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Distance Learning and Medical Laboratory Education in Malaysia: Lessons from the Global Pandemic

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Abstract

The 2019 Coronavirus disease outbreak (CoVID-19) caused a dramatic change in institutions of higher learning where face-to-face learning had to be converted to online distance learning. The aim of this study was to investigate the perspectives and challenges faced by Diploma in Medical Laboratory Technology students towards the implementation of online distance learning during the CoVID-19 pandemic. A cross-sectional descriptive study was utilized. Students were strongly encouraged to fill out the questionnaire which was administered online via Google Form online survey and their participation were voluntary. Quantitative data was analysed using basic distribution of percentages and for the responses to the open-ended question the most common repeated key words were identified and counted. In general, 43.7% of students did not provide certainty whether they really felt satisfied with distance learning activities during the CoVID-19 pandemic. But 53.5% of students disagree and strongly disagree that distance learning gives similar satisfaction as classroom learning. In terms of teaching and learning satisfaction 60.6% of students agreed that lectures were well-organized in relation to each other, while in terms of the effectiveness of e-learning in improving clinical skills, assessment methods, discussion, and video and sound quality got various reactions ranging from strongly agree to strongly disagree. For strength in distance learning, more than 45% of students agreed that they can easily access online materials, participate, and engage in learning sessions wherever they are, record teaching sessions, more self-directed and eager to prepare earlier with learning materials. The major challenges agreed upon by students were weaknesses in terms of interaction among students (60.6%) and also with educators (56.3%), followed by technical problems, lack of self-discipline, lack of focus during online lectures and lack of honesty while conducting assessments. Majority of students indicate that the learning process of lectures (54.9%) and tutorials (53.5%) can be conducted in a blended learning manner. But for practical sessions, 76.5% of students prefer to return to offline class. The results of this study show the best ways to ensure that learning and teaching sessions are not affected even if we must face situations such as other global pandemics in the future. Henceforth, the valuable information gained as

a result of this experience can be used to strengthen the curriculum and to maximize learning and teaching.

Keywords: CoVID-19, Online and Distance Learning, Medical Education, Medical Laboratory, Malaysia

Introduction

In December 2019, the Wuhan Municipal Health Commission in China reported a cluster of cases of pneumonia. But in reality, novel coronaviruses were identified to cause this condition. On 13 January 2020, CoVID-19 cases were first detected outside China, namely in Thailand and at the end of that same month, almost 18 countries outside China had reported positive CoVID-19 cases. After all the relevant assessments made by the World Health Organization, on 11 March 2020, CoVID-19 was characterized as a pandemic (WHO, 2020). Most countries in the world declared a movement control order starting from the global alarm that has been sounded by the WHO. All sectors were instructed to close immediately, and people were required to work from home and stay at home to prevent the transmission of the virus that causes CoVID-19 from spreading. Incidentally, educational institutions were also instructed to close immediately and students were asked to return to their homes (Amir et al., 2020; Amir Rad et al., 2021; Azlan et al., 2020; Eltayeb et al., 2020; Kim et al., 2020; Oyedotun, 2020).

Literature Review

Most countries changed the method of face-to-face learning in the classroom to distance learning to enable education to be delivered to students wherever they are. Various teaching and learning methods of distance learning were implemented to ensure that education can be delivered to students. The use of digital learning came to full use, for example, some institutions provided recordings of lectures, simulation videos for practical learning, and the use of all sorts of digital applications for the implementation of assessments (Amir et al., 2020; Rad et al., 2021; Azlan et al., 2020; Eltayeb et al., 2020; Kim et al., 2020; Oyedotun, 2020). At the same time, educators also have to learn to apply digital skills immediately, so that students were not left behind in getting continuous education.

Malaysia was also not far behind in the use of digital learning. Most educational institutions in Malaysia already have digital learning systems but these were less fully utilized as there were hitherto no constraints in conducting physical teaching and learning in the classroom (Adnan, 2018; Adnan & Zamari, 2012; Adnan et al., 2021; Karim et al., 2020). The Malaysian government previously issued the Malaysia Education Blueprint 2015-2025 (Higher Education) to meet the advancement of Education 4.0 and Industrial Revolution 4.0 (see, Adnan, 2020). Globalization of online learning and transformed higher education delivery are some of the shifts listed in the Blueprint. Due to the global pandemic, educators had to switch to fully digital teaching and learning initiatives (Amir et al., 2020; Amir Rad et al., 2021; Azlan et al., 2020; Kim et al., 2020). All the same, local higher education institutions in Malaysia had earlier begun to identify gaps in the use of digital tools in distance learning to ensure that the quality of student learning is upheld (Abd Karim et al., 2020; Zamari & Adnan, 2011).

As for the Diploma in Medical Laboratory Technology, the program is one of the main programs offered by Medical higher education institutions in central Peninsular Malaysia (Malaysian Medical HEI). Physical face-to-face teaching and learning methods are practiced entirely for lectures, tutorials, and practical work. Activities such as group discussions, presentations and lab work are all conducted in classroom learning with online support. For

some educators at these institutions, Google Classroom (GC) is the main e-learning management system used to facilitate various teaching and learning activities. Access to additional learning resources and materials is available through GC to support self-directed learning. The global pandemic resulted in almost all courses delivered in the classroom having to be transferred immediately to fully online learning (see, Akil & Adnan, 2022).

As the pandemic spread throughout the world, students gain new experiences with the virus in their learning environments. Although distance learning methods have been widely debated in the past, due to the pandemic, distance learning grew in popularity as it provides the best solution to academic stress. As such, it is critical to understand students' perspectives on distance learning as well as the problems they faced, particularly during the global pandemic. The goal of this study was chiefly to evaluate students' perspectives of distance learning implementation during the global pandemic scare, as well as the challenges they faced, in order to develop approaches to improve learning performances.

Research Questions

The goal of this study is to investigate the perspectives and challenges of Medical Laboratory Technology Diploma students at a Malaysian Medical HEI site, to gauge distance learning implementation in the context of COVID-19. Understanding students' viewpoints will provide useful insights into how to improve distance learning implementation for more effective and efficient course delivery, now and in the future. Therefore, this study addressed the following guiding questions:

1. What are the perspectives of Medical Laboratory Technology Diploma students in a Malaysian Medical HEI, with regards to distance learning implementation during the global pandemic?
2. What are the challenges that Medical Laboratory Technology Diploma students in that Malaysian Medical HEI faced, with regards to the distance learning implementation during the global pandemic?

Methodology

Context of the Study

This study was conducted at a Malaysian Medical HEI. This study involved all Diploma students who enrolled in the Medical Laboratory Technology program. This program involves three-year full-time study. The program consists of six semesters. There were no students in semester two because of the intake for the January 2021 session was postponed due to severe CoVID-19 conditions.

Responding to the Global Pandemic

In response to the government's call to curb the spread of the virus, the Malaysian Medical HEI implemented distance learning in stages. The educational didactic session was stopped for a while starting from the government's directive on the ‘Movement Control Order’ in March 2020. Students were also instructed to return to their homes starting March 2021. Therefore, the concept of distance learning was chosen to ensure the continuity of the learning processes.

In June 2020, the upper Management Division of the Malaysian Medical HEI issued guidelines for conducting distance learning sessions. In the guideline, critical points related to the design of online teaching and learning were explained so that student learning time (SLT) can be filled with appropriate teaching and learning methods. The learning model emphasized

'social presence', 'teaching presence' and 'cognitive presence' in all teaching and learning activities featured during the pandemic and post-pandemic period. Instructors were asked to communicate and establish interpersonal relationships in the formation of learning communities through familiarization activities in forums, mention of students' names in discussions, and provide online student profiles. The instructors also need to be able to design and facilitate meaningful learning experiences in online learning courses and support their students throughout the course through course briefings, online meetings, clear and effective communication as well as virtual presence in assisting their students. Furthermore, the instructors were given time to develop challenging learning activities, engage students, generate high-level thinking, and encourage exploration to construct meaning through continuous reflection and exposure.

In the guideline, online teaching and learning were classified into two components namely 'synchronous' and 'asynchronous'. Examples of learning activities and applications that can be used for synchronous learning and teaching are 'Live' video sessions using YouTube Live, Facebook Live or Google Meet, group presentations using Google Meet and online discussions and forums using WhatsApp, Telegram or Skype. While examples of learning activities and applications that can be used for asynchronous learning and teaching sessions are audio or video web lectures, seminar recordings stored on YouTube, the uploading of learning materials via web or email, CDs and DVDs, and assigning individual assignments using the GC platform. Initially, practical training involved specialized equipment and competencies could not be replaced by online methods. Students were then mandated to take turns to carry out practical training at the Malaysian Medical HEI site based on strict SOPs set. However, as the pandemic situation got worse, most of the practical sessions have to be conducted online using simulation methods or video recordings on related techniques. For clinical training, only final semester students were allowed to perform clinical training. But over time as the global pandemic escalated, most clinical training centres banned students from attending training laboratories to curb the increasingly dangerous spread of the virus. Therefore, online clinical teaching and learning also had to be implemented to replace the delayed learning.

Apart from that, the assessment and evaluation system also had to be changed in accordance with the global pandemic situation. Continuous assessment was done flexibly, for example using non-face-to-face quiz methods. The final examination was conducted according to the set schedule. The written examination was conducted online and the practical examination (OSCE/ OSPE/ VIVA/ SPOT TEST/ etc.) were conducted according to the SOPs or appropriate methods that had been set. The assessment method ensured that the teaching and learning align with the course learning outcomes (CLOs) or learning objectives. Any changes to the final examination must also be referred to the Examination Unit of the Medical HEI. The weightage for each continuous assessment and final examination of the semester, on the other hand, was done according to the curriculum of each course.

Research Design and Ethical Consideration

This study is a cross-sectional descriptive study. This study aims to obtain perspectives from students in one of the selected training institutes with regards to the implementation of distance learning during the global pandemic and identify the challenges faced by students. For ethical consideration, the respective institution has given permission to use data and engage respondents for this study.

Data Collection, Sampling, and Analysis

Data were collected through a well-constructed questionnaire adapted from Kim et al (2020), Amir et al (2020); Rad et al (2021) with modifications. The questionnaire was developed to assess student perception and challenges they faced on the distance learning method during the global pandemic. Students were informed about the study and were asked to sign consent forms. 132 respondents are the minimum recommended size of this study as suggested by Raosoft's Sample Size Calculator, with 5% margin of error and a 95% confidence level. Students were strongly encouraged to fill out the questionnaire, but their participation remained voluntary. The questionnaire was distributed by WhatsApp and Telegram groups and administered online via Google Form online survey.

It is divided into three parts, with 24 closed-ended questions and one open-ended question. Basic demographic information is included in Part 1. Part 2 deals with the students' perspectives and challenges, which were assessed on a 5-point Likert scale ranging from 1 to 5 (5: strongly agree, 4: agree, 3: neither agree nor disagree, 2: disagree, and 1: strongly disagree). It was composed with four components namely 'general satisfaction', 'teaching and learning satisfaction', 'strength of distance learning', and 'weakness of distance learning'. Part 3 also includes closed-ended questions about future thoughts on direction of lectures, tutorials and discussion, and practical sessions, and one open-ended question for free comments on distance learning during the global pandemic.

The privacy and the data confidentiality of the students were protected, and no personal identifiers were recorded. The questionnaires were open for participation from in October of 2021. The basic percentage of the distribution obtained from the survey was used to analyse the quantitative Likert-scale data. As for the open-ended question, the most common repeated key words were identified and quantified.

Data Presentation

PART 1: Basic demographics

There were a total of 71 students who responded to this survey. There were no intake for semester 2, so it can be seen that there were no response from the respective semester. Out of the 71 students, the most percentages of responses come from semester 1 students which contributed to 25.4% and the least responses come from Semester 6 students with 12.7%. The results can be seen in Figure 1.

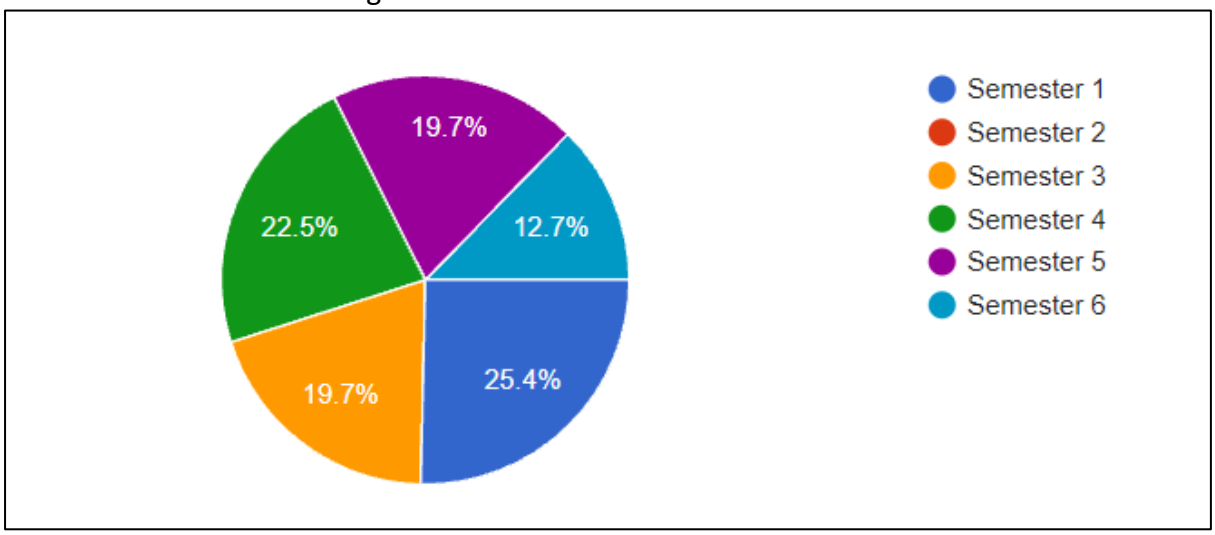

Figure 1: Distribution of the students that responded to the survey based on semester.

As for Information Technology (IT) skills, majority of the responses describe their IT skills as intermediate. Only a few students describe their self as expert in IT skills. This percentages are shown in Figure 2.

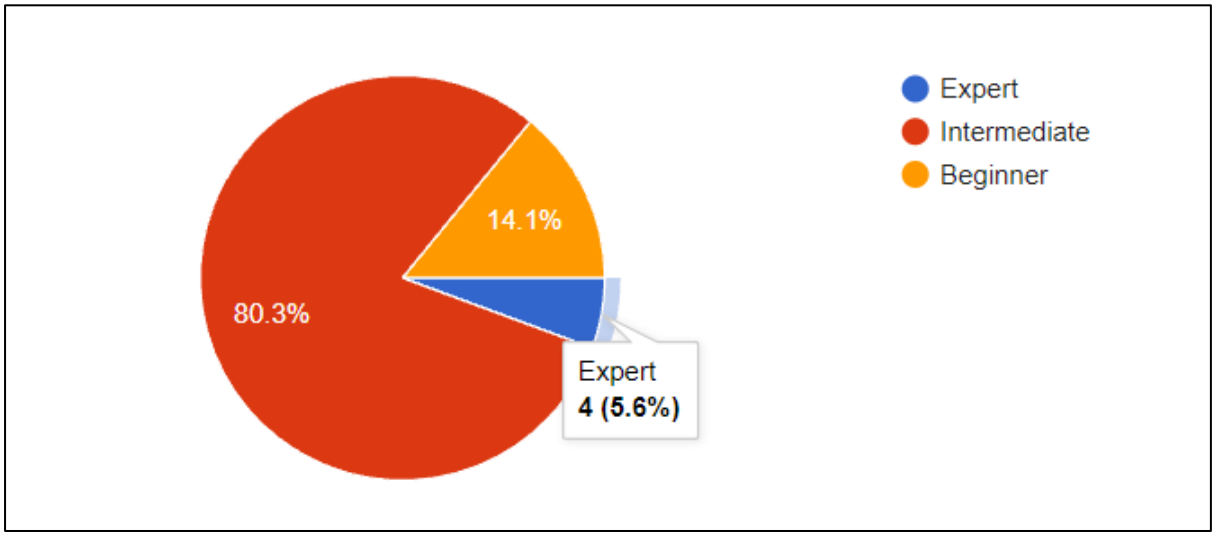

Figure 2: Distribution of the students according to their self-describing of their IT skills.

There were 64.8% students admitted that they were exposed and had participated in e-learning before the pandemic. Whilst 35.2% of students haven't encounter with the e-learning before pandemic. This shows that 35.2% were new to e-learning concept. The results can be seen in Figure 3.

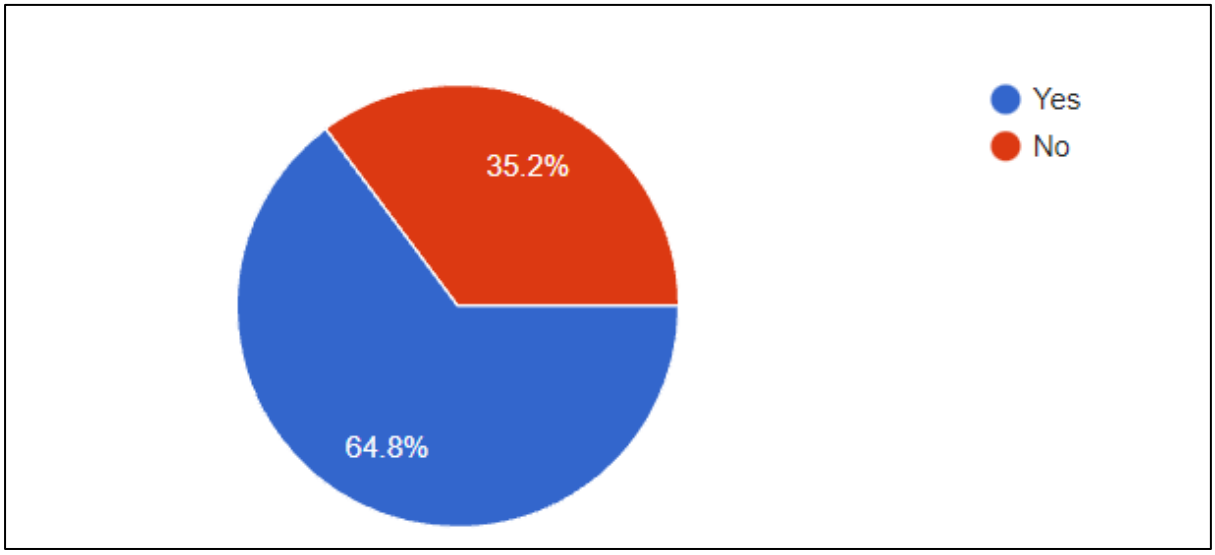

Figure 3: Distribution of students based on exposure to e-learning before pandemic.

PART 2: Students' perspectives and challenges

For Part 2 which covers the general satisfaction, teaching and learning satisfaction, strength and weakness of distance learning were calculate in percentages as shown in Table 1. In general, 43.7% of students were unsure whether that they were completely satisfied with distance learning activities or not, and there were students who indicated that they disagreed (39.4%) and strongly disagreed (14.1%) that distance learning gives similar learning satisfaction as classroom learning.

Table 1

Percentages on students' perspective and challenges.

* 5-point Likert scale Rating system (5: strongly agree, 4: agree, 3: neither agree nor disagree, 2: disagree, and 1: strongly disagree).		* 5-point Likert scale Rating system				
		⑤	④	③	②	①
A. GENERAL SATISFACTION						
1.	I am generally satisfied with my distance learning activities.	7.0%	35.2%	43.7%	14.1%	0.0%
2.	Distance learning give similar learning satisfaction as classroom learning.	5.6%	15.5%	25.4%	39.4%	14.1%
B. TEACHING AND LEARNING SATISFACTION						
1.	Lectures were well-organized in relation to each other.	9.9%	60.6%	22.5%	7.0%	0.0%
2.	I am generally satisfied with the effectiveness of e-learning in terms of increasing clinical skills.	4.2%	32.4%	33.8%	21.1%	8.5%
3.	Assessment is more suitable delivered in distance learning.	8.5%	36.6%	26.8%	21.1%	7.0%
4.	Discussion and clarification session is suitable delivered in distance learning.	8.5%	33.8%	23.9%	26.8%	7.0%
5.	I am generally satisfied with the video and sound quality of the online distance learning.	5.6%	36.6%	29.6%	18.3%	9.9%
C. STRENGTH OF DISTANCE LEARNING						
1.	I was satisfied with the accessibility of online materials during CoVID-19 distance learning.	5.6%	46.5%	31.0%	12.7%	0.0%
2.	I was satisfied with the ability to participate the online learning anywhere.	8.5%	49.3%	22.5%	15.5%	0.0%
3.	I was able to involve in classes activity effectively during CoVID-19 distance learning.	7.0%	47.9%	31.0%	11.3%	0.0%
4.	I was able to record a meeting during CoVID-19 distance learning.	11.3%	47.9%	19.7%	18.3%	0.0%
5.	I able to motivate for self-directed learning and eager to prepare learning materials before group discussion during CoVID-19 distance learning.	7.0%	45.1%	28.2%	12.7%	0.0%
D: WEAKNESS OF DISTANCE LEARNING						
1.	Lack of interaction between educator and student.	23.9%	56.3%	14.1%	5.6%	0.0%
2.	Lack of interaction among students.	23.9%	60.6%	11.3%	4.2%	0.0%
3.	Difficulty in concentrating during online lectures.	43.7%	43.7%	11.3%	1.4%	0.0%
4.	Technical problems.	36.6%	52.1%	11.3%	0.0%	0.0%
5.	Lack of self-discipline.	25.4%	45.1%	23.9%	5.6%	0.0%
6.	Lack of honesty during assessment.	25.4%	42.3%	23.9%	7.0%	0.0%

PART 3: Opinions and comments

In Part 3 of the questionnaires, students were required to state their stand on the lectures, tutorials, and practical / practicum sessions to go back to offline, or stay online, or blended

learning. As for the lectures and tutorials most of the students want to be handled in blended learning approach. The results are 54.9% and 53.5% respectively and the distribution can be seen in Figure 4 and Figure 5. While in Figure 6, it can be seen for practical sessions, the majority of the students which contribute to 76.5% prefer to go back to offline class.

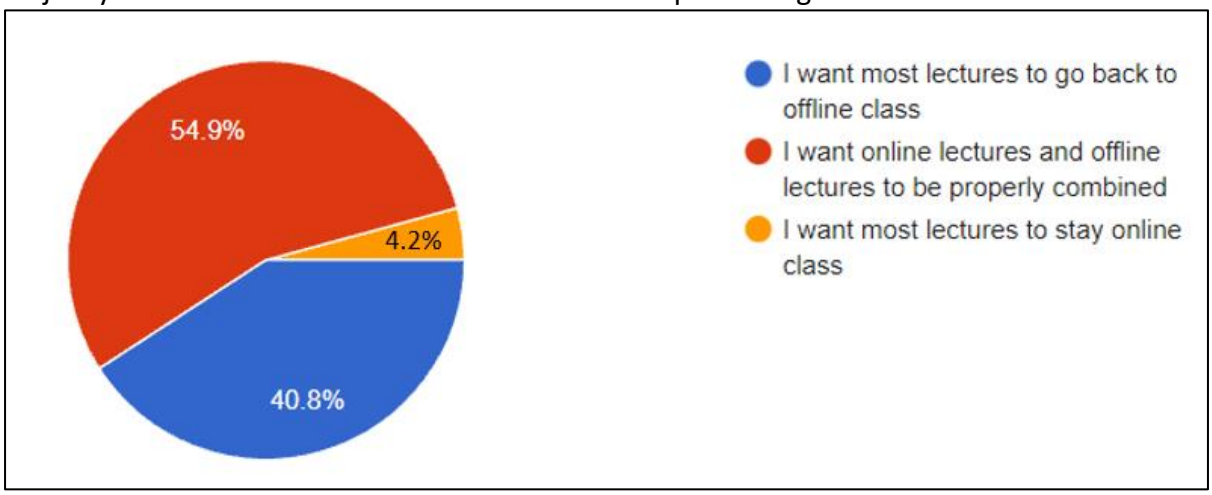

Figure 4: Distribution of student's opinion on future direction of lectures.

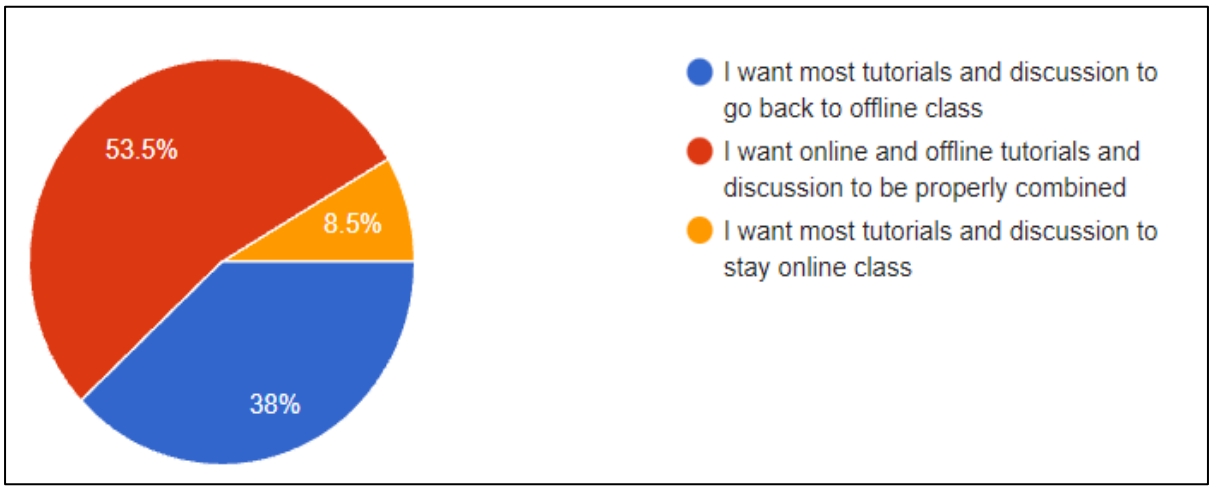

Figure 5: Distribution of student's opinion on future direction of tutorials.

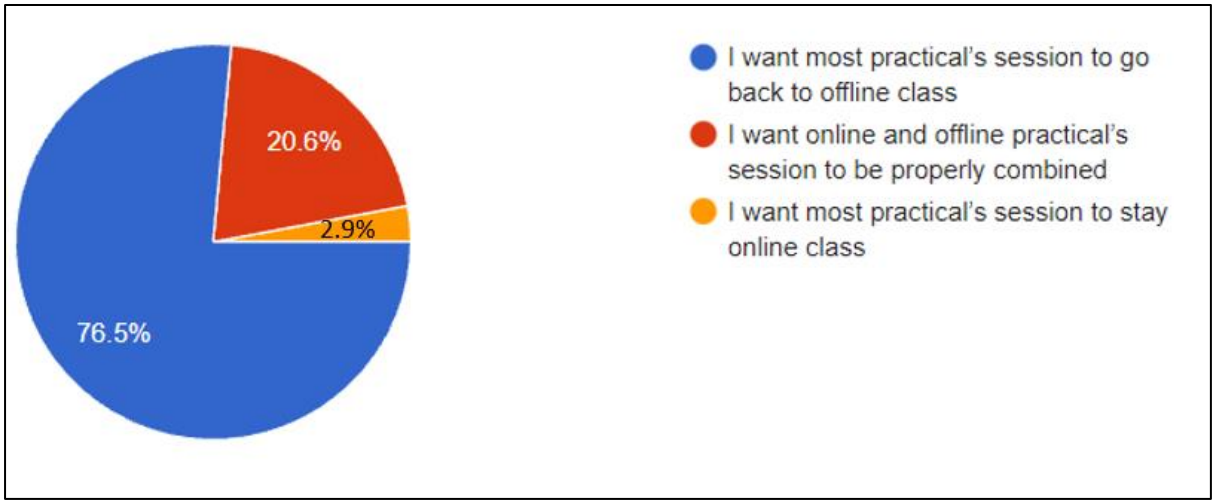

Figure 6: Distribution of student's opinion on future direction of practical / practicum sessions.

Besides that, the open-ended question which allowed students to express their comments freely is also added in Part 3 of the questionnaires. The comments were segregated in several key points as in Table 2. Most of the comments stated that students preferred offline learning more than anything else.

Table 2
Tabulation of the comments according to the key point in the comments.

No.	Criteria of comments	Percentages of students
1.	No comments.	31%
2.	Preferences on offline learning.	31%
3.	Preferences on blended learning.	8.5%
4.	Preferences on online learning.	2.8%
5.	No problem.	1.4%
6.	Uncategorized comments 1. *I hope we will do study theory first after that follow up with practical in one day.* 2. *Need improvement about online class.* 3. *It has pros and cons.* 4. *I agree with online classes in certain cases like can reduce the classmate noise during class and also, I can record the topic individually. But sometimes I don't agree when students being forced to open camera when it sometimes can affect some poor connections.* 5. *Lack of time to study especially when in practical.* 6. *If the classes are online, it should have a formal email for every student in any institute.* 7. *Everyone needs to plan properly right from the bottom if the situation of the world doesn't change in 2-3 years later.* 8. *I hope everything will be improved for the future.* 9. *I hope every student and lecturers can cope with the current situation whether online or offline method.* 10. *Thanks to all lecturers that stay patient with us during online session.* 11. *Hope Covid-19 doesn't affect to us as student to improve our skills in the lab.* 12. *Learning is fun. But study environment should motivate student and realise they are students.* 13. *If this subject or this syllabus is online, then make it interesting.* 14. *Online "banyak kerja" (trans.: too much work).* 15. *Both online and offline study methods have pro and cons.* 16. *"Semua okay cuma disebabkan online waktu praktikal rasa tidak mencukupi dan tidak bersedia sepenuhnya untuk OSCE & CA hands-on" (tran.: All is okay but the*	25.4%

No.	Criteria of comments	Percentages of students
	online time for practical work isn't enough, and I don't feel I'm fully ready for OSCE and CA hands-on work). 17. *My lack of skills.* 18. *Better be safe online.*	

Discussion

Based on the information gathered in the basic demographic section, students from each semester group responded to the survey distributed. Almost 80.3% classified their IT skills as intermediate, demonstrating their ability to adapt to digital skills. While a high percentage of students who have been exposed to and participate in e-learning prior to the global pandemic, warmed up to the teaching methods of some educators who already applied digital tools to facilitate teaching and learning processes prior to the pandemic. This situation confirmed that the use of e-learning had already started well before the pandemic. But after the virus spread and distance learning was implemented, there were students who disagreed (39.4%) and strongly disagreed (14.1%) that distance learning provides similar learning satisfaction as classroom learning.

This indicated that the learning methods used during distance learning should be reviewed and explored further now so that if distance learning is required on a large scale in the future, all higher education institutions can ensure that students' needs and improvements could be implemented more effectively and efficiently. Azlan et al. (2020) shortlisted the main features, advantages, and limitations of several virtual learning environments (VLEs) commonly used throughout the global pandemic as shown in Table 3. These VLEs allowed lectures, tutorials, quizzes, and discussions to be implemented through distance learning. But most of these VLEs applications offered limited functions as a free package, and users need to subscribe for a paid package to access more function. This caused local higher education institution to scramble for additional budget because most instructors and students were not (and are still) unwilling to pay the cost themselves. Otherwise, they must choose and adapt to work within the limits of the free package.

Table 3

Commonly used virtual learning environment (VLE) tools (Azlan et al., 2020).

Software (Developer)	Main features	Advantages	Limitations
Moodle (Moodle Pty Ltd)	- A full-featured open-source VLE platform with a modular design	- Complete, very customisable and free usage of essential functions	- Not user-friendly
Blackboard (Blackboard Inc)	- Comprehensive proprietary VLE platform	- Very user-friendly for teachers and students	-Expensive -Limited number of users
Canvas (Instructure Inc)	- Open source VLE platform	- User-friendly platform	-Lack of customisation capabilities
Google Classroom (Google LLC)	- VLE to enhance students-educator collaboration	- Simple interface, user-friendly and full integration with Google G Suite	-Limited functions compared to other platforms

Exposure to GC prior to the global pandemic may have aided the distance learning process in this particular institution to some extent. Other studies revealed that GC has several benefits, such as ease of use, where students can easily enrol into given classes, and the enrolment process only requires a registered Gmail account. Furthermore, any form of assignment, learning materials, link, or document can be posted straight to GC for student access. Students can access GC from any location and at any time. Collaborative teaching is also very easy to implement due to the ability to add co-teachers to an existing class (see. Shak et al., 2021). Somehow the presence of GC, to some extent, indirectly facilitated students in this institution to refer to GC for the latest information and instructions related to learning during the pandemic period.

As for teaching and learning satisfaction, most students were satisfied with the content of the lectures given which they had agreed that these were structured properly and were very much interrelated with each other, meaning there was continuity between one lecture and another. This coincided with the results of the survey which showed that almost 54.9% of students agreed to continue lectures in online and offline learning which most probably can be implemented as blended learning. Blended learning can increase social interaction, communication, and collaboration where students are able build online communities and learning practice to share ideas, experiences, and knowledge. In addition, blended learning offers flexibility and efficiency by allowing face-to-face teaching sessions in the classroom to be replaced with video or conference recordings, as well as learning information are easily available directly on the web (Sapriati et al., 2023). This allows instructors and students to discover knowledge that can be acquired virtually and not just rely on face-to-face sessions in the classroom alone (Azizan, 2010).

A percentage value of less than 36% was identified in the teaching and learning satisfaction part for the components of effectiveness in clinical skills, assessment, video and sound quality, and discussion. This situation may be due to constraints or problems that students must go through during the distance learning process. There are two types of e-learning delivery modes applicable for online distance learning applied in this institute: synchronous and asynchronous. Asynchronous mode of delivery is usually applied for

lectures, tutorials, quizzes, and discussions. It requires the use of video conferencing platforms such as Microsoft Teams, Skype, Google Meet, Zoom, Cisco WebEx, and other video conferencing platforms to facilitate learning. However, free packages have usage restrictions, and instructors and students must pay to use other functions on related platforms. Furthermore, the efficacy of synchronous methods is highly dependent on the quality of the internet connection. Any issues with the internet connection during the video conferencing process will have an impact on the delivery of teaching. Aside from that, students in rural areas undoubtedly fell behind due to lack of internet access and infrastructures. Students also needed to spend a lot of money to support their internet usage. In addition, the disadvantage of asynchronous teaching is that there was no direct interaction between educators and students. Students did not receive immediate feedback from educators for any questions, and they needed discipline in managing their learning time to motivate themselves to complete any assignments and learning as no one can monitor them due to the long distance (Azlan et al., 2020). As for clinical skills, hands-on ability is very important to provide experience to students. Therefore, online visual methods are highly impractical and will affect students' skills. All students at this institute have already gone through the phase of practical learning online and offline. Thus, only 2.9% of respondents wanted online practical sessions, while the majority wanted face-to-face practical sessions probably because they feel the difference when they have to undergo online learning and apply physically when face-to-face classes were conducted.

As for the strengths of distance learning, the highest percentages of students were satisfied with the ability to participate in online learning activities wherever they are, followed by being able to engage in online learning activities and can record learning sessions. Azlan et al (2020) suggested active student engagement during online distance learning where instructors can integrate additional tools into their online teaching. Examples are Mentimeter, Poll Everywhere, Slido, Kahoot!, Quizizz and iClicker. Such tools can attract students' interest in learning activities. There are also several video conferencing platforms that are already included with additional tools such as Cisco WebEx, MS Teams, BigBlueButton and Jitsi. It is faster and easier to implement during the learning process and there is no need to link to other platforms. Students also agreed with the ability to obtain learning materials and prepare for class before it started. This shows that the distance learning process that has been implemented in this institution complies with the theory of independence and autonomy where it is consistent with the ability of students for self-directed learning (Aydemir et al., 2015).

As for the weakness or challenges of distance learning faced by students, the majority of students agreed with the lack of interaction between fellow students themselves and lack of interaction with educators. This situation can cause students to be unfamiliar with communicating and may be a problem if they need to deal with people. Therefore, it is important to diversify learning methods so that the communication aspect can be improved if distance learning has to be carried out in the future (Valentina et al., 2019). For example, creating project-based learning to allows students communicate with each other or communicate with external parties in completing the given task (Baihaqi et al., 2020). Apart from that, the majority of students also agreed that technical problems led to the weakness and challenge of distance learning. This are followed by lack of self-discipline, difficulty concentrating during online lectures and honesty problems during assessment.

Studies from various educational institutions also showed a high percentage related to technical problems during distance learning. This problem includes slow internet connection,

rural areas that do not have the appropriate infrastructure or having appropriate equipment to meet the needs of distance learning technology because some of them might have to rely on the capacity of mobile phone use only (Mathew & Chung, 2020; Hačatrjana, 2021). Apart from that, the distance learning approach is the first to be used in this institution. Previously, students were only exposed to face-to-face teaching methods which is more structured, fixed schedule and physical learning environment that easily can be monitored directly because educators and students were in one place. The long-distance during the CoVID-19 pandemic may cause students to adapt in a short time to manage time and setup for a conducive learning environment. In addition, the long distances make it difficult for effective monitoring and consultation of students with problems. Students need to have their own initiative and strive to ensure that they are not left behind in terms of learning (Hačatrjana, 2021; Mathew & Chung, 2020).

Hence, problem solving skills need to be introduced to students so that they can overcome unexpected situations such as another global pandemic. Hačatrjana (2021) listed several key processes in problem solving skills stated in the OECD (2013) handbook, namely exploration and understanding, representation and formulation, planning and executing, monitoring, and reflecting. This process can be taught to students to impart them with problem-solving skills to enable them to adapt to any unexpected situations or problems. Self-management skills are also important for students in facing challenges and overcoming distance learning problems during the global pandemic. According to a study conducted by Zhu (2021), the findings show that instructors facilitate students' self-management skills in four ways. First is through the formulation of learning goals such as providing a clear description of learning objectives. Second, assist in planning student time management by providing a time frame and performance indicators of progress. Third, assist in facilitating resource management and support such as flexible learning sessions, introducing peer assessment approach, and facilitating access to information resources. The fourth is navigation, where video tutorials are organized and arranged to enable students to understand on how to use digital technology for learning.

On the flipside, dishonesty in online assessments can be caused by a variety of factors, including the students themselves or the institutions themselves, such as the methods of delivery and assessment used. Lacking in aspect of having strict rules, implementation of penalties, budgeting to pay for technology of online monitoring systems, and knowledge in ensuring the integrity of students during online examinations contribute to students' dishonesty during assessment. Assessment methods should also be improved so that students do not randomly take copies currently available on the website and use them to complete assignments or the given task. The assessment should be more innovative so that students require to learn to complete the respective assignments and doing in-depth reading to meet the requirements of the question (Holden et al., 2021).

Limitations

For this study, the participation is voluntary. So, the response rate might be below than the initial targeted where only 71 students responded to the distributed questionnaires. This is less 46.21% from the minimum number required. Non-respondents may therefore have undermined the strength of this study and the potential response bias cannot be completely ruled out. The results of the study must therefore be interpreted with caution. Besides that, the data is obtained from a single institution and mainly focuses on the student-side only. So, the findings overall might not apply to *all* institution and may not represent the whole picture.

Conclusion and Recommendation

The experience of teaching and learning gained during the global pandemic has enriched and broadened the learning approach for the Medical Laboratory Technology Diploma program in this particular institution. Based on the findings of this study, the majority of the Diploma in Medical Laboratory Technology students do not agree and strongly disagree with the claim that distance learning provides the same level of satisfaction as classroom learning. As well as the majority of students choose to attend offline classes especially for practical sessions. The main difficulties encountered by Medical Laboratory Technology Diploma students when implementing distance learning are listed in Table 4.

Table 4

Challenges encountered during the implementation of distance learning (according to the percentage of strongly agree and agree, from highest to lowest).

Challenges faced		Total % with "agree" and "strongly agree"
1.	Technical problems	88.70%
2.	Lack of focus during online lectures	87.40%
3.	Weaknesses in terms of interaction among students	84.50%
4.	Weaknesses in terms of interaction with educators	80.20%
5.	Lack of self-discipline	70.50%
6.	Lack of honesty while conducting assessments	67.70%

However, it should be noted that effectiveness and efficiency in engaging online teaching delivery not only involve recording lectures and online meetings. There is a need to explore other online collaborative learning tools to improve teaching delivery and increase student engagement. Besides that, there are many other ways and methods to help students in dealing with problems and fostering self-management as well as self-discipline. It is important for students to achieve high academic performance and successfully engage in the learning process. To achieve such goals, instructors also need to integrate certain sub-skills into teaching activities. Therefore, other institutes should identify suitable ways and embed such skills to students so that distance learning sessions in the future may be improved. In addition, if distance learning is not implemented anymore, blended learning methods that may use digital learning approaches should be continued as these experiences are able to provide students with appropriate skills and indirectly expose students to the latest technology of learning environments.

In addition, the lack of in-depth and hands-on training for clinical students as well as in practical learning may have serious implications for the groups of students involved. They are also likely to struggle in future when they are working in a real pathology laboratory. The use of advanced technologies in medical education is most likely a much needed component. Such technologies need to be studied and improved so that the transformative changes in medical education can be implemented effectively and efficiently. The improvement of instructional strategies requires the use of distance learning approach and institutions must identify and consider all issues involved in the implementation of distance learning. This comprises features like available infrastructure, policy, teaching and learning methodology,

assessment, resources, and general support system, monitoring of the effectiveness of the methods utilized, and most importantly the quality of graduates that will be produced.

As a consequence, this study's findings on students' perspectives regarding distance learning and the challenges they experienced can help local institutions to enhance the quality of teaching and learning in the near future. Currently, Malaysia is moving towards digital and technology development. This can be seen through the formation of the Malaysia Education Blueprint 2015-2025 (Higher Education) which emphasizes on the development of online learning globally and the transformation of higher education delivery methods. Therefore, the knowledge obtained from this study may be applied in the future improvement of delivery in accordance with the mission of Malaysia Higher Education 4.0 and Industry revolution 4.0. Additionally, prior to the global pandemic, expenditure for 'physical' teaching and learning involved high bills and facilities maintenance costs. Therefore, if distance teaching and learning methods can be improved, it can indirectly reduce an institution's expenditure and budget channelled to the institution can then be used to improve the quality of other services that require greater attention.

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