Commonwealth of Learning

Report on the Baseline Study of Technology-Enabled Learning at the Mauritius Institute of Education

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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.

This report was prepared by Ms. Anuradha Gungadeen (Senior Lecturer in Open & Distance Learning) on behalf of the Mauritius Institute of Education.

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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

Table of Contents

List of Figures

List of Tables

Executive Summary

For technology to have a positive transformative impact on education at the Mauritius Institute of Education (MIE), it is essential to have a guiding policy document that provides an enabling and resilient environment for optimising the use of technology-enabled learning (TEL). It is expected that the framework presented in this report will serve as a benchmark for sustaining standards, quality assurance practices, and rigour in the use of technology to enable teaching and learning that will provide a richer experience in teacher education programmes. In the medium to long term, it is anticipated that an effective TEL strategy will increase the number of courses that use technology to deliver blended courses, strengthen technical support, increase access to quality teaching and learning, and foster an enabling environment for promoting the use of appropriate technologies and innovation in the application of information and communication technologies (ICT) in education.

This document reports on the findings of a baseline survey conducted at the Mauritius Institute of Education with the objective of establishing TEL preparedness at the institution and thereafter developing TEL policy and implementing TEL with support from the Commonwealth of Learning (COL). It outlines the findings of a self-review of the institutional facilities related to technology and policies, and the preparedness of faculty members and students to use technology for teaching and learning at the MIE.

The MIE is the sole teacher education institute established through the MIE Act 1973, subsequently amended in 1984 and 2017. The MIE is a degree-awarding teacher education institution of higher learning, set up with three mandates: Teacher Education, Curriculum Development, and Educational Research. It is responsible for providing teacher professional development at the pre-primary, primary, secondary and tertiary education levels in the Republic of Mauritius and operates under the aegis of the Ministry of Education, Tertiary Education, Science and Technology.

The institution has a staff capacity of 298, including 95 faculty members and 203 non-teaching and support staff. The MIE is involved in undergraduate, graduate, postgraduate and doctoral research and currently has 900 registered students.

For two decades, the MIE has exhibited foresight and willingness to include ICT for content delivery in selected teacher programmes. The focus driving the integration of technology was initially to facilitate reaching students. However, new challenges and opportunities have created the need for a paradigmatic shift institutionally to adopt a more systematic and proactive approach to technology-enabled learning.

The MIE adopted a systematic approach in developing the Technology-Enabled Learning Policy document, which consisted of a baseline study aiming to assess the TEL environment and the enabling policies in educational institutions. This study sought to establish the feasibility of ICT use in teaching and learning at the MIE to guide the adoption, integration and implementation of policies and strategies for TEL. Three types of questionnaires from COL's *TEL Implementation Handbook* (Kirkwood & Price, 2016) were used to gather data: Technology-Enabled Learning Infrastructure and Policies; Survey of Faculty Use of Technology for Teaching and Learning; and Survey of Learners' Use of Technology. The questionnaires were slightly modified and adapted to the MIE setting and were administered and co-ordinated by the MIE Director's Office. Both online and hardcopy formats were sent to faculty members to secure data collection in a convenient manner.

The findings of the study revealed that the MIE has no policy on TEL, although the Director of the institute demonstrates a high level of commitment to supporting and advancing the use of current technology to achieve institutional strategic and academic goals.

While the MIE has an IT Unit, which handles the installation and maintenance of institutional ICT, it has no unit that can offer its academic staff and students specialised support in TEL. To support academic staff in the use of ICT to transform their pedagogical practices, the MIE should establish a TEL Steering Committee to co-ordinate and monitor all TEL activities.

It was established that the institute has a robust ICT infrastructure. However, much of it is not being maximised for teaching and learning. All faculty members have access to laptops that they utilise to prepare their online content. However, to optimise the use of ICT tools, the MIE should invest in regular and customised capacity-building training for faculty members and students. Alongside this, it is also important to strengthen the current technological infrastructure, to make it more TEL friendly and accommodating for TEL practices.

Presently, the MIE has an Online Learning and Teaching Coordinator, three instructional designers and very few staff in the Computer Education Department dedicated to guiding the development of e-content. These staff provide techno-pedagogical support to faculty in designing, developing and delivering their course content using the blended mode of learning. Alongside them, the Online Learning and Teaching Co-ordination Team provides capacity-building training in the use of the institute's learning management system. However, owing to limited human resources and logistical support, very few courses have so far been converted and deployed online, meaning the MIE's strategic goal of having 50% of courses delivered online has not been achieved. Hence, competent personnel should be recruited.

Although faculty members are using ICT in their teaching and learning, it has been noted that many of them have not been able to use ICT tools to transform their pedagogical practices innovatively and creatively. In addition, pedagogical innovations that have been introduced are not visible because they are neither documented nor shared. Hence, for the benefit of the institution and to increase its visibility, the MIE has to institutionalise the practice of documenting and sharing TEL innovations. This could be done through regular sharing of evidence-based good practices at research workshops and/or by publishing research in scholarly journals. The MIE could also devote a special edition of its institutional journal to TEL practices.

Faculty use of technology for teaching remains basic to intermediate at the MIE. However, appropriate TEL practices are not visible there, so appropriate training in TEL is deemed fundamental at this stage.

Students' use of technology for learning is evident in their positive perceptions of and attitudes towards using technology, and their increasing engagement with technological tools such as social media, massive open online courses and open educational resources to improve their learning experiences. This indicates students will be receptive to the implementation of a TEL policy.

The survey also established the strong need for continuous and personalised professional development among faculty and staff in the field of TEL. MIE management therefore should include TEL professional development in its Staff Development Programme. The MIE should also collaborate and partner with other reputable institutions that have expertise in TEL.

Leadership is the backbone of success in an organisation, and leadership in the education setting is crucial. From this point of view, it is vital to highlight that the MIE's leadership is determined and supportive of TEL. This was demonstrated by the Directorate's efforts to conduct the TEL baseline survey and to develop a TEL Policy for the MIE.

Chapter 1: Introduction and Background

The Mauritius Institute of Education (MIE) is the sole teacher education institute established through the MIE Act 1973, subsequently amended in 1984 and 2017.[1] The MIE is a degree-awarding teacher education institution of higher learning, set up with three mandates: teacher education, curriculum development, and educational research. It is responsible for providing teacher professional development at the pre-primary, primary, secondary and tertiary education levels in the Republic of Mauritius and operates under the aegis of the Ministry of Education, Tertiary Education, Science and Technology. The MIE dispenses courses in the Republic of Mauritius, including its outer islands of Rodrigues and Agaléga.

The objectives of the MIE are "to provide facilities and to engage in educational research, curriculum development and teacher education and thereby to promote the advancement of learning and knowledge in the field of education and, in particular, to provide a teacher education responsive to the social, economic, linguistic, administrative, scientific, agricultural and technological needs of Mauritius."[2]

Vision

To be a leader in professional development in the education sector and an innovative change maker for the 21st century.

Mission

The Mauritius Institute of Education is committed to advancing professional standards dedicated to the making of an institution of excellence in teaching, curriculum development and research, while advancing creativity and engagement at all levels.

In 2021, the MIE responded to a call from the Commonwealth of Learning (COL) to strengthen its use of technology for teaching and learning. After several consultations, the MIE and COL agreed to implement technology-enabled learning (TEL) systematically through developing policy and blended courses, augmenting information and communication technologies (ICT), and building staff capacity. This report is the outcome of the institutional survey that guided TEL policy development at the MIE.

The aims of the baseline report are to understand:

- the TEL environment and enabling policies in the MIE
- MIE academics' access to media and technology, and how they use these
- learners' access to media and technology, how they use these, and their preferred means of learning

1.1 Methodology

Three types of questionnaires from COL's *TEL Implementation Handbook* (Kirkwood & Price, 2016) were used to gather data: Technology-Enabled Learning Infrastructure and Policies; Survey of Faculty Use of Technology for Teaching and Learning; and Survey of Learners' Use of Technology. The questionnaires were slightly modified and adapted to the MIE setting and were administered and co-ordinated by the Director's Office. Both online and hardcopy formats were sent to faculty members to secure data collection in a convenient manner. The researcher

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[1] https://mauritiusassembly.govmu.org/Documents/Acts/2017/act0217.pdf
[2] http://web.mie.ac.mu/mie-about-us/, quoting the MIE Act 1973:2.

supported faculty members and students in completing and submitting the survey questionnaires. After access to the online forms was closed, COL sent the student, faculty and institutional data to the MIE for analysis and report writing.

Chapter 2: The TEL Environment at the MIE

The institutional questionnaire was co-ordinated through the Director's Office and completed collectively by four people at the MIE: the Director of the institute, the System Administrator, the co-ordinator for online learning and teaching, and the co-ordinator for digitalisation of content. The institutional survey was used to elicit information about the current provision of hardware and software and the digital infrastructure that is available to be used for teaching and learning.

The MIE has developed a robust ICT infrastructure providing broadband Internet and wireless connectivity through a private Internet service provider (ISP), with a current bandwidth of <1 Gbps. Internet facilities are available on campus to officials and staff, faculty members, students, researchers, as well as visitors. The broadband Internet connection is accessible in classrooms, the library, faculty rooms, laboratories, the reception lounge, seminar halls, students' common rooms, and open areas. In terms of hardware, there are 200 laptops, 75 desktop computers and 30 tablets, all of which are connected to Internet. To secure the ICT infrastructure, controlled access is in place, and heavy download of online content is restricted to ensure a fair share of Internet connectivity among all users and to control bandwidth-consuming sites.

The different types of content accessed or downloaded are as follows:

- video channels (e.g., YouTube, Vimeo, etc.),
- audio channels (e.g., iTunes, online MP3 players, etc.),
- software (e.g. Cnet.com, Sourceforge.net, etc.)
- emails

The following are not accessible:

- social media (e.g., Facebook, Twitter, LinkedIn, Instagram, etc.)
- chat/messengers (e.g., WhatsApp, Viber, Skype, etc.)
- massive downloads of video, audio, reference books, etc.
- adult content

The MIE maintains an official profile/institutional group on the Facebook social media platform and a YouTube video channel where e-resources are hosted. The Internet is also occasionally used to live stream conferences.

The MIE has recently invested in 15 e-classrooms with facilities such LCD projectors fitted with desktop computers, laptops and DVD players, and a sound-proof studio for recording. Audiovisual production is done in-house.

The Curriculum Development, Implementation and Evaluation Unit is responsible for developing e-content materials for primary and secondary schools in the Republic of Mauritius. The e-content is deployed on the MIE website.[3]

At present, the educational e-content or audiovisual materials produced by the institution are not available under a Creative Common licence. Moreover, there is no institutional repository for open educational resources (OER), and the institution is not a member of any OER consortia or formal OER networks. Nonetheless, the e-resources produced by the MIE as part of the Student Support Programme (SSP) initiative[4] are hosted on the Ministry of Education, Tertiary

[3] http://web.mie.ac.mu/curriculum_books/
[4] https://ssp.moemu.org/eresources.php

Education, Science and Technology website.

With respect to MIE programmes, they contain several modules delivered in a blended mode with some component of online learning. It is equally important to point out that all courses were running fully online during the Covid-19 pandemic; with the reopening of schools, this gradually shifted to a mix of face-to-face and online. Nonetheless, a few modules offered for students from Rodrigues are still being delivered fully online. The online courses are delivered using the Moodle learning management system (LMS) and Microsoft Teams videoconferencing.

As far as online teaching in concerned, the different phases of developing online courses are under the purview of the newly appointed Co-ordinator for Online Learning and Teaching, who collaborates with the Instructional Designers and the Moodle Administrator. The Online Learning and Teaching Team is also responsible for providing timely, relevant and current continuous training. The MIE is exploring avenues for external partnerships to reinforce the online learning landscape.

Although training on TEL is viewed as essential, the institution is not engaged in regular training for faculty and learners to use technology effectively. For blended courses that have some online components, an online orientation is carried out with the students before each course begins.

Previously, training on TEL was organised as and when needed, but with the appointment of an Online Co-ordinator for Online Learning and Teaching, the type of training is being reviewed, together with its frequency. A series of Moodle training workshop sessions has been organised and delivered since December 2021, amounting to 44 hours, including ten hours of live synchronous sessions.

2.1 Institutional Preparedness for TEL

Table 1 presents information regarding institutional preparedness for TEL at the MIE. Each of the criteria was scored from 1 to 5, where 1 = strongly disagree or does not exist; 2 = disagree or only marginally demonstrates existence; 3 = neither agree nor disagree/existence or otherwise is difficult to explain; 4 = agree or it does exist; and 5 = strongly agree or it definitely exists and is well established. As per COL's *TEL Implementation Handbook*, the scores for MIE preparedness tallied to 102, showing that MIE is "developing preparedness." This implies that the MIE has put in place some of the aspects of a TEL system, policy and infrastructure and is in the process of developing a robust system for effective utilisation of TEL.

Table 1. Institutional Preparedness for TEL

Areas/Items	Score (1–5)
Area 1: Policy	
There is a well-documented technology-enabled learning policy.	1
The vision and mission of the technology-enabled learning policy are aligned with the mission of the organisation.	1
The vision and mission of technology-enabled learning 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
Area 2: Strategic plan	
There is a strategic plan for the implementation of technology-enabled learning.	1
The strategic plan for technology-enabled learning has measurable goals and outcomes.	1
The strategic plan for technology-enabled learning is approved by the senior management of the organisation and is supported by adequate financial provisions.	1
Area 3: IT support	

The organisation has an IT department that handles procurement, installation and maintenance of technologies for teaching and learning.	5
There is an ICT policy in place, which is implemented by a high-powered committee in the organisation.	2
The head of the IT support department reports to senior management and is responsible for overall functioning of the 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.	3
Area 4: Technology	
There is adequate hardware infrastructure for teaching and learning (e.g., access to computers for students and learners).	5
There are adequate applications and software for teaching and learning (e.g., access to appropriate software, intranet, learning management system, etc.).	3
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.	3
Area 5: Content development	
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.).	3
There are instructional designers in the organisation, or faculty members are trained to organise learning content appropriately.	4
Teachers have adequate access to the online system to develop courses for technology-enabled learning.	3
Area 6: 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 technology-enabled learning are stored and shared within the organisation for others to access and learn from.	2
The workflow processes and responsibilities to implement technology-enabled learning are well documented in the organisation.	1
Area 7: 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
Area 8: Leadership	
Leaders in the organisation are involved in the implementation of technology-enabled learning.	2
Senior management in the organisation regularly review, monitor and evaluate the progress of technology-enabled learning.	1
The top leadership of the organisation is supportive of technology-enabled learning and provides encouragement and motivation to the faculty and staff to achieve the academic goals.	4
Area 9: 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 technology-enabled learning.	3
There is adequate staff to support technology-enabled learning.	2
The organisation has a structure in place to create teams for content development and delivery of technology-enabled learning.	2
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.	2

Area 10: TEL champions	
There are early adopters of technology-enabled learning in the organisation.	5
There are TEL champions in the organisation who support and care about pedagogic innovations.	5
There are faculty members who can take leadership roles in developing appropriate policies and a technology-enabled learning strategy for the organisation.	4
Total score for all items in the ten areas	**102**

Chapter 3: Faculty Survey on the Use of Technology for Teaching and Learning

A very low faculty member participation rate was observed. The MIE has 95 academics, of whom only 34 (36%) agreed to participate in the faculty survey. Of these, 23 were valid responses. These respondents were at the levels of lecturer, senior lecturer and associate professor, working in the following departments of the MIE:

- Curriculum and Evaluation
- English
- French
- Higher Studies
- Home Economics
- Mathematics
- Science
- Visual Arts

3.1 Faculty Respondents' Profile

When asked to indicate their gender, 56.5% identified as females and 39.1% as males, while 4.3% preferred not to declare their gender (Figure 1). Most of the respondents (87%) were aged 41 years or above; 34.8% of the respondents were in the age group 41–50 years, 21.7% were in the age group 46–50 years and 13% of the respondents were in the age group 36–40 years (Figure 2). Senior lecturers accounted for 43.5% of the respondents, lecturers 30.4% and associate professors 26.1% (Figure 3). The largest proportion of the respondents (60.9%) held a master's degree; 30.4% had a PhD, while 8.7% had an MPhil or MTech (Figure 4). More than half of the respondents (65.2%) were involved in teaching undergraduate programmes, while 34.8% were engaged with graduate or postgraduate teaching (Figure 5). All the respondents had a minimum of five years of teaching experience; 30.4% had 21–25 years, 26.1% had 16–20 years, 21.7% had 26–30 years, 17.5% had 11–15, while the remaining 4.3% had five or fewer years (Figure 6).

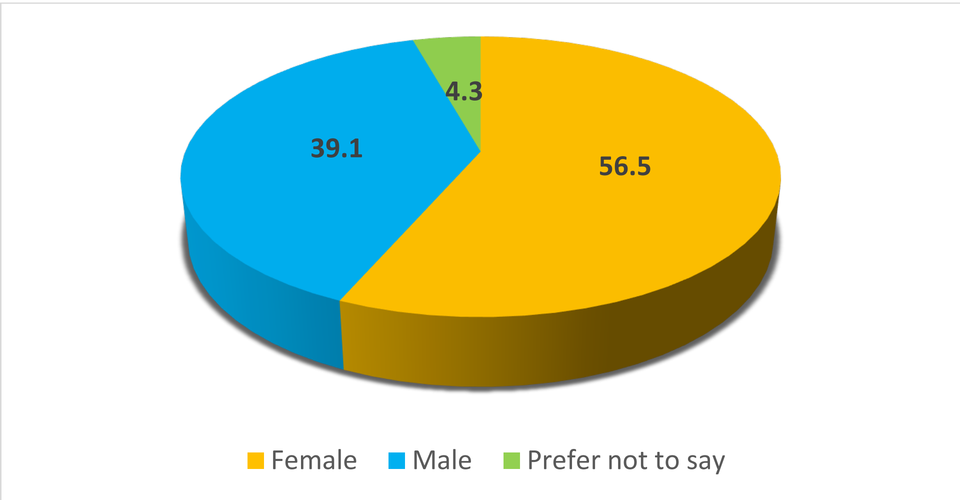

Figure 1. Gender distribution

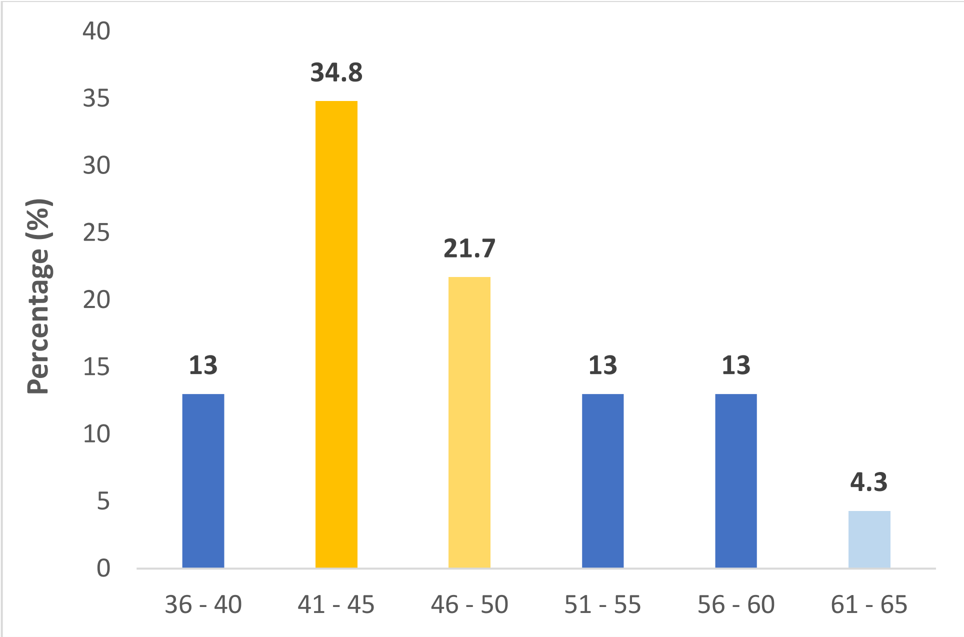

Figure 2. Age group distribution

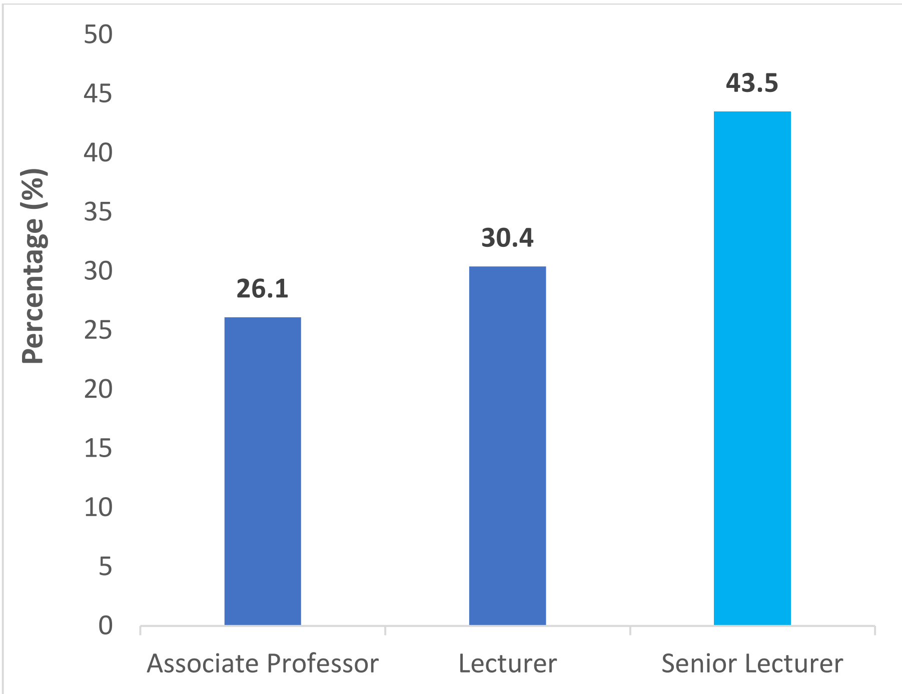

Figure 3. Position of respondents

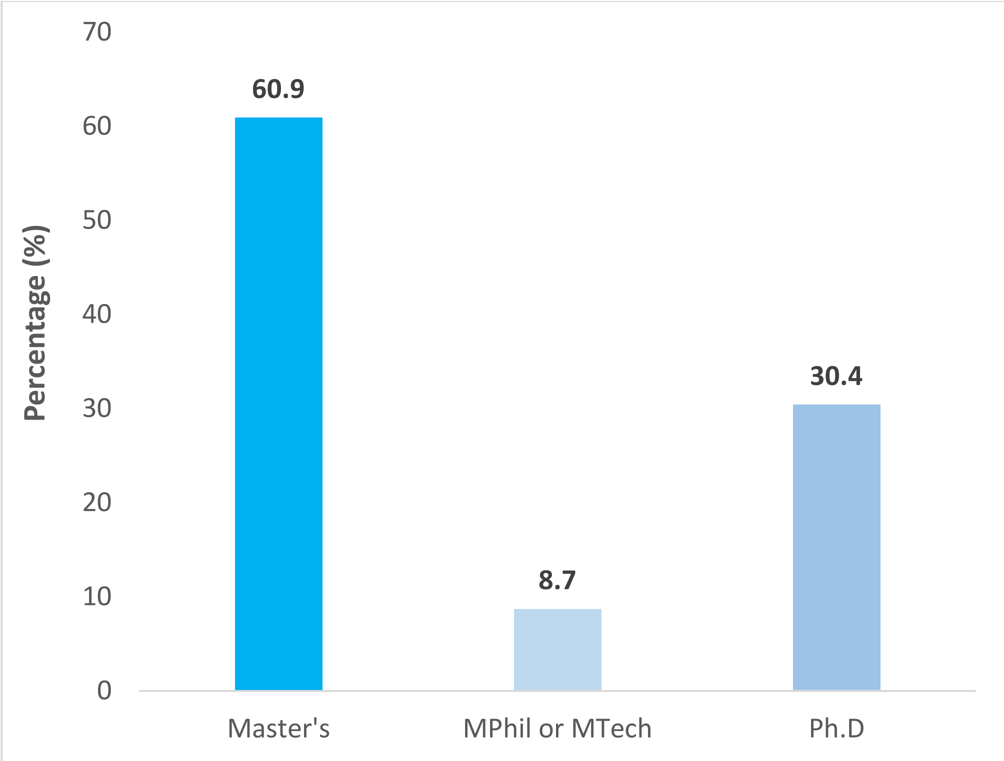

Figure 4. Highest qualification of respondents

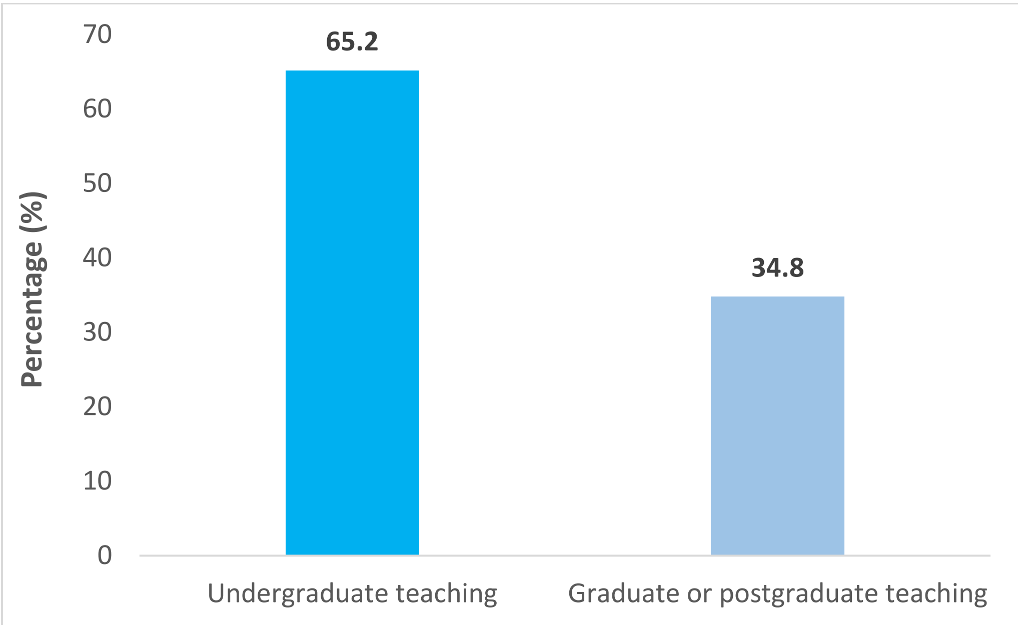

Figure 5. Level of teaching involvement

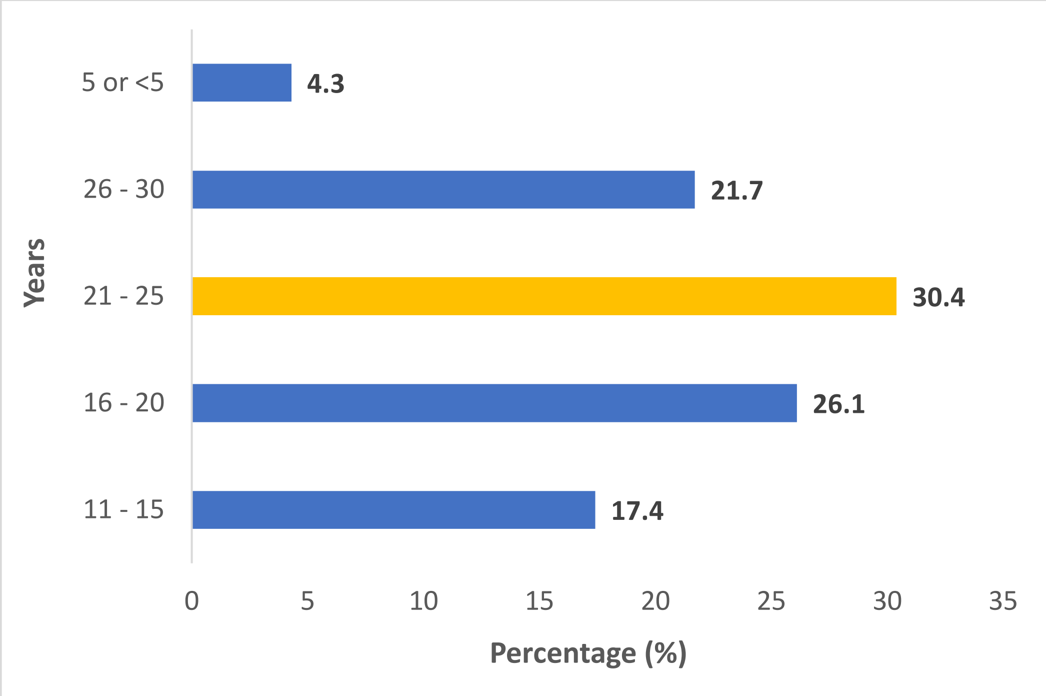

Figure 6. Years of teaching experience

3.2 Access to and Use of ICT

3.2.1 Ownership of and Access to ICT

This section presents findings on the faculty's access to media and technology. All the respondents had their own devices. Most of them reported owning either a laptop (28%) or a smartphone (28%), the most common devices owned by the respondents, while 24% owned a tablet device, and the remaining 20% had a desktop computer (Figure 7).

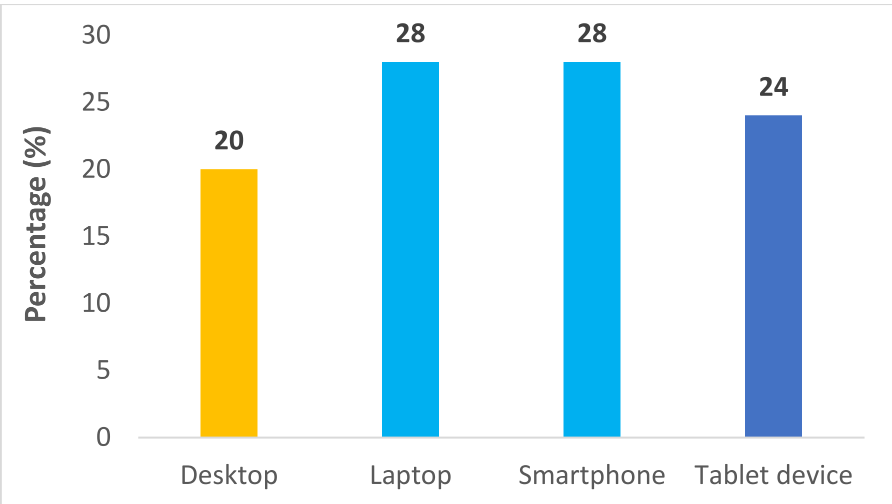

Figure 7. Device ownership

3.2.2 Internet Access

Regarding Internet access, more than 91.3% of the respondents reported accessing it from either their home or their office (Figures 8 and 9). Most of the respondents had access predominantly through either wireless or ADSL connections. The most frequently used (preferred) devices to access the Internet were smartphones and laptops. While 73.9% of the respondents agreed that there was broadband Internet connectivity on the MIE campus, 4.3% did not agree with the statement (Figure 10). Moreover, it was reported that broadband Internet access was available in classrooms, the library, faculty rooms, laboratories, seminar halls, student common rooms as well as open areas. Most of the respondents (82.6%) agreed that they could access the Internet through Wi-Fi/wireless Internet connectivity on the MIE campus (Figure 11). Daily Internet access was reported by 82.6% of the respondents, while 13.0% accessed it on alternate days. Nonetheless, it is important to highlight that 4.3% of the respondents accessed the Internet only irregularly (Figure 12).

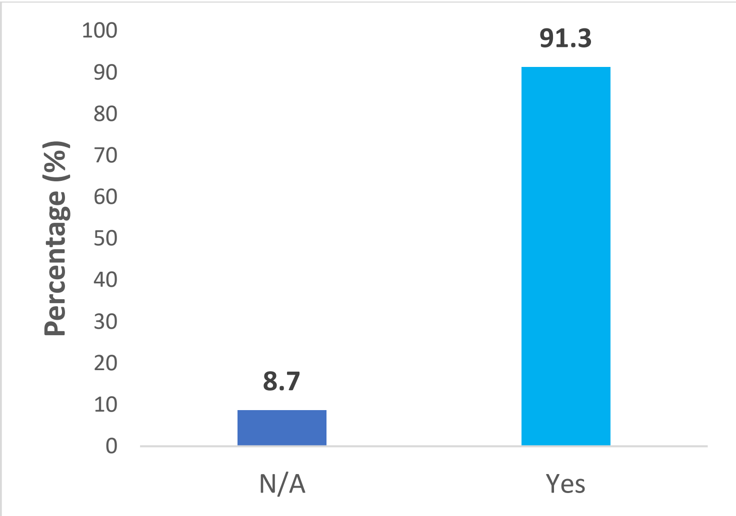

Figure 8. Internet access (home)

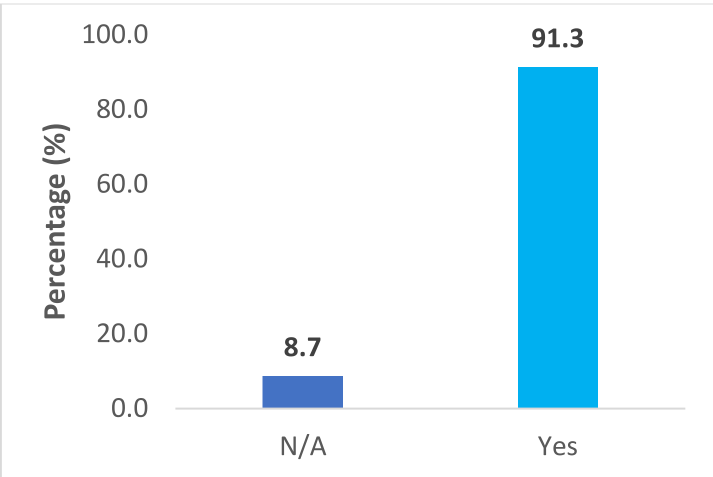

Figure 9. Internet access (office)

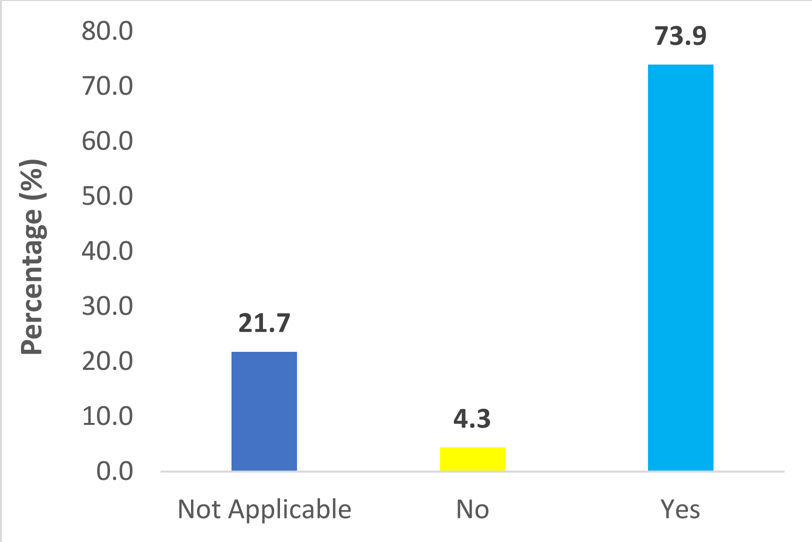

Figure 10. Broadband Internet connectivity (campus)

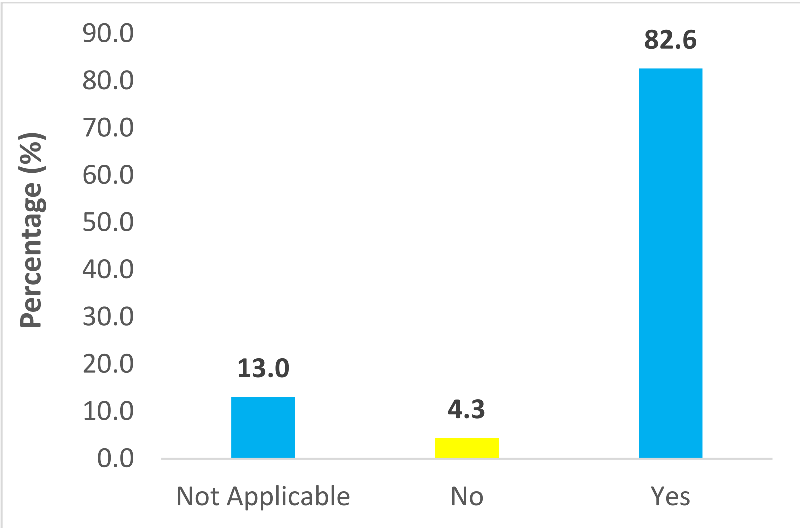

Figure 11. Wi-Fi/wireless Internet connectivity on campus

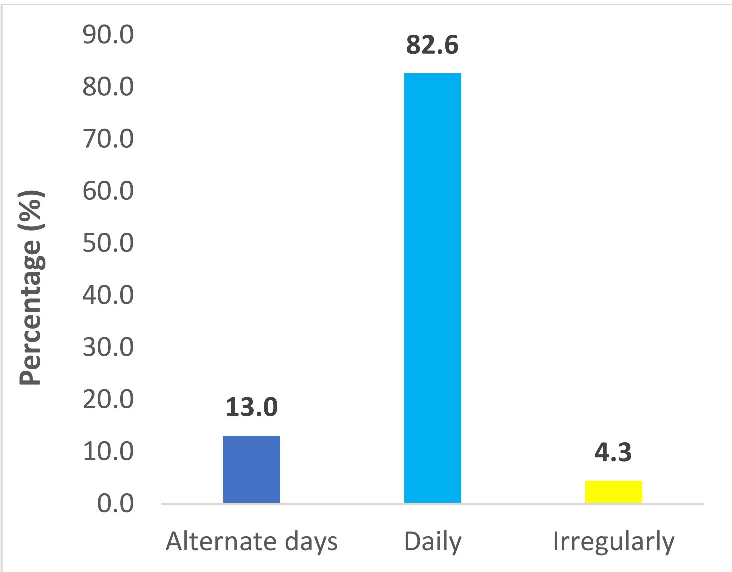

Figure 12. Frequency of accessing the Internet

3.2.3 Use of ICT

Proficiency in computer-related skills is a key ingredient for successful implementation of TEL. Faculty members were asked to rate their experiences with several resources provided at the MIE on a Likert scale, where 1 = basic level, 2 = intermediate level, 3 = advanced level, 4 = expertise level and 0 = non-user level. The responses showed that most faculty members were basic-to intermediate-level users, with a mean of 1.57, indicating they are fairly comfortable with most computer-related skills. The mean scores displayed in Table 2 indicate that faculty members were intermediate- to advanced-level users of email (2.6), Microsoft Word (2.5) and Microsoft Presentation (2.3), while the comfort level with the LMS (1.8) and Microsoft Spreadsheets (1.7) was between basic and intermediate. The faculty members also displayed a fair comfort level with digital audio, communication platforms (MS Teams/Zoom), graphic editing, multimedia authoring, and video-editing activities. However, the mean score of 0.4 for webpage design showed that respondents did not engage in this and were not comfortable with webpage design activities. These findings imply that faculty members at the institution have a poor competency in using advanced ICT tools. These are skills in which faculty members at the MIE require appropriate training to effectively use TEL.

Table 2. Comfort level in computer-related activities

	Non-user level (0)	User level (basic) (1)	User level (intermediate) (2)	User level (advanced) (3)	Expert level (trainer) (4)	Mean score
Email	2	2	4	10	5	2.6
Word processor (e.g., Microsoft Word)	2	2	6	8	5	2.5
Presentation (e.g., Microsoft PowerPoint)	2	2	8	9	2	2.3
LMS (e.g., MIE Moodle)	3	5	9	5	1	1.8
Spreadsheets (e.g., Microsoft Excel)	2	9	7	3	2	1.7
Digital audio	4	7	10	0	2	1.5
Communication platforms (MS Teams/Zoom)	5	8	8	1	1	1.4
Graphic editing	6	9	6	1	1	1.2
Multimedia authoring	7	9	4	2	1	1.2
Databases	4	7	3	2	2	1.2
Video editing	5	13	4	0	1	1.1
Webpage design	15	7	1	0	0	0.4

3.2.4 Social Media

The data indicated that 78.3% of the respondents had a profile/account on one or more social media platforms, while 21.7% did not (Figure 13). Facebook (87%) was the most popular and commonly used social media among the respondents (Figure 14). Interestingly, while 47.8% preferred to use research-sharing sites (Academic.edu, Researchgate.net, etc.), nearly the same proportion (43.5%) did not show any interest in such platforms (Figure 15). It is equally important to point out that social bookmarking sites (Delicious, Scoop.it, Pinterest, etc.) were the least preferred or used by the respondents (with 82.6% replying "no") (Figure 16).

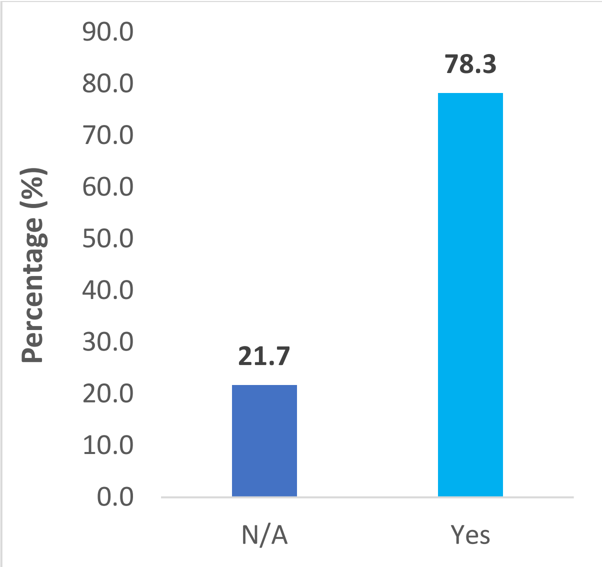

Figure 13. Account on social media platform

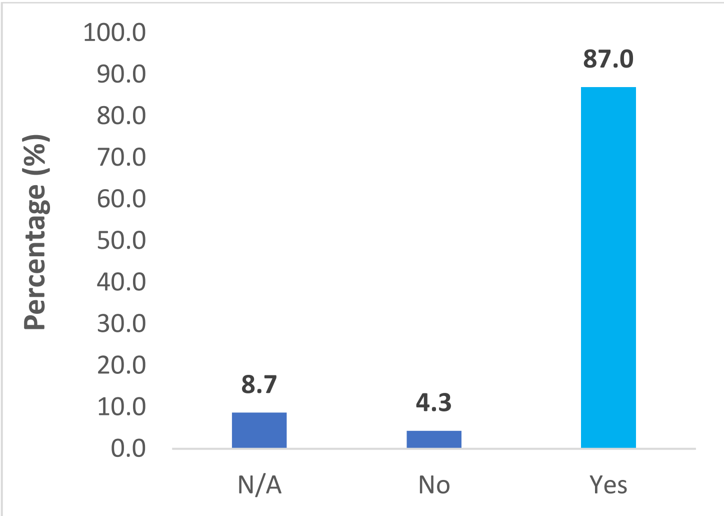

Figure 14. Preference for Facebook

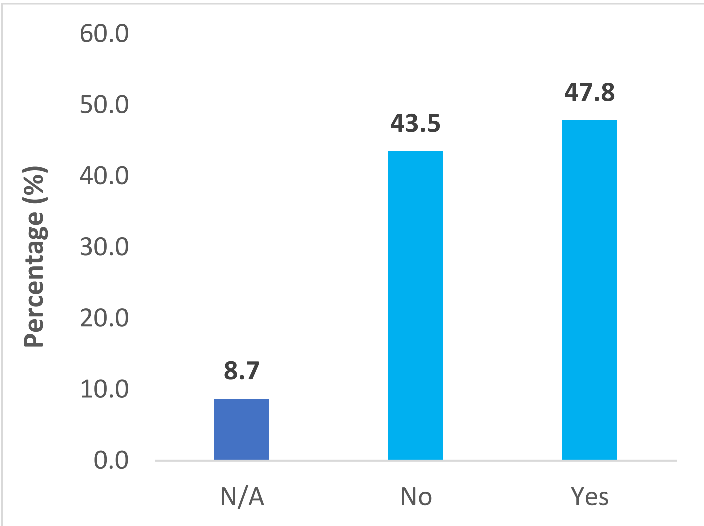

Figure 15. Preference for research-sharing site

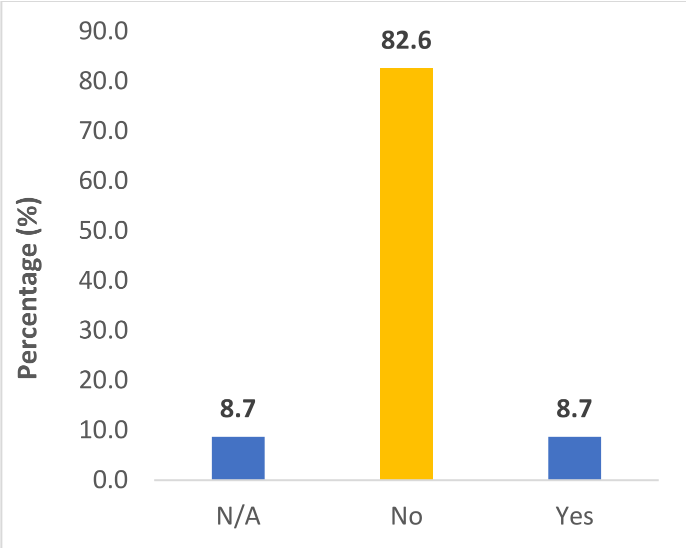

Figure 16. Preference for social bookmarking sites

3.2.5 Mailing Lists and Discussion Forums

When asked whether they were a member of any mailing list or discussion forum, 47.8% of the respondents said yes, 26.4% said no, and 26.1% chose "not applicable" (Figure 17). Most (86.9%) were subscribed to between one and five email-based discussions, with the remaining 13.0% subscribed to more than five (Figure 18). Moderating mailing lists and discussion forums was not applicable to most respondents (52.2%), with only 13.0% doing so. However, a significant percentage (34.8%) reported not being engaged in any such activity (Figure 19).

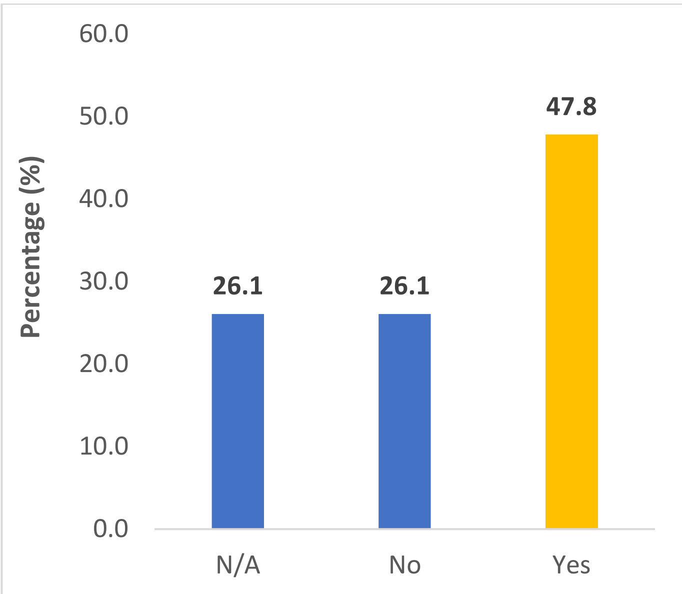

Figure 17. Member of mailing list or discussion forum

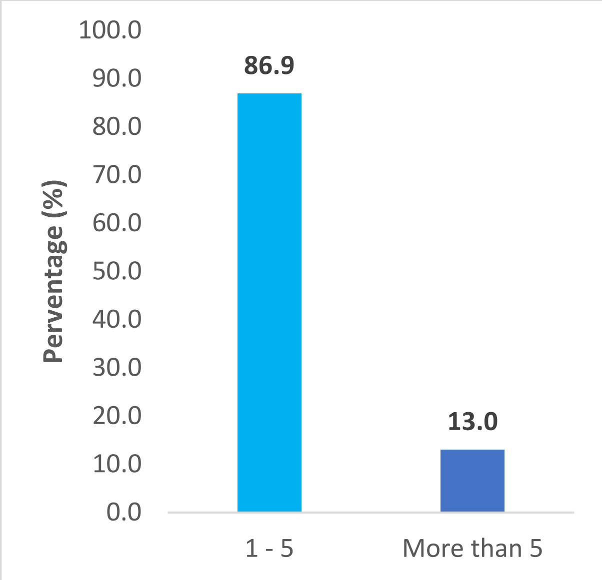

Figure 18. Subscription to email-based discussions

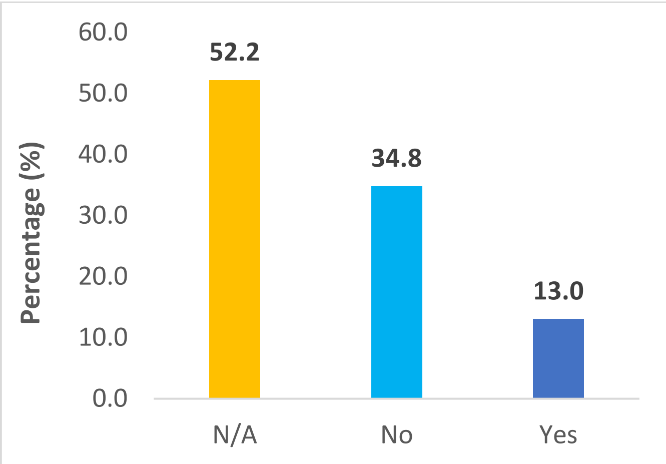

Figure 19. Involvement in moderating discussion forum/mailing list

3.2.6 Experiences in ICT Resources and Services Provided by the MIE

Faculty members were asked to rate their experiences with several resources provided at the MIE on a Likert scale, where 1 = poor, 2 = fair, 3 = neutral, 4 = good, 5 = excellent and 0 = not available. The results revealed that on average, most of the faculty members were fair to neutral regarding their experiences with the ICT resources/services/spaces provided by the MIE. The findings displayed in Table 3 shows that faculty members have had fairly good experiences with the institutional email services, the Moodle LMS, e-classroom facilities, Wi-Fi access, network bandwidth, online technologies and e-portfolios. On the other hand, they have had poorer experiences with access to software (e.g., MATLAB, GIS applications, statistical software, qualitative data analysis, graphics software, textual or image analysis programs, etc.) and with support services for ICT maintenance and repair. This suggests the existing TEL environment at the MIE, including its ICT resources and services, should be improved to enhance faculty's TEL experiences.

Table 1. TEL environment experience

	Not available (0)	Poor (1)	Fair (2)	Neutral (3)	Good (4)	Excellent (5)	Mean score
Email services (institutional)	2	1	2	0	11	7	3.7
Learning management system (e.g., Moodle, etc.)	2	2	3	0	14	2	3.2
e-classroom facilities (e.g., computers, projection systems, lecture capture systems, SMART boards, etc.)	2	2	4	2	10	3	3.1
Wi-Fi access	2	2	3	4	10	2	3.0
Network bandwidth/speed of Internet (download and upload)	2	3	4	4	8	2	2.8
Online or virtual technologies (e.g., network or cloud-based file storage system, Web portals, etc.)	2	3	2	11	3	2	2.7
e-portfolio	3	4	3	8	4	2	2.6
Download and use of free and open-source software for teaching and learning	2	4	6	3	5	3	2.6
Computer labs (for practical and Internet access)	5	2	4	4	7	1	2.4
Support for maintenance and repair of ICT	2	7	5	5	3	1	2.1
Access to software (e.g., MATLAB, GIS applications, statistical software, qualitative data analysis, graphics software, textual or image analysis programs, etc.)	3	8	4	7	0	1	1.8

3.3 Using ICT for Teaching and Learning

This section encompasses the use of ICT for creating digital content for teaching, the nature of the classes faculty teach and how often they use digital resources or platforms in their teaching. It further investigates faculty use of ICT to create and share teaching and learning materials, their knowledge of OER, their use of OER platforms for teaching and learning, and how they rate their individual skills for integrating teaching and learning technologies.

3.3.1 Use and Creation of Digital Content for Teaching

Nature of the classes taught

The respondents' most preferred mode of teaching (82.6%) was blended, whereby some components of study are done online (Figure 20). On the other hand, 26.1% of the respondents opted for fully online teaching (Figure 21), and 55% of the respondents still believed in traditional face-to-face teaching.

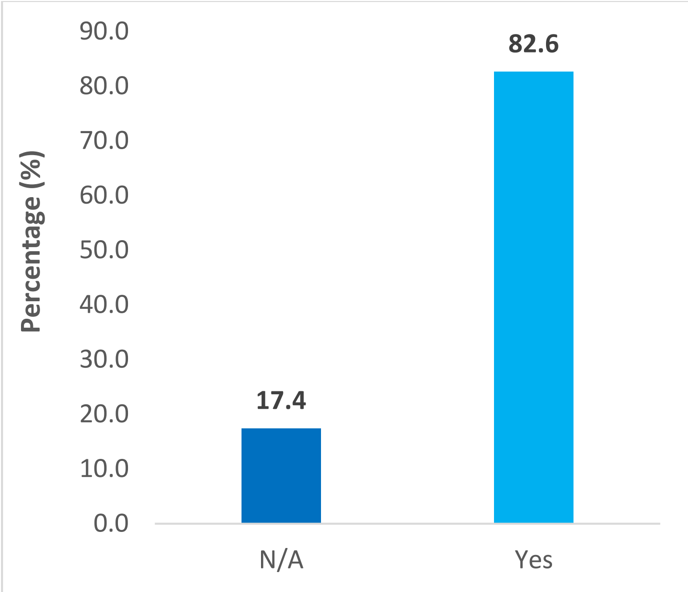

Figure 20. Blended mode of teaching

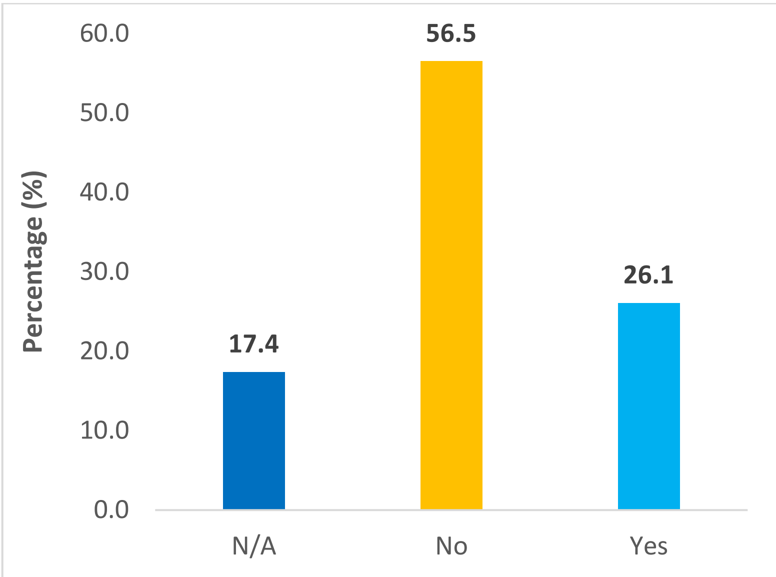

Figure 21. Fully online mode of teaching

Frequency of using digital resources/platforms in teaching

Members of faculty were asked to indicate how often they used digital resources and platforms in their teaching. Frequency was rated on a Likert scale from 1 to 5, where 1 = never, 2 = rarely, 3 = sometimes, 4 = often and 5 = always. Table 9 shows the mean score of the frequency of use of each resource/platform. The mean scores reveal that the four digital resources faculty members frequently used were presentations (e.g., PowerPoint, including from online sources), Word files (activity sheets/handouts/notes), images (pictures, photographs, including from the Web) and digital films/video (e.g., YouTube). The mean scores for blogs (0.6), social bookmarking (0.4) and micro-blogging (1.1) indicated these were the least frequently used digital resources in teaching, implying that training is required in these resources.

Table 2. Frequency of using digital resources/platforms in teaching

	Never (0)	Rarely (1)	Sometimes (2)	Often (3)	Always (4)	Mean score
Presentations (e.g., PowerPoint, including from the online sources)	4	0	0	8	11	3.0
Word files (activity sheets/handouts/notes)	4	0	1	8	10	2.9
Images (pictures, photographs, including from the Web)	4	0	1	9	9	2.8
Digital films/video (e.g., YouTube)	4	0	2	11	6	2.7
Open access research papers	5	3	5	6	4	2.0
Audio recordings	4	3	8	6	2	2.0
Learning management system	7	6	2	6	2	1.6
Simulations and 2D/3D animation/printing	7	7	4	3	2	1.4
Open textbooks	7	5	7	3	1	1.4
Microblogging (Twitter, Facebook, etc.)	10	6	2	5	0	1.1
Blogs	13	7	2	1	0	0.6
Social bookmarking	17	5	0	1	0	0.4

Creation and sharing of teaching and learning resources

Faculty's experience in creating and sharing teaching and learning resources is an essential indicator of their level of expertise in a given field. This was assessed using a three-point Likert scale, where 1 = never, 2 = yes but not shared with others and 3 = yes and shared through an open licence. As per Figure 22, the most created but not shared resources were images (52.1%), audio recordings (39.1%) and course packs (30.4%), while the most popular resources created and shared through an open licence were Word files (43.5%), course-pack presentations (39.1%) and digital films (30.4%). However, in a few areas, the majority of the respondents had never used blogs (91.3%), simulations or 2D/3D animation (82.6%) or a learning management system (69.6%) for creating and sharing learning resources. This strongly supports the need for building faculty members' capacities in these areas to advance TEL practices at the institute.

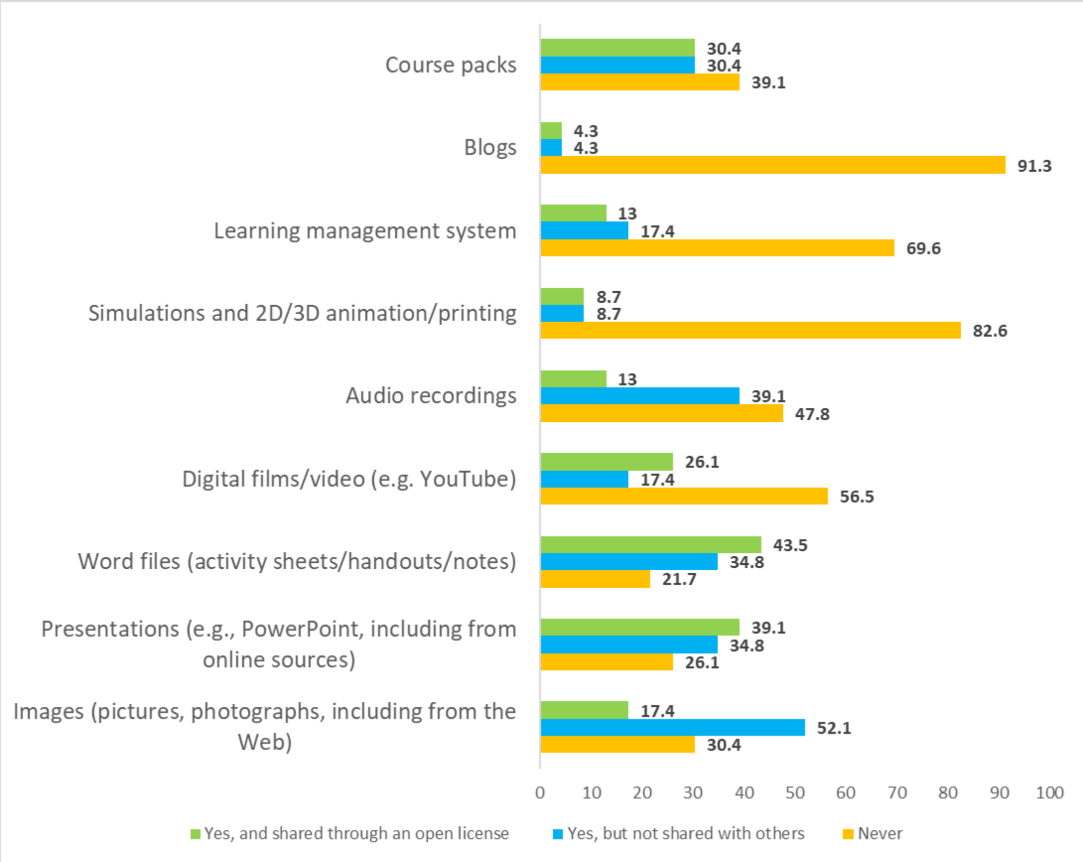

Figure 22. Creation and sharing of teaching and learning resources

3.3.2 Awareness and Frequency of Using OER in Teaching and Learning

Using OER in teaching, learning, assessment and research is essential for TEL implementation. As such, determining how frequently faculty use them is an important indicator of how resourceful MIE academics will be for their students and for successfully implementing TEL.

When asked about their OER awareness, a significant percentage (73.9%) indicated being aware of OER in their discipline, 8.7% were unaware, while 17.4% chose "not applicable" (Figure 23).

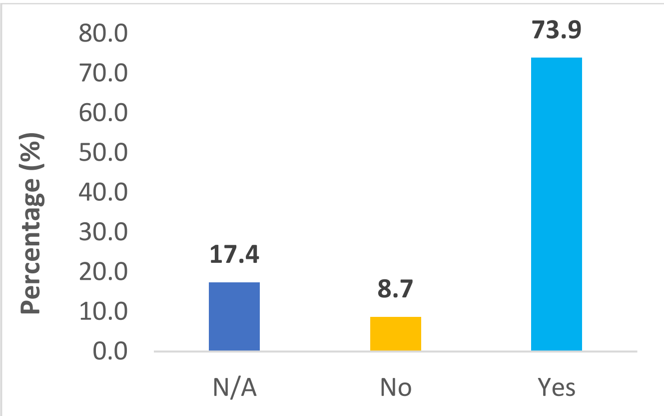

Figure 23. Awareness of OER in our discipline

Frequency of OER use in teaching and learning was determined by asking how often members of faculty used a series of resources, rated using a Likert scale, where 1 = never, rarely = 2, 3 = sometimes, 4 = often and 5 = always. As shown in Table 5, the mean score of all the responses was 1.1, indicating that generally, faculty members rarely used OER for teaching and learning. The most commonly used OER platforms/sources were the Directory of Open Access Journals, OER Commons and the Directory of Open Access Books. Other OER platform/sources, such as Saylor Academic, College Open Textbooks and MERLOT, were rarely consulted. This implies that the use of OER to enable and support more active forms of learning in a TEL environment should be encouraged at the institutional level. A systematic and evidence-based approach needs to be devised to promote better student engagement and learning.

Table 3. Frequency of the use of OER platforms for teaching and learning

	Rarely (1)	Sometimes (2)	Often (3)	Always (4)	Mean score
Directory of Open Access Journals	16	4	2	1	1.5
OER Commons	17	6	0	0	1.3
Directory of Open Access Books	19	2	2	0	1.3
Wiki Educator	20	2	1	0	1.2
Saylor Academy	22	0	0	1	1.1
College Open Textbooks	21	1	1	0	1.1
MIT OpenCourseWare	21	2	0	0	1.1
MERLOT	22	0	1	0	1.1
OpenLearn, UK	22	1	0	0	1.0
OpenStax College	23	0	0	0	1.0
BCcampus Open Textbooks	23	0	0	0	1.0
NPTEL, India	23	0	0	0	1.0

3.3.3 Competencies for Technologies in Teaching and Learning

A probe to determine what competencies faculty have for integrating ICT in teaching was done using a five-point Likert scale, where 0 = I can't use it, 1 = I can use it to a small extent, 2 = I can use it satisfactorily, 3 = I can use it well and 4 = I can use it very well.

The responses show that faculty members did not possess the required ICT skills for teaching with technology. This is evidenced by the mean score of 1.6 shown in Table 6. The data revealed that the respondents could satisfactorily use MS Teams/Zoom, online video/audio, e-books/e-textbooks and the Moodle LMS in their teaching and learning. However, they did not possess appropriate skills in accessibility tools for persons with disabilities.

This implies a strong need to sensitise and provide appropriate capacity training to faculty members on the use of technologies in teaching and learning, to enhance their competencies in ICT and in technology-driven transformations.

Table 4. Skills rating

	I can't use it (0)	I can use it to a small extent (1)	I can use it satisfactorily (2)	I can use it well (3)	I can use it very well (4)	Mean score
MS Teams/Zoom	4	1	4	7	7	2.5
Online video/audio	5	3	4	7	4	2.1
E-books/e-textbooks	4	3	7	7	2	2.0
Learning management system (e.g., Moodle)	4	4	7	6	2	1.9
Educational games/simulations	6	3	7	5	2	1.7
Online collaboration tools (e.g., Adobe Connect, Google Docs)	5	6	5	5	2	1.7
E-portfolio	5	9	5	3	1	1.4
Lecture capture tools	7	0	5	3	3	1.4
Social media (blogs, wikis, etc.)	8	7	4	3	1	1.2
Accessible tools (for persons with disabilities)	17	4	1	0	1	0.4

3.3.4 Training and Staff Development

While staff training is not a regular activity at the MIE, a probe to determine whether faculty received training on the use of ICT for teaching and learning found that more than half of the respondents (65.2%) agreed they had (Figure 24), while 60.9% indicated the MIE did not provide regular training on the use of new technologies for teaching and learning. However, the remaining 39.1% agreed the institution provided them with regular similar training (Figure 25). A significant percentage agreed they had participated in online training, while the remaining 30.4% did not (Figure 26). Respondents' participation in a massive open online course (MOOC) (52.2%) was relatively low, with 47.8% saying they had not (Figure 27). Regarding their awareness of MOOC platforms, most responded "no" to the various questions (Figure 28). Coursera was the most known among those listed (60.9%). Notably, 17.4% indicated awareness of MOOC platforms was not applicable to them.

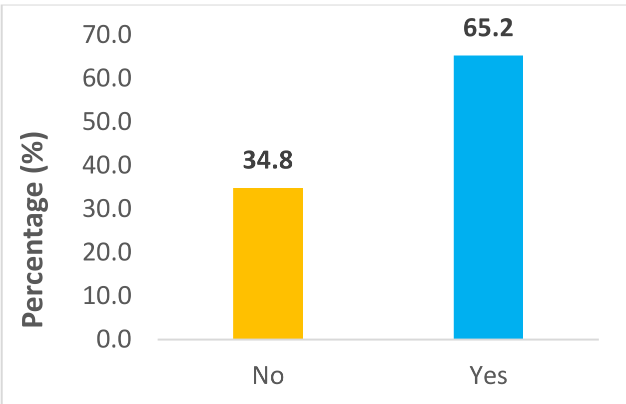

Figure 24. Training in the use of ICT for teaching and learning

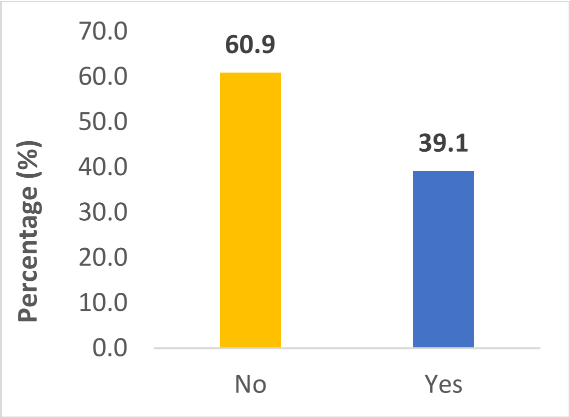

Figure 25. Regular training provided by the MIE

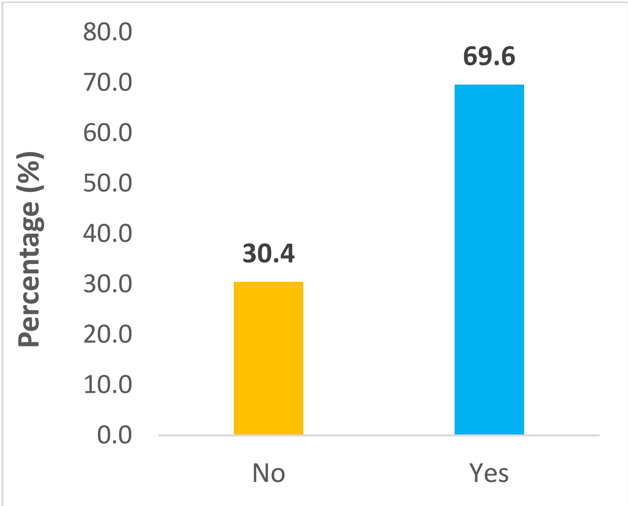

Figure 26. Participation in any online training

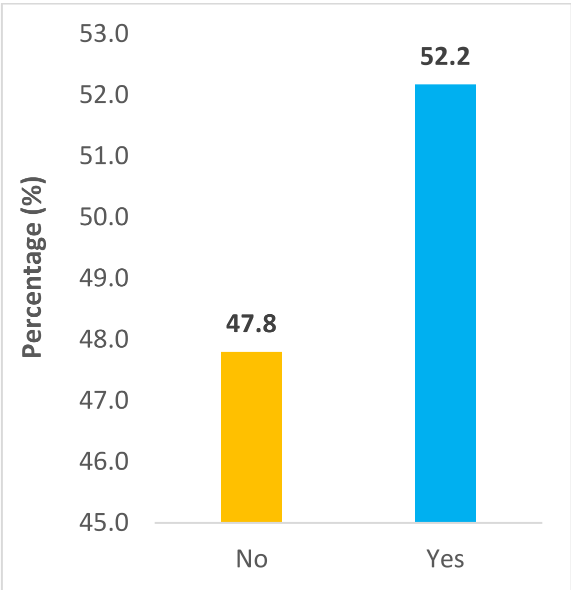

Figure 27. Participation in MOOCs

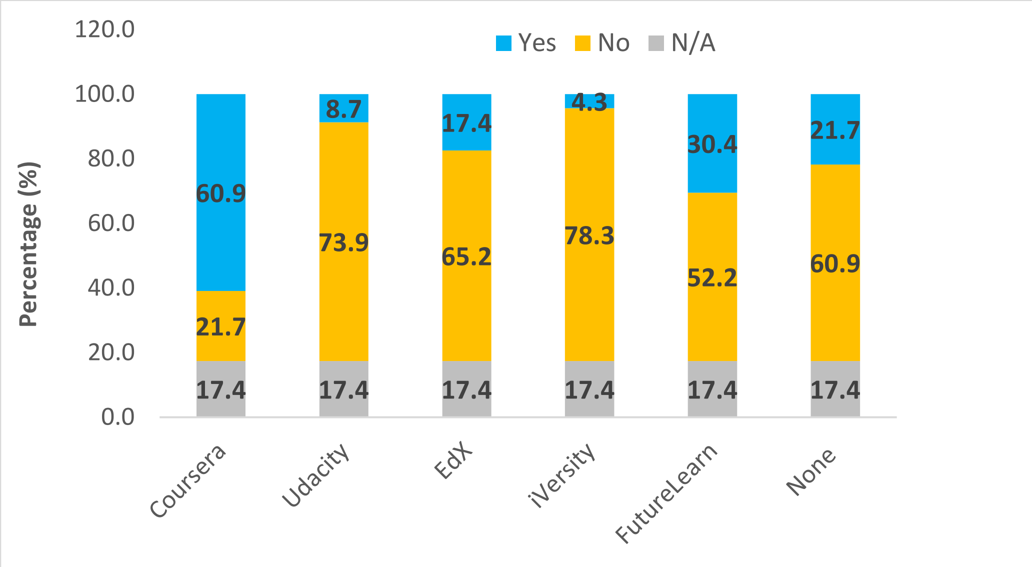

Figure 28. Awareness of MOOC platforms

3.3.5 Knowledge of TEL Policy Issues at the MIE

The survey collected information on faculty members' knowledge of TEL-related policy issues, with rating from 0 to 2 where 0 = do not know, 1 = no and 2 = yes, as presented in Figure 29. The data revealed that most of the respondents were unaware of the existing policies for TEL at the MIE. However, the respondents (n = 12) were aware of the workflow and escalation procedure for the repair and maintenance of ICT, together with the policy on plagiarism (73.9%). On average, more than 50% were not aware of any policies for TEL.

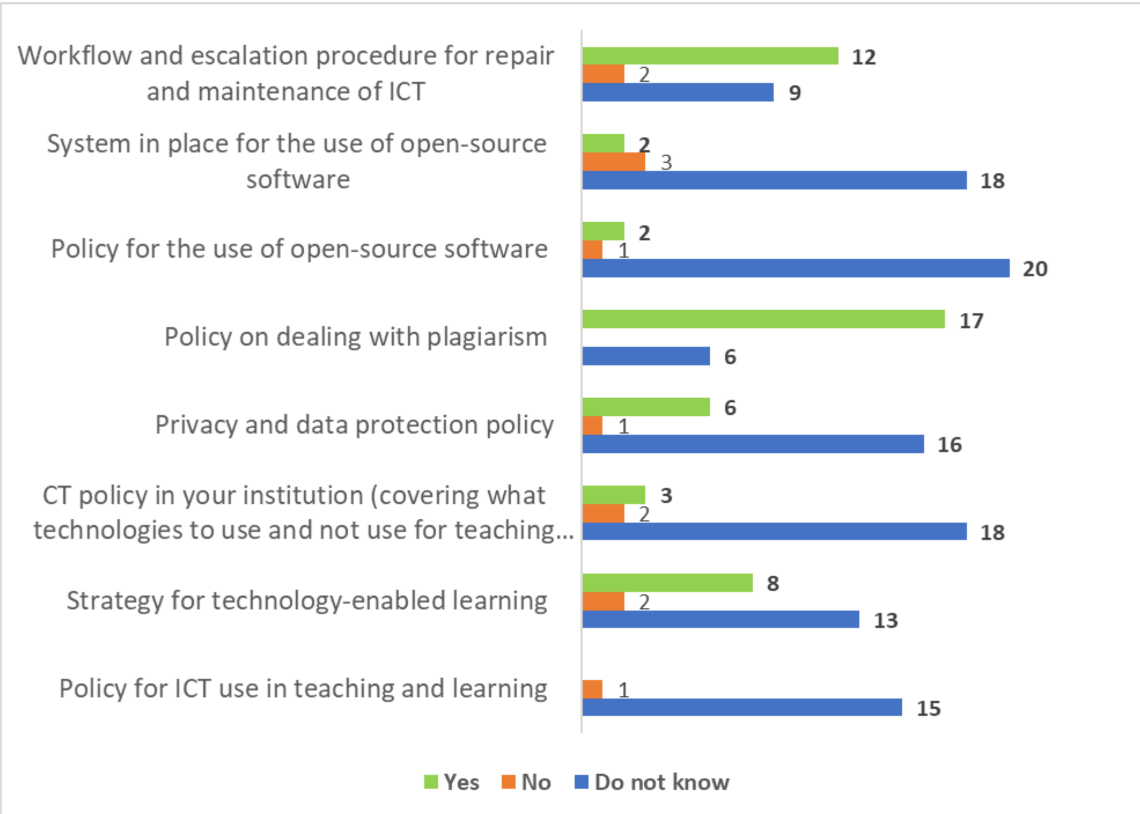

Figure 29. Awareness about policies for technology-enhanced learning

3.4 Use of ICT for Research and Scholarship

3.4.1 Access to e-Resources in Library

The library forms an integral part of the teaching and learning environment in any educational institution. Faculty members were probed to determine whether the library at the MIE provided subscription-based e-resources. Most of them (78.3%) had access to subscription-based e-resources, but 4.3% responded that they did not (Figure 30).

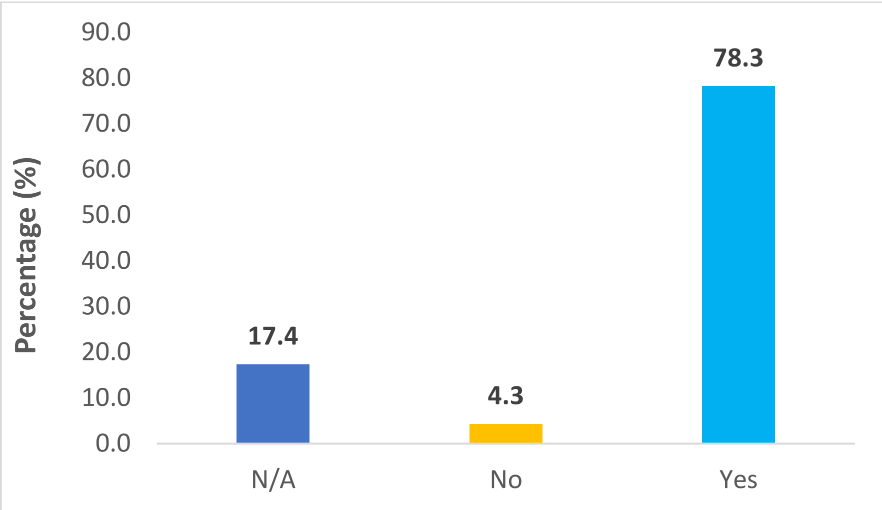

Figure 30. Access to subscription-based e-resources

3.4.2 Access to E-resources in the Library

Table 7 shows faculty members' responses about the kinds of library resources they regularly accessed for teaching and learning, measured on a Likert scale, where 0 = never, 1 = rarely, 2 = sometimes, 2 = often and 4 = always. The mean score is 1.4, indicating faculty rarely consulted the library's e-resources. The mean scores of e-journals (2.4), e-books (2.2) and e-theses and dissertations (1.6) indicated faculty sometimes used these, but they almost never consulted patent and statistical databases. This implies a need to create awareness about the availability of e-resources in the MIE library and to encourage faculty to effectively use them for teaching and learning.

Table 5. Frequency of use of library resources for teaching and learning

	Never (0)	Rarely (1)	Sometimes (2)	Often (3)	Always (4)	Mean score
E-journals	4	2	5	5	7	2.4
E-books	5	1	5	8	4	2.2
E-theses and dissertations	10	1	3	6	3	1.6
Citation databases	8	3	5	5	2	1.6
E-proceedings of conferences	8	3	9	2	1	1.4
E-newspapers	10	4	3	5	1	1.3
Statistical databases	14	5	3	0	1	0.7
Patent databases	16	4	3	0	0	0.4

3.4.3 Availability of Research Support

Resources that support research in an institution are critical components of learning in this technological era, as they facilitate the research process, documentation of findings, and evidence-based decision making. The faculty members' experiences with the resources, services and spaces provided by the institute to support research were measured on a Likert scale from 0 to 5, where 0 = not available, 1 = poor, 2 = fair, 3 = neutral, 4 = good and 5 = excellent. The mean score of 2.1 in Table 8 reveals faculty members had "fair" experiences with the resources, spaces and services provided by the MIE. It is important to note that the mean score for plagiarism detection software is 3.1, indicating a neutral experience, although this resource is provided by the MIE. Evidently, the institution needs to create awareness about the resources, services and spaces it provides to support the TEL environment.

Table 6. Experience regarding resources/services/spaces provided by the MIE

	Not available (0)	Poor (1)	Fair (2)	Neutral (3)	Good (4)	Excellent (5)	Mean score
Plagiarism detection software	4	1	2	2	10	4	3.1
Citation/reference management software	6	3	4	7	1	2	2.0
Access to data storage	6	4	5	4	1	3	2.0
Funds to support open-access publications	5	2	7	8	0	1	2.0
Data visualisation software	5	4	6	6	1	1	1.9
Institutional repository for sharing research	6	5	4	5	2	1	1.8

3.5 Perceptions About Using TEL

3.5.1 Attitudes Towards the Use of TEL

TEL supplements existing educational practices by triggering technology-enhanced transformation, thereby improving learning opportunities. Faculty members' perceptions about the use of TEL were assessed by evaluating the respondents' attitudes to a variety of statements, using a Likert scale with responses coded as 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree. Table 9 shows a mean score of 4.0, which confirms faculty had a positive attitude towards the use of TEL. The respondents agreed to the adoption of more TEL for the benefit of students. This response was consistent with the respondents' perception that TEL increases access to education and training, enhances the quality of teaching and learning because it integrates all forms of media, and increases the flexibility of teaching and learning. These findings support the view that faculty members are prepared to integrate technology in teaching and learning as well as to advance TEL implementation at the institute.

Table 7. Attitudes towards the use of TEL

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)	Mean score
Universities/institutions should adopt more and more technology-enabled learning for the benefit of their students.	0	1	6	5	11	4.1
Technology-enabled learning increases access to education and training.	0	0	5	11	7	4.1
Technology-enabled learning increases the quality of teaching and learning because it integrates all forms of media: print, audio, video and animation.	0	0	6	9	8	4.1
Technology-enabled learning will bring new opportunities for organising teaching and learning.	0	0	6	10	7	4.0
Technology-enabled learning saves time and effort for both teachers and students.	0	0	8	6	9	4.0
Technology-enabled learning increases the flexibility of teaching and learning.	0	0	6	10	7	4.0
Technology-enabled learning can solve many of our educational problems.	0	0	7	10	6	4.0
Technology-enabled learning increases my efficiency in teaching.	0	1	6	9	7	4.0
Technology-enabled learning enhances the pedagogic value of a course.	0	0	8	8	7	4.0
Technology-enabled learning enables collaborative learning.	0	1	6	10	6	3.9
Technology-enabled learning can engage learners more than other forms of learning	0	1	9	7	6	3.8
Technology-enabled learning improves communication between students and teachers.	0	2	8	6	7	3.8

3.5.2 Motivators to Use TEL

Motivating faculty members to embrace TEL practices is key for successful TEL project implementation. Members of faculty were probed to determine their motivation to use TEL, using a Likert scale for a number of factors, where 1 = very weak motivator, 2 = weak motivator, 3 = average motivator, 4 = strong motivator and 5 = very strong motivator.

Table 10 shows that one of the strongest motivations among the respondents was their personal interest in technology, supported with a mean score of 3.8. Other important motivations were intellectual challenge (3.5), self-gratification (3.4), training in technology-enabled learning (3.4) and improved infrastructure (hardware and software) deployment (3.4). However, credit towards promotion as well as peer recognition, prestige and status were identified as weak motivators for the use of TEL, substantiated with mean scores of 2.8 and 3.0, respectively.

Table 8. Self-motivators to use TEL

	Very weak motivator (1)	Weak motivator (2)	Average motivator (3)	Strong motivator (4)	Very strong motivator (5)	Mean score
Personal interest in using technology	5	0	1	6	11	3.8
Self-gratification	5	0	3	8	7	3.5
Intellectual challenge	6	0	2	8	7	3.4
Training on technology-enabled learning	6	0	3	7	7	3.4
Improved infrastructure (hardware and software) deployment	7	0	2	6	8	3.4
Release time/reduction in existing workload	7	1	1	5	9	3.4,
Better Internet bandwidth at workplace	7	0	3	5	8	3.3
Professional incentives to use technology-enabled learning	6	2	2	6	7	3.3
To be a trendsetter by early adoption of technology in education	7	0	4	5	7	3.2
Technical support	6	1	4	7	5	3.2
Peer recognition, prestige and status	8	1	3	5	6	3.0
Credit towards promotion	7	3	5	4	4	2.8

3.5.3 Barriers Impeding the Use of TEL

Faculty barriers to TEL were investigated using a Likert scale, where 1 = very weak barrier, 2 = weak barrier, 3 = average barrier, 4 = strong barrier and 5 = very strong barrier.

The results revealed, on average, an overall barrier to TEL, with a mean score of 2.8. Table 11 reveals four major barriers to TEL implementation as identified by the respondents: lack of time to develop e-courses, lack of instructional design support for TEL, concern about workload, and lack of technical support at the MIE. Other important barriers were the lack of institutional policy for TEL, lack of training in TEL and inadequate availability of hardware and software.

Table 9. Barriers to the use of TEL

	Very weak barrier	Weak barrier	Average barrier	Strong barrier	Very strong barrier	Mean score
Lack of time to develop e-courses	5	0	6	10	2	3.2
Lack of instructional design support for technology-enabled learning	5	1	6	8	3	3.1
Concern about faculty workload	6	2	7	1	7	3.0
Lack of technical support in the institution	5	1	8	6	3	3.0
Lack of institutional policy for technology-enabled learning	5	1	8	8	1	3.0
Lack of training on technology-enabled learning	5	2	9	5	2	2.9
Inadequate availability of hardware and software	6	2	7	5	3	2.9
Concern about students' access to technology	6	3	6	5	3	2.8
Concern about the quality of e-courses	6	1	9	5	2	2.8
Lack of incentives to use technology-enabled learning	5	3	10	3	2	2.7
Poor Internet access and networking in the institution	6	3	6	7	1	2.7
No role models to follow	7	2	6	6	2	2.7
Lack of credit towards promotion	6	3	8	4	2	2.7
Concern about security issues on the Internet	8	2	6	4	3	2.7
Lack of professional prestige	5	3	12	2	1	2.6
Intimidated by technology	10	1	5	3	4	2.6

3.6 Open-Ended Question

The last question asked faculty members to comment on the statement: "There is a need to develop a technology-enabled learning policy and strategy in your university." All the respondents strongly agreed. Respondents were also of the opinion that a TEL policy would drive technological innovation at the MIE. However, they believed that quality, transparency, equity and fairness should be applied in developing such a policy. The importance of regular capacity building was mentioned, along with faculty member accountability (Figure 31).

Figure 31. Word cloud illustrating the need for TEL policy and strategy at the MIE

Here are some of the responses:

> "Strategic plan mentions the use of ICT in teaching and learning, and innovation. However, a policy on TEL and strategy will be most welcomed."
>
> "There is a certainly the need to develop strategies and policies."
>
> "There is a strong need to develop Technology-Enabled Learning policy and strategy at the MIE because the benefits of using technology-enabled teaching and learning outweigh the barriers and we need to keep abreast of developments."

3.7 Summary and Conclusion

In a nutshell, the institution is ready for the implementation of a TEL policy. The symbolic commitment of the Director of the MIE in his opening speech during the TEL workshop evidently supports the advance of a TEL agenda. In terms of technology and infrastructure, the MIE already has a reliable system, which needs strengthening to provide enabling conditions to support and sustain the implementation of a TEL policy. Alongside this, the faculty members strongly support the need for a TEL policy at the MIE, and they are ready to embrace its implementation. In terms of technological devices, the MIE has provided a laptop to all its faculty members, and the Internet is accessible in all offices. Wireless connectivity is also accessible in most parts of the MIE premises. The findings further revealed that faculty members have a positive attitude towards technology and have an adequate level of ICT skills to explore technology in their teaching and learning. However, the design, development and delivery of authentic blended learning courses require more attention in terms of instructional design and personalised training for ongoing professional development and growth in TEL. The availability of appropriate software was cited as being essential for designing resources adapted to blended learning. Technical support was another important aspect considered crucial for sustaining TEL implementation. Faculty's low level of experience with OER signals an urgent need to reinforce sensitisation about using OER in teaching and learning, together with OER's pedagogical benefits for the teaching community. The MIE needs to sustain faculty motivators for engaging in TEL and address the barriers to TEL in a timely manner to ensure its successful implementation.

Chapter 4: Learners' Survey on the Use of Technologies for Learning

4.1 Learner Profile

The current student enrolment at the MIE is 900, and a participation rate of 36% was recorded for the Learner Survey. However, only 211 valid surveys were received. The respondents were MIE registered students (at Mauritius and Rodrigues) who were currently enrolled in one of the following programmes: Post-Graduate Certificate in Education; BEd (Secondary); BEd (Primary); Advanced Certificate in Education; Diploma in Special Education Needs; Certificate in Educational Management; Early Childhood Education Teacher's Certificate; Teacher's Diploma in Primary – Holistic Education; Proficiency Certificate; Foundation in Special Education Needs; and EdD. Most of the respondents were in either year 1 (60.3%) or year 2 (31.8%) of their programme of study.

4.1.1 Gender and Age Distribution

The gender distribution of the respondents was 85% female, 14% male and 1% preferring not to say (Figure 32). It is important to note that the respondents were predominantly young, with 67.9% under 41 years (Figure 33).

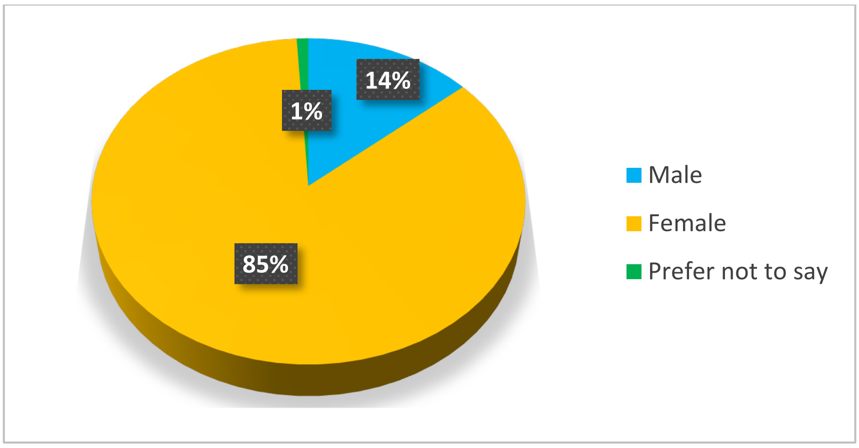

Figure 32. Gender distribution

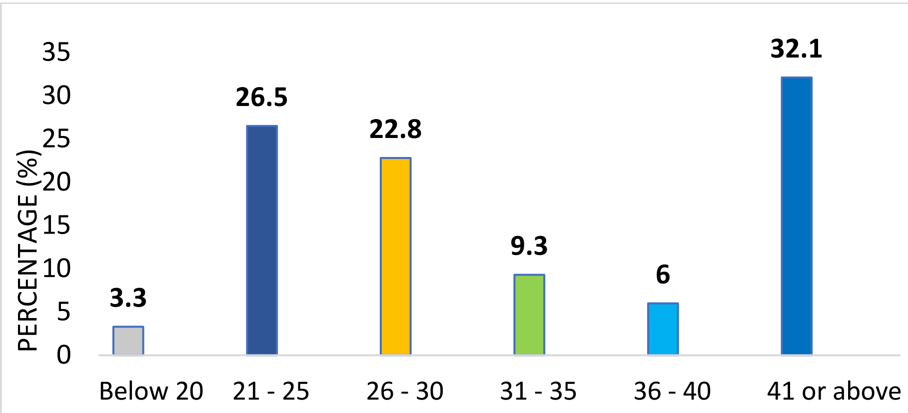

Figure 33. Age group distribution

4.1.3 Physical Learning Disability

In response to a question eliciting information about student disabilities, 1.7% of the respondents reported having physical or learning disabilities that require accessible or adaptive technologies for coursework.

4.1.4 Mode of Learning Delivery

Students were asked their mode of study, and the responses showed that most of them (85.3%) had online experience, as they were following courses being delivered in a blended mode, where some study components are done online.

4.2 Access to and Use of ICT

This section investigates learners' access to ICT devices both at home and on campus, as well as their access to the Internet, their frequency of Internet use and the specific devices they use. This part also displays learners' level of proficiency with ICT by assessing their comfort level with computer-related skills and activities, their social media presence and their participation in mailing lists and discussion forums. Finally, this segment assesses their experiences with resources that support TEL and the use of online courses.

4.2.1 Ownership and Access to ICT

Ownership of technological devices is crucial for accessing TEL resources. The survey revealed that most of the respondents owned either a smartphone (95%) or a laptop (89.8%). Smartphone was the most popular device (Figure 34). This preference might have been influenced by their age.

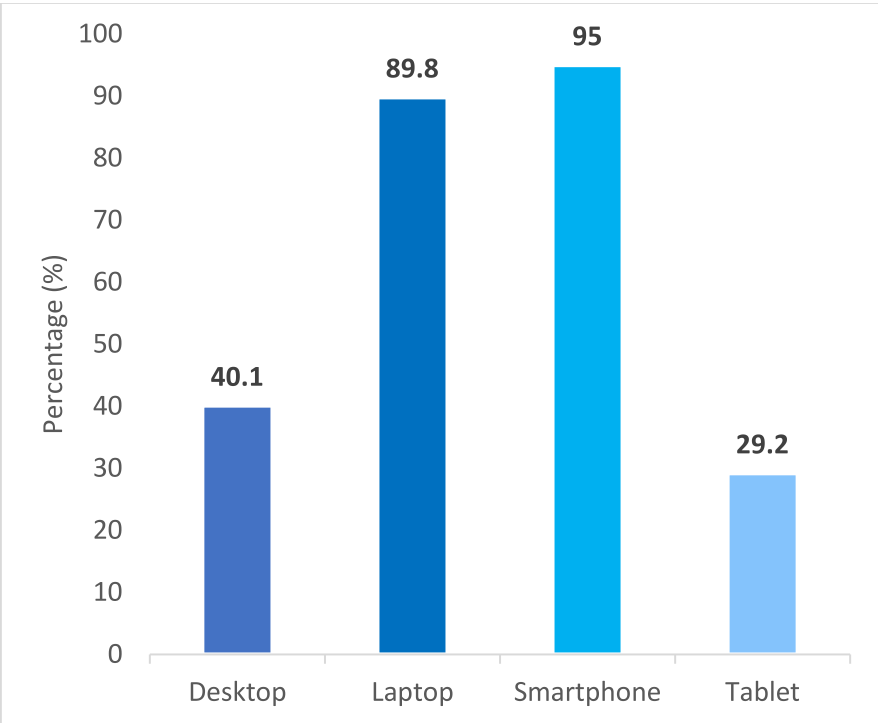

Figure 34. Ownership of ICT devices

On campus, 75.4% of the respondents used their personal laptop, while 39.2% used a desktop computer provided by the MIE.

4.2.2 Internet Access

Internet access is a pivotal element of TEL, so it is important to determine how comfortable learners are with Internet provision at the MIE. The majority of the respondents (95.8%) had broadband access at home and 30.2% at school, while 1.6% had no access to broadband (Figure 35). Most of the students accessed the Internet through either wireless or mobile devices. Nonetheless, a few respondents were still using a dial-up connection to access the Internet.

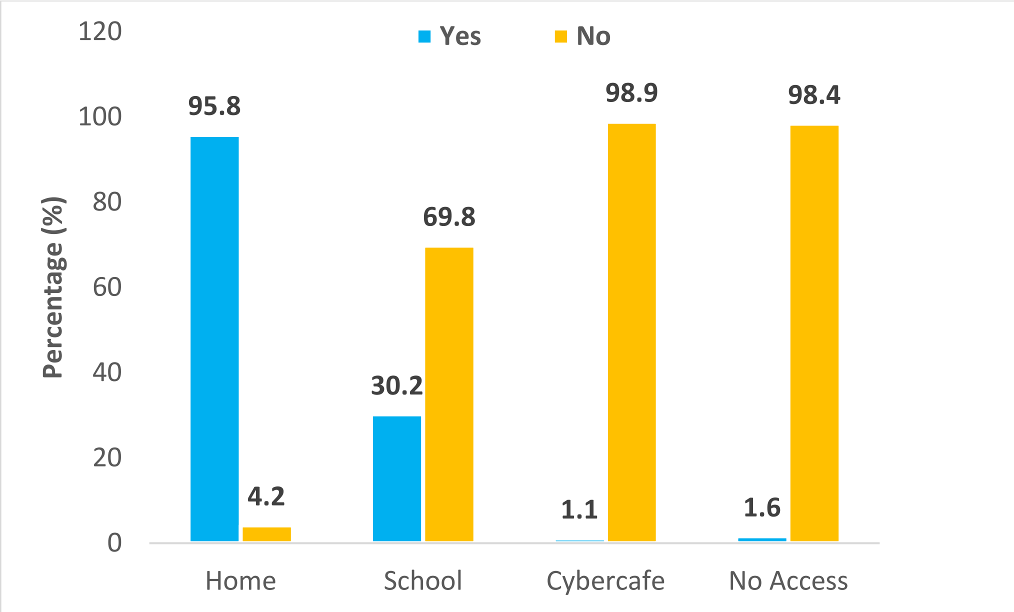

Figure 35. Internet access location

4.2.3 Frequently Used Devices to Access the Internet

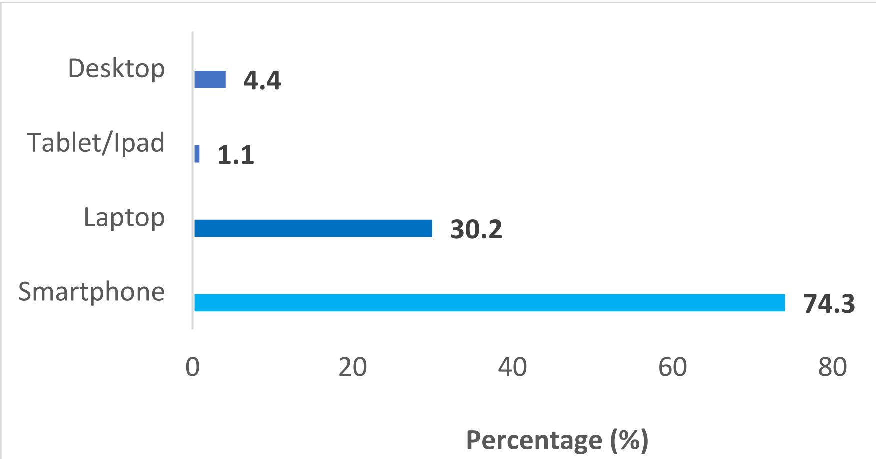

Figure 36. Frequency of device(s) used to access the Internet

The smartphone was the most frequently used device to access the Internet (74.3%), while 30.2% relied on a laptop. It was also interesting to note that 4.4% of the respondents used a desktop to access the Internet, and the remaining 1.1% used a tablet (including an iPad) (Figure 36). Moreover, 93.3% of respondents used the Internet daily, and 3.3% never accessed it. Figure 37 illustrates that 55% of the respondents spent a minimum of three hours daily on Internet-related activities, while the average amount of time spent was between one and two hours.

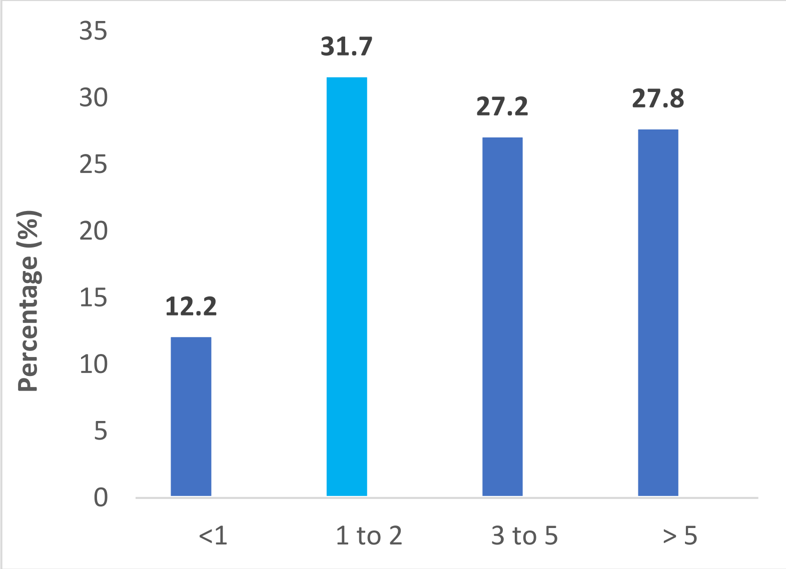

Figure 37. Daily average time spent on Internet-related activities

4.2.4 Broadband and Wi-Fi Access at the MIE

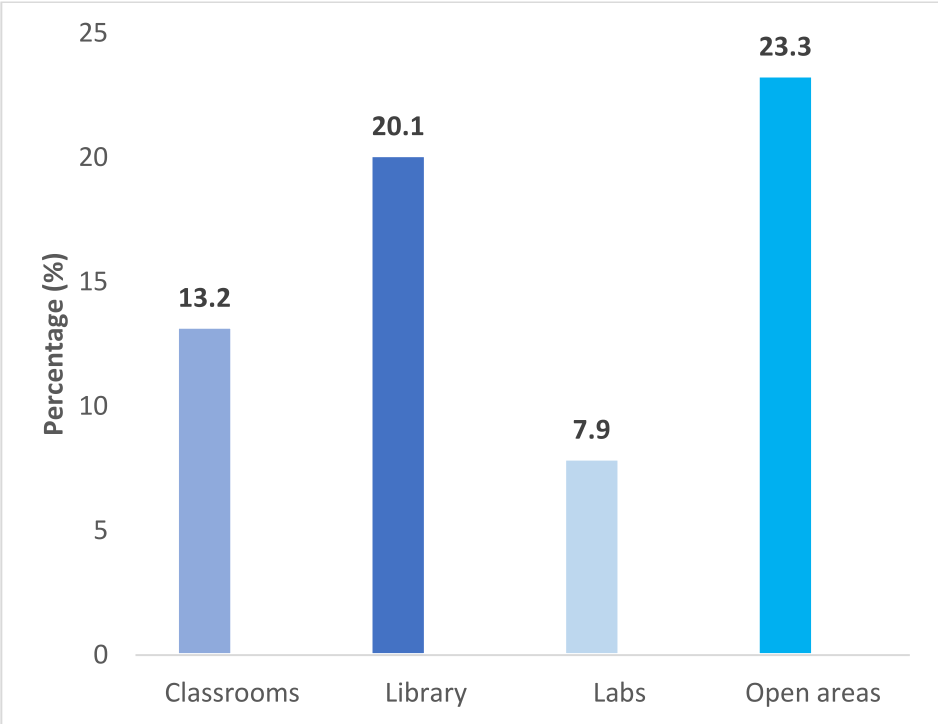

Figure 38. Broadband access on the MIE campus

High-speed Internet connectivity is key in this digital era. Hence, knowing where students access high-speed Internet is vital for strategically positioning the resources that support TEL, to ensure convenience and optimal use.

When the students were asked where they accessed high-speed Internet, they reported having broadband access in open areas (23.3%), the library (20.1%), classrooms (13.2%) and labs (7.9%) on the MIE campus (Figure 38). However, only 34.4% of the respondents had access to Wi-Fi on the campus.

4.2.5 ICT Skills in Computer-Related Activities

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 = use to a small extent, 2 = use satisfactorily, 3 = use well and 4 = use very well (Table 12)

Table 12 shows that the mean scores for email, word processor, communication platforms, search engine and presentation were between 2.4 and 2.9, which revealed that the respondents were most skilful in those computer-related activities. The mean scores for Web 2.0 (1.6), Moodle LMS (1.6) and video and graphics editing (1.4) indicated the respondents did not possess the relevant ICT skills to be able to skilfully engage in those activities. It is also important to point out that the low mean score of 0.9 for webpage design indicated respondents were least proficient in that activity.

Table 10. ICT skills in computer-related activities

	Very well (4)	Well (3)	Satisfactorily (2)	Small extent (1)	Can't use (0)	Mean score
Email	61	65	37	12	6	**2.9**
Word processor	50	71	43	12	5	**2.8**
Communication platforms	40	63	52	17	6	**2.6**
Search engine	48	47	46	21	17	**2.5**
Presentation	37	56	41	33	13	**2.4**
Spreadsheet	30	43	46	44	17	**2.1**
Web 2.0 tools	14	32	42	45	43	**1.6**
Learning management system	16	33	36	46	45	**1.6**
Database	17	28	30	64	33	**1.6**
Digital audio	11	27	40	54	45	**1.5**
Video editing	9	30	29	56	52	**1.4**
Multimedia authoring	14	19	41	56	44	**1.4**
Graphic editing	11	16	32	50	67	**1.2**
Webpage design	8	15	23	39	91	**0.9**

4.2.6 Social Media and Mailing List/Discussion Forums

Most of the learners (88.8%) had a social media account, while 11.2% did not; 33.1% of the respondents spent one to two hours on social media, while 26% spent a minimum of three hours daily, and 7.7% of the respondents did not use social media on a daily basis. Figure 39 shows that Facebook was the most popular social media platform used by the respondents (85.5%), followed by photo-sharing (35.2%) and social bookmarking (24.4%) platforms. The study indicated that more than 50% of the respondents did not frequently update their social media profile, while 12.1% did not update it at all. On the other hand, 18.2% of the respondents updated their social media account at least once per day, and the remaining 13.2% did so either weekly or fortnightly (Figure 40).

When asked about mailing lists and discussion forums, 62.9% of the learners reported not being a member of any, while 37.1% of them were a member of either a mailing list or a discussion forum. However, all learners were subscribed to email-based discussions, where most of them (91.0%) were subscribed to between one and five email-based subscriptions, and the remaining 9.0% had more than five subscriptions. With respect to moderating discussion forums and mailing lists, 66.3% of the respondents were not involved in doing so, while 33.4% were engaged in that activity. The data also revealed that 65% of the learners did not frequently post to discussion forums and mailing lists, but 13.6% of them posted at least once to a discussion forum or mailing list at least once a day (Figure 41).

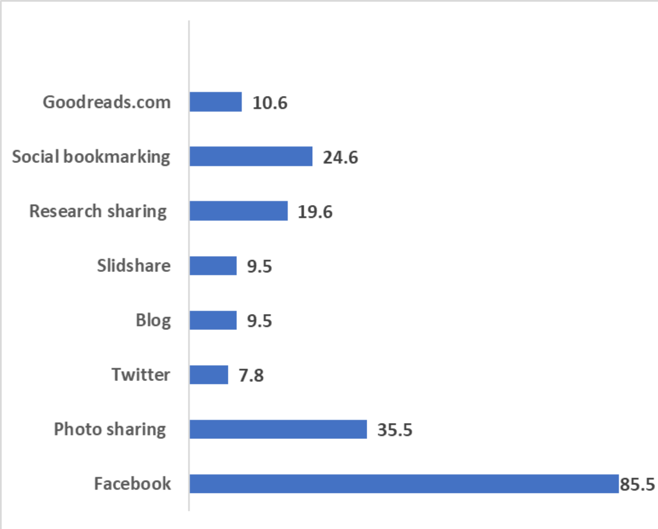

Figure 39. Usage of social media platforms

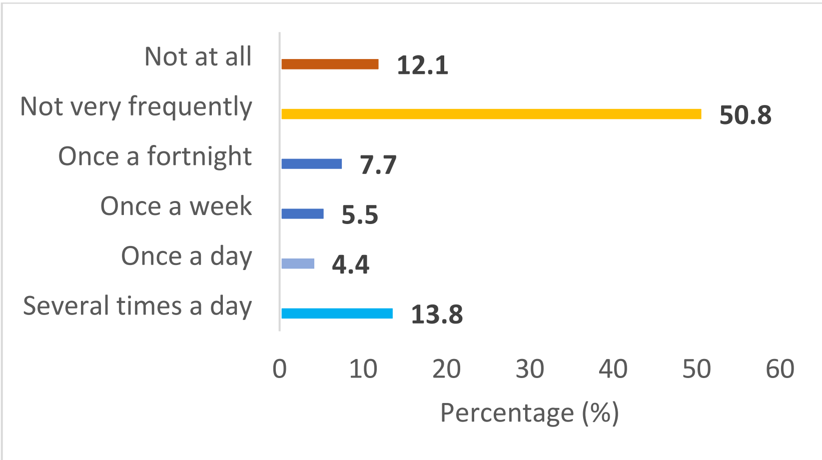

Figure 40. Frequency of updating social media account

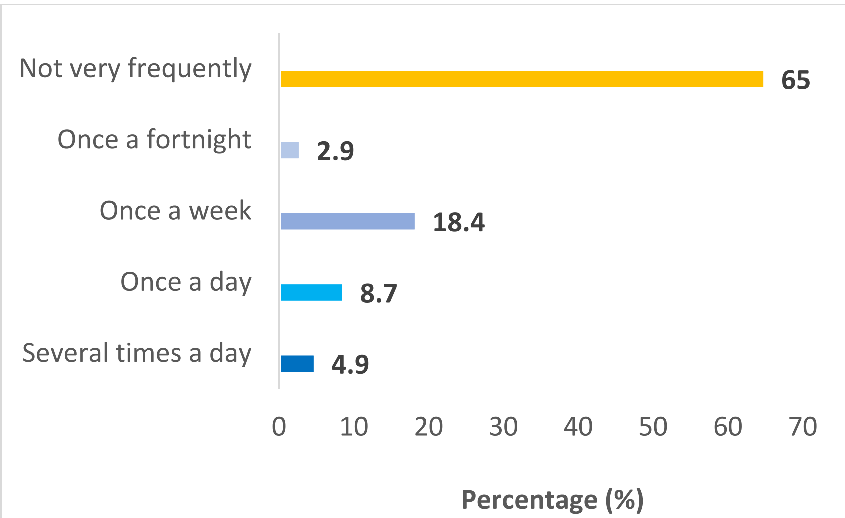

Figure 41. Frequency of posting to discussion forum/mailing list

4.2.11 Experiences with TEL Resources/Services/Spaces Provided by the MIE

The learners were asked to rate their experiences with a number of resources and services provided by the MIE. This was assessed using a Likert scale, where 0 = not available, 1 = poor, 2 = fair, 3 = neutral, 4 = good and 5 = excellent.

The findings in Table 13 reveal that the level of experience ranged from fair to nearly good, implying the learners had a good experience with MS Teams/Zoom, email services, plagiarism detection software, learning management software and e-books provided at the institutional level, and a fair experience with e-portfolios, Wi-Fi access, statistical databases, network bandwidth and access to software. This points to a need to improve and upgrade these services, make the appropriate software available and have orientation sessions to increase students' sensitisation to statistical databases, e-proceedings of conferences and patent databases.

Table 11. User experience with resources/services/spaces provided by the MIE

	Not available (0)	Poor (1)	Fair (2)	Neutral (3)	Good (4)	Excellent (5)	Mean score
MS Teams/Zoom	1	2	18	25	82	39	3.8
Email services	7	5	25	35	72	23	3.4
Plagiarism detection software	9	16	19	40	60	17	3.1
Classroom facilities	12	16	25	43	57	15	3.0
LMS	13	8	26	44	56	16	3.0
E-books	12	11	25	42	60	9	3.0
Download and use of free and open-source software	11	19	26	58	39	9	2.8
E-journals	14	15	27	51	45	7	2.7
Access to data storage	14	18	16	69	36	7	2.7
E-newspapers	14	16	26	57	38	6	2.7
Internal repository for sharing research	14	16	21	67	32	5	2.7
Computer labs	23	18	22	42	46	11	2.6
Bibliographic databases	17	17	21	58	38	6	2.6
Online/virtual technologies	15	20	22	65	33	4	2.6
Citations databases	17	17	22	64	32	5	2.6
E-theses and dissertations	16	38	24	61	30	3	2.6
Data visualisation software	19	21	17	68	29	5	2.5
Citation/reference management software	16	23	25	55	35	4	2.5
Support for maintenance and repair of ICT	16	29	16	66	27	6	2.5
E-portfolio	19	17	19	59	44	4	2.4
Wi-Fi access	23	32	16	52	38	3	2.4
Statistical databases	22	21	17	68	26	2	2.4
E-proceedings of conferences	23	21	16	71	23	2	2.4
Network bandwidth	16	27	23	55	37	5	2.3
Patent databases	22	23	17	69	21	3	2.3
Access to software	26	33	17	57	28	2	2.2

It can be deduced that the respondents had an excellent experience with MS Teams/Zoom, but fair to poor experiences with e-journals and e-theses and dissertations, respectively. Some also reported that software was inaccessible. Overall, most of the TEL resources, services and spaces provided by the MIE were rated in the range of fair to neutral.

4.2.12 Engagement with MOOCs through Any Institution/Organisation

Figure 42 illustrate that 22% of the respondents had taken a MOOC through an institution or organisation; 17% had completed it, while the remaining 5% had not. On the other hand, 15% of the respondents had not engaged with a MOOC but were aware of MOOCs. Most importantly, 67% neither had engaged with a MOOC nor were aware of them.

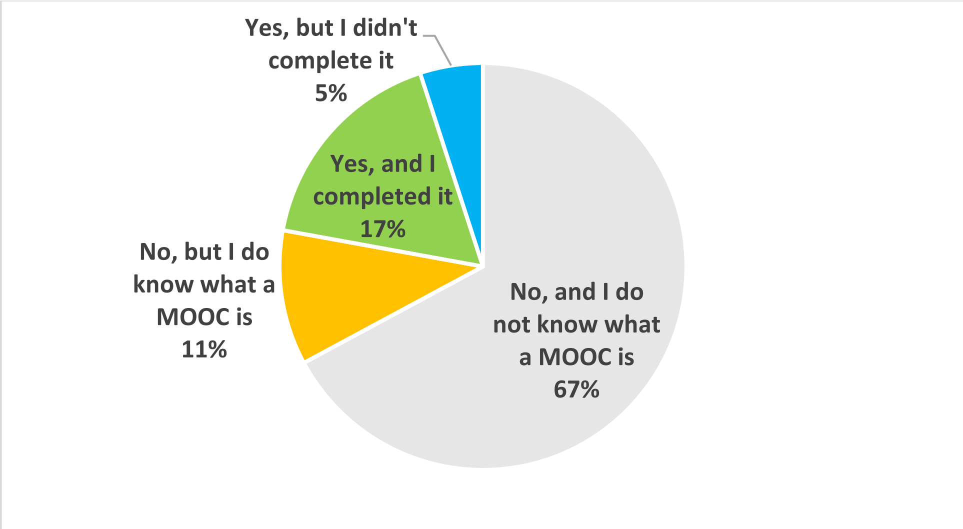

Figure 42. Engagement with MOOCs through any institution/organisation

4.3 Perceptions About the Use of TEL

4.3.1 Reasons for Using Technologies When Studying

Learners' perceptions about the use of TEL were evaluated from their responses to a range of statements on technology, using Likert scale items where 1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree and 5 = strongly agree. Table 14 indicates that students' reasons for using technologies when studying yielded a mean score of 1.9, implying they did not have a positive attitude towards the use of technology in their studies. It is important that students develop a positive attitude towards the use of technology to experience the potential benefits. This can be achieved by frequently exposing students to TEL learning environments, coupled with appropriate necessary training to improve their digital skills. By actively engaging students in similar learning situations, their expectations about and conceptions of learning with technology will be progressively influenced by their positive experiences. Students will thereby become familiar with, gain more confidence about and feel comfortable learning with technology.

Table 12. Reasons for using technologies when studying

I want to use technologies in my studies because…	Strongly agree (5)	Agree (4)	Neither agree nor disagree (3)	Disagree (2)	Strongly disagree (1)	Mean score
It makes completing work in my subjects more convenient.	51	95	16	1	51	3.2
It will help me get better results in my subjects.	9	70	16			1.62
It motivates me to explore many topics I may not have seen before.	8	81	5	1		1.66
It will help me understand the subject material more deeply.	5	77	13			1.62
It allows me to collaborate with others easily, both on and outside of the campus.	9	79	6	1		1.66
It will improve my IT/information management skills in general.	15	76	3	1		1.72
It will improve my career or employment prospects in the long term.	8	73	13	1		1.62

4.3.2 Perceived Usefulness of Technologies in Current and Future Studies

The respondents were required to rate how useful they perceived different technologies to be for their current and future studies. A scoring rubric of 0 = not useful at all, 1 = useful to a limited extent, 2 = neutral, 3 = useful, 4 = very useful and 5 = do not know was employed to analyse the data in Table 15. The findings revealed that the students believed only three out of the list of technologies provided were useful in their studies, while the remaining were considered less useful. This implies that students have limited exposure to technologies in their studies. It is important to recognise that appropriate use of technologies and digital tools for the advancement of TEL practices is essential at the MIE. It is equally vital that faculty members integrate pertinent and accurate technologies in the design of TEL-friendly learning activities, pedagogical resources and communication activities, as well as efficient student support mechanisms to enhance students' engagement and learning experiences. Raising awareness and building the capacities of faculty members will significantly contribute to enhancing their intellectual skills for effectively using technology and successfully implementing TEL. Similarly, relevant training should be dispensed to students to develop their intellectual skills for active participation in the learning process.

Table 13. Perceived usefulness of technologies in current and future studies

Use of technologies	Not useful at all (0)	Useful to a limited extent (1)	Neutral (2)	Useful (3)	Very useful (4)	Do not know (5)	Mean score
Receive alerts about course information (e.g., timetable changes, the release of new learning resources, changes in assessment) via text message on your mobile phone	0	6	9	64	83	4	3.4
Use instant messaging/chat (e.g., WhatsApp, Skype, Messenger, Hangout, etc.) on the Web to communicate/collaborate with other students in the course	0	6	12	53	91	1	3.4
Use your mobile phone to access web-based institution services or information (e.g., enrolment, paying fees)	0	9	22	69	65	1	3.2
Use microblogging (such as Twitter) to share information about class-related activities	0	40	47	19	18	21	2.5
Keep your own blog as part of your course requirements	0	45	50	15	15	19	3.4
Design and build webpages as part of your course	0	49	39	9	22	16	2.4
Contribute to another blog as part of your course requirements	0	18	45	11	14	18	2.7
Contribute with other students to the development of a wiki as part of your course requirement	0	67	41	6	8	11	1.9
Use an e-portfolio system to record your achievements for future use beyond the course of your studies	0	69	26	2	10	12	1.9
Use a personal dashboard on the MIE intranet to access all your academic information related to courses, grades, etc.	0	60	27	1	13	7	1.9
Use a social media networking platform (e.g., Facebook) on the Web to communicate/collaborate with other students on the course	0	67	22	7	10	6	1.8

Use the Web to share digital flies related to your course (e.g., photos, audio files, movies, digital documents, websites, etc.)	0	84	25	4	9	3	1.6
Receive grades/marks from your lecturer via text message on your mobile phone	0	62	16	3	12	9	1.9
Use instant messaging/chat (e.g., Skype, Messenger, Hangout, etc.) on the Web to communicate with teachers and administrative staff from the course	0	73	26	4	7	6	1.7
Create and present audio/video as part of your course requirements	0	66	21	2	13	5	1.8
Use web-conferencing or video chat to communicate or collaborate with other students in the course	0	83	22	1	11	3	1.6
Create and present multimedia shows as part of your course requirements (e.g., PowerPoint)	0	73	12	1	17	4	1.8
Use the Web to access institution-based services (e.g., enrolment, paying fees)	0	65	25	1	10	4	1.7
Receive alerts about course information (e.g., timetable changes, the release of new learning resources, changes in assessment) via RSS feeds on the Web	0	62	22	1	11	5	1.8
Receive pre-class/post-class discussion questions from your lecturer via text message on your mobile phone	0	66	19	2	7	7	1.7
Download or access online audio/video recordings of supplementary content materials	0	69	14	1	8	1	1.5
Download or access online audio/video recordings to revise content of lectures you have already been to	0	61	15	1	6	2	1.5
Download or access online radio/video recordings of lectures you could not attend	0	60	15	1	6	2	1.5

4.3.3 Attitudes Towards Using Technologies for Learning

The respondents were asked to rate their extent of agreement with general attitudinal statements about technology use. Table 16 employs a scoring rubric where 1 = do not know, 2 = useful to a limited extent, 3 = neutral, 4 = useful and 5 = very useful.

The findings indicate that students' attitudes towards the use of technologies in learning was broadly positive, as revealed from the data. As the average mean score is below 3 in most cases, it may appear that students' attitude toward technology use was negative. However, most of the statements are negatively worded, so the lower scores indicate a positive student disposition.

Table 14. Attitudes towards the use of technologies in learning

Use of technologies	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean score
Attitudes towards use of technologies for learning						
I am more likely to skip classes when materials from course lectures are available online.	28	38	74	4	2	**2.4***
Technology interferes with my ability to concentrate and think deeply about subjects I care about.	63	38	34	3	21	**2.3***
I am concerned about cyber security (password protection and hacking).	99	17	2	5	42	**2.2***
I wish my lecturers/professors at the MIE would use and integrate more technology in their teaching.	65	62	7	5	25	**2.2**
I am concerned that technology advances may increasingly invade my privacy.	69	56	16	3	21	**2.1***
Multitasking with my technology devices sometimes prevents me from concentrating on or doing the work that is most important.	68	45	27	3	17	**2.1***
In-class use of mobile devices is distracting to me.	51	56	33	3	7	**2.1***
In-class use of mobile devices is distracting to my teacher.	67	55	19	13	9	**2.0***
When it comes to social media (e.g., Facebook, Twitter, LinkedIn), I like to keep my academic life and social life separate.	90	9	1	2	0	**1.2**

* Score indicates a positive response, as the sentences are negatively worded.

4.3.4 Open-Ended Question

Students were asked to respond to the comment: "There is a need to improve the technology-enabled learning in your institute." Students were optimistic about TEL implementation at the MIE and suggested areas for improvement such as better network access, greater Internet bandwidth and more training in computer-related skills. It is evident that most of the students use technology to a large extent in their daily lives. Using technology for teaching and learning would help them be better engaged with their learning content, connected with their peers and prepared for the challenges of the 21st century. Figure 43 captures highlights in a word cloud.

Figure 43. Word cloud of students' responses to open-ended question

The word cloud draws the attention to key aspects such as improved Wi-Fi connectivity on campus, adequate and timely technical support, proper training in ICT skills for computer-related activities, training of faculty members to effectively use ICT tools in teaching and learning, reviewing online activities, enriching online learning experiences, integrating online learning — including live sessions on conventional teaching that offers flexibility in learning — and exploring other LMSs to augment the quality of TEL.

Here are some of the responses:

> "When it comes to online learning, connection may vary at times. Therefore increasing broadband will facilitate the learning process on both sides."

> "Give free access to Wi-Fi in classes . . . I would like to be equipped with the technology knowledge, animation for my video class, PowerPoint presentation etc."

> "I believe live sessions are important. It saves time concerning travelling and giving time to family. I think we need to come to the MIE only if there is practical work or things which are not possible on live sessions."

Chapter 5: Findings and Recommendations

Findings

Institutional Review

As per COL's *TEL Implementation Handbook*, the scores for MIE preparedness tallied to 102; this was in the 95–129 score range, indicating that the MIE is "developing preparedness." This implies it has put in place some of the aspects of a TEL system, policy and infrastructure and is in the process of developing a robust system.

The findings of the baseline survey indeed revealed that the MIE has a robust ICT infrastructure in place. However, there is a strong need to consolidate the existing system for optimal use. Concerns were raised about hardware and software accessibility, reliability, currency, relevance, monitoring and regular updates. Leadership at the institutional level remains key in successfully implementing TEL, and it is of utmost importance to point out that the Director of the MIE is committed and supportive and will be involved in the implementation of TEL at the MIE.

Some key findings of the faculty member survey and student survey are below.

Faculty Survey

Faculty members' readiness to use technology signals a strong willingness to embrace more ICT tools in their teaching and learning, which would lead to technology-based innovations. This would be possible through a customised series of capacity-building activities for faculty members to ensure they were better equipped with the appropriate ICT skills. The accessibility of relevant and current software to improve TEL practices was also highlighted. It is evident that faculty members are willing to learn about new technology in the institution. Nonetheless, forging collaboration among faculty members would be necessary to develop a culture of knowledge creation and sharing that is impactful in the institution. Awareness and use of OER and MOOCs in teaching and learning is one of the major challenges reported by faculty members participating in the study. This implies an urgent need to create awareness about the availability and use of OER and MOOCs for teaching and learning. The MIE should include an OER policy that addresses the use of OER as quality and cost-effective resources to complement its teacher education programmes. To increase its visibility, the MIE should also set up its own open access repository by creating openly licensed course content and course packs that can be shared with the world as OER.

The MIE ICT Policy, which is more than a decade old, should be reviewed, keeping in mind the rapid changes taking place in education technology. TEL should be an integral part of the policy document to better support TEL implementation. Added to that, the MIE should further enhance its flow of communication to better articulate MIE policies. With clear and transparent information flow to faculty members and learners, awareness will grow organically, and staff and students will avail themselves of the opportunities that TEL offers. Security while working online was another important concern pointed out by faculty members.

As per the MIE's Strategic Plan 2018–2022,[5] the institution was to convert its existing courses into online or blended formats and ensure that 50% of its courses were dispensed through

[5] http://portal.mie.ac.mu/wp-content/uploads/2020/03/Updated_27-Aug-18_MIE_StrategicPlan_2018.pdf

online modes by 2020. This goal has not been met. With the opportunities that a TEL Policy would bring to the MIE, this strategic action could be achieved in a realistic manner.

With respect to the motivations for and barriers to using TEL, it is interesting that one of the strongest motivations among the faculty members was their personal interest in technology, followed by intellectual challenge, self-gratification, training in TEL, and improved infrastructure (hardware and software) deployment. Notably, credit towards promotion and peer recognition (prestige and status) were identified as weak motivators. The major barriers to using TEL were lack of time to develop e-courses, lack of instructional design support for TEL, concern about workload, and lack of technical support in the institution. Other important barriers were lack of institutional policy for TEL, lack of training in TEL, and inadequate availability of hardware and software.

Based on the faculty survey findings, it is essential that the MIE adopt TEL as an effective and efficient mode of delivering quality education in both conventional and blended modes. Moreover, it is important to point out that TEL implementation also envisages that faculty members will use ICT effectively for teaching their existing courses. The positive attitudes towards TEL displayed by faculty members send a strong signal that they would contribute to the successful implementation of TEL. Alongside this, it is of utmost importance to highlight that faculty members agreed a TEL policy is long overdue.

Student Survey

Student respondents were predominantly comfortable with technology use, owning and commonly using smartphones and/or laptops. Those students without access to their own ICT devices used the computer labs on campus. The majority of the students had broadband access at home and were daily Internet users. The Internet was mostly accessed from home. Students had access to broadband connectivity on campus, but they complained about poor Wi-Fi connectivity. The findings revealed that students rated their skills in computer-related activities from fair to neutral, which implies that training on specific skills in computer-related activities should be strengthened. The survey also highlighted the popularity of social media, indicating students' ease with using technology. Another positive point was that students were subscribed to mailing list or discussion forums. However, students did not commonly participate in MOOCs, implying they should have better exposure to MOOCs and appreciation of their importance in teaching and learning. It was interesting to note that students perceived the benefits of TEL for improving their career and IT skills, fostering collaboration with others, completing tasks more easily, increasing their motivation to explore novel topics, or boosting their scores. Likewise, students perceived the usefulness of specific technologies for their studies. This implies they understand the importance of technology and demonstrates their readiness to embrace TEL in their programmes of study. Moreover, students highlighted a valid wish for faculty members to integrate more technology in their teaching. Two important concerns that echoed those of faculty members were privacy and cyber security.

Recommendations

Based on the above-mentioned findings, the following recommendations are proposed:

- Commitment of the MIE to seek approval of the TEL Policy at its Council and actively engage with the implementation phase. This will enable the MIE to institutionalise the TEL Policy and develop other TEL-related policies, such as an OER Policy and a User

Privacy and Data Protection Policy; the latter should be guided by the Data Protection Act 2017.[6]

- Establish a TEL Steering Committee for taking decisions, guiding TEL implementation, and reviewing the institution's TEL Policy. The reporting structure should be embedded in the existing MIE governance structure, enabling a seamless bi-directional flow of information and views between management, faculty members and the student community.
- The MIE should establish a comprehensive, transparent, well-understood process for the management and governance of TEL. This should be supported by an effective and efficient communication mechanism. Otherwise, the MIE TEL Policy will not be embraced by everyone, as lack of information might lead to disillusionment and dissent among academic staff.
- Consolidate the MIE's technology and infrastructure to foster enabling conditions for TEL practices and provide high-quality, effective and efficient technical support to faculty members and students. Enhancing the digital environment will further motivate faculty members to engage with TEL to advance technology-based innovation in their teaching and learning.
- Conduct OER and MOOC training sessions to sensitise faculty and students, and integrate the use of OER and MOOCs into e-content development, including assessments.
- Building the capacities of faculty members is one of the critical factors for improving their ICT skills and use of technology for teaching and learning while adopting scholarly approaches to teaching with technology and enhancing student learning experiences. Likewise, appropriate professional development for students should also be envisaged. This holistic approach will contribute towards successful implementation of TEL, thereby equating quality teaching with technology.
- The MIE should invest in an open access repository to encourage faculty members and students to engage in open content creation and sharing, and to increase the institution's visibility.
- The MIE should encourage partnership at the institutional level among various schools/departments, and at the international level via more exchange programmes with reputable institutions/organisations advocating for TEL. This would allow the sharing of good practices as well as the benchmarking of best practices with those at similar institutions in Mauritius and around the Commonwealth.

[6] https://dataprotection.govmu.org/Pages/The%20Law/Data-Protection-Act-2017.aspx

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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

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