



An Investigation on the Preference Approach in Experiencing Open and Distance Learning Methods

Masyitah Md Nujid^{1*}  <https://orcid.org/0000-0002-4332-5361>, Duratul Ain Tholibon²  <https://orcid.org/0000-0002-2729-2694>

¹School of Civil Engineering, College of Engineering, Universiti Teknologi MARA, Cawangan Pulau Pinang, Permatang Pauh Campus, 13500 Pulau Pinang, Malaysia

²School of Civil Engineering, College of Engineering, Universiti Teknologi MARA, Cawangan Jengka, 26400 Bandar Tun Razak, Pahang, Malaysia

e-mail: ^{1}masyitahnujid@gmail.com

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ABSTRACT

Open and distance learning (ODL) has become an alternative in teaching and learning (T&L) while the COVID-19 pandemic crisis struck the world globally in December 2019. However, the preferred tool and platform to be chosen in the transition period among students remain uncertain. The purpose of this study was to assess and investigate the effect of T&L preference techniques and technologies chosen by employing ODL in universities during the pandemic. This research adopted a descriptive approach and a quantitative survey was used to collect the necessary data. The questionnaire consisted of 14 questions and was separated into two parts: demographic information and undergraduate students' preference towards online class technology during the COVID-19 pandemic. Four themes and 16 sub-themes were identified in the set of questions in the survey. The results of the analysis revealed that ODL is the preferred method with WhatsApp social media platform as the medium for communication between educators and learners. Educators might consider devoting additional attention to improving teaching and learning practices in open and distance learning in choosing the right approaches and platform to be used through online and offline classes.

INTRODUCTION

After a year, the COVID-19 (C-19) pandemic struck the world globally with a very dangerous disease. The world faces an extraordinary health crisis that affects economic and social interaction due to the spread of the virus. The outbreak has changed the way people live socially and physically. All sectors face tremendous challenges and impacts in dealing with the pandemic.

In order to reduce the contagious disease from C-19 the governments around the world had implemented few strategies among are by imposing lockdown, social/physical distancing, avoiding face-to-face teaching and learning (T&L), and immigration restrictions (Qazi et al., 2020). All countries in the world, including Malaysia, are affected by the disease. In Malaysia, the first case of COVID-19 was detected in Malaysia on 25th January 2020 and the number of cases increased exponentially in March 2020 (Azlan et al., 2020). On 18th March 2020, the government imposed the Movement Control Order (MCO), among them are six restrictions, including the prohibition from attending mass gatherings; health screening for COVID-19 detection and self-isolation after returning from foreign countries; the

restriction of foreign tourists and visitors from entering Malaysia; the closure of nursery, primary, and secondary schools, as well as public and higher education institutions and skill training institutes nationwide; and the closure of government and private premises, except for essential services. To control the spreading of the virus, it is urged to practice social distancing as preventive measures to limit social activities and services that affect the economy, trade, tourism, and education industries. The effects of COVID-19 in daily life changed to home delivery services, the shift to online lessons, and the adoption of remote working solutions.

COVID-19 pandemic has affected almost all countries and significantly affected available T&L. In education industries, drastic changes are implemented from physical class of T&L to non-physical class, which affected students globally. There is no conventional face-to-face T&L and the approach shifts to non-face-to-face online T&L. The changes from offline to online learning have to be made and implemented in a short period by educators and learners in schools or universities ([Rafique et al., 2021](#)). Issues related to T&L in higher education globally in response to the pandemic impact can be categorized into three groups ([Santiago et al., 2021](#)), i) maintaining in-class teaching with social distancing, ii) creating hybrid models (blended learning, limitation of students in campus), and iii) moving to online instruction ([Santiago et al., 2021](#)).

In developing countries such as Malaysia, the pandemic has changed T&L activities tremendously, where all public and higher education institutions and skill training institutes are closed. The available method to conduct T&L during the time is the online approach. However, the facility and equipment to implement online T&L become a big challenge nationwide. Among the factors are different demographic backgrounds of students, internet coverage and bandwidth provided, and the equipment and facilities for T&L activities at home. The objectives of this study are to assess and gather information about the T&L techniques and technologies during the pandemic and also to investigate challenges and their effects on T&L preference techniques and technologies chosen during the pandemic.

Demographic Background of Students

One of the public universities in Malaysia is an institution of higher learning and a body corporate established under Act 1976, and only Bumiputera students are allowed to enter the institution. Since 1976, the mission and vision of the university are to provide access to higher education to indigenous groups in Peninsular Malaysia, Sabah, and Sarawak, reflecting its important role in the higher education system ([Sirat et al., 2020](#)). The university is consistently ranked as the most popular university to study based on its reputation and quality of education ([Bakar et al., 2020](#)). The university's education system is more comprehensive than those in most public or private universities in the country, and affirmative intake by Bumiputera is specific only for the university. The university comprises one main campus in Shah Alam and 34 satellite campuses throughout Malaysia. It offers over 500 programs (part-time and full-time) taught in English that range from undergraduate to postgraduate level. It allows many working adults to further their education and formally recognize their professional experiences ([Sirat et al., 2020](#)).

The university's students are from middle- to upper-income families, where they choose the university due to its reputation and quality education rather than its relatively low academic fees ([Bakar et al., 2020](#)). In December 2020, more than 60% of the university's students composed of individuals from the bottom 40% of households (B40) of the indigenous groups in Peninsular Malaysia, Sabah, and Sarawak ([Sirat et al., 2020](#)), where higher education is more accessible to the B40 group. The indigenous population or the Bumiputera are identified as the poorest, most disadvantaged, and most economically marginalized group ([Sirat et al., 2020](#)). The B40 is one of the social-economic household income classifications in Malaysia, in which the income range per month is between RM3,970 and RM2,500 (B1–B4) ([Department of Statistics Malaysia, 2020](#)). Those from B40 households may not have full access to digital technologies, learning equipment, and facilities, and internet connectivity as their homes are located in remote or rural areas ([Saidi et al., 2021](#)) and also due to economic status.

It may bring illiteracy in computer technology due to its technology-intensive nature. Most – if not all – students are proficient in using digital technologies, own laptops/tablets, and smartphones, and have a wireless connection at home, which limit the potential impact of COVID-19 due to socio-economic differences and the digital divide, as reported by ([Santiago et al., 2021](#)).

Industrial Revolution 4.0 and Education 5.0

The Industrial Revolution 4.0 (IR4.0) has impacted and pushed to a new education transformation landscape in which technologies and innovations will shape IR4.0. It is powered by technological advancements, such as artificial intelligence, virtual reality, data analytics, and the Internet of Things that create new ways of completing tasks, bringing new value-creation opportunities for organizations and businesses, and maintaining partnerships and long-term relationships with customers ([Idzwan et al., 2020](#)). It is a response to the needs of IR4.0, where humans and technology are aligned to enable new possibilities ([Anaelka, 2018](#)). In [Anaelka \(2018\)](#), Fisk explained that the new vision of learning promotes learners to learn the skills and knowledge needed and identifies the source of these skills and knowledge. Learning is built around where and how to learn, and performance tracking is done through data-based customization. Peers become very significant in their learning. They learn together and from each other, while teachers assume the role of facilitators in their learning.

In response to the current changes in education involving the IR4.0 era, universities must have a curriculum review of academic programs in preparing students to gain knowledge and equip skillsets for future job requirements, as stated by the World Economic Forum ([Anaelka 2018](#)). The soft and hard skills in 21st-century education will enhance their cognitive, psychomotor, and affective domains in critical thinking, problem-solving, leadership skills, and lifelong learning to fulfill the changing demands of the IR4.0 in job demands. The university also plays a vital role in introducing Education 5.0 in 2019 to face changes and challenges regarding the impact of IR4.0 in the education landscape.

Education 5.0 is defined as a learning-centric ecosystem that is sustainable, balanced, and principled, driven by the values and concepts of *adab* and *amanah*, powered by intellect, and afforded by new, ubiquitous technologies ([Academic Affairs Division, 2019](#)). Education 5.0 is introduced to nurture progressive thinking learners who are creative, innovative, and adaptive to be versatile professionals, job creators, and leaders in the future through inspired learning and personalization. The goal can be attained through five pillars of the Curriculum, Delivery, Learning Experience, Learning Environment, and Educators driven by the clarity of purpose, positive culture, appropriate emerging technologies, engaging ecosystem, and people-centered principles.

The university in 2017 has evaluation scored 75.3% to qualify for a 5-star rating among the mature university category as in their strategic planning. To sustain the quality education in the IR4.0 era, Education 5.0 is determined as the best model to shift the T&L paradigm into different perspectives, from conventional methods to digital technology approaches. Thus, the university introduced the Pioneering University in 2020 to boost existing academic programs by launching data analytics labs and smart classrooms in various faculties and state campuses to support the country's IR4.0 initiative ([Idzwan et al., 2020](#)). More than 50% of 370 lecturers from 35 university's campuses and 26 faculties around Malaysia understood and showed good acceptance of the Education 5.0 framework and its initiatives in teaching activities during Wisdom Wednesday and Week Without Wall, engaged in designing HE TVET programs, and using Smart Classrooms and Big Data Labs for T&L ([Idzwan et al., 2020](#)).

As COVID-19 struck in late 2019, digital technologies have replaced conventional approaches in T&L; however, there are fewer challenges and impacts on the course learning outcome and students' performance. Thus, the challenges and impacts of T&L during the COVID-19 pandemic are focused through the implementation of open and distance learning (ODL) as a flexible learning pathway where the content must be made available in such a way that students can access it anytime and anywhere ([Müller et al., 2018](#)).

Flexible learning is broadly defined by [Mueller et al. \(2018\)](#), allowing students to gain access and flexibility based on at least one of the dimensions of time, place, pace, learning style, content, assessment, or learning path. The university offers online and offline programs for traditional and non-traditional learners from disadvantaged (indigenous) groups. Distance learning for part-time learners was implemented in the university long before open entry was accepted as a matter of policy in 2005. The university is an example of a conventional public university offering a separate ODL program ([Sirat et al., 2020](#)). Seven areas that comprise good practice in the offering of ODL in Malaysia, which will be assessed for program accreditation, are program development and delivery/curriculum design and delivery; assessment of student learning; student selection and support services; academic staff;

educational resources; program management; and program monitoring, review, and continual quality improvement ([Sirat et al., 2020](#)).

Open and Distance Learning (ODL)

By definition, open and distance learning is an alternative delivery system in which the students and educators are separated by distance, time, or both. Most students or learners who choose this option are adults working part-time and disadvantaged groups who do not have the accessibility to study full-time.

ODL is widely used in schools and universities during MCO by many governments worldwide to control the spreading of COVID-19 and practice social distancing between students, lecturers, and staff. ([Shim & Lee, 2020](#)) stated that the transition to remote learning and flexible approach gives advantages of comfortable, educational environments, smooth interactions, and efficient time utilization, while network instability, unilateral interactions, and reduced concentration are the causes of students' complaints. Online platforms for video conferencing, such as Google Meet, are mostly preferred among undergraduate students (95%) and educators (98%) in Malaysia ([Saidi et al., 2021](#)), and WhatsApp was chosen as the offline communication medium between students (81%) and educators (97%). From the survey findings, 40% of 485 respondents staying in rural areas faced internet problems, such as poor connectivity, broadband and audio, and video quality, limitation on daily mobile data usage, and cost and pricing, which are among the concerns in implementing these online platforms for ODL in their respective institution ([Saidi et al., 2021](#)). ODL is a flexible T&L method, accessible to everyone and everywhere at any time using any technology or non-technology platform ([Müller et al., 2018](#)). It is open to learners from different backgrounds, from poor to rich, staying in remote/rural or urban areas, young to adults, part-time or full-time students.

Among the issues related to ODL implementation among students and educators are non-conducive home environment, inflexibility, internet connectivity, platforms and tools to be learned, mindset and perspective change, anxiety and depression, lacking ODL skills among educators, and reaching out and cooperating among peers ([Alias, 2020](#)). [Kamal et al. \(2020\)](#) found that the transition from face-to-face T&L activities to online learning has emotionally impacted affective and psychomotor domains. The feeling of anxiety and competency level in digital literacy may disrupt the students' motivation to be engaged online. Students are advised to manage their study time and involve actively in online activities. Despite the challenges in online learning, it leads to better student participation among pre-university Universiti Malaysia Sarawak (UNIMAS) students in T&L of STEM during the pandemic.

The success of the distance learning approach is because the learning environment affects the adult learners' level of self-directedness, independence, and self-reliance, particularly when they control their learning ([Foen & Confessore, 2011](#)). [Lapitan et al. \(2021\)](#) developed a five-component blended learning strategy referred to as Discover, Learn, Practice, Collaborate, and Assess (DLPCA) in the transition period during the COVID-19 pandemic. The strategy focused on the analysis of T&L experience based on three indicators: (i) student's learning experience, (ii) student's academic performance, and (iii) instructor observations. The results showed that DLPCA had a positive impact on students and instructors and concluded that: (i) asynchronous teaching using lecture videos allowed students to progress at their own pace because they could repeatedly watch the videos at any time, (ii) checklists such as progress trackers and weekly guides helped students organize and manage their tasks, and (iii) asynchronous assessments were effective in addressing problems with slow internet connectivity.

Learning Management System (LMS) is an online communication platform between educators and learners to monitor students' performance while performing ODL during the COVID-19 pandemic. The LMS also allows educators to monitor and manage their classes by providing online materials, discussions, task evaluations, and other online activities ([Saidi et al., 2021](#)). In Pakistan, the readiness of students to engage with online learning through information manager or library and information sciences showed that the students were not fully personalized and successful in the decisions about their online educational activities during the COVID-19 pandemic ([Rafique et al., 2021](#)), showing that

students' skill on computer/internet self-efficacy and online communication self-efficacy relied on gender, age, and levels of degree programs.

Some T&L methods adopting digital and technologies in ODL are e-learning ([Shahzad et al., 2020](#)), blended learning ([Oweis, 2018](#)), virtual reality and augmented reality ([Yin et al., 2020](#), [Sholihin et al., 2020](#)), and massive open online course ([Notaris et al., 2021](#), [Alhazzani, 2020](#)). The LMSs work in an asynchronous mode only, where the course instructors can upload the course videos and other course contents they desire ([Pal & Vanijja, 2020](#)), which are ineffective in handling the pandemic requirements the LMS lacks interactivity and personalization.

METHODS

The methodology of this study is a quantitative method using descriptive statistics on 41 students from the indigenous group of B40 in one of the university's campuses in Malaysia. An online survey was distributed among students through the WhatsApp group of lecturers teaching the subject. Three groups were registered, and a total of 41 students participated voluntarily in this survey. The questionnaire consisted of 14 questions and was separated into two parts: demographic information and undergraduate students' preference towards online class technology during the COVID-19 pandemic. Four themes and 16 sub-themes were identified in the set of questions in the survey. The study's main purpose was to gather information about students' T&L techniques and technologies during the COVID-19 pandemic. A descriptive statistic approach for data analysis was considered.

Based on the survey data analysis, four themes and 16 sub-themes were reported for this questionnaire. The first theme described students' demographic information. For this theme, four sub-themes were collected by the researchers, namely gender, group registration, location, and final exam grading score. The second theme showed the internet source with four sub-themes: internet connection, type of internet connection, mobile data speed, and home data speed. The third theme illustrated the T&L techniques with five sub-themes, including facility, method of T&L during the pandemic, platform/technology preference, and preferred study time. Lastly, the final theme of the study was the effect of techniques and technologies chosen during the pandemic. The themes and sub-themes are presented in Table 1. All the responses were analyzed, tabulated, and converted to percentages. The following section presents the findings of the questionnaire using open-source software, JASP 0.14.1.0, used to analyze the variables involved in the study.

Table 1. Themes and sub-themes for survey

Themes	Sub-Themes
1. Demographic	1. Gender 2. Group Registration 3. Location of Respondents
2. Source of Internet	1. Connection 2. Type of Connection 3. Speed of Mobile Data 4. Speed of Home Internet
3. Teaching and Learning	1. Facility (Laptop/Desktop/Tablet/Handphone) 2. Method of T&L (ODL/OL) 3. Platform for T&L through ODL approach 4. Platform for T&L through OL approach 5. Study Time for OL
4. Final Exam Grading Score	1. Course Learning Outcome Attainment 2. Grade Score

RESULTS AND DISCUSSION

Demographic Profile of Respondents

The respondents were asked about their gender, group registration, the location of respondents to collect their demographic information, and the final exam grade from their academic results after the

semester ended. From Table 2, in the demographic analysis, the gender factor showed that female participants had a higher response rate of 97.6% compared to 2.4% of male participants registered in the three groups. At the beginning of the semester, each group was allocated a maximum of 30 students. However, some reasons showed an imbalanced distribution of students registered in these groups. There is a higher enrolment of female students than male students in Malaysian universities (Shahzad et al., 2020). Meanwhile, 29.3% of the respondents scored A+ in the course grade for the final examination.

Table 2. Demographic Profile of Respondents (N = 41)

Category		Frequency	Percentage (%)
<i>Gender</i>	Female	40	97.6
	Male	1	2.4
	Total	41	100
<i>Group Registration</i>	F	18	43.9
	J	16	39.0
	K	7	17.1
	Total	41	100
<i>Location of Respondents</i>	Rural	26	63.4
	Town	15	36.6
	Total	41	100
<i>Score Final Exam Grade</i>	A+	12	29.3
	A-	17	41.5
	B+	3	7.3
	B	3	7.3
	B-	3	7.3
	C+	1	2.4
	D+	2	4.9
Total		41	100

Internet Connection

Figure 1 illustrates the number of male and female respondents, in which 34 (97%) of female students had access to the internet, while six students could not access the internet from their locations. The only male respondent had access to the internet for T&L in the ODL approach during the pandemic. The number of respondents was dominant for the female who had the internet connection while having T&L in ODL. The three groups of registration courses had participated and analyzed in the study only.

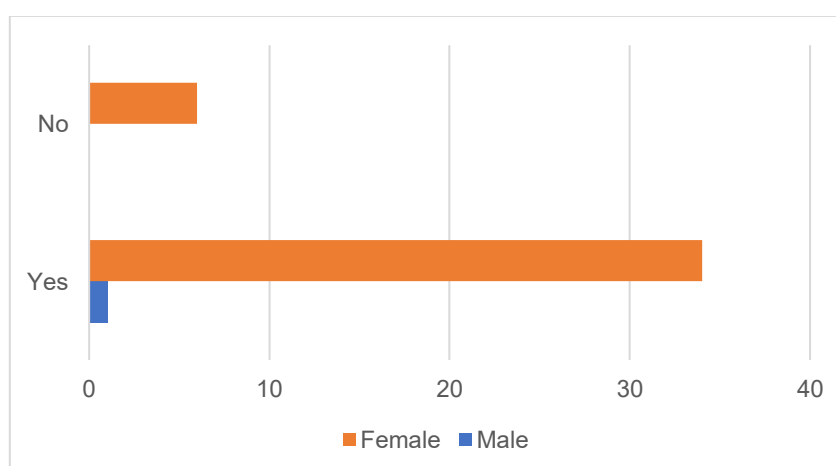


Figure 1. Number of respondents with accessibility to the internet for open and distance learning

In Figure 2, most respondents relied on mobile data from telecommunication providers to access the live teleconferencing class or recorded live class video through YouTube, LMS, or Microsoft. It is similar to the asynchronous class through social media applications, which required students to have enough mobile data. The consumption of mobile data is very high during this time, and in ODL for T&L activities, and due to that, students had to spend money to reload frequently. They did not have enough money or financial aids to have accessibility to the internet or to have home broadband. This situation also occurred in India, where consumption varied for different class schedules and activities ([Pal & Vanijja, 2020](#)).

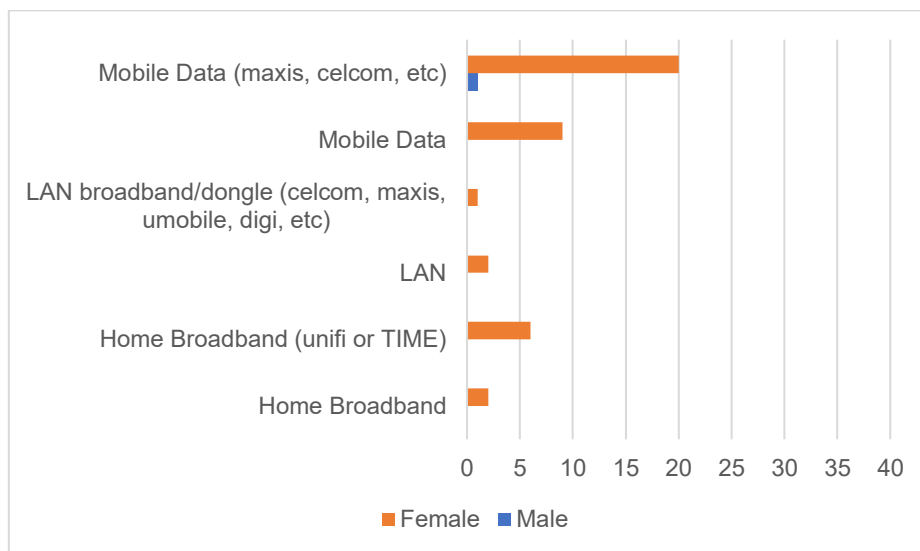


Figure 2. Number of respondents with accessibility to the type of internet connectivity during open and distance learning

As shown in Figure 3, only 3G and 4G connections could be provided by telecommunication providers during the pandemic. This situation worsened during the peak usage hour as many people stayed at home to work and study. Thus, the participants managed their study time to have full access to internet coverage with high bandwidth.

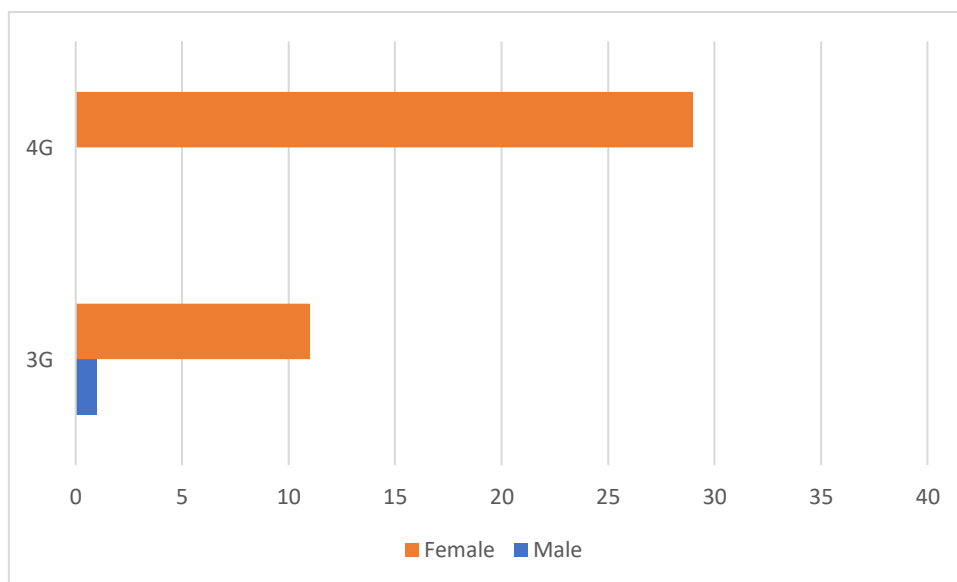


Figure 3. Number of respondents with accessibility to internet connectivity by mobile data during open and distance learning

Table 3 and Figure 4 give an overview of the internet speed coverage at home offered by authorized telecommunication providers. Most female students faced difficulties in T&L with a limited internet speed of fewer than 10 Mbps, and only two students had access to the speed coverage higher than 100 Mbps. Currently, it is becoming a big challenge for them in ODL, such as they have to find the right time to study at their effort in understanding the topic without any help from educators during asynchronous T&L. However, asynchronous teaching using lecture videos allows students to progress at their own pace because they can repeatedly watch the videos at any time, whereas asynchronous assessments effectively address problems with slow internet connectivity (Lapitan et al., 2021). Developing countries in Asia, such as the Philippines, also faced internet connectivity issues, which affected students' participation during synchronous sessions (Lapitan et al., 2021).

Table 3. Internet speed coverage at home

Internet Speed Coverage at Home	Gender	Frequency	Percentage (%)	Valid Percentage (%)	Cumulative Percentage (%)
< 10 Mbps	Female	24	96.000	96.000	96.000
	Male	1	4.000	4.000	100.000
	Total	25	100.000		
> 10 Mbps	Female	7	100.000	100.000	100.000
	Male	0	0.000	0.000	100.000
	Total	7	100.000		
> 100 Mbps	Female	2	100.000	100.000	100.000
	Male	0	0.000	0.000	100.000
	Total	2	100.000		
> 50 Mbps	Female	7	100.000	100.000	100.000
	Male	0	0.000	0.000	100.000
	Total	7	100.000		

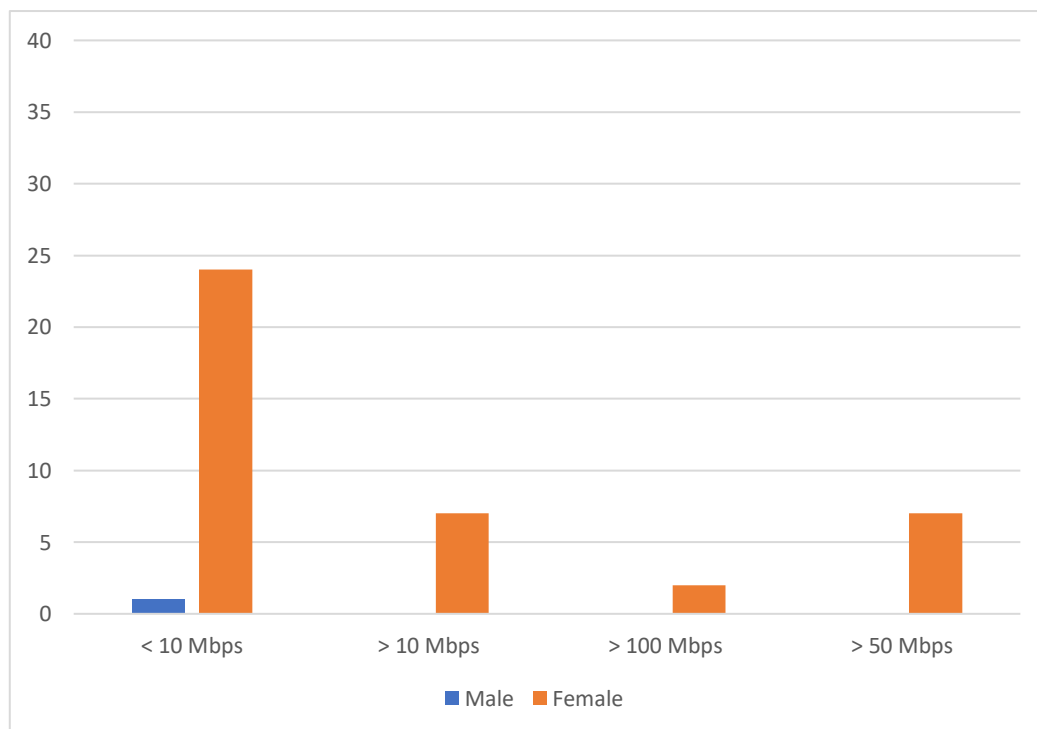


Figure 4. Number of respondents with accessibility to internet speed coverage during open and distance learning

Teaching and Learning

The importance of mobile devices and personal laptops or desktops in T&L activities are shown in Figure 5. 4. 97% of the total female respondents had laptop/desktop and mobile devices for ODL, while seven female students did not have any facilities to be used during the semester. In India, mobile devices and personal laptops/desktops were very important as 86% of the students used their smartphones (mostly Android) for attending online classes, while only 14% used their laptops (Pal & Vanijja, 2020). In South Korea, the most familiar environment and methods for participating in classes were student homes and personal laptops (Shim & Lee, 2020).

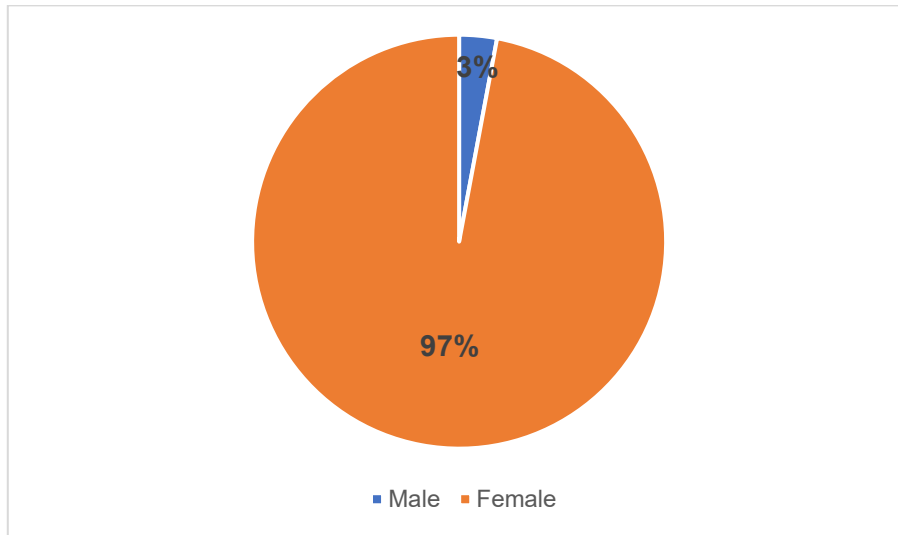


Figure 5. Number of respondents with facilities/equipment for open and distance learning

Figure 6 shows that most respondents preferred ODL approaches with asynchronous lectures. It is also agreed by (Lapitan et al., 2021), where students in the Philippines chose the asynchronous method. By adopting the ODL with asynchronous lectures, the instructors record lecture videos and upload them in the LMS or YouTube so that students can access them at their most convenient time (Lapitan et al., 2021). Meanwhile, in synchronous online lectures (real-time), instructors and students meet online using video conferencing software during the designated class hours, and instructors give lectures on the course. Students participate in the lectures and can ask questions vocally or via live text chat. It is similar to the finding of (Shim & Lee, 2020), where online learning that allows one to choose one's environment for taking classes freely is considered a great advantage for emergency remote learning.

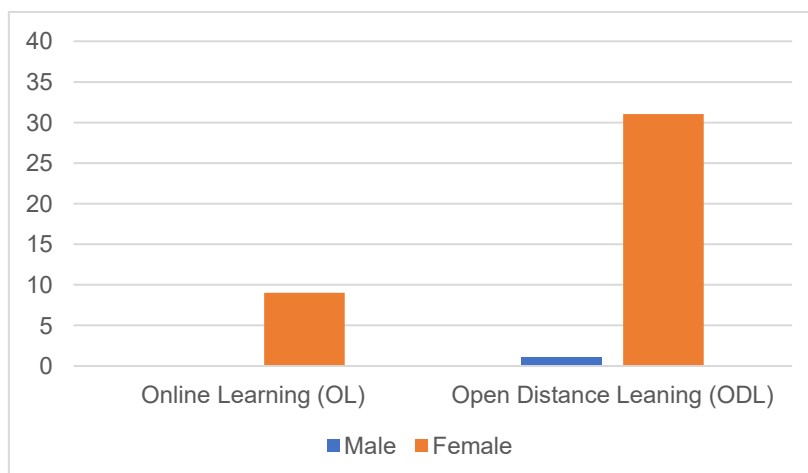


Figure 6. Number of respondents' preference in online learning and open and distance learning

It shows that ODL through asynchronous method using Microsoft 365 (Form) and WhatsApp were preferred by respondents to engage in the course activity. It is similarly found by (Saidi et al., 2021), where students and educators chose WhatsApp as an ODL platform.

Table 4. Preferred platform used for ODL

Platform	Gender	Frequency	Percentage (%)	Valid Percentage (%)	Cumulative Percentage (%)
Microsoft 365 (Form)	Female	16	100.000	100.000	100.000
	Male	0	0.000	0.000	100.000
Telegram	Female	8	100.000	100.000	100.000
	Male	0	0.000	0.000	100.000
WhatsApp	Female	16	94.118	94.118	94.118
	Male	1	5.882	5.882	100.000

Table 5 shows that the respondents opted for Meet instead of Teams because, during the transition mode, they are not exposed to use Teams in the previous T&L class. Even though Microsoft Teams supports both synchronous and asynchronous learning and is also used as the LMS for educators and learners (Pal & Vanijja, 2020), lack of exposure and experience using the platform previously has made students felt like it is difficult to engage with the platform. There is an insignificant gender difference in choosing any platform during ODL (Pal & Vanijja, 2020).

Table 5. Preferred platform used for OL

Platform	Gender	Frequency	Percentage (%)	Valid Percentage (%)	Cumulative Percentage (%)
Meet	Female	5	100.000	100.000	100.000
	Male	0	0.000	0.000	100.000
Teams	Female	10	100.000	100.000	100.000
	Male	0	0.000	0.000	100.000
Zoom	Female	25	96.154	96.154	96.154
	Male	1	3.846	3.846	100.000

Preferable Study Time for OL

As it is flexible for students to engage in ODL, they preferred and managed to join the online class if conducted at 10 AM–12 PM (20 respondents). Few respondents chose the class at 8 AM, 2 PM, and 4 PM if needed, as presented in Figure 7.

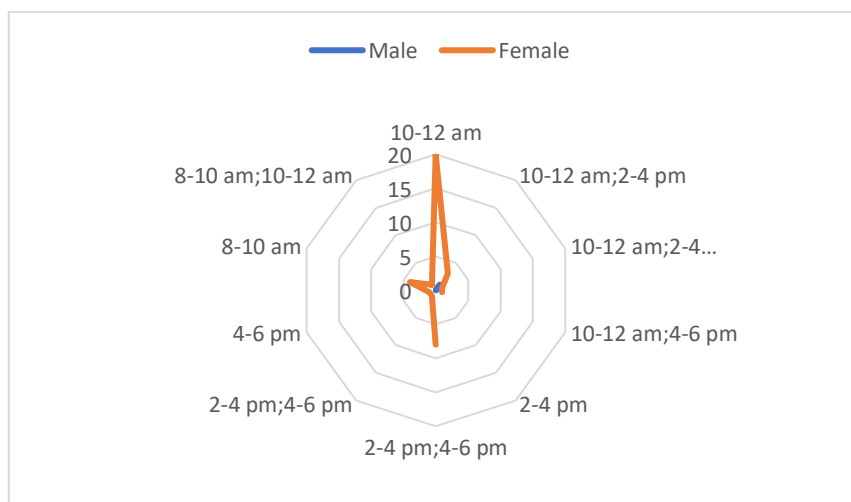


Figure 7. Number of respondents' flexible time for open learning

Learning Outcome and Grading Score

Figure 8 indicates the percentage of learning outcomes for the course taken by respondents, where CO1 is to acquire various engineering parameters and design methods and CO2 is to conceptualize and resolve problems related to engineering. It shows that CO2 achieved higher performance compared to CO1. As ODL commenced in mid-March 2020, an eclectic T&L approach between face-to-face in the early semester and ODL took place subsequently after the semester started. The CO1 effectively delivered the technique supposedly given through physical class. However, it was replaced by a non-face-to-face approach. The course grading score showed that 70.7% of the respondents scored above 75%, and two students failed the course subject. Students' performance cannot be assumed similar to the previous face-to-face classes and ODL by considering the factors during the study time (Lapitan et al., 2021).

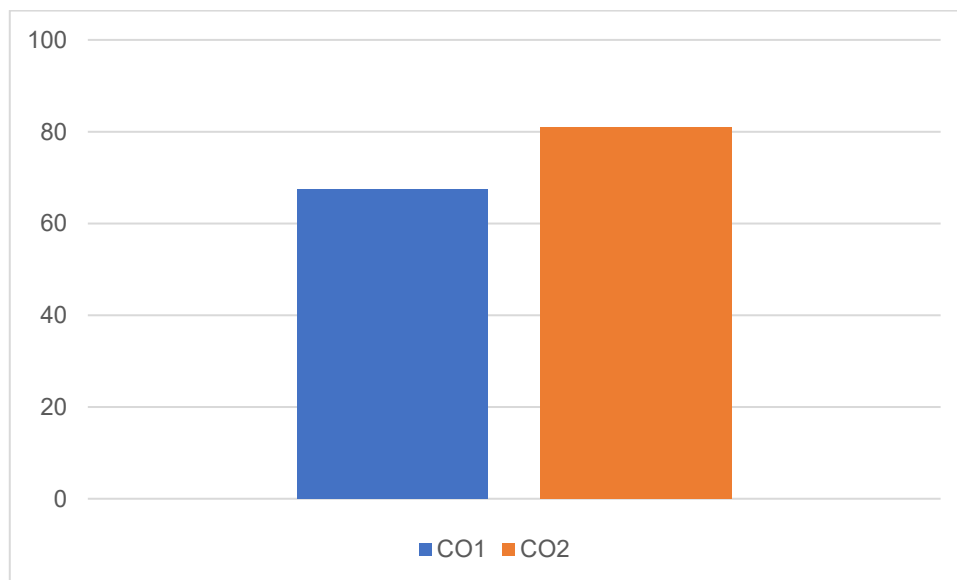


Figure 8. Course learning outcome

CONCLUSION

As T&L shifts from conventional to digital technology approaches in the current situation, ODL becomes the flexible learning approach chosen worldwide. The advantage of having ODL, either synchronous or asynchronous, is that students can manage their time to study and learn at their own pace. They preferred good conditions and an environment to study at their home. However, the limitations for some students in remote areas are internet coverage and bandwidth speed, which become huge challenges to them. ODL is preferred through WhatsApp social media application for the communication between educators and learners.

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The authors declare that there is no funding and conflicts of interest for this article.

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