3: Population and sample

Survey Participants	Total Population	Number of Responses	Response Rate
Learners	7,000	884	12.6%
Lecturers	200	61	30.5%

Challenges and Limitations

The major challenge was that the surveys were sent to students at the end of the semester, when examinations were about to start, so students and teachers were all busy preparing for the exams.

Chapter 2: Policy Review & Infrastructure Audit at UoK

The institutional questionnaire was completed by UoK's Director of ICT. It aimed to establish the readiness of the university's infrastructure and policies to support TEL.

ICT Hardware and Internet Connectivity

UoK has a total number of 51 desktop computers and two laptops, all of which are connected to the Internet. The university has a broadband Internet connection on the premises, available to staff, faculty members, students and visitors. Internet connectivity can be accessed from designated areas around the campus, such as classrooms, the library, faculty rooms, laboratories, the reception lounge, seminar halls and open areas.

Available Infrastructure at UoK for E-learning

1. **Server:** A server is already available but requires greater capacity.
2. **Internet:** Internet bandwidth (at least 5 Mbps). However, UoK is working towards providing a more efficient intranet system with wider coverage on the university property and its campuses.
3. **Software:** A learning management system is available.
4. **Delivery Platforms**
    - Moodle (LMS)
    - Web-conferencing tools, including BigBlueButton, Google Blackboard, Google Classroom, Google Hangouts and Zoom
5. **Technical support:** There is an ICT department.
6. **Quality assurance:** There is a Directorate of Quality Assurance.

Open Educational Resources

UoK has an open educational resources (OER) repository that was created in 2022, but it is not sufficiently populated. The institution has produced only a few educational e-content and audiovisual materials with Creative Common licences. The library staff also need training in the skills required to manage an institutional OER repository.

Online Courses

UoK has a number of courses in the LMS that lecturers use to blend their teaching. However, lecturers need training in online course development and facilitation. This will improve the quality of UoK's online content to benefit learners.

Other Online Facilities

The resources, services and spaces that UoK provides are summarised in Table 4.

Table 4: Online facilities provided by the University of Kabianga

Resources Available	Resources Planned	Resources Not Available
E-classroom facilities (e.g., computers, projection systems, lecture capture systems,	Bibliographic databases	E-proceedings of conferences
SMART boards, etc.)	Statistical databases	E-newspapers
Computer labs (for practical and Internet access)	Data visualisation software	
Email services (institutional)	Citation/reference management software	
Learning management system (e.g., Moodle, etc.)	Access to software (e.g., MATLAB, GIS applications, statistical software, qualitative data analysis, graphics software, textual or image analysis programs, etc.)	

Institutional Preparedness for TEL

UoK scored 120 on institutional preparedness. According to Kirkwood and Price (2016), a score of 95–129 signifies developing preparedness: "The institution has put in place some of the aspects of a Technology-Enabled Learning system, policies and infrastructure, and is in the process of developing a robust system" (Kirkwood & Price, 2016, p. 88). However, it was also observed that UoK scored averagely on:

- alignment of the TEL policy with the organisation's mission
- support for the creation of digital multimedia content in the organisation (e.g., production of e-courses, audio and video materials, animation, etc.)
- a strategic plan for TEL approval by the senior management of the organisation, and support through adequate financial provisions
- adequacy of policies and procedures to protect privacy and organisation data

UoK scored poorly on having an understanding of the TEL vision and mission across the organisation.

The above points highlight that UoK needs to prioritise improvements in these areas with poor and average scores to successfully implement its TEL programme.

During policy workshop discussions, it was agreed that the initial preparedness assessment, which tallied to 157, overrated some aspects in the score sheet; Table 5 presents the revised values. As noted above, the adjusted score of 120 shows emerging preparedness, meaning there are still issues that UoK must resolve to attain a state of TEL preparedness. One such issue is having a TEL policy that addresses the use of technology in learning.

Table 5: Institutional preparedness score

Policy	Score
There is a well-documented TEL policy.	3
The vision and mission of the TEL policy are aligned with the mission of the organisation.	3
The vision and mission of TEL are well understood across the organisation.	2
There is a commitment on the part of the institutional leaders to use technology to achieve strategic academic goals.	4
Subtotal	**12**
Strategic Plan	
There is a strategic plan for the implementation of TEL.	3
The strategic plan for TEL has measurable goals and outcomes.	3
The strategic plan for TEL is approved by the senior management of the organisation and is supported by adequate financial provisions.	3
Subtotal	**9**
IT Support Department	
The organisation has an IT department that handles procurement, installation and maintenance of technologies for teaching and learning.	4
There is an ICT policy in place, which is implemented by a high-powered committee in the organisation.	4
The head of the IT support department reports to senior management and is responsible for the overall functioning of technology in the organisation.	4
The head of the IT support department is well qualified and up to date in order to manage the technological requirements of the organisation.	4
Subtotal	**16**
Technology	
There is adequate hardware infrastructure for teaching and learning (e.g., access to computers for students and learners).	3
There are adequate applications and software for teaching and learning (e.g., access to appropriate software, intranet, learning management system, etc.).	4
There is adequate networking infrastructure in the organisation (e.g., access to adequate bandwidth).	4
There are adequate policies and procedures in place to protect privacy and organisation data.	2
Subtotal	**13**
Content	
There is support available for the creation of digital multimedia content in the organisation (e.g., production of e-courses, audio and video materials, animation, etc.).	2
There are instructional designers in the organisation, or faculty members are trained to organise learning content appropriately.	2
Teachers have adequate access to the online system to develop courses for TEL.	3
Subtotal	**7**
Documentation	
There is a variety of help available to support teachers and students in using technology effectively.	3
Lessons learned in the implementation of the TEL are stored and shared within the organisation for others to access and learn from.	3

The workflow processes and responsibilities to implement TEL are well documented in the organisation.	3
Subtotal	**9**
Organisational Culture	
Faculty and staff members are willing to learn about new technology in the organisation.	4
Faculty and staff members support each other easily.	3
There is a culture of knowledge creation and sharing in the organisation.	3
Subtotal	**10**
Leadership	
Leaders in the organisation are involved in the implementation of TEL.	4
Senior management in the organisation regularly review, monitor and evaluate the progress of TEL.	4
The top leadership of the organisation is supportive of TEL and provides encouragement and motivation to the faculty and staff to achieve the academic goals.	4
Subtotal	**12**
Human Resources and Training	
Faculty members are qualified and trained to use technology for teaching and learning.	3
Faculty and staff members receive regular training to update them in the use of TEL.	3
There are adequate staff to support TEL.	4
The organisation has a structure in place to create teams for content development and delivery of TEL.	3
Faculty members trust the support received from instructional designers and technology support staff while developing and delivering the courses.	3
The IT staff members are highly skilled and trained to provide the needed support.	4
Subtotal	**20**
TEL Champions	
There are early adopters of TEL in the organisation.	3
There are TEL champions in the organisation who support and care about pedagogic innovations.	3
There are faculty members who can take leadership roles in developing appropriate policies and a TEL strategy for the organisation.	3
There are TEL champions to research and disseminate good practices in TEL.	3
Subtotal	**12**
Grand Total Score	**120**

Chapter 3: Instructors' Use of Technologies for Teaching & Learning

3.1 Profile of Instructors

A total of 61 lecturers at UoK responded to the TEL usage faculty survey.

Gender and Age Distributions

Participants were asked to indicate their gender and age. As presented in Figure 1, 44% of the respondents were male while 56% were female.

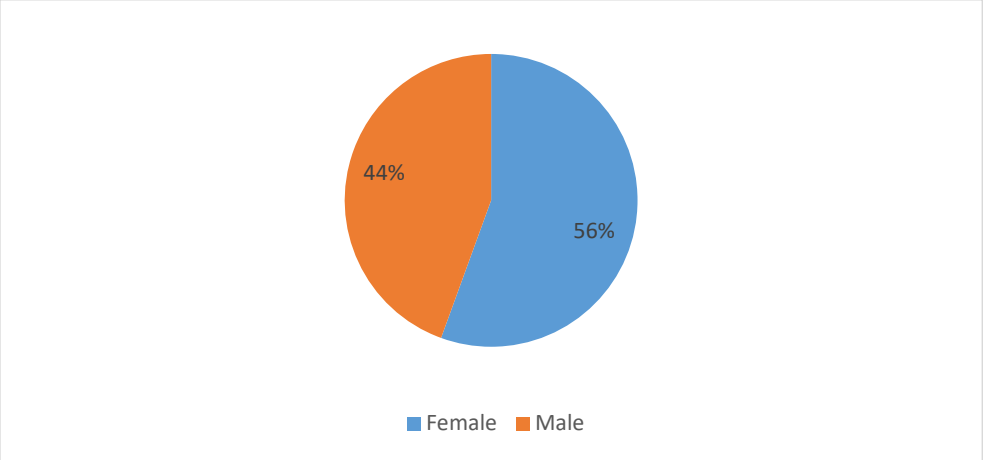

Figure 1: Gender ratio of instructor respondents at UoK.

The respondents' age distribution shows that 20.0% of the faculty respondents were in the 41–50 age bracket, with 37.9% aged 50 years and up, indicating a mixture of young and older (Figure 2).

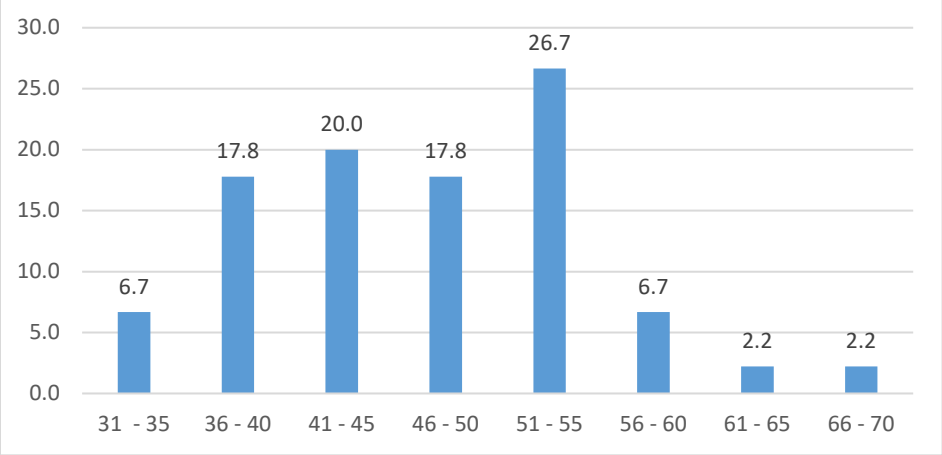

Figure 2: Age groups of instructors.

Faculty Positions and Qualifications

Lecturers comprised 90.74% of the faculty respondents, while 3.70% were associate professors and 5.56% were assistant professors (Figure 3); 70.37% held a PhD and 29.63% a master's (Figure 4).

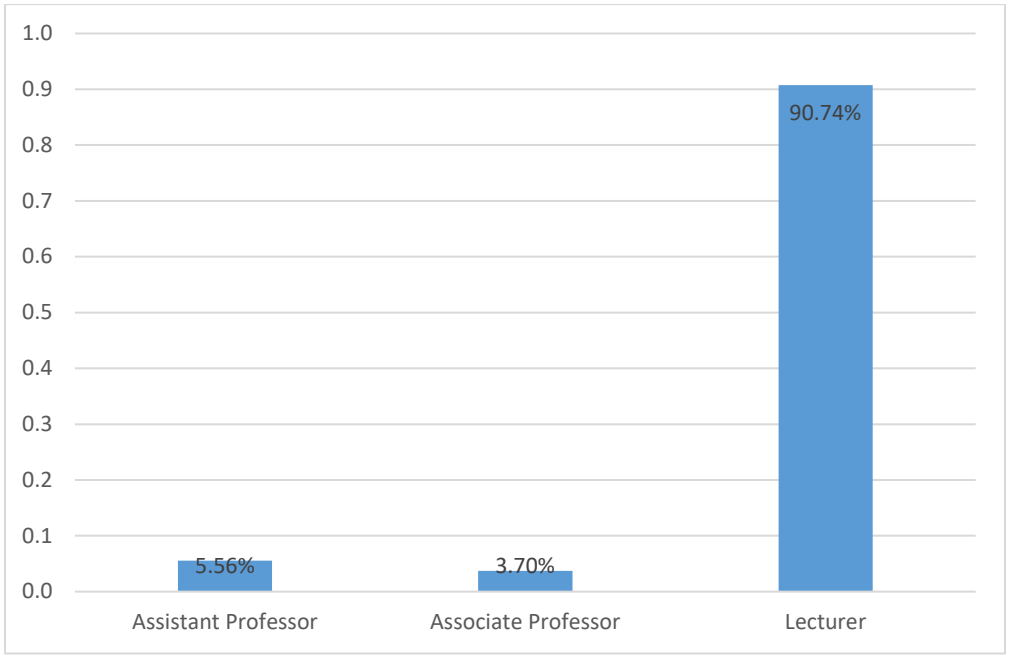

Figure 3: Instructors' positions.

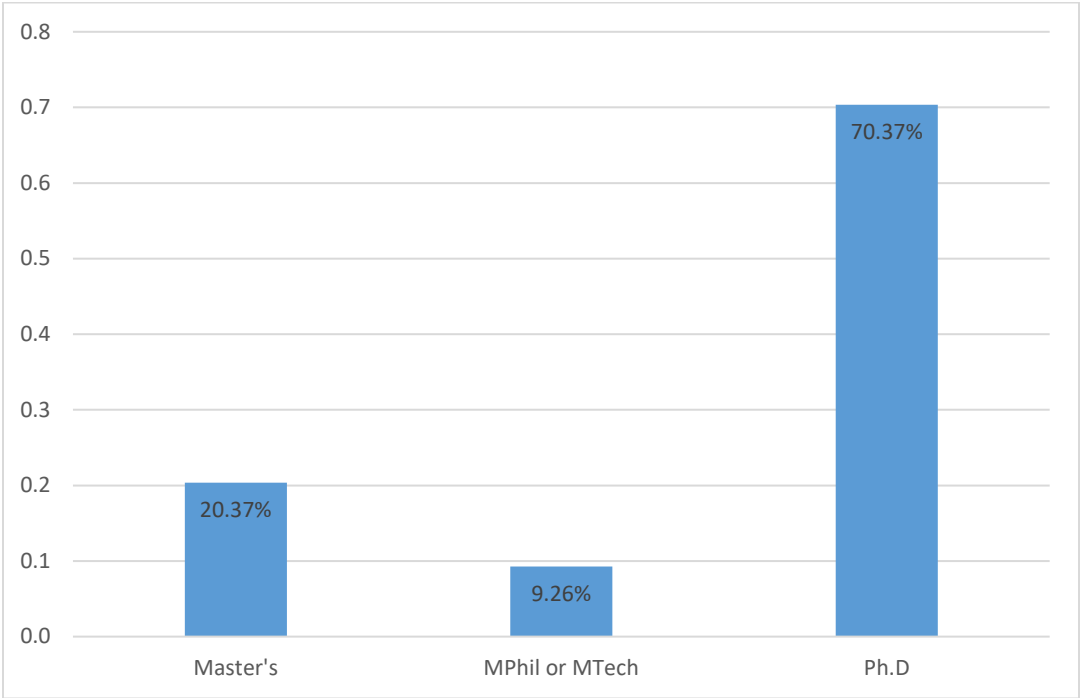

Figure 4: Instructors' qualifications.

Teaching Level and Experience

When asked about teaching level, 63.6% of the respondents were teaching undergraduates while 36.4% were teaching graduates or postgraduates (Figure 5); 33.33% of the lecturers had 11–15 years of teaching experience, 25.93% had six to ten years, and 2.22% had 31–35 years (Figure 6).

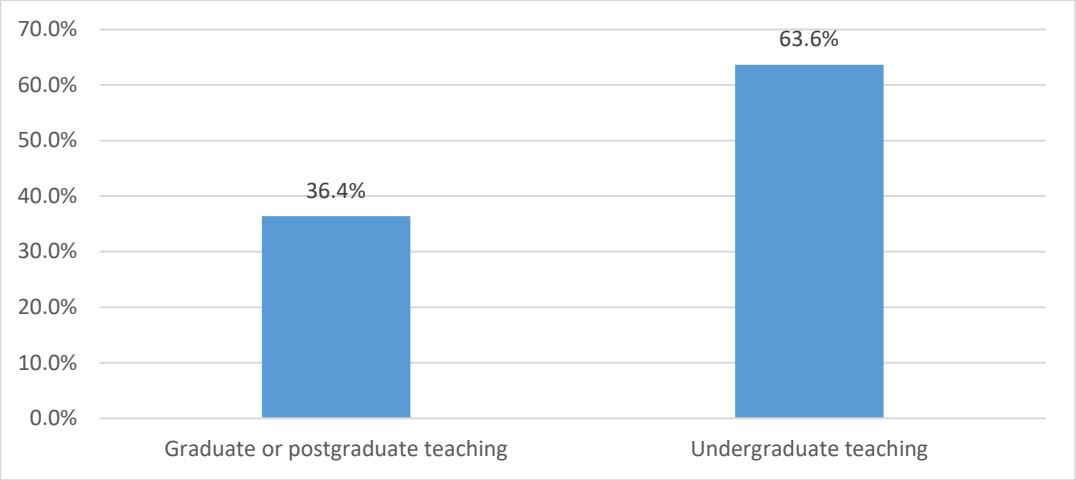

Figure 5: Teaching level.

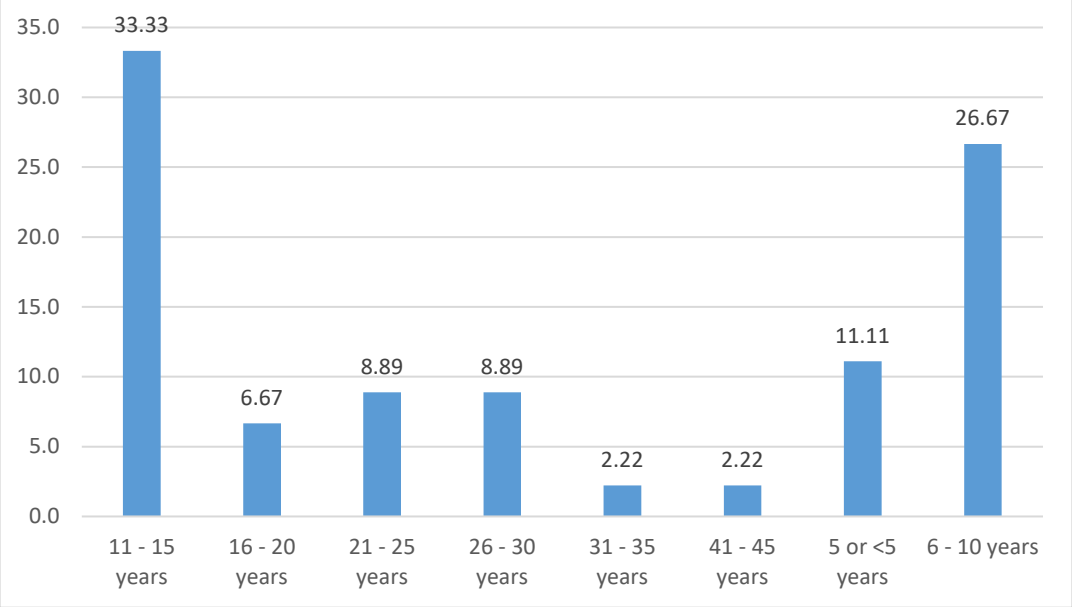

Figure 6: Years of teaching experience.

Faculties of Respondents

Just over half of the respondents (51.11%) were in social science disciplines, while fine and performing arts accounted for only 2.22%. Figure 7 illustrates the popularity and size of the various disciplines at UoK.

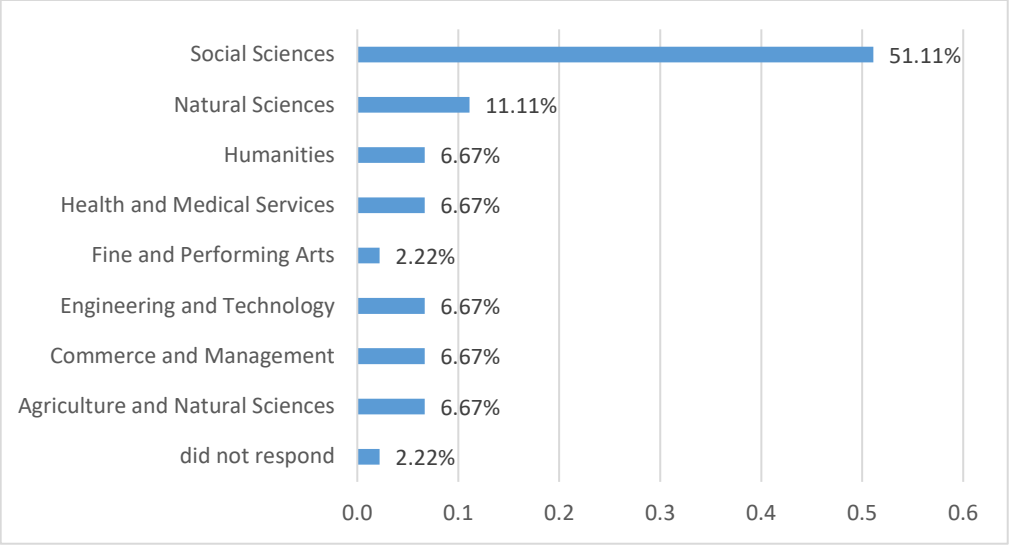

Figure 7. Faculty or discipline.

3.2 Access to and Use of ICT

Ownership of and Access to ICT

Smartphones were owned by 95.25% of the lecturers, and all faculty respondents owned or had access to a laptop. Desktop devices had the lowest ownership, at only 33.3% (Figure 8).

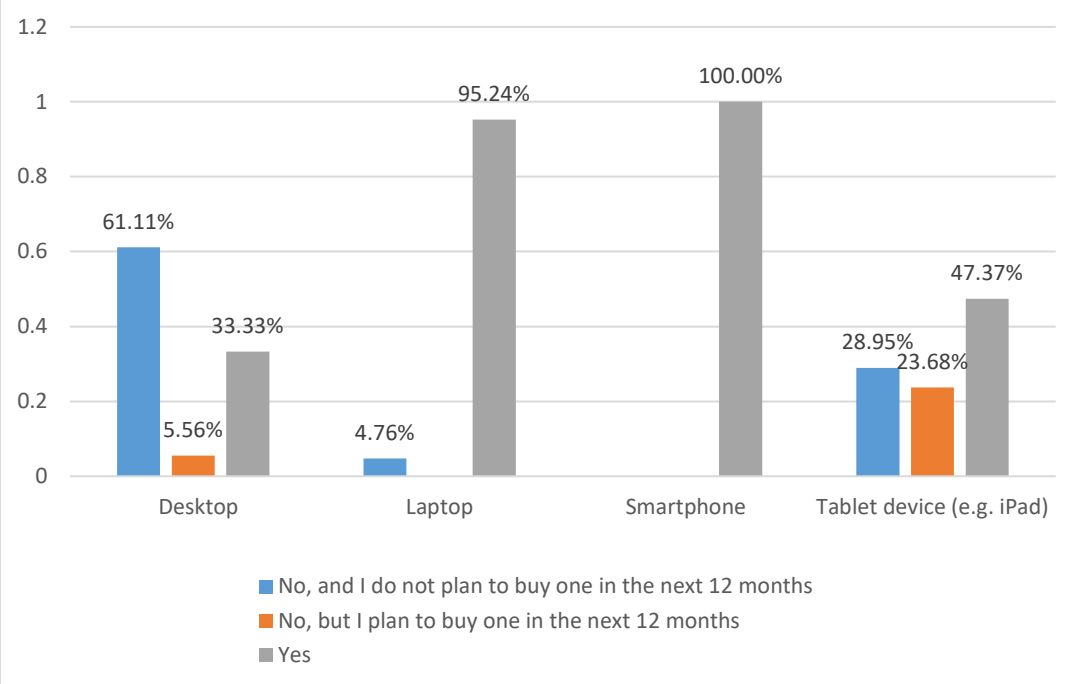

Figure 8: Ownership of devices.

Access to Devices

Lecturers were asked what devices they had access to; while 87.18% used their own smartphones and laptops, 57.50% instead or also used desktops provided by the university (Figure 9).

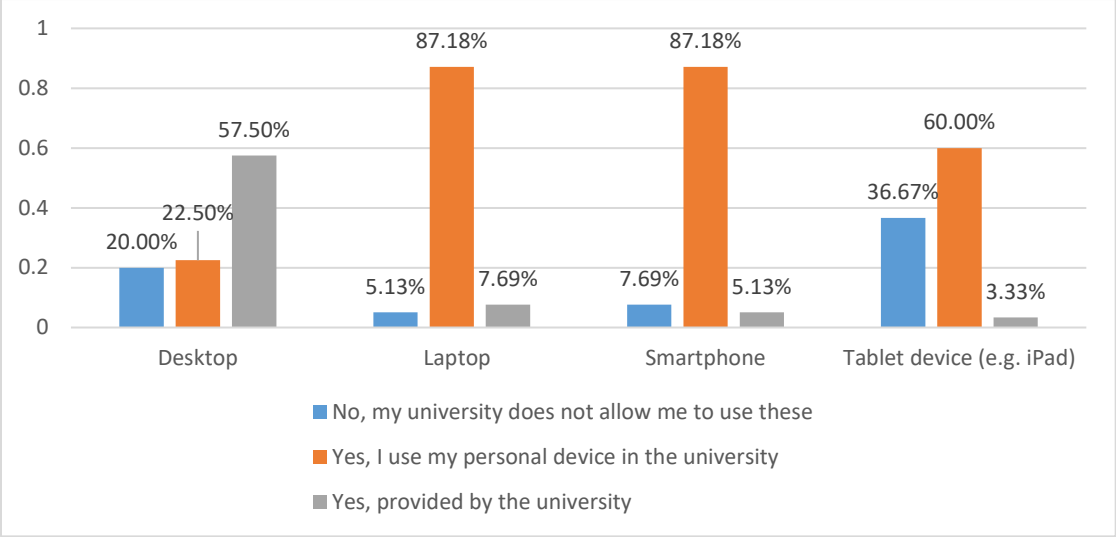

Figure 9: Lecturers' access to devices at UoK.

Internet Access Location

Lecturers were asked to indicate they access the Internet. The responses in Table 6 indicate that all lecturers accessed the Internet, most of them at their offices (86%) and homes (86%).

Table 6: Internet access location

Internet Access	No	Yes
Home	16%	84%
Office	14%	86%
Cybercafé	79%	21%
Do not access	100%	0%

Internet Access Type

Lecturers were asked what Internet access type they used. Responses are provided in Figure 10, showing that most lecturers employed mobile and wireless connections.

Devices Used for Accessing the Internet

Lecturers were asked to indicate the devices they used to access Internet. Responses are provided in Figure 11, showing that 61.90% used, 30.95% used laptops and 7.14% used tablets.

Broadband Internet Access

Almost all lecturers indicated having broadband Internet access, as shown in Figure 12.

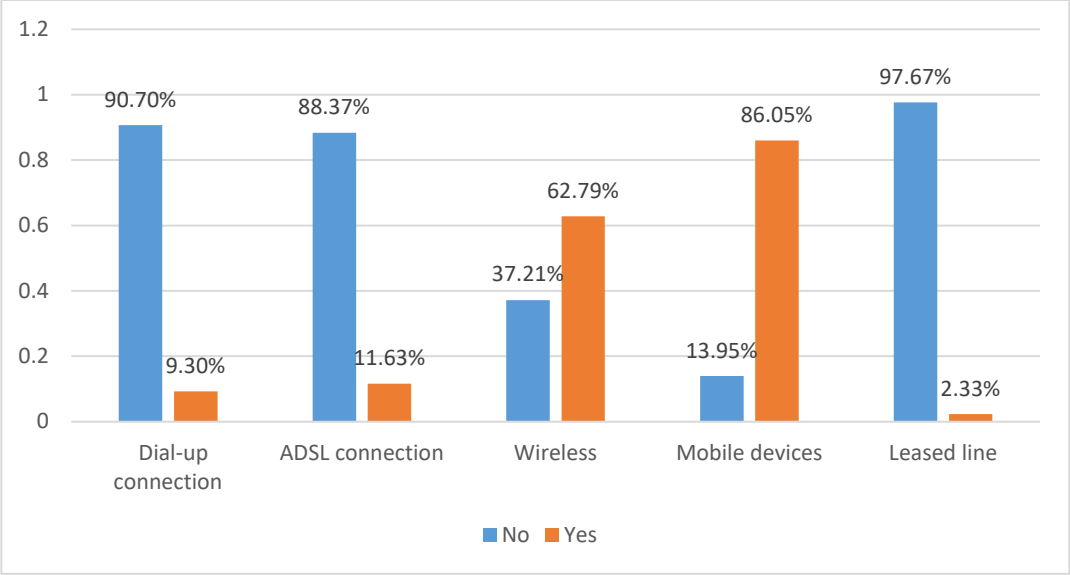

Figure 10: Internet access type.

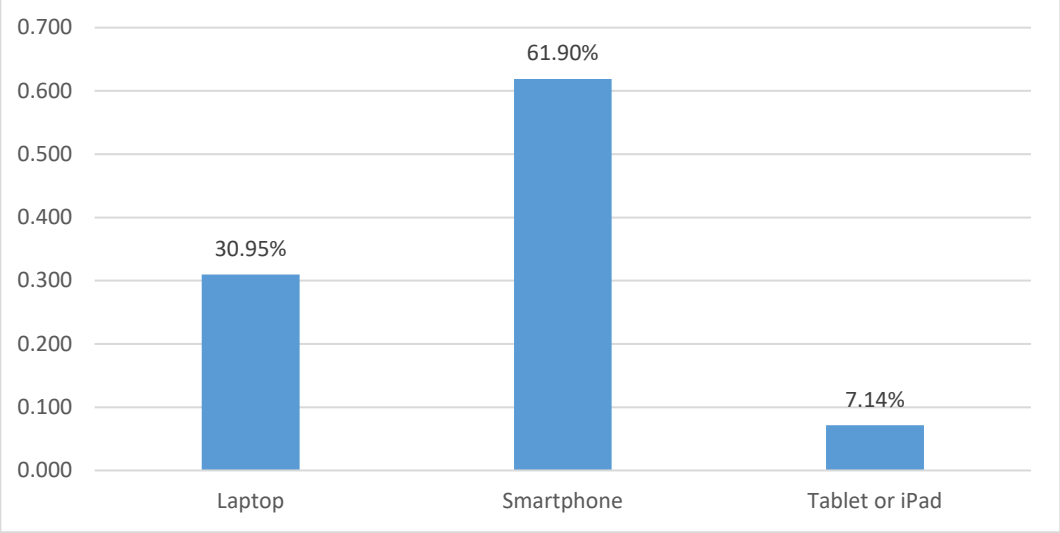

Figure 11: Devices used by instructors to access the Internet.

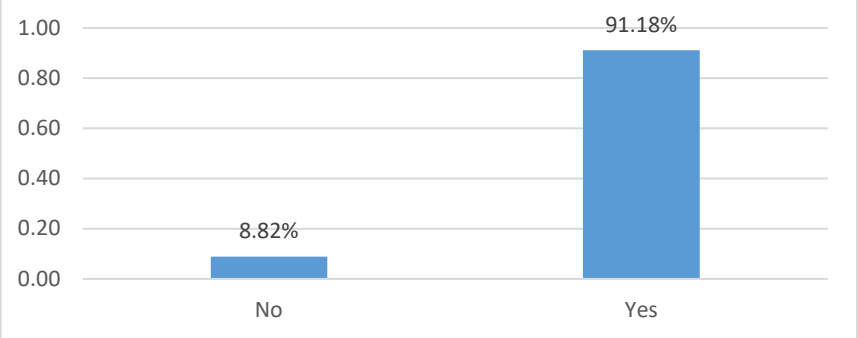

Figure 12: Broadband Internet access.

Internet Access Areas

Lecturers were asked where they access the Internet. Responses are provided in Figure 13, which indicates most accessed it in the faculty rooms (76.74%), followed by the library (37.21%), classrooms (25.58%) and open areas (20.93%). They rarely did so from laboratories or hostels.

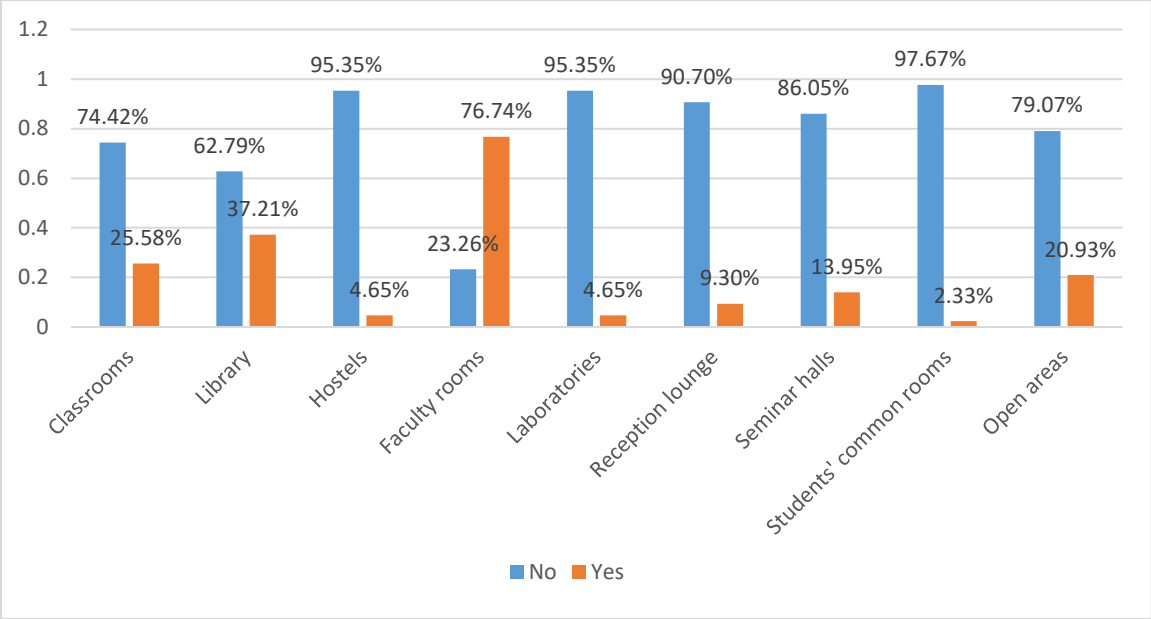

Figure 13: Location of accessing Internet.

Wi-Fi Internet Access

Lecturers were asked whether they have Wi-Fi access. Responses are summarised in Figure 14.

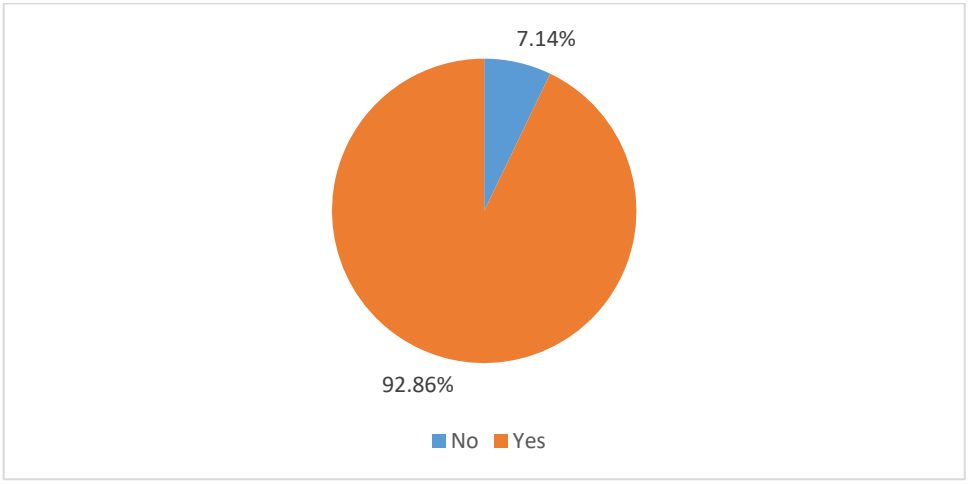

Figure 14: Wi-Fi Internet access.

The findings revealed that 92.86% had access to Wi-Fi Internet at the institution. This demonstrates a basic level of infrastructure available in readiness to use technology in teaching and learning.

Frequency of Internet Access

Lecturers were asked how often they accessed the Internet. Responses are provided in Figure 15, revealing that 86.05% used the Internet daily and only 4.65% irregularly.

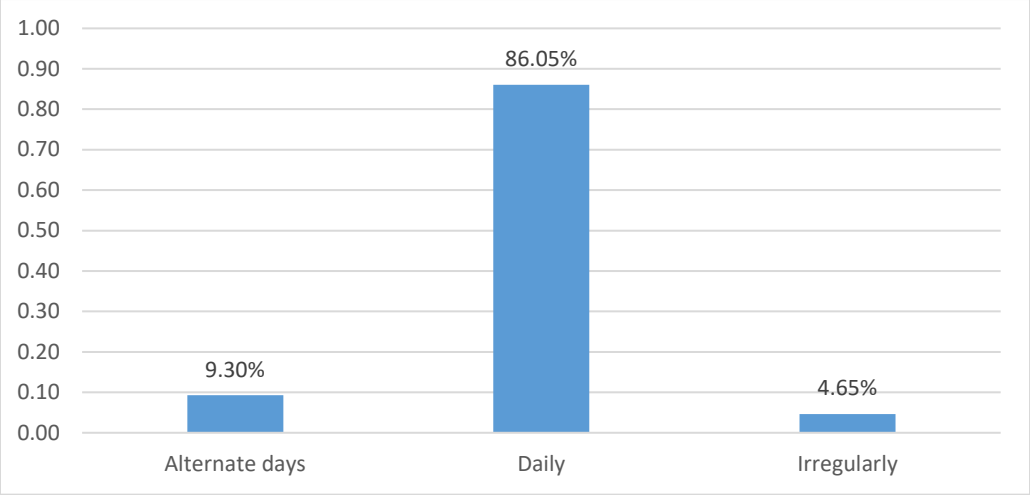

Figure 15: Frequency of Internet access.

Instructors' Comfort Level with Computer-Related Activities

Lecturers were asked to rate their level of comfort with engaging in various computer-related activities. Responses are given in Table 7.

Table 7: Comfort level with computer-related activities

	Non-user	Basic	Intermediate	Advanced	Expert	Mean	SD
Word processor (e.g., Word)	2%	6%	23%	46%	23%	3.81	.938
Spreadsheets (e.g., Excel)	4%	13%	38%	32%	13%	3.29	1.110
Presentation (e.g., PowerPoint)	0%	15%	29%	33%	23%	3.65	1.000
Email	0%	6%	27%	44%	23%	3.83	.859
Databases	8%	27%	35%	23%	6%	2.92	1.048
Multimedia authoring	11%	43%	28%	17%	2%	2.52	1.031
Graphic editing	35%	40%	15%	8%	2%	2.02	1.021
Digital audio	15%	56%	19%	6%	4%	2.29	.944
Video editing	48%	31%	13%	8%	0%	1.81	.960
Webpage design	67%	21%	10%	2%	0%	1.48	.772
Learning management system (e.g. Moodle)	8%	17%	58%	10%	6%	2.90	.928
Web 2.0 tools (wikis, blogs, social networking)	15%	38%	31%	13%	4%	2.54	1.031
Communications platform (e.g., MS Teams)	15%	29%	33%	17%	6%	2.71	1.110

Findings indicate that most of the lecturers were comfortable using word processing, PowerPoint and email. Comfort comes with the possession of basic skills in a given area. The numbers of skilled

instructors diminished and non-users increased in the areas of graphics, video and audio editing, and webpage design. Lecturers thus require further training in these skills to effectively use TEL.

Use of Social Media

Lecturers were asked to indicate their usage of social media platforms. Responses are provided in Figure 16, showing 91.67% owned a social media account and only 8.33% did not.

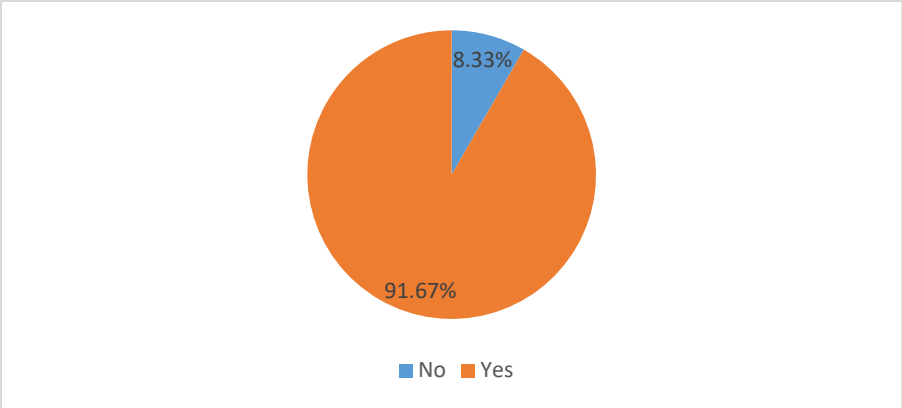

Figure 16: Social media account ownership.

Frequency of Using Social Media

Lecturers were asked how frequently they used social media. Responses are shown in Table 8. The two most popular social media platforms were Facebook (64.8%) and research-sharing sites (72.1%). Twitter came third at 44.2%.

Table 8: Lecturers' frequency of using social media

Social Media Platform	No		Yes		Total
Twitter	24	55.8%	19	44.2%	**43**
Blog (using Blogger or WordPress or within institutional website/CMS)	39	90.7%	4	9.3%	**43**
SlideShare or similar presentation platform	38	88.4%	5	11.6%	**43**
Photo sharing (Instagram/Flickr/Picasa Web, etc.)	38	88.4%	5	11.6%	**43**
Research-sharing site (Academic.edu, Researchgate.net, etc.)	12	27.9%	31	72.1%	**43**
Social bookmarking sites (Delicious, Scoop.it, Pinterest, etc.)	37	86.0%	6	14.0%	**43**
Goodreads.com (to connect with authors, readers) or similar	40	93.0%	3	7.0%	**43**

Updating Social Media

Lecturers were asked how frequently they updated social media. Figure 17 presents the results. Nearly two-thirds (65.85%) indicated they did not very frequently update their social media status, while only 2.44% updated daily. This shows lecturers had low activity on social media.

Mailing Lists and Discussion Forums

The survey captured lecturers' involvement in mailing lists and discussion forums. Responses (Figure 18) showed 60% of lecturers were members of a mailing list whereas 40% were not.

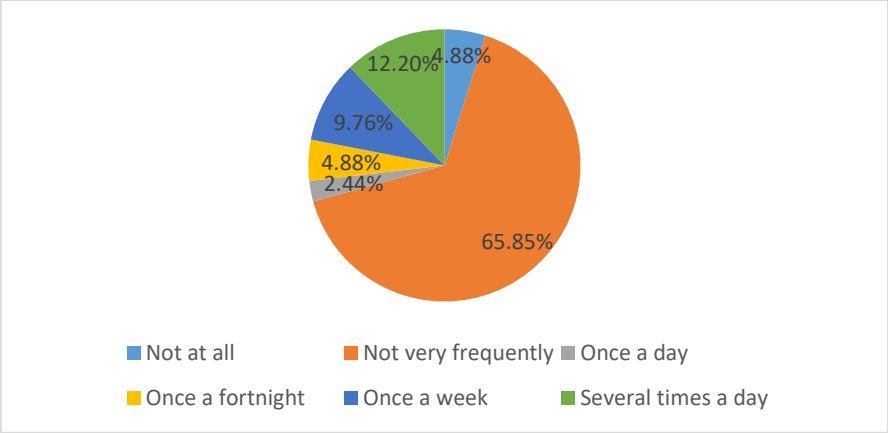

Figure 17: Frequency of updating social media.

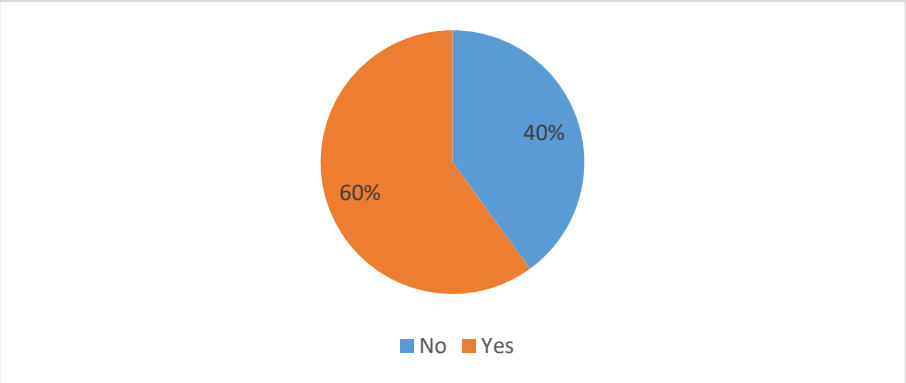

Figure 18: Instructors' membership in mailing lists.

Email-Based Discussion Forum Subscription

Lecturers were asked whether they subscribed to email-based discussion forums. Figure 19 indicates that 88% had one to five email-based discussion forums, while 12% had more than five.

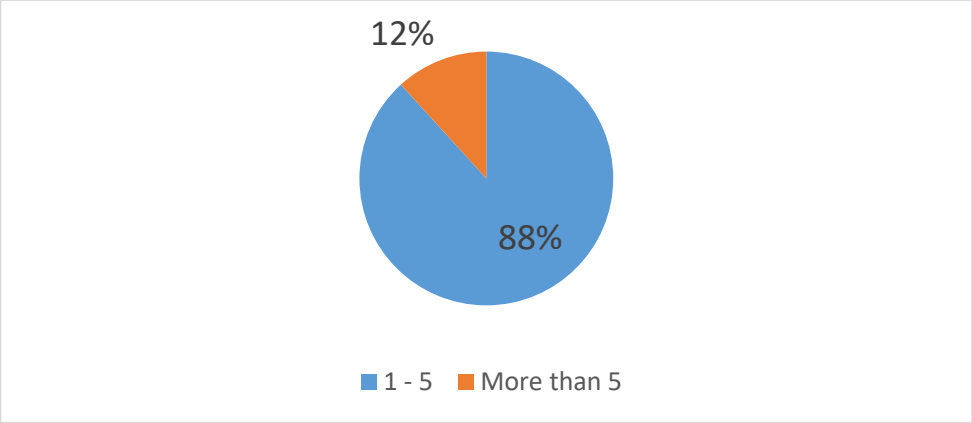

Figure 19: Email-based discussion forum subscription.

Frequency of Posting in Forums

Lecturers were asked how often they posted in forums. The responses provided in Figure 20 indicate that most UoK lecturers post in forums only infrequently.

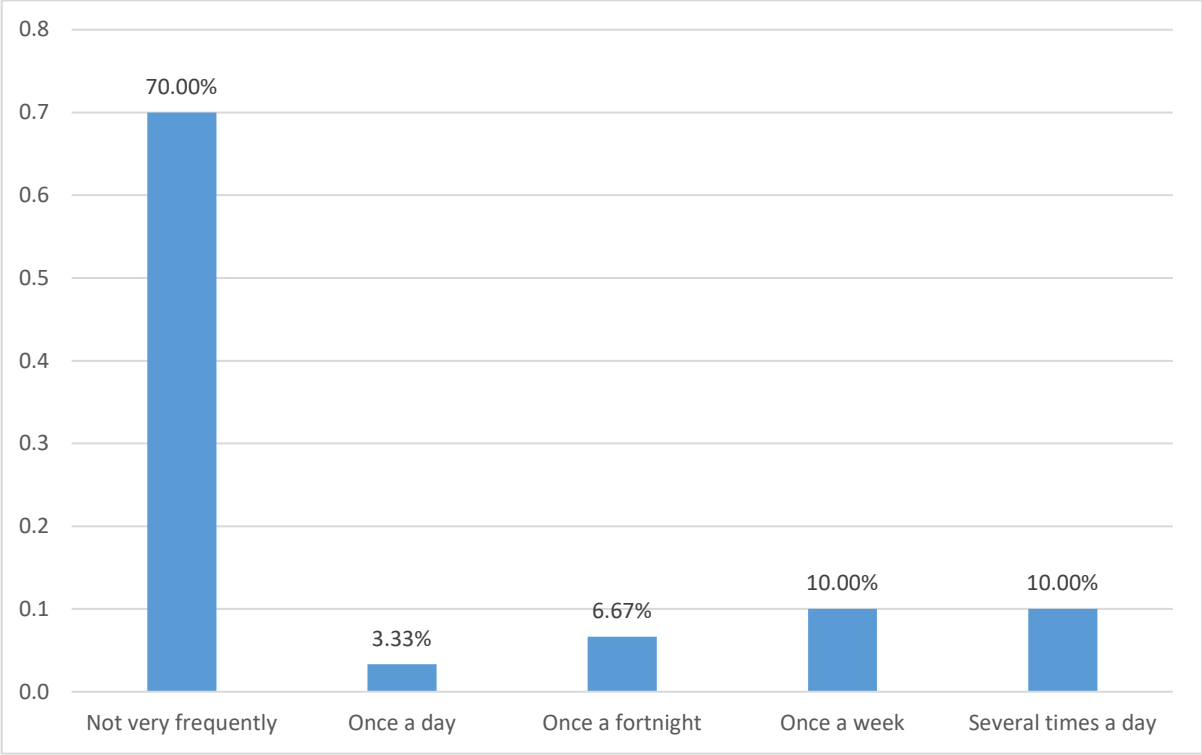

Figure 20: Frequency of posting in forums.

Experiences of ICT Resources, Services and Spaces

UoK lecturers were asked to evaluate their experiences with a range of resources, services and spaces at the university. Experiences were rated on a Likert scale where 0 = no response, 1 = poor, 2 = fair, 3 = neutral, 4 = good, 5 = excellent and 6 = not available. Results are given in Table 9.

For the most part, lecturers' experiences were below average (2.5 mean score), except for email services (institutional), the learning management system, network bandwidth/speed of Internet (download and upload) and Wi-Fi access, which have a weighted mean of more than 3.

These results indicate that to enhance the teachers' experiences of TEL, the ICT environment needs to be improved by (i) providing what is missing and (ii) training lecturers in the using various resources at UoK, such as developing and implementing e-portfolios, as well as employing various kinds of software and hardware for teaching and learning activities.

Table 9: Experience of ICT resources, services and spaces

	Not Available	Poor	Fair	Neutral	Good	Excellent	Mean
E-classroom facilities (e.g., computers, projection systems, lecture capture systems, SMART boards, etc.)	14.9%	17.0%	23.4%	8.5%	34.0%	2.1%	2.36
Computer labs (for practical and Internet access)	8.5%	17.0%	34.0%	12.8%	27.7%	0.0%	2.34
Email services (institutional)	0.0%	2.1%	14.9%	10.6%	57.4%	14.9%	3.68
Learning management system (e.g., Moodle, etc.)	0.0%	6.4%	23.4%	10.6%	55.3%	4.3%	3.28
E-portfolio	21.3%	10.6%	19.1%	27.7%	19.1%	2.1%	2.19
Network bandwidth/speed of Internet (download and upload)	2.1%	8.5%	27.7%	10.6%	48.9%	2.1%	3.02
Wi-Fi access	0.0%	2.1%	38.3%	10.6%	44.7%	4.3%	3.11
Online or virtual technologies (e.g., network or cloud-based file storage system, Web portals, etc.)	6.4%	17.0%	25.5%	23.4%	27.7%	0.0%	2.49
Access to software (e.g., MATLAB, GIS applications, statistical software, qualitative data analysis, graphics software, textual or image analysis programs, etc.)	12.8%	29.8%	25.5%	23.4%	6.4%	2.1%	1.87
Download and use of free and open-source software for teaching and learning	8.5%	17.0%	29.8%	14.9%	27.7%	2.1%	2.43
Support for maintenance and repair of ICT	10.6%	29.8%	25.5%	19.1%	14.9%	0.0%	1.98

3.3 Using ICT for Teaching and Learning

Delivering Classes

Lecturers were asked how they deliver classes at UoK. Their responses, summarised in Table 10, indicate most of the lecturers (82.1%) used blended modes of teaching, while 46.2% used the traditional face-to-face mode. None used a completely online mode of teaching.

Table 10: Class delivery types

How Classes Are Delivered	No	Yes
Traditional face-to-face mode	53.8%	46.2%
Completely online	100%	0.0%
Blended, where some components of the study are done online	17.9%	82.1%
Distance education	100%	0.0%

Types of Resources

Lecturers were asked to indicate how frequently they use a range of digital resources and platforms in their teaching. Frequency was rated on a Likert scale from 0 to 5, where 0 = no response, 1 = always, 2 = often, 3 = sometimes, 4 = rarely and 5 = never. Responses are shown in Table 11.

Table 11: Types of resources used by lecturers at UoK

	Never	Rarely	Sometimes	Often	Always	Mean
Images (pictures, photographs, including from the Web)	2%	16%	40%	30%	12%	2.98
Presentations (e.g., PowerPoint, including from online sources)	0%	12%	35%	33%	21%	3.25
Word files (activity sheets/handouts/notes)	0%	7%	33%	37%	23%	3.38
Digital films/video (e.g., YouTube)	14%	42%	23%	16%	5%	2.29
Audio recordings	21%	40%	33%	2%	5%	2.06
Simulations and 2D/3D animation, printing	51%	37%	9%	0%	2%	1.48
Learning management system	7%	33%	35%	16%	9%	2.58
Blogs	43%	43%	10%	2%	2%	1.56
Social bookmarking	41%	37%	10%	7%	5%	1.69
Microblogging (Twitter, Facebook, etc.)	35%	40%	12%	9%	5%	1.88
Open textbooks	14%	28%	30%	14%	14%	2.56
Open-access research papers	9%	12%	33%	35%	12%	2.94

Results indicate that UoK lecturers were using a range of digital resources and platforms. Their favoured resources were Word files, presentations (e.g., PowerPoint slides) and images. Notably, 51% had never used simulations and 2D or 3D animation or printing. This demonstrates that lecturers need greater capacity to use the platforms and resources available for implementing TEL.

Creating and Sharing Teaching Resources

Lecturers were asked what types of teaching and learning materials they had created and shared. Table 12 indicates they had created some forms of teaching material, such as PowerPoint slides, Word files and LMS files, but many had not shared them. The only two resources that most lecturers at UoK had both created and shared through an open licence were PowerPoint and Word files. Many lecturers had never created digital films and videos, audio recordings and simulations.

Table 12: Lecturers' creation and sharing of teaching and learning resources

	Never	Yes, and shared through an open licence	Yes, but not shared with others
Images (pictures, photographs, including from the Web)	59.0%	0.0%	41.0%
Presentations (e.g., PowerPoint, including from online sources)	15.8%	21.1%	63.2%
Word files (activity sheets/handouts/notes)	15.4%	28.2%	56.4%
Digital films/video (e.g., YouTube)	68.4%	2.6%	28.9%
Audio recordings	71.1%	2.6%	26.3%
Simulations and 2D/3D animation	94.7%	0.0%	5.3%
Learning management system	41.0%	15.4%	43.6%
Blogs	84.6%	5.1%	10.3%
Course packs	73.0%	2.7%	24.3%

Awareness of OER

When asked whether they were aware of OER, 64.1% were, while 35.9% were not (Figure 21).

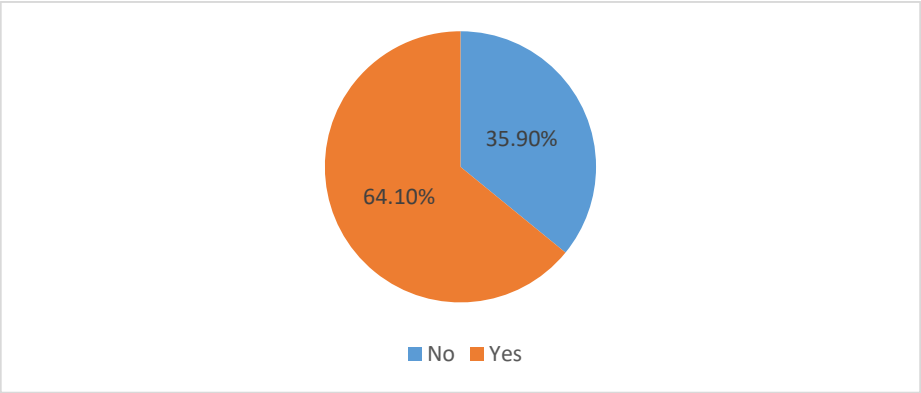

Figure 21: OER awareness.

Frequency of Using OER Platforms

Lecturers were asked to indicate how often they used OER platforms during teaching and learning, based on a Likert scale from 0 to 4, where 0 = no response, 1 = always, 2 = often, 3 = sometimes and 4 = rarely. Responses in Table 13 show that lecturers mainly said they "rarely" or "sometimes" use these resources. This suggests that overall, the capacity to integrate ICT for teaching and learning at UoK is low and therefore requires development through training and MOOCs.

Table 13: Frequency of using OER platforms

	Always	Often	Rarely	Sometimes
OER Commons	9%	9%	60%	23%
Saylor Academy	0%	0%	94%	6%
WikiEducator	9%	3%	74%	15%
OpenStax College	3%	3%	94%	0%
BCcampus Open Textbooks	3%	3%	91%	3%
NPTEL, India	0%	0%	94%	6%
MIT OpenCourseWare	0%	12%	79%	9%
OpenLearn, UK	3%	0%	76%	21%
CollegeOpenTextbooks	3%	0%	88%	9%
Directory of Open Access Journals	3%	24%	53%	21%
Directory of Open Access Books	6%	17%	63%	14%
MERLOT	0%	0%	88%	12%
COLCommons	3%	3%	85%	9%

Skills for Integrating Technologies

Lecturers were asked about their skills for integrating technologies in their teaching. As Table 14 shows, all the technologies received a mean score of below average (2.5) except the LMS (2.54). This indicates lecturers lack adequate skills to use these ICT tools, which notably include educational games and accessibility tools for people with disabilities. These deficits demonstrate the need for training to equip them with skills in these and other relevant technologies.

Table 14: Skills for integrating technologies

	I can't use it	I can use it to a small extent	I can use it satisfactorily	I can use it well	I can use it very well	Mean
LMS (e.g., Moodle)	7%	26%	43%	17%	7%	2.54
Online collaboration tools (e.g., Adobe Connect, Google Docs)	24%	29%	26%	14%	7%	2.21
E-portfolio	48%	29%	17%	2%	5%	1.65
E-books/e-textbooks	12%	21%	36%	17%	14%	2.63
Online video/audio	17%	26%	33%	14%	10%	2.40
Educational games/simulations	48%	26%	17%	7%	2%	1.67
Lecture capture tools	36%	33%	19%	10%	2%	1.83
Accessibility tools (for people with disabilities)	64%	17%	12%	5%	2%	1.44
Social media (blogs, wikis, etc.)	21%	33%	31%	10%	5%	2.13
Communications platform (e.g., MS Teams)	22%	29%	24%	15%	10%	2.23

Training and Staff Development

Lecturers were asked whether they had received training and staff development in using ICT for teaching and learning. Table 15 reveals that 51.9% said yes, while 25.9% said no. Lecturers were also asked to indicate how often they were trained. As shown in Table 16, 78.6% confirmed that UoK does not provide regular training on the use of new technologies for teaching and learning.

Table 15: Training on using ICT for teaching and learning

Responses	Frequency (N = 54)	Percent
No	14	25.9
Yes	28	51.9
Totals	**54**	**100**

Table 16: Frequency of training

Responses	Frequency (N = 42)	Percent
No	33	78.6
Yes	9	21.4
Total	**42**	**100**

Online Training Participation

Lecturers were asked whether they participated in online training. As shown in Table 17, 95.2% of the lecturers said they had, while only 3.7% indicated they had not.

Table 17: Online training participation

Responses	Frequency (N = 42)	Percent
No	2	4.8
Yes	40	95.2
Total	**42**	**100**

Attendance in MOOCs

When asked whether they had attended a MOOC, 61.9% had not, while 38.1% had (Table 18).

Table 18: Instructors' attendance in MOOCs

Responses	Frequency (N = 42)	Percent
No	26	61.9
Yes	16	38.1
Total	**42**	**100**

MOOCs at UoK

Lecturers were asked what MOOC platforms they were aware of. Responses are given in Table 19. Most of the lecturers had low awareness of the various MOOC platforms, with 48.8% indicating they were not aware of any among those listed. None knew of the iVersity platform, while only 2% were aware of Udacity. These findings demonstrate a need to expose UoK lecturers to online learning platforms such as MOOCs so they can develop their online teaching skills.

Table 19: MOOCs at UoK

Responses (N = 43)	No	Yes
Coursera	69.8%	30%
Udacity	97.7%	2%
EdX	93.0%	7%
iVersity	100.0%	0%
FutureLearn	79.1%	21%
MOOC4DEV	83.7%	16%
None	48.8%	51%

Policies for Technology-Enabled Learning

The survey assessed lecturers' knowledge of TEL-related policy issues. The results in Table 20 show that a significant number of lecturers possessed inadequate knowledge of most of the policy issues queried. This indicates the need to sensitise UoK lecturers on policies for TEL and related topics.

Table 20: Policies for TEL at UoK

	Do not know	No	Yes
Is there a policy for ICT use in teaching and learning in your university?	28%	15%	56%
Is there a strategy for TEL in your university?	31%	13%	56%
Is there an ICT policy in your university/institution covering what technologies to use and not use for teaching and learning?	38%	24%	38%
Is there a privacy and data protection policy in your university?	46%	13%	41%
Is there a policy on dealing with plagiarism in your university?	13%	0%	87%
Is there a policy for the use of open-source software in your university?	64%	0%	36%
Is there a system in place for the use of open-source software in your university?	69%	3%	28%
Is there a workflow and escalation procedure for the repair and maintenance of ICT in your university?	46%	18%	36%

3.4 Using ICT for Research and Scholarships

E-Resources Usage at UoK

Lecturers were asked whether the library provided access to subscription-based e-resources. Figure 22 shows that 97% indicated there was such access, while 2.7% indicated there was not.

Lecturers were also asked to indicate their usage of e-resources at UoK. Results are shown in Table 21. The resources they accessed most at UoK were e-books (with the highest mean of 3.17), e-theses (2.69) and e-journals (3.08). E-newspapers were rarely or never accessed.

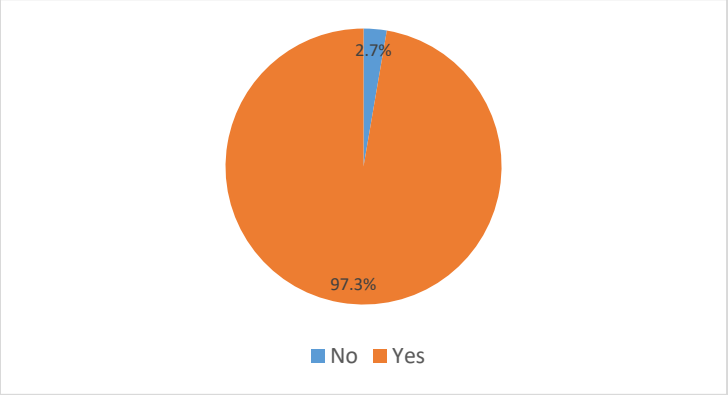

Figure 22: Access to subscription-based e-resources.

Table 21: E-resources regularly accessed

	Never	Rarely	Sometimes	Often	Always	Mean
E-journals	3%	5%	38%	30%	25%	3.08
E-books	3%	3%	35%	33%	28%	3.17
Citation databases	15%	13%	38%	23%	13%	2.54
E-newspapers	28%	23%	33%	3%	15%	2.13
E-theses and dissertations	13%	13%	30%	30%	15%	2.69
Patent databases	31%	49%	10%	3%	8%	1.69
E-proceedings of conferences	26%	46%	21%	3%	5%	1.75
Statistical databases	30%	38%	20%	5%	8%	1.85

Availability of Research Support

Lecturers were asked to indicate the types of research support available at UoK. The results (Table 22) show that the availability of plagiarism detection software was rated highly, with 19% selecting excellent, 42% good, 15% fair and only 2% poor. Funding for research publications received low ratings, with 4% choosing excellent, 19% fair, 4% good and 23% poor; 27% stated funding for research publications was not available. Hence, UoK needs to make these resources available and support lecturers in using them to harness their potential for TEL implementation.

Table 22: Availability of research support

	Poor	Fair	Neutral	Good	Excellent	Not available	Mean
Access to data storage	13%	15%	19%	29%	0%	25%	3.65
Data visualisation software	19%	13%	33%	6%	0%	29%	3.44
Citation/reference management software	6%	19%	29%	21%	4%	21%	3.60
Institutional repository for sharing research	6%	6%	13%	44%	10%	21%	4.08
Funds to support open-access publications	23%	19%	23%	4%	4%	27%	3.29

3.4 Perceptions About Using TEL

Attitudes

The study looked at UoK lecturers' attitudes towards the use of TEL. This was done by evaluating their responses to a variety of statements, using a Likert scale with responses coded as 0 = no response, 1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree and 5 = strongly disagree. The results are shown in Table 23.

Table 23: Instructors' attitudes towards the use of TEL at UoK

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Mean	SD
TEL can solve many of our educational problems.	0%	0%	3%	23%	75%	3.94	1.838
TEL will bring new opportunities for organising teaching and learning.	0%	0%	0%	23%	78%	3.98	1.839
TEL saves time and effort for both lecturers and students.	0%	0%	3%	35%	63%	3.83	1.802
TEL increases access to education and training.	0%	0%	3%	40%	58%	3.79	1.786
TEL increases my efficiency in teaching.	0%	0%	3%	30%	68%	3.88	1.817
TEL enables collaborative learning.	0%	0%	3%	23%	75%	3.94	1.838
TEL can engage learners more than other forms of learning.	0%	10%	18%	25%	48%	3.42	1.808
TEL increases the quality of teaching and learning because it integrates all forms of media: print, audio, video and animation.	0%	0%	5%	38%	58%	3.77	1.789
TEL increases the flexibility of teaching and learning.	0%	0%	3%	33%	65%	3.85	1.810
TEL improves communication between students and lecturers.	0%	5%	13%	30%	53%	3.58	1.808
TEL enhances the pedagogic value of a course.	0%	3%	3%	50%	45%	3.65	1.756
Universities should adopt more and more TEL for the benefit of their students.	0%	0%	0%	28%	72%	3.83	1.906

Mean scores above 3.00 for all the statements indicate that UoK lecturers have a positive attitude towards TEL. It is worth noting that only a few statements received the "disagree" response, and the percentage in each case was low. Given this positive attitude, UoK should deliberately adopt more TEL for the benefit of its learners and for better teaching and learning experiences.

Motivations for Using TEL at UoK

Instructors' motivations for using TEL were assessed by evaluating their responses to a variety of statements, using a Likert scale with responses coded as 0 = no response, 1 = very strong motivator, 2 = strong motivator, 3 = average motivator, 4 = weak motivator and 5 = very weak motivator. The results are shown in Table 24.

Table 24: Motivations for using TEL

	Very weak motivator	Weak motivator	Average motivator	Strong motivator	Very strong motivator	Mean	SD
Personal interest in using technology	0%	0%	5%	28%	68%	3.85	1.822
Intellectual challenge	0%	5%	5%	50%	40%	3.54	1.750
Self-gratification	3%	8%	3%	50%	38%	3.44	1.785
Training in TEL	0%	5%	5%	33%	56%	3.58	1.889
Better Internet bandwidth at workplace	8%	0%	28%	33%	33%	3.19	1.770
Credit towards promotion	13%	13%	25%	25%	25%	2.81	1.758
Professional incentives to use TEL	5%	15%	23%	28%	30%	3.02	1.756
Technical support	3%	10%	15%	38%	35%	3.27	1.771
Peer recognition, prestige and status	10%	20%	30%	28%	13%	2.60	1.594
Improved infrastructure (hardware and software) deployment	5%	8%	15%	38%	35%	3.25	1.792
Release time/reduction in existing workload	8%	8%	20%	28%	38%	3.17	1.826
To be a trend-setter by early adoption of technology in education	5%	8%	15%	38%	35%	3.25	1.792

For the most part, lecturers are moderately motivated. Critical examination of the means for the different factors reveals that personal interest (3.85), training (3.58), self-gratification (3.44) and intellectual challenge (3.54) were the main motivators. Others were technical support (3.27), the desire to be a trend-setter by early adoption (3.25), reduction in workload (3.17), better Internet bandwidth at the workplace (3.19) and improved infrastructure (3.25). Credit towards promotion (2.81) and peer recognition and status (2.60) were considered comparatively less significant, which is a positive indicator. Evidently, almost all of the listed factors play a role in motivating teachers at UoK to adopt TEL.

3.5 Barriers to Using TEL

Lecturers were asked to indicate barriers to the use of TEL. As Table 25 shows, the major barriers are concern about students' access to technology, with the highest mean of 3.38, and lack of training on the use of technology in teaching (3.33). Other barriers are a lack of technical support in the university (3.29), a lack of incentives to use TEL (3.06), a lack of instructional design support for TEL (3.15), inadequate availability of hardware and software (3.15) and poor Internet connectivity (3.04).

Table 25: Barriers to the use of TEL

	Very weak barrier	Weak barrier	Average barrier	Strong barrier	Very strong barrier	Mean	SD
Concern about faculty workload	10.0%	15.0%	32.5%	25.0%	17.5%	2.71	1.650
Concern about students' access to technology	2.5%	7.5%	15.0%	32.5%	42.5%	3.38	1.806
Lack of training on TEL	5.0%	7.5%	12.5%	32.5%	42.5%	3.33	1.837
Lack of technical support in the university	2.5%	12.5%	10.0%	37.5%	37.5%	3.29	1.798
Lack of institutional policy for TEL	7.5%	15.0%	22.5%	27.5%	27.5%	2.94	1.755
Lack of professional prestige	5.0%	30.0%	32.5%	17.5%	15.0%	2.56	1.556
Concern about the quality of e-courses	0.0%	27.5%	22.5%	30.0%	20.0%	2.85	1.637
Lack of incentives to use TEL	2.5%	17.5%	15.0%	40.0%	25.0%	3.06	1.719
Lack of credit towards promotion	5.0%	25.0%	15.0%	22.5%	32.5%	2.94	1.791
Intimidated by technology	27.5%	25.0%	12.5%	20.0%	15.0%	2.25	1.670
Concern about security issues on the Internet	15.0%	12.5%	25.0%	32.5%	15.0%	2.67	1.680
Inadequate availability of hardware and software	5.0%	17.5%	12.5%	25.0%	40.0%	3.15	1.845
Poor Internet access and networking in the university	2.5%	12.5%	27.5%	32.5%	25.0%	3.04	1.688
Lack of time to develop e-courses	15.0%	15.0%	22.5%	15.0%	32.5%	2.79	1.833
Lack of instructional design support for TEL	12.5%	2.5%	10.0%	45.0%	30.0%	3.15	1.833
No role models to follow	17.5%	7.5%	35.0%	22.5%	17.5%	2.63	1.684

3.6 Open-Ended Responses

In response to the survey's open-ended question, 37 of the 61 lecturers gave their feedback; representative excerpts are provided in Table 26. All 37 gave positive responses that demonstrated their intention to embrace and integrate TEL at UoK. Notably, 37 of the 61 lecturers involved in this study (60.6%) felt UoK needs a TEL policy.

Table 26: Selected excerpts from instructors' responses to open question

There is indeed an urgent need. It is high time my University responds to this urgent need. The 21st-century skills and the need to move away from teacher-centered methodology to active, interactive, competency-based learner-centered methodologies require the use of EdTech.
I agree very strongly that there is an urgent need to launch an elearning policy into our institution and sustain it there for long enough to enable it stand on its own.
Yes there is need to develop TEL policy and motivate staff through rewarding (monetary, promotion recognition, training) them when they develop modules.
Yes in order to raise the bar in effective teaching.
Developing Technology-enabled learning will set a stage for preparing a future generation that will be technology conversant and compliant. This will aid a move from paper use era (as it's currently) to a paperless generation in the near future.
Yes. Very important and should be put in place as soon as yesterday
There is serious need to develop TEL policy and strategy as this will be a beginning point. Most of university management decisions are guided by policies.
There is need to enhance the already existing technology-enabled learning policy at the University
Technology-enabled learning is of utmost importance in teaching and learning. This can be realised through implementation of clearly strategised policies.
Yes. Due to the many benefit, there is a great need.
Yes. This is necessary to drive the training needs of both learners and lecturers. There is need to develop and create awareness on content development compensation and data protection.
The University needs to have a TEL policy and strategy to provide standardised guidelines for quality content development and online teaching.
Should have already been done. Technology is the way to go in the 21st century classroom.
Yes, it will enable the institution to provide services to students who cannot physically avail themselves.
There is need to have a directorate of technology-enabled learning.

3.7 Summary

Responses from the lecturers indicate that:

1. Lecturers lack skills for integrating technology in their teaching. In its TEL policy, UoK should provide a well-structured skill development plan for lecturers.
2. Lecturers need training on the use of technology in teaching.
3. Lecturers are moderately motivated to use technology in teaching. Factors such as personal interest, training, self-gratification and intellectual challenge are their main motivators.
4. Lecturers cited these major barriers to using technology in teaching: lack of technical support at UoK; lack of training; concern about students' access to technology; and lack of training on using technology in teaching. Other barriers are: lack of incentives to use TEL; lack of instructional design support for TEL; inadequate availability of hardware and software; and poor Internet connectivity. These should be addressed in UoK's TEL policy.
5. Lecturers' attitude towards the use of technology in teaching is positive.
6. A majority knew little about MOOCs, which are very good for professional development. The TEL policy should recommend lecturers complete at least one MOOC per year.
7. More than half of the lecturers were not aware of the existing online learning policy.
8. A majority of the lecturers stated a TEL policy is needed.

Chapter 4: Learners' Use of Technologies for Learning

4.1 Learners' Demographic Profile

Gender and Age

Learners were asked their gender; 324 (51%) were female and 316 (49%) were male (Table 27).

Table 27: Genders of learners

Gender	N	Percent
Female	324	51%
Male	316	49%
Total	640	100.0

Learners were also asked to indicate their age. As presented in Figure 23, 20.74% were below 20 years, 76.96% were aged 21–25 and 2.15% were between 26 and 30.

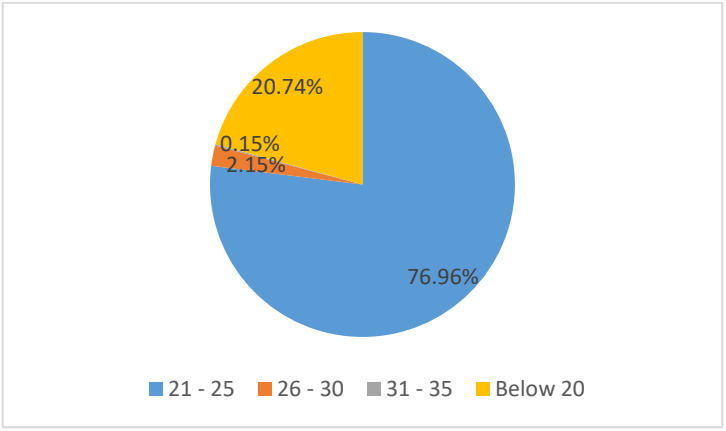

Figure 23: Age groups of learners.

Education Level and Year

The learners were asked their level of study at UoK. The responses summarised in Figure 24 show 99% were enrolled in undergraduate courses and 1% in graduate or postgraduate courses.

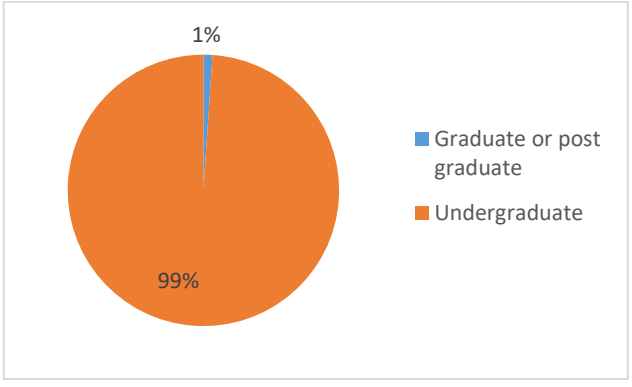

Figure 24: Level of study.

Learners were asked to indicate their year of study. As shown in Figure 25, the largest percentage (43.1%) was in year 3.

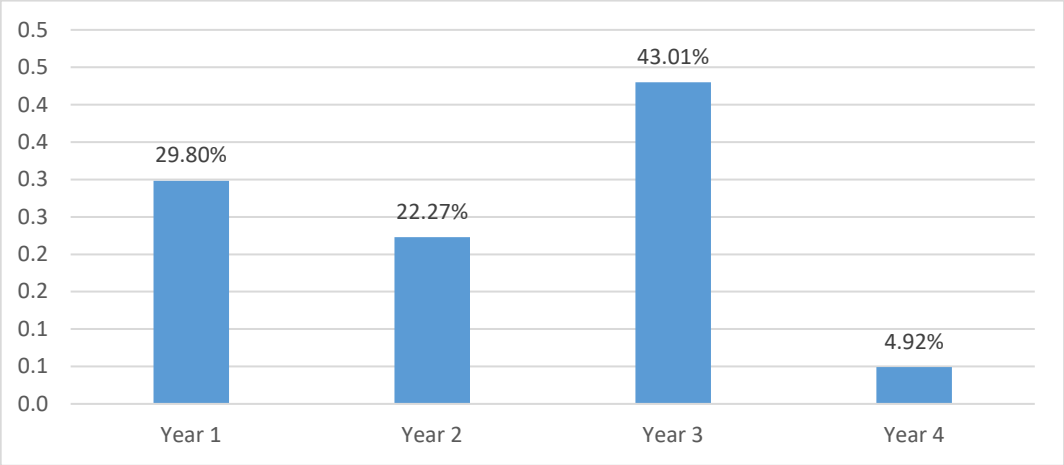

Figure 25: Year of study.

Faculty/School Discipline

The learners were asked to indicate their faculty/school. As depicted in Figure 26, the majority were in the social sciences, with the second-largest percentage in the humanities. The responses reflect the population of students at UoK; humanities and social sciences are in the School of Education, Arts and Social Sciences, which has the highest proportion of UoK's students.

Mode of Course Delivery at UoK

The learners were asked how their courses at UoK were delivered. Figure 27 shows the most common delivery mode was blended (79.91%), while traditional face-to-face teaching was used for 19.63% of the respondents' courses, and only 0.46% indicated they study completely online. These responses are in agreement with those given by UoK lecturers (see Table 10).

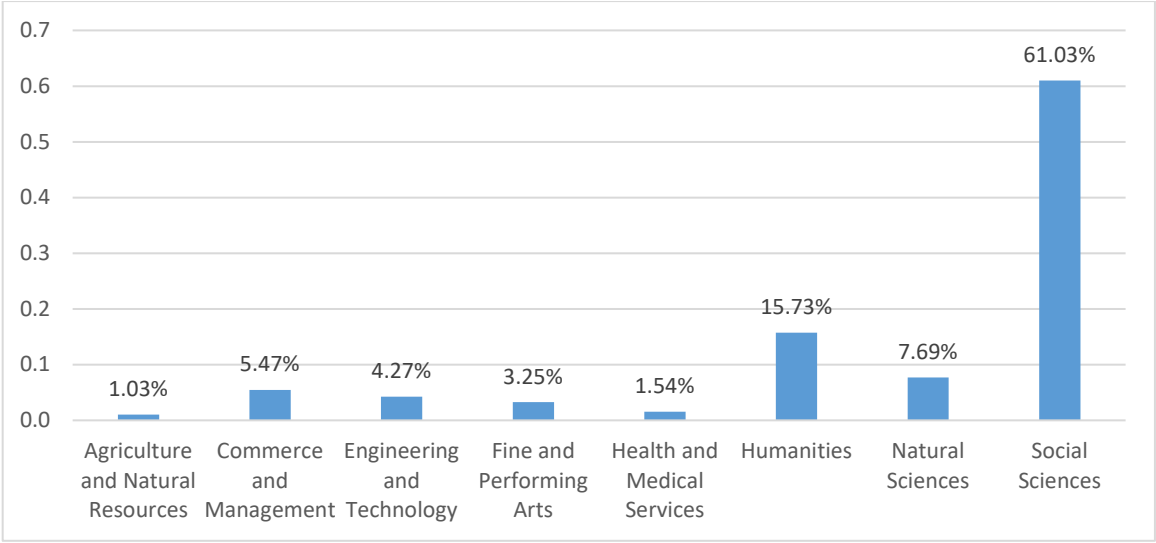

Figure 26: Faculty of study.

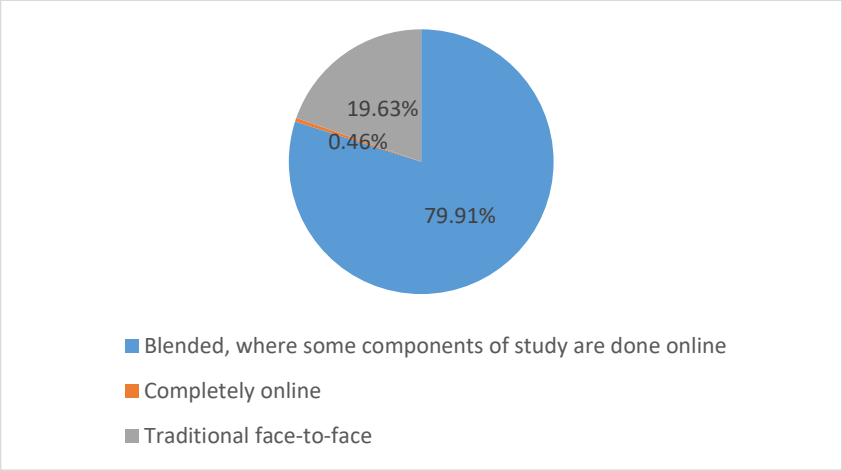

Figure 27: Mode of course delivery.

Disabilities that Require Adaptive Technology

Learners were asked whether they had learning and/or physical disabilities that would require adaptive technologies. Figure 28 shows 93% answered no, 1% had one or more learning disabilities requiring accessible or adaptive technologies, another 1% had one or more physical disabilities requiring such technologies, while 1% indicated having both learning and physical disabilities requiring such technologies; 4% preferred not to answer. Notably, UoK lecturers indicated they lacked skills to assist learners with disabilities needing adaptive technologies (see Table 14). Hence, lecturers require appropriate training in working with these learners and in using accessible and adaptive technologies for teaching and learning.

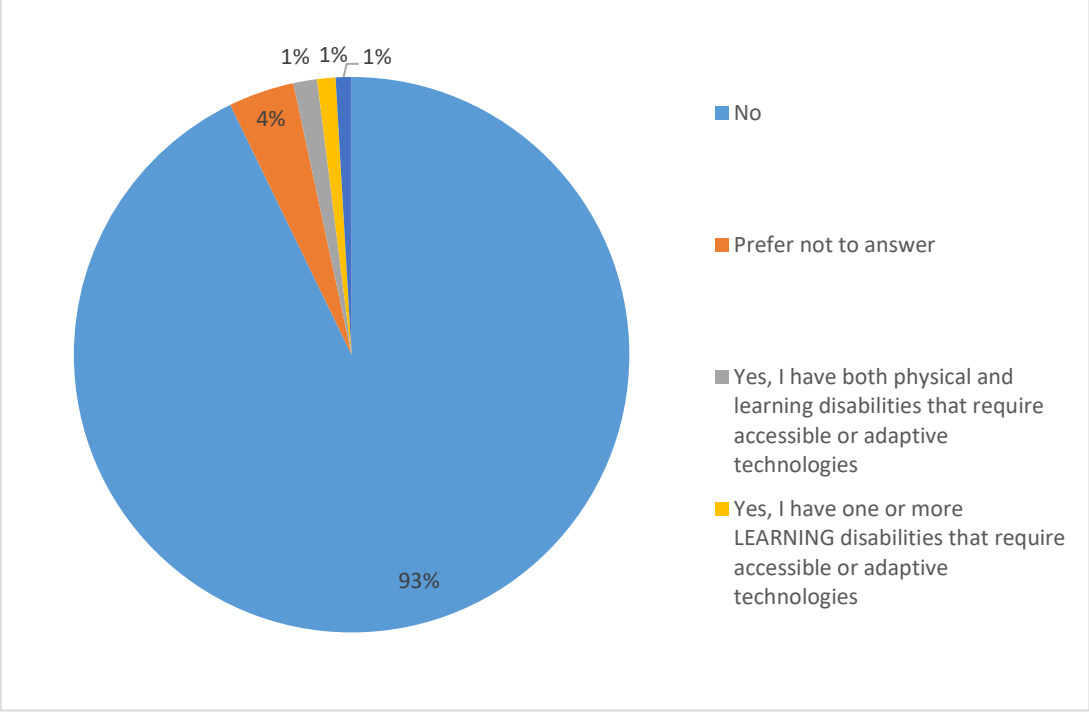

Figure 28: Physical and learning disabilities.

4.2 Learners' Access to Devices and Technology

Ownership of Devices

The learners were asked about their ownership of digital devices (desktops, laptops, smartphones and tablets). The results shown in Figure 29 revealed that 98.11% owned a smartphone, with 0.95% indicating they planned to buy one within the next 12 months and the remaining 0.95% saying they had no plans to do so. Only 27.09% owned a laptop, but 49.49% were planning to buy one within the next 12 months. A smaller portion (9.53%) owned a desktop, but 38.35% were planning on buying one in the next 12 months, and while only 3.28% owned a tablet device, 32.70% planned to purchase one in the next 12 months. These are significant findings, since TEL implementation requires that learners have a digital device.

Access to Devices at UoK

The responses regarding device access on the university's premises are presented in Figure 30, showing that 53.91% of students had desktop access provided by UoK. A further 54.70%, 90.50% and 54.70% indicated they used their own laptops, smartphones and tablets, respectively, while 26.0%, 20.73%, 5.35% and 41.17% indicated they are not allowed to use desktops, laptops, smartphones and tablets, respectively, on the campus.

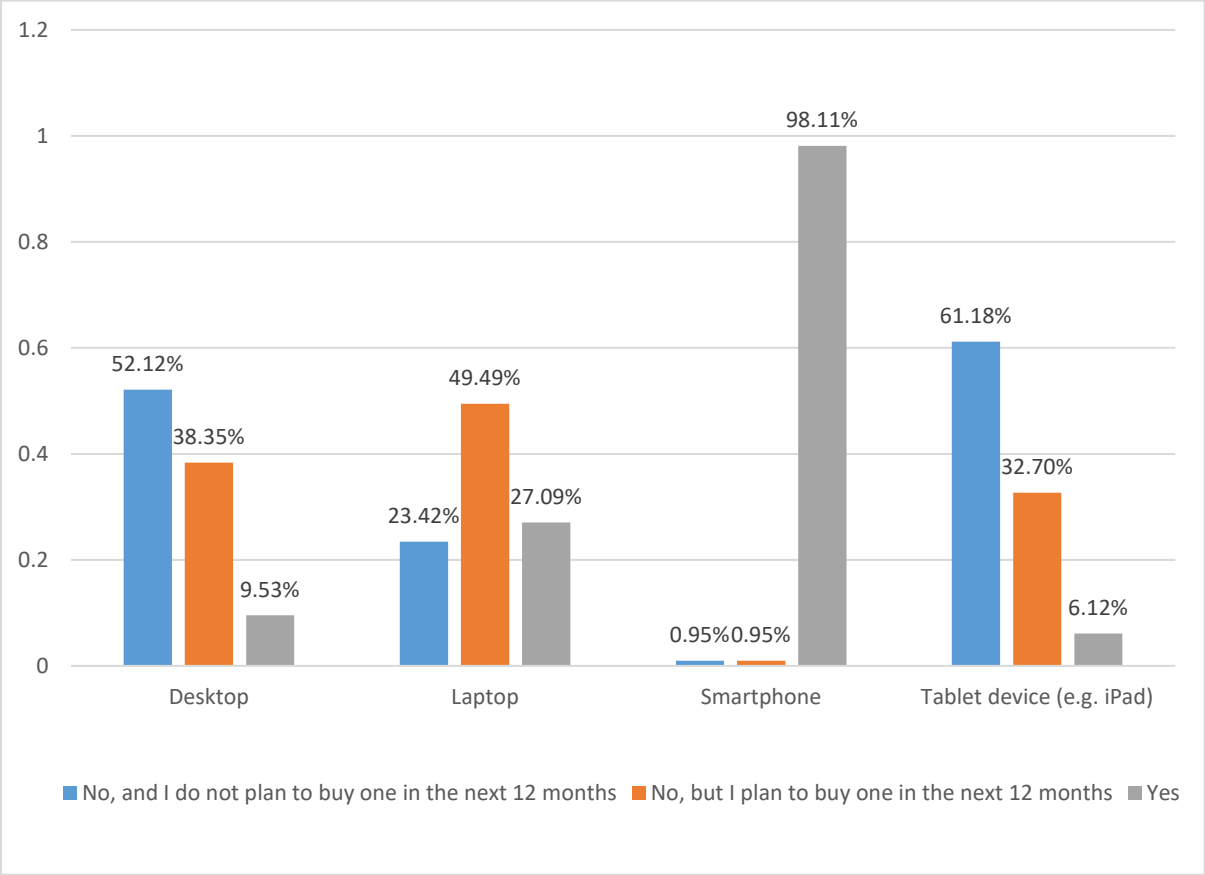

Figure 29: Learners' ownership of devices.

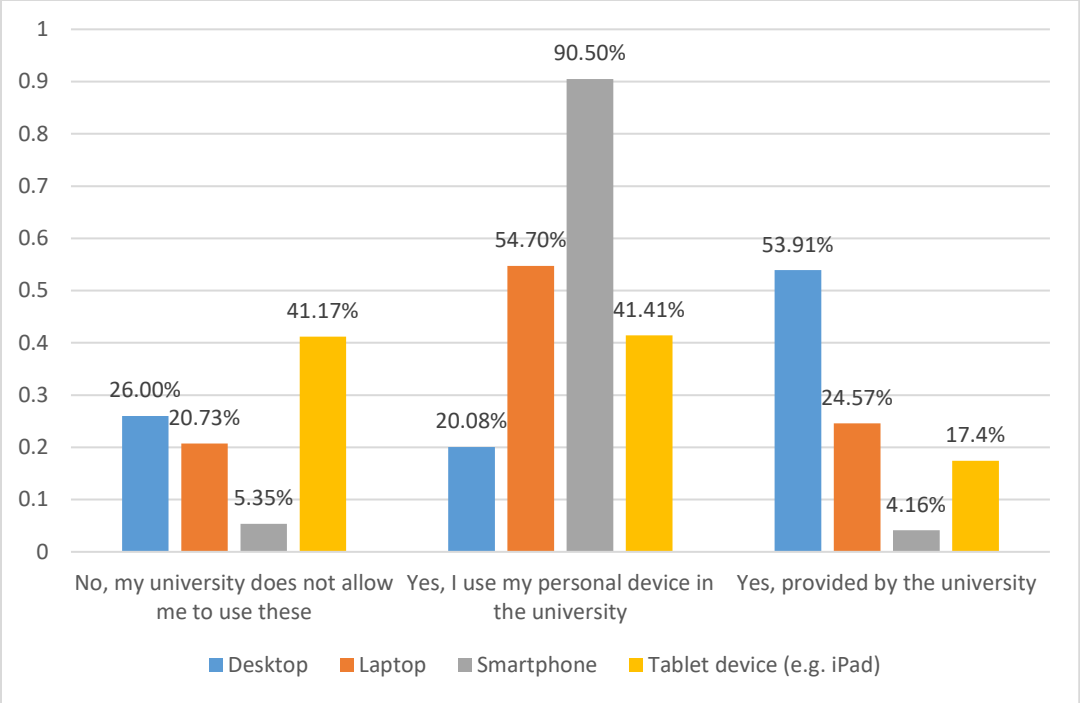

Figure 30: Access to devices at UoK.

4.3 Internet Access

Places to Access the Internet

Asked where they accessed the Internet (Figure 31), 81.90% of the learners indicated school (on campus), 32.80% had Internet access at home, 7.89% used cybercafés, and 1.43% had no access.

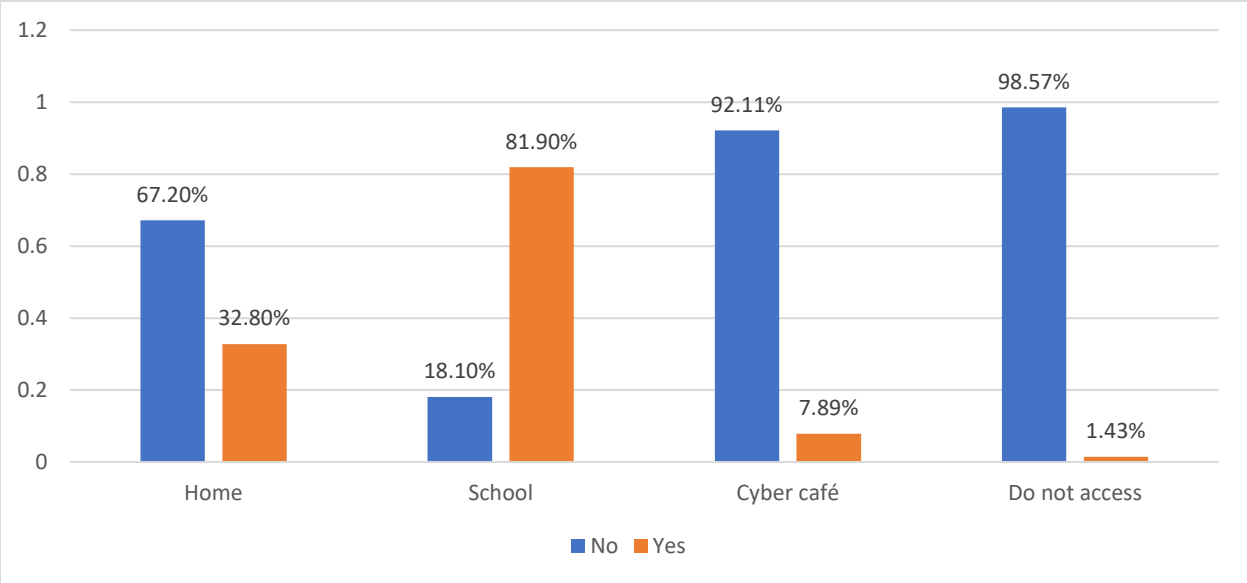

Figure 31: Where learners accessed the Internet.

Mediums Used to Access the Internet

Figure 32 presents learners' responses when asked what mediums they used to access the Internet. The most common was mobile devices, at 62.01%, followed by Wi-Fi, with 47.31%. Dial-up connection, ADSL connection and a leased line were used by 6.27%, 2.87% and 1.08%, respectively.

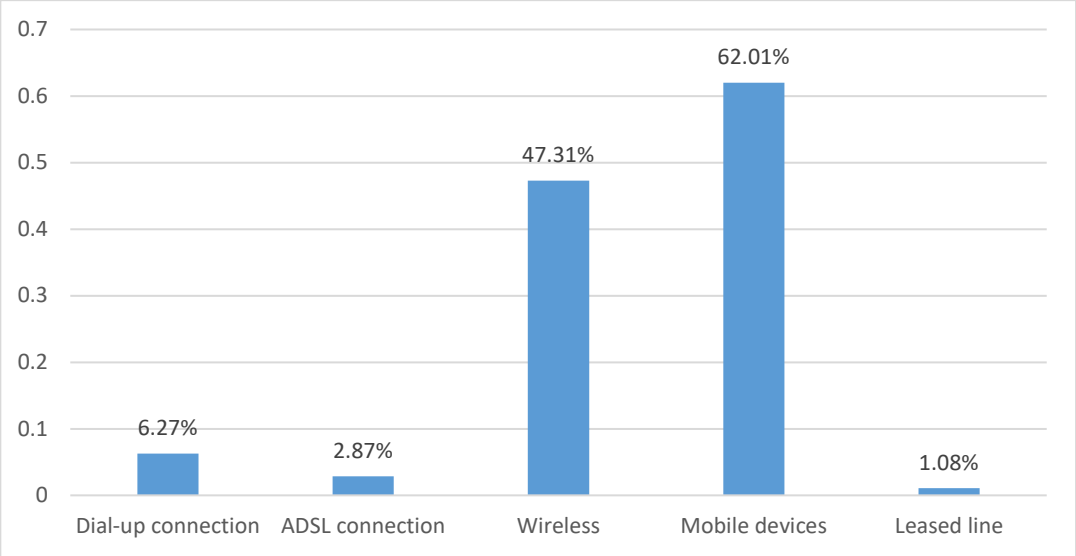

Figure 32: Mediums used to access the Internet.

Devices Used Frequently to Access the Internet

Learners were asked what devices they used frequently to access broadband Internet connectivity. The graph in Figure 33 shows that learners overwhelmingly used smartphones (97%). Only 2% used laptops, while close to 0% used desktops or tablets.

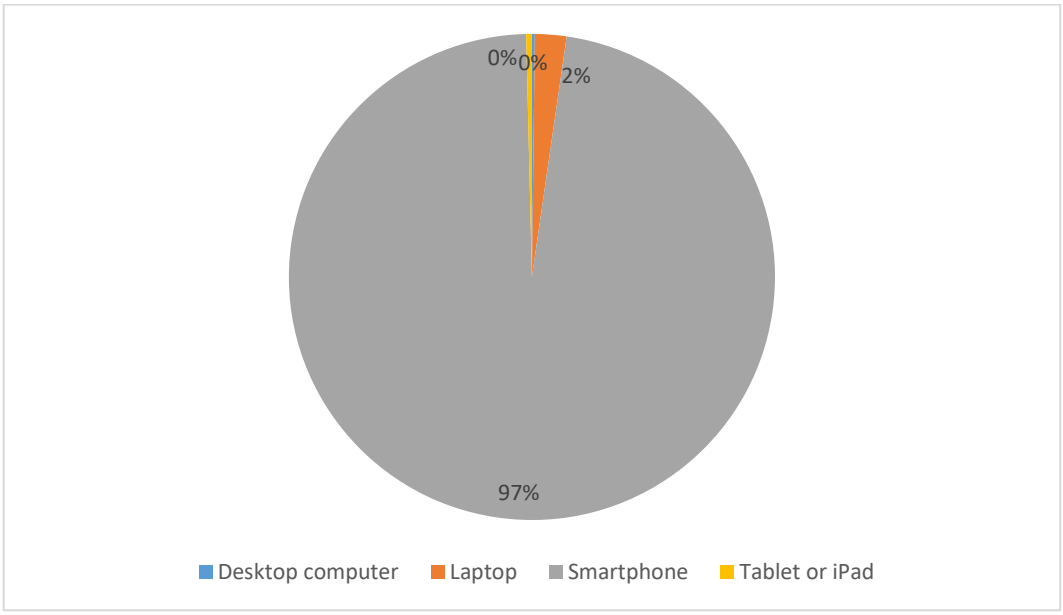

Figure 33: Devices learners used to access the Internet.

Broadband Internet Connectivity

Learners were asked where they accessed broadband Internet connectivity. The graph in Figure shows that 34.77% indicated at school (on campus), 21% at home and 4% at a cybercafé, while 4% had no broadband access. This implies that the respondents with no broadband access at home could benefit from access while at UoK.

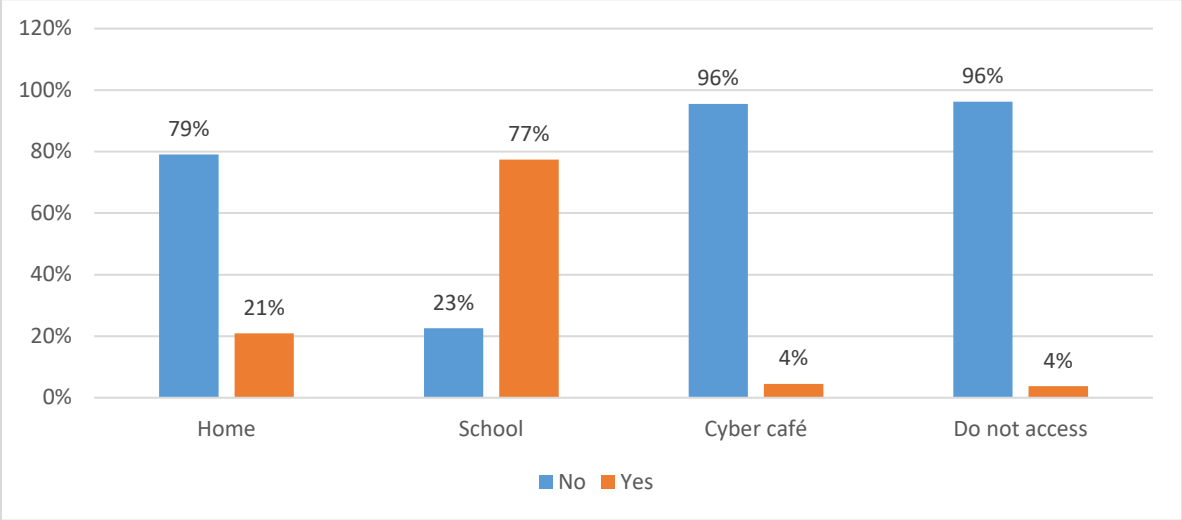

Figure 34: Places learners used for broadband Internet connectivity.

Access to a Broadband Connection at UoK

Learners were asked to indicate places they accessed a broadband Internet connection at UoK. As shown in Table 28, 32% used classrooms, 62% the library, 11% laboratories, 7% the hostel, 4% seminar halls, 9% faculty rooms, 3% the reception lounge, 27% open areas and 12% the students' common rooms. However, Internet throughput was not measured to ascertain the actual rate at which data travels on the network. A high percentage of students indicated not having access to broadband connections in most of the places listed.

Table 28: Students' access to a broadband connection

Areas with Broadband Internet	No	Yes
Classrooms	68%	32%
Library	38%	62%
Hostels	93%	7%
Faculty rooms	91%	9%
Laboratories	89%	11%
Reception lounge	97%	3%
Seminar halls	96%	4%
Students' common rooms	88%	12%
Open areas	73%	27%

Wi-Fi/Wireless Internet Connectivity at UoK

Learners were asked whether they had access to Wi-Fi connectivity at UoK. The graph in Figure 35 shows that 98% responded yes, while only 2.0% indicated having none.

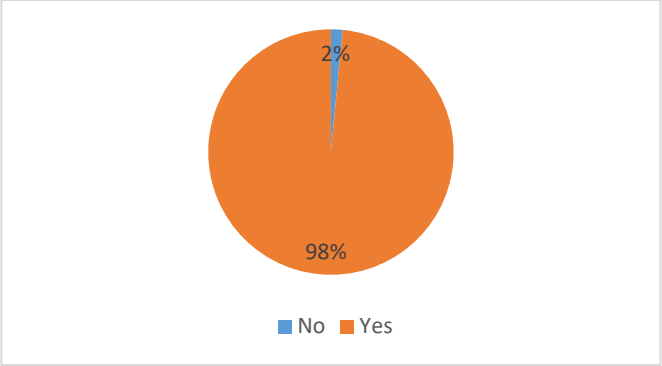

Figure 35: Students' Wi-Fi connectivity at UoK.

Internet Usage Frequency

Learners were asked how frequently they used the Internet. Figure 36 shows 51% indicated using it daily, 23% on alternate days, 16% irregularly, 8% rarely and 1% once a week; no one chose "never."

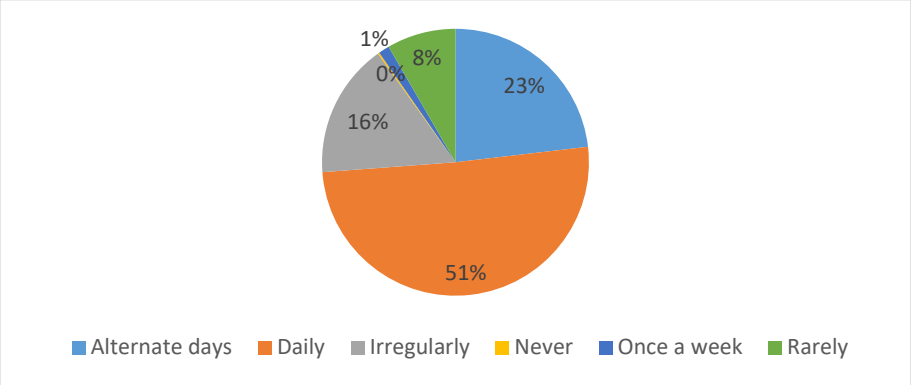

Figure 36: Students' Internet usage frequency.

Time Spent on Internet-Related Activities

When asked how much time they spent on the Internet each day (Figure 37), 11% indicated more than five hours, 28% spent one to two, while 28% spent three to five.

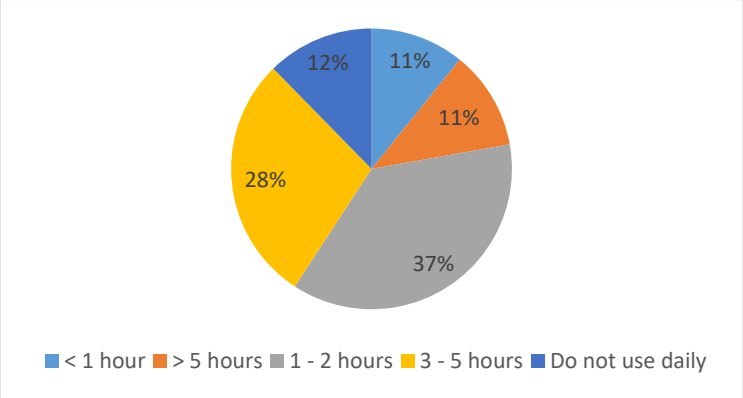

Figure 37: Time students spent on Internet-related activities.

Computer Proficiency and ICT Skills

Learners' competency in using a range of computer skills was evaluated with Likert scale items ranging from 0 to 4, where 0 = can't use it, 1 = can use to a small extent, 2 = use satisfactorily, 3 = use well and 4 = use very well. The results of the responses are shown in Table 29.

Table 29: Competency levels in ICT skills

	I can't use it	I can use it to a small extent	I can use it satisfactorily	I can use it well	I can use it very well	Mean	SD
Word processor (e.g., MS Word)	10%	31%	19%	20%	20%	1.83	1.819
Spreadsheets (e.g., MS Excel)	17%	36%	12%	22%	13%	1.63	1.708
Presentation (e.g., MS PowerPoint)	16%	30%	15%	22%	16%	1.71	1.767
Email	7%	18%	18%	29%	28%	2.08	1.995
Databases	19%	33%	14%	22%	12%	1.61	1.691
Multimedia authoring	27%	34%	15%	18%	6%	1.42	1.527
Graphic editing	26%	35%	13%	16%	9%	1.43	1.555
Digital audio	21%	34%	15%	19%	11%	1.54	1.642
Video editing	24%	35%	12%	17%	11%	1.49	1.615
Webpage design	38%	33%	13%	11%	6%	1.25	1.407
Learning management system (e.g., Moodle)	27%	31%	14%	17%	11%	1.48	1.623
Web 2.0 tools (wikis, blogs, social networking)	34%	32%	12%	15%	6%	1.33	1.478
Search engine	29%	26%	13%	18%	15%	1.54	1.698
Communications platform (e.g., MS Teams)	23%	31%	15%	18%	13%	1.56	1.677

Mean scores for all the skills were below the 2.0 mean score. Less than 20% of the learners indicated having various digital skills to a satisfactory level. This indicates a lack of digital skills and thus a need to build learners' capacity through training to improve the effectiveness of TEL implementation. These findings are in agreement with those of Kamonjo and Ngatia (2022), as UoK learners in their study indicated needing training on using online learning.

Less than 20% of the learners indicated being able to engage satisfactorily in digital presentations, word processing, spreadsheets, databases, multimedia authoring, digital audio, webpage design, a

learning management system, Web 2.0 tools, communication platforms, emails and search engines. More than 20% indicated having little ability to use any of the listed tools apart from email. Over 20% of the learners indicated their skill levels as "can use it very well" only for word processing and email. This implies that learners need more training in ICT skills to have better experiences in TEL. These finding are, again, in agreement with those of Kamonjo and Ngatia (2022).

Social Media

Learners were asked various questions about social media. The responses summarised in Table 30 show that 94% had social media accounts, while only 6% did not. This high ownership indicates great interest in online matters, which is positive for TEL implementation.

Table 30: Social media account ownership

Social media account ownership	Frequency	Percent
No	31	6%
Yes	471	94%

Popularity of Social Media

Learners were asked to indicate the social media tools they normally use. Table 31 shows that the most popular social media with UoK learners is WhatsApp, at 55.2%, then Facebook (39.0%), TikTok (23.5%) and Twitter (23.2%). The survey also noted that 11.9% of the respondents used photo-sharing platforms and 9.0% used research-sharing sites. Given these findings, social media could be used as a learning tool in TEL at UoK.

Table 31: Popularity of social media

Platform	Cases
Facebook	39.0%
Twitter	23.2%
WhatsApp	55.2%
TikTok	23.5%
Blog (using Blogger or WordPress or within institutional website/CMs)	2.1%
SlideShare or similar presentation platform	4.1%
Photo sharing (Instagram/Flickr/Picasa Web, etc.)	11.9%
Research-sharing site (Academic.edu, Researchgate.net, etc.)	9.0%
Social bookmarking sites (Delicious, Scoop.it, Pinterest, etc.)	4.5%
Goodreads.com (for connecting with authors and readers) or similar	3.8%

Social Media Status Update Frequency

Learners were asked how frequently they updated their social media status. Table 32 shows 20.3% updated their social media account several times a day, while 46.9% chose "not very frequently."

Table 32: Frequency of updating social media

Frequency	N	Percent
Not at all	4	0.8%
Not very frequently	238	46.9%
Once a day	99	19.5%
Once a fortnight	16	3.2%
Once a week	47	9.3%
Several times a day	103	20.3%

Time Spent on Social Media

When asked how many hours they spent on social media in a given day (Table 33), 40.2% of the students indicated one to two hours, while 26% said three to five hours. Only 6.7% indicated not using social media daily. This is a positive result when it comes to TEL implementation, which may require the frequent use of social media.

Table 33: Time spent on social media daily

Average Time on Social Media Daily	N	Percent
<1 hour	63	12.4%
>5 hours	73	14.4%
1–2 hours	204	40.2%
3–5 hours	133	26.2%
Do not use daily	34	6.7%
Total	**507**	**100.0 %**

Mailing List and Online Discussion Forums

Learners were asked whether they had memberships in mailing lists or discussion forums. As Table 34 shows, 57.5% indicated no, whereas 42.5% said yes.

Table 34: Students' membership of mailing lists

Membership in Mailing List or Discussion Forum	Frequency	Percent
No	276	57.5%
Yes	204	42.5%
Total	**480**	**100.0%**

4.4 The TEL Environment

Resources, Services and Spaces for Learners

In this section of the survey, learners evaluated their experiences with a range of resources, services and spaces at UoK, rating them on a Likert scale where 0 = no response, 1 = poor, 2 = fair, 3 = neutral, 4 = good, 5 = excellent and 6 = not available. Table 35 (next page) presents the results.

Responses to all the listed items had mean scores of less than 2.00, far below the average mean of 2.5. This indicates poor experiences. The finding could be attributed to learners' lack of awareness of what is available at the university. UoK should deliberately inform or educate its learners on the resources available to them in the institution. In addition, UoK should deliberately incorporate the use of these critical resources in all departments in an effort to support learning that will facilitate TEL implementation.

Students' Experience with Massive Open Online Courses

Learners were asked to indicate their experience with MOOC (Table 36). Asked whether, in the past year, they had taken a MOOC through any institution, 30.3% chose no and 69.7% chose yes. UoK needs to share information about MOOCs with learners, as these courses can improve their learning

experience and assist them with gaining jobs or career-related skills. This would make UoK's "products" (students) more marketable in the crowded Kenyan job market.

Table 35: Resources UoK provides to students

Resources/Services/Spaces Provided by Your Institution	Poor	Fair	Neutral	Good	Excellent	Mean	SD
E-classroom facilities (e.g., computers, projection systems, lecture capture systems, SMART boards, etc.)	8%	25%	13%	36%	18%	1.86	1.891
Computer labs (for practical and Internet access)	15%	26%	13%	33%	13%	1.66	1.791
Email services (institutional)	5%	23%	13%	43%	16%	1.93	1.904
LMS (e.g., Moodle, etc.)	7%	23%	11%	40%	18%	1.89	1.920
E-portfolio	11%	32%	19%	30%	8%	1.53	1.681
Network bandwidth/speed of Internet (download and upload)	9%	30%	15%	35%	12%	1.74	1.797
Wi-Fi access	8%	22%	11%	36%	23%	1.93	1.951
Online or virtual technologies (e.g., network or cloud-based file storage system, Web portals, etc.)	7%	31%	13%	38%	12%	1.75	1.805
Access to software (e.g., MATLAB, GIS applications, statistical software, qualitative data analysis, graphics software, textual or image analysis, etc.)	15%	28%	15%	35%	7%	1.52	1.696
Download and use of free and open-source software for teaching and learning	8%	28%	13%	37%	13%	1.73	1.823
Support for ICT maintenance and repair	14%	29%	15%	34%	8%	1.60	1.725
Access to data storage	8%	31%	14%	33%	13%	1.68	1.802
Data visualisation software	10%	33%	15%	33%	9%	1.57	1.717
Citation/reference management software	11%	31%	15%	35%	8%	1.57	1.732
Plagiarism detection software	12%	33%	16%	32%	6%	1.46	1.667
Institutional repository for sharing research	12%	30%	16%	33%	8%	1.55	1.718
E-journals	11%	33%	15%	34%	7%	1.52	1.691
E-books	9%	33%	13%	32%	13%	1.62	1.772
Citation databases	12%	33%	15%	34%	6%	1.47	1.676
Bibliographic databases	13%	33%	15%	32%	7%	1.46	1.673
E-newspapers	11%	30%	14%	37%	8%	1.57	1.738
E-theses and dissertations	15%	30%	17%	32%	6%	1.40	1.649
Patent databases	16%	32%	17%	30%	5%	1.38	1.624
E-proceedings of conferences	11%	29%	16%	33%	10%	1.57	1.747
Statistical databases	11%	31%	16%	34%	8%	1.52	1.708
Communications platform (e.g., MS Teams)	8%	30%	16%	35%	12%	1.65	1.783

Students' Enrolment in MOOCs

Learners were asked whether they had ever enrolled in a MOOC. The responses in Table 37 show that 28.25% indicated having registered in and completed a MOOC, while 15% had registered but did not complete the MOOC; 36.25% indicated they had never enrolled in a MOOC and did not know

what it was, and 20.50% stated they had never registered in one but knew what a MOOC was. This shows UoK learners have low exposure to online learning, so they need such exposure to support TEL implementation.

Table 36: Students' experience with MOOCs

Had Taken a MOOC	Frequency	Percent
No	142	30.3%
Yes	327	69.7%
Total	**469**	**100.0**

Table 37: Students' enrolment in MOOCs

Have you taken a MOOC?	N	Percent
No, and I do not know what a MOOC is.	145	36.25%
No, but I do know what a MOOC is.	82	20.50%
Yes, and I completed it.	113	28.25%
Yes, but I didn't complete it.	60	15.0%
Total	**400**	**100.0%**

4.5 Perceptions About Using TEL

The study also measured UoK learners' perceptions about using TEL, with findings provided in Table 38. The perception statements have mean scores above 2.00 but below the average mean of 2.5. This indicates a less than positive perception. This could be attributed to Internet unreliability, power outages and a lack of digital devices.

Table 38: Learners' perceptions about using TEL

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Mean	SD
It will help me get better results in my subjects.	0.9%	1.1%	4.8%	50.2%	42.9%	2.15	2.223
It will help me understand the subject material more deeply.	1.2%	2.1%	4.4%	50.7%	41.7%	2.10	2.212
It makes completing work in my subjects more convenient.	0.7%	2.6%	3.0%	52.4%	41.3%	2.10	2.213
It motivates me to explore many topics I may not have seen before.	0.9%	1.6%	1.6%	48.2%	47.7%	2.16	2..254
It allows me to collaborate with others easily, both on and outside of the campus.	0.9%	2.3%	3.5%	49.9%	43.4%	2.11	2.223
It will improve my IT/information management skills in general.	1.4%	0.2%	2.6%	47.0%	48.8%	2.15	2.260
It will improve my career or employment prospects in the long term.	0.5%	2.1%	3.3%	47.4%	46.7%	2.13	2.243

Key: 0–1 highly –ve, 1.1–2.0 moderately –ve, 2.1–3.0 lowly +ve, 3.1–4.0 moderately +ve, 4.1–5.0 highly +ve.

However:

- 50.2% and 42.9% agreed or strongly agreed that TEL would help them get better results in their subjects.
- 48.2% and 47.7% agreed or strongly agreed that TEL would motivate them to explore many new topics.
- 47% and 48.8% agreed or strongly agreed that using technology in learning would ultimately improve their IT skills.
- 47.4% and 46.7% agreed or strongly agreed that using technology in learning would improve their career and employment prospects in the long term.

These findings indicate that UoK learners have embraced and understood the benefits of technology in their learning and future careers. This positive perception would be highly instrumental in TEL implementation.

Usefulness of Technology for Learners

UoK learners were asked to rate a range of technologies and tools in terms of how useful these are in their studies. The findings are in Table 39.

A majority of the learners indicated that the mentioned technologies are useful or very useful in their learning process. All the statements scored a mean of between 3.54 and 4.31. Using mobile phones to access web-based university services or information (e.g., enrolment, paying fees) scored highest for utility, followed by receiving alerts about course information (e.g., timetable changes, the release of new learning resources, changes in assessment) via text message on their mobile phone. Given these results, UoK should leverage this usefulness of technology for learners to implement TEL.

Table 39: Usefulness of technologies in studies

	Do not know	Not at all useful	Useful to a limited extent	Neutral	Useful	Very useful	Mean	SD
Design and build web pages as part of your course?	2.5%	4.6%	18.2%	11.4%	37.5%	25.8%	3.54	1.308
Create and present multimedia shows as part of your course requirements (e.g., PowerPoint)?	2.8%	3.0%	11.1%	12.2%	41.3%	29.6%	3.75	1.234
Create and present audio, video as part of your course requirements?	2.5%	3.3%	9.1%	10.1%	45.1%	29.9%	3.82	1.198
Download or access online audio/video recordings of lectures you could not attend?	1.0%	2.5%	8.4%	7.8%	39.0%	41.3%	4.05	1.103
Download or access online audio/video recordings to revise content of lectures you have already been to?	1.0%	0.5%	8.1%	8.1%	39.2%	43.0%	4.13	1.014
Download or access online audio/video recordings of	0.5%	1.8%	8.1%	9.9%	41.0%	38.7%	4.05	1.025

	Do not know	Not at all useful	Useful to a limited extent	Neutral	Useful	Very useful	Mean	SD
supplementary content materials?								
Use the Web to access university-based services (e.g., enrolment, paying fees)?	2.0%	0.3%	6.3%	7.1%	39.0%	45.3%	4.17	1.048
Use your mobile phone to access web-based university services or information (e.g., enrolment, paying fees)?	0.8%	0.0%	4.8%	7.3%	35.7%	51.4%	4.31	.897
Use instant messaging, chat (e.g., Skype, Messenger, Hangout, etc.) on the Web to communicate, collaborate with other students in the course?	1.3%	1.5%	6.6%	9.4%	41.0%	40.3%	4.08	1.046
Use a social networking platform (e.g., Facebook) on the Web to communicate with other students in the course?	1.0%	2.3%	7.6%	11.6%	41.3%	36.2%	3.98	1.073
Use microblogging (such as Twitter) to share information about class-related activities?	2.3%	5.3%	10.9%	12.7%	39.5%	29.4%	3.70	1.270
Keep your own blog as part of your course requirements?	3.8%	3.5%	10.6%	18.2%	37.5%	26.3%	3.61	1.284
Use instant messaging/chat (e.g., Skype, Messenger, Hangout, etc.) on the Web to communicate with teachers and administrative staff from the course?	1.0%	1.3%	8.6%	13.7%	43.0%	32.4%	3.94	1.039
Contribute to another blog as part of your course requirements?	3.8%	3.8%	11.1%	17.5%	39.5%	24.3%	3.58	1.281
Use the Web to share digital files related to your course (e.g., photos, audio files, movies, digital documents, websites, etc.)?	1.5%	1.3%	6.8%	13.4%	45.3%	31.6%	3.95	1.040
Use web-conferencing or video chat to communicate, collaborate with other students in the course?	2.5%	0.8%	8.6%	12.7%	44.8%	30.6%	3.88	1.114
Receive alerts about course information (e.g., timetable changes, the release of new learning resources, changes in assessment) via RSS feeds on the Web?	1.5%	1.8%	5.6%	10.4%	39.5%	41.3%	4.08	1.067
Receive alerts about course information (e.g., timetable changes, the release of new	1.0%	0.5%	5.6%	9.6%	36.5%	46.8%	4.21	.977

	Do not know	Not at all useful	Useful to a limited extent	Neutral	Useful	Very useful	Mean	SD
learning resources, changes in assessment) via text message on your mobile phone?								
Contribute with other students to the development of a wiki as part of your course requirement?	3.0%	2.3%	7.1%	13.9%	43.3%	30.4%	3.83	1.180
Receive grades, marks from your lecturer via text message on your mobile phone?	1.0%	2.8%	7.6%	11.9%	33.7%	43.0%	4.04	1..126
Receive pre-class discussion questions from your lecturer via text message on your mobile phone?	1.0%	1.8%	5.3%	10.1%	39.2%	42.5%	4.12	1.024
Use a personal dashboard on the university intranet to access all your academic information related to courses, grades, etc.?	1.0%	1.5%	5.3%	13.2%	38.2%	40.8%	4.08	1.023
Use an e-portfolio system to record your achievements for future use beyond the course of your studies?	4.1%	3.0%	8.1%	15.9%	39.7%	29.1%	3.72	1.273

Learners' Perceptions About Using Technology in Their Education

Learners were asked to indicate their level of agreement with statements about the usefulness of technology in education and their courses. Responses are shown in Table 40.

All the statements with positive stems had mostly positive responses, with mean scores ranging from 3.02 to 4.25. Statements with negative stems scored low means of 2.78 and 2.88. This result shows that the learners at UoK have positive perceptions about using technology in education. Informed by these responses, UoK should leverage these positive perceptions when implementing TEL.

In response to the statement, "I get more actively involved in courses that use technology," 52.9% and 26.6% agreed or strongly agreed, while 8.4% and 3.8% disagreed or strongly disagreed. This indicates that using TEL would promote active learning. Regarding their likelihood of skipping classes when materials from course lectures are available online, 27.1% agreed and 10.1% strongly agreed. However, a majority would still attend class, as shown by 37.0% disagreeing and 13.9% strongly disagreeing. These responses point to the flexibility advantage of online learning; students can learn at their own pace and do so anywhere, anytime, at their convenience.

Regarding their preparedness to use the technology needed in their courses, 72.2% felt they were adequately prepared. There was agreement or strong agreement that technology makes them feel connected to other learners (90.4%) and to instructors (85.5%). About 82.2% indicated wishing their instructors would use and integrate more technology in their teaching, and 91.7% agreed or strongly agreed that technology makes them feel connected to what is going on at the university.

UoK should take advantage of this goodwill towards technology when implementing TEL.

Table 40: Learners' perceptions about using technology in their education

	Do not know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Mean	SD
I get more actively involved in courses that use technology.	1.5%	3.8%	8.4%	6.8%	52.9%	26.6%	3.86	1.112
I am more likely to skip classes when materials from course lectures are available online.	1.5%	13.9%	37.0%	10.4%	27.1%	10.1%	2.78	1.302
When I entered university, I was adequately prepared to use the technology needed in my courses.	0.8%	4.8%	14.4%	7.8%	52.7%	19.5%	3.65	1.135
Technology makes me feel connected to other students.	0.8%	1.8%	3.0%	4.1%	53.4%	37.0%	4.18	.883
Technology makes me feel connected to teachers.	1.3%	1.8%	5.3%	6.1%	51.6%	33.9%	4.07	.986
Technology interferes with my ability to concentrate and think deeply about subjects I care about.	0.5%	14.4%	34.4%	9.9%	28.6%	12.2%	2.88	1.315
I am concerned that technology advances may increasingly invade my privacy.	2.5%	7.8%	30.1%	14.9%	33.4%	11.1%	3.02	1.275
I am concerned about cyber security (password protection and hacking).	3.8%	2.3%	11.9%	7.6%	50.4%	24.1%	3.71	1.234
In-class use of mobile devices is distracting to my teacher.	2.8%	5.8%	20.3%	11.4%	42.0%	17.7%	3.37	1.297
The use of tablets/laptops in class improves my engagement with the content and class.	1.5%	4.1%	12.7%	10.9%	46.6%	24.3%	3.70	1.174
Multitasking with my technology devices sometimes prevents me from concentrating on or doing the work that is most important.	1.3%	6.3%	19.7%	8.6%	48.4%	15.7%	3.44	1.221

	Do not know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Mean	SD
When it comes to social media (e.g., Facebook, Twitter, LinkedIn), I like to keep my academic life and social life separate.	2.3%	1.8%	10.6%	7.6%	52.9%	24.8%	3.82	1.115
I wish my teachers in the university would use and integrate more technology in their teaching.	1.3%	3.3%	5.1%	8.4%	49.6%	32.4%	3.99	1.054
Technology makes me feel connected to what's going on at the university.	0.8%	2.0%	1.3%	4.3%	50.9%	40.8%	4.25	.863
In-class use of mobile devices is distracting to me.	1.8%	10.1%	23.3%	11.1%	36.7%	17.0%	3.22	1.342

Notably, though, 44.5% of the students indicated concern that technology advances may increasingly invade their privacy, while the majority were ignorant of cyber security issues. This points to a need for students to receive instruction about cyber security so that they understand their rights and equip themselves with the skills and knowledge to protect themselves against cybercrimes and bullying when online.

4.6 Open-Ended Responses

Learners were given an opportunity to write comments in response to the statement that the TEL environment at their institution needs improvement. Everyone who answered strongly agreed on the need for such improvement. Excerpts from some of the responses are below.

Indeed there is a crucial need to upgrade technology in school to enable us [to]do our researches and equip us with diverse knowledge in various disciplines so us we can fit in our ever changing society in the world with relevant skills and technical skills.
The use of e learning has significant impact on computer skills and also Internet help to ease communication between students worldwide. In addition Internet expose students to wide range of learning resources and experiences.
Technology is my oxygen. Am planning to make an aircraft engine to demonstrate how it works. All that is in my mind is technology. I agree that technology be the first priority.
Technology should be improved for easy access to all study materials and for easy assessment.
There is a wide gap in terms of technology in university, an improvement should be made to accommodate the incoming and current population for efficiency.
Technology advances every learning, a student can study anywhere, anytime.
Improved in order to accommodate all university students.
Please just improve it will be of great help to us more so the comrades.
There is need to and the institution should ensure enough resources concerning technological devices.
Improvement in technology will results to improve the skills and knowledge of the students which will enhance high performance.

Improvement of technology helps mostly to access all the requirements necessary for our learning process throughout our courses.
There is need to adjust network coverage at most university rooms for better connectivity.
Improvement of technology leads to better understanding of the courses by students at the university.
In order to make students understand the concepts being taught more easily and maybe apply them after completing their course.
Use of technology in learning enhances understanding and make learning interesting.
Technology based learning should be used along with the face to face classes because it makes learning very interesting.
In order to allow all students to access e-learning resources and make learning more enjoyable.
Technology allows one to be open minded even in decision making in the current society because even the issues of LBGTQ are addressed from the perspective of technology.
This would provide more learning resources to students thus improving performance.
Because in the future technology would be used to do everything. The earlier we adapt to it the better. Technology makes learning easier and interesting.
Technology betters our learning.
In order to be more connected and accessed more communications concerning the school.
To allow access of learning materials easily.
It will be imperative in term of achieving educational objectivity, access to resources.
For betterment of learning.
To enable room for improvement in students' results.

The dissenting minority voices stated:

- "In Kabianga everything to do with technology is pathetic."
- "Use of technology in class should be avoided because it may distract students."

Some learners offered the following recommendations:

To the administration allow us to access all eLearning materials without any complications.
I would like to recommend that the school provide enough devices for Internet access by students eg the laptops and desktop since very many students are not and cannot be able to purchase them.
Improve to reach almost everyone.
Technology should also be easily accessible.
The university needs to improve the technology by installing more desktops, bringing many laptops for students to access.
Increasing the network bandwidth, and boosting of speed, making Wi-Fi network accessible in most parts of the school.
Computer laboratory should be accessible to all University of Kabianga students.
The Internet should be accessible everywhere within the university.

4.7 Summary

1. Students wish to have high-speed Wi-Fi so they can swiftly access reading materials provided on the LMS and other online learning platforms. With fast access, learners will be more motivated to go online and learn.
2. More OER should be developed for students and distributed through common platforms; these could include but not be limited to the LMS and social media. The more students interact with learning resources, the more they can understand concepts that have a beneficial impact on

their academic achievement.

3. Students are positive about the use of technology for teaching and learning, and they look forward to the innovative use of ICT tools to improve their learning experiences at UoK. A positive attitude is key in the adoption of novel technologies and approaches in education. UoK should take advantage of this positivity and continue with TEL implementation.

Chapter 5: Key Findings, Conclusions & Recommendations

5.1 Key Findings

Preparedness for TEL

1. UoK has a basic infrastructure to support TEL.
2. UoK had a total adjusted score of 120 for institutional preparedness, indicating a "developing preparedness" level.
3. UoK provides Internet access to both instructors and learners. However, bandwidth and connectivity speed need to be increased. Learners also need more sites where they can access the Internet on campus.

Lecturers' Access to and Use of TEL

1. Faculty are mixed in terms of age, with 37.05% 41–50 years old and 44.07% 50 or above. Only a few instructors owned laptops or desktops, and the majority relied on their smartphones to access the Internet at UoK.
2. Lecturers' use of technology for teaching is very basic, as seen by the predominance of Word documents and PowerPoint presentations, with little use of educational games and graphics. This deficit seems to be due to a lack of skills.
3. Lecturers are active on social media.
4. Their experience with the university's ICT resources, services and spaces is average and needs boosting through training.
5. Lecturers facilitate classes predominantly in a blended mode.
6. Most are aware of OER, but they rarely create or share content. This could be because they lack the skills to develop OER or lack sufficient time due to other responsibilities.
7. A majority of UoK lecturers lack adequate skills for integrating technologies in their teaching, despite using a blended learning mode in their classes.
8. A majority require training on the use of ICT for teaching and learning.
9. UoK lecturers have positive attitudes towards the use of TEL, which will make its implementation easy.
10. They are motivated to embrace TEL, chiefly for personal interest, training, self-gratification, intellectual challenge, the availability of support, and the provision of ICT infrastructures.
11. UoK lecturers are concerned about learners' ability to learn through TEL, their own lack of training on TEL, and not having enough time to develop e-courses.
12. Most UoK lecturers lack awareness about MOOCs.
13. A majority stated that UoK needs a TEL policy.

Learners' Access to and Use of Technology for Learning

1. The majority of learners at UoK attended blended learning.
2. A significant percentage of the learners have smartphones, and a few have laptops. Some

learners have no digital devices that would be used for TEL. UoK should establish a policy that ensures learners have at least one basic device (a smartphone) for blended learning.

3. A significant number of students at UoK access the Internet from campus, and only a few (1.2%) do not access it at all, because they lack devices.
4. Learners are very active on social media, as they update their social media status several times a day. This indicates they have basic skills for using devices to access or share resources online, which can be tapped for TEL.
5. Learners had average satisfaction with the resources provided by UoK. Management needs to determine why learners are dissatisfied with the resources.
6. Learners have a positive perception about using TEL.
7. Learners indicated that using technology would increase their efficiency, provide motivation, and ultimately improve their IT skills as well as their career and employment prospects.
8. A large portion of UoK learners consider technologies useful or very useful in their studies.
9. A majority stated that the TEL environment at UoK needs improvement.

5.2 Conclusions

UoK has the potential to roll out TEL effectively and efficiently, given the conducive environment identified in this study. Instructors have a positive attitude and moderate motivation towards the use of technology in teaching and learning, while learners have a positive attitude and high motivation towards TEL. These are vital factors for preparedness. Additional key points are:

1. Smartphones are the most popular devices with instructors and learners. This could be due to their affordability and portability.
2. A majority of learners spend more than five hours per day on Internet-related activities. These hours could be used for educational purposes if content were made available online.
3. The three most popular social media platforms with learners are WhatsApp, Facebook and TikTok, in that order. These platforms can be used for educational purposes if content is made available online.
4. More male instructors at UoK integrate ICT in their teaching than do female instructors.
5. The three most popular social media platforms with instructors are Facebook, research-sharing sites and Twitter, in that order. These platforms could be used for educational purposes if instructors developed content for online teaching.
6. Instructors need sensitisation on MOOCs for continuous professional development and lifelong learning
7. A majority of the instructors have a low comfort level with computer-related skills such as spreadsheets and educational games, among others. This can be improved through training.

5.3 Recommendations

1. Policies

UoK needs to develop a robust policy to support TEL. This would complement the e-learning policy that is already in place.

2. LMS

UoK lectures should be trained on developing e-courses and using learning management systems to provide blended learning. Learners should also be trained in the use of technology in learning.

3. Open educational resources

There is a need to train instructors on using OER and to build a repository for sharing knowledge resources created by instructors the world over.

4. Training

UoK needs to increase the frequency and quality of training for both lecturers and learners in the use of both basic and advanced technologies. ICT growth and change occur very rapidly, so learners and lecturers need to maintain a reasonable level of currency through training. This would improve the quality of learning and thereby the quality of UoK graduates.

5. MOOCs

UoK needs to sensitise lecturers and learners on MOOCs, as these are very useful for continuous professional development, lifelong learning and staying up to date on educational matters. Furthermore, UoK should encourage lecturers to develop MOOCs, which would increase student enrolment as well as improve its institutional resilience and visibility.

6. Infrastructure

UoK should improve Internet bandwidth access for instructors and learners, the majority of whom use the Internet on campus. Further, additional ICT devices should be procured to maintain a better computer-to-student ratio.

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4710 Kingsway, Suite 2500
Burnaby, BC V5H 4M2
Canada
Tel: +1 604 775 8200
Fax: +1 604 775 8210
E-mail: info@col.org
Web: www.col.org

August 2023