

# Exploring the Digital Divide between Pre-clinical Teachers and Students in an Integrated Medical Curriculum from a Malaysian Private University

Jaiprakash Mohanraj<sup>1,\*</sup>, Kee Ooi Yuen<sup>2</sup>, Primeena Eshvary<sup>2</sup>, Arushi Sangwan<sup>2</sup>, Anas Thasya<sup>2</sup>,  
Nur Syahirah Sahlan<sup>2</sup>, Nur Ashikin<sup>2</sup>, Hasveen Kaur<sup>2</sup>

<sup>1</sup>Associate Professor, Department of Biochemistry, Faculty of Medicine, MAHSA University, Malaysia

<sup>2</sup>Faculty of Medicine, MAHSA University, Malaysia

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**Abstract Background:** The effectiveness of the integration of technology within the classroom setting has been well documented, however the use of this technology is still far from reaching its true potential. Although the presence of digital divides between teacher and staff documents, the extent and nature of the divide is not well defined. This could have limited the potential exploitation of technology in teaching and learning, especially in a medical school with an integrated curriculum. Our study intended to identify the student's and teachers' perceptions of benefits of using technology in teaching and learning in a medical school and also investigate the nature of the gap that is present between teachers and students. **Methodology:** This cross-sectional study was conducted through a census during which we had 212 pre-clinical medical students and 30 lecturers engaged in the teaching of these students in an integrated curriculum. A pre-validated self-administrative questionnaire survey was conducted for Usage of ICT in learning and Perception of the Use of E-education Tools and Implementation of E-courses. The significance of the association between teachers and students was tested using Kruskal-Wallis test. **Results:** Over 3 hours in a day was spent by teachers and students on desktop and smartphone for TLA, indicating that students are mobile learners engaging in learning activities in their time and place of choice. 60-65% of students preferred using YouTube for their leaning activates, and around 50% of the teacher used this platform in teaching and related activities. Usages of journals as found to be high among teachers (55%) while the use of other popular learning applications. This study also showed that both teachers and students strongly agreed that they enjoy using technology, indicating the acceptance and willingness to explore its potential. **Conclusion:** The study

shows the use of ICT is prevalent between both medical teachers and staff; the difference was only in the degree of usage and also both the groups enjoyed the use of technology. It was also clear that both medical teachers and students viewed the use of ICT to be integral in delivering the curricula.

**Keywords** Information Communication Technology, Digital Divide, Teaching Learning Activity, E-learning

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## 1. Introduction

From a teacher's point of view, the difference between an un-engaging and a disruptive classroom is most often not in the causes but the degree. Over the last decade, one element that has been alleviating this form of student behavior is the incorporation of information and communication technology (ICT) into the students learning environment. Several studies have shown the effectiveness of technology in education among students, and also among teachers (1-3). The integration of technology as a tool in teaching and learning has been widely studied and experimented, particularly in the context of higher education (4). The aim of ICT integration has been linked to improve and increase the quality, accessibility, and cost-efficiency of the delivery of education while taking advantage of the benefits of networking to equip students to understand regional relevance in their learning and face the challenges of global competition. It is imperative to understand the role of ICT in crafting student's learning styles and preferences and its influence on teachers' teaching approaches.

### 1.1. Use of Technology and Its Effectiveness among Students

The future workplace driven by industrial revolution 4(IR4) will require students to have technical and digital ability to use standard programs such as spreadsheets and presentations along with the understanding of sophisticated technology behind Artificial Intelligence. It has been suggested by many researchers that interaction in online learning programs promote student-centered learning, encourage broader student participation, and produce more in-depth and reasoned discussions than observed in a traditional face-to-face program (5, 6). Davis and colleagues have also shown that several educational institutes had started moving from textbooks to tablet in classrooms (7) and had demonstrated impressive results with regards to the student's learning behavior.

Domingo et al. suggested that facilitating access to information and increasing engagement to learning are the two main impacts of mobile technology in the classroom(8). A study conducted in Clearwater High School reported an 18% increase in the test score when student learning was substituted with the use of the internet using the Kindle instead of a textbook. The study also showed that students were able to see their homework assignments, complete work, read their textbooks, and much more right at the touch of a button. Studies also report that technology has the potential to improve quantitative assessment performance in core subjects, as well as overall GPA. The use of ICT also leads to qualitative improvements; resulting in higher-quality student work. Gulek et al. in their study concluded that students using computers when learning to write are not only more engaged and motivated in their writing but also produce work that is of greater length and higher quality, especially at the secondary level(9). Although an array of studies have demonstrated many advantages in student learning, most of which were set up in schools with sparse data available from professional courses and even fewer from medical schools.

### 1.2. Use of Technology and Its Effectiveness among Teachers

Teachers, who are also lifelong learners, are now expected to have to adapt to the integration of ICT in their learning process in varying degree either by updating their skill set via various online courses or using online search engines in research or using YouTube and other video streaming portals enhance teaching activities. Most of the studies conducted on digital immigrants have observed acceptance of this integration among a large number of teachers and reluctance among a significant teacher's population.

Kim et al. conducted in-depth interviews and classroom observations of five middle school science teachers to conclude that teachers perceived that using Web resources made students' learning more dynamic and active as it promotes the interaction and communication among students and between students and teachers (10). Another study

examined pre-service teachers' computer acceptance and concluded that the perceived usefulness of technology had a significantly positive effect on teachers' intentions to use computers in the classroom (11). On the other hand, few reviews also suggest that many teachers feared that using technology would harm students' understanding of basic math concepts, make them overly dependent on technology, and not be useful as an instructional tool (12).

A research conducted in 2005 involving 15 teachers from two urban schools and two rural schools in Canada showed that none of the teachers considered that technology could increase students' confidence. They also concluded that nine teachers claimed that they would use technology only for keen students and that the use of technology demands time and specific skills. Weak students needed to focus on the practice of necessary skills rather than wasting time on technology integration. Several teachers said that the traditional textbook-based approach would be more appropriate for weak students than technology-supported learning (13). In our understanding, the research community had presented a broadly divided view among teachers over the incorporation of ICT in a student learning environment, more so with among those teaching in a professional course.

### 1.3. Digital Gap between Students and Teachers

A study conducted in Shanghai showed that Chinese students spend a long time using ICT than their teachers, with teachers using ICT more inside the classroom than outside (14). Their findings also revealed a complicated relationship between personal factors and social influence that explained the teacher's ICT adoption. In contrast, Ertmer et al. found that teacher's pedagogical beliefs (i.e., student-centered or teacher-centered pedagogy), as well as their beliefs and attitudes about the relevance of technology in education, played vital roles in shaping ICT practices(15). Several studies have explored the influence of technology and concluded that technology could motivate students to learn mathematics and science (11, 16, 17).

An earlier review of the literature indicated that many teachers feared that using technology would harm student's understanding of basic math concepts, make them be overly dependent on technology, and not be useful as an instructional tool (18). The study further showed that a significant number of teachers perceived that they had never been introduced to any software that aided in teaching and believed that using the software did not save time in teaching or evaluation (18). The digital gap that can exist in teaching and learning between teachers and students can be partly owed to what we identify as the generation gap. This gap examines differences not among students, but rather between students and teachers. Many youths today have spent much of their lives surrounded by, and multitasking with, computers, video games, cellular phones, digital cameras, digital music players, and the Internet (19).

In contrast, today's teachers being digital immigrants have grown to use computers, the internet, and other digital media

which could be used by the teachers depending on their interest, dependency, and inclination towards technology. Like all immigrants, teachers learn to adapt to their environment, but “they always retain their accent and their foot in the past. Their teaching style, which likely reflects the way they were taught as children, may not match well with the learning styles of their digital native students.

Although several studies have demonstrated the effectiveness of technology integration within classroom setting for subjects such as mathematics and sciences, our study is intended to identify the students and teachers perception on benefits of using technology in teaching and learning in a medical school and also investigate for the possible gap that may be present between teachers and students. This study aims to investigate the perception on the effectiveness and usage of information and communication technology (ICT) in teaching and learning activities (TLA) among pre-clinical medical students and medical lecturers in a private medical university and further evaluated the association between the perception of ICT between pre-clinical medical students and teachers.

## 2. Materials and Methods

A cross-sectional study was conducted between November 2017 and July 2018 at a private medical university in Malaysia. Census was used to gather information from 212 pre-clinical medical students and 30 lecturers engaged in the teaching of these students in an integrated curriculum. Among the pre-clinical students, 100 were from year 1, and 112 were from year 2. Ethical clearance was obtained from the medical faculty research committee.

A self-administrative questionnaire survey method was chosen for data collection because of the large and scattered number of participants (across different campuses). Usage of ICT in learning(20) and Perception of the Use of E-education Tools and Implementation of E-courses(21) questionnaires were used. These are validated five-point Likert-scale questionnaire with numbers indicating 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. Before the commencement of this project, a pilot study was conducted with students outside the medical faculty to

establish the validity and reliability of the questionnaires.

Written consent was obtained from volunteering participants who were involved in the TLA from within the faculty of Medicine. The final data was then analysed by using Statistical Package for the Social Sciences (SPSS) software package 23.

## 3. Results

### 3.1. Socio-demographic Characteristics of the Study Population

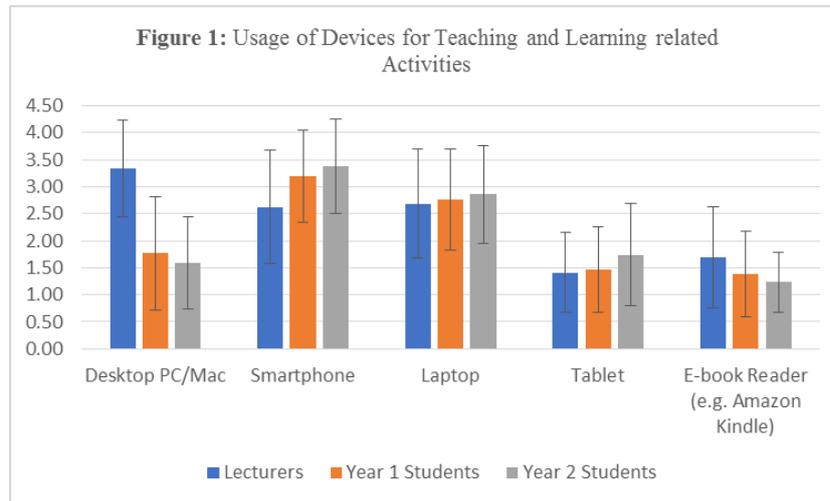
A total of 212 participants were included in this study, which comprised 30 teachers, 112 year 2, and 100 year 1 medical student. As shown in table 1, the mean age of lecturers was 49.61(± 13.763), year one students were 20.35 (± 1.358), and year two students were 21.14 (± 1.172). Over 60% of the student population were females, while among teachers, 60% were males. Over 80% of the medical students were from an urban background, while around 50% of the medical teacher’s population were from urban.

**Table 1.** Demographic characteristics of the study population

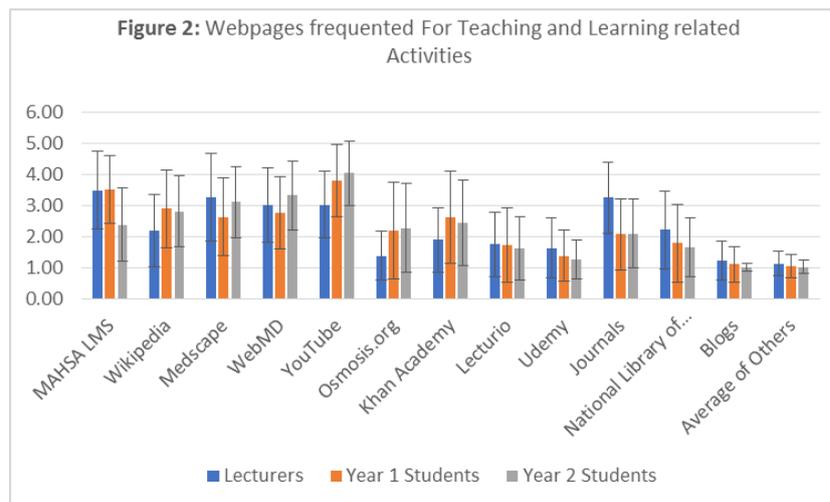
Variables	Category	Year 1	Year 2	Teachers
Number(n)		100 (41%)	112 (46%)	30 (13%)
Age (Mean ±SD)		20.35±1.35	21.14±1.17	49.61±13.73
Gender(n)	Male	31 (31%)	41 (37%)	18 (60%)
	Female	69 (69%)	71 (63%)	12 (40%)
Previous Residency (%)	Urban	85%	82%	55%
	Rural	15%	18%	45%

### 3.2. Utilization of Devices for TLA

The y-axis in Figure 1 indicates the degree of usage measured on a Likert Scale where 1 = Never, 2 = <3 hours a day, 3 = 3-5 hours a day, 4 = >5 hours a day, for the devices represented in the x-axis. As observed (Fig. 1) that the majority (65%) of the teachers prefer to use a desktop when compared to a student who has shown to prefer smartphones (60-65%) for their TLA. It is also noted that the usage of the laptop was prevalent among both teachers and students alike.



**Figure 1.** Usage of devices for Teaching and Learning related Activities



**Figure 2.** Webpages frequented for Teaching and Learning related Activities

### 3.3. Webpages Engaged for TLA

The y-axis in Figure 2 indicates the degree of usage measured on a Likert Scale where 1 = Never/Very Rare, 2 = Rare, 3 = Moderate, 4 = Frequent, 5 = Very Frequent, for the webpage engaged during TLA indicated in the y-axis. Around 55% of teachers and year one medical students were engaged in the utilization of university resources from Learning Management System when compared to 40% of year two students. It is also observed that 60-65% of students from both year 1 & 2 preferred using YouTube for their learning activities and around 50% of the teacher also used this platform in teaching activities. Usages of journals are found to be high among teachers (55%) while the use of other popular learning applications such as WebMD and Medscape was popular among students. Other popular applications such as Khan's Academy, Osmosis, Lecturio,

etc. were sparingly used by both teachers and students alike.

### 3.4. Utilization of Technology for Recreational Purposes

Table 2 presents the mean and SD of the score for interpreting the usage of technology for recreational purpose on a Likert Scale where 1 = Never/Very Rare, 2 = Rare, 3 = Moderate, 4 = Frequent, 5 = Very Frequent, for the recreational activities engaged during indicated in the x-axis. It is noted that there is a statistically significant difference between the teachers and students with students clearing engaging in higher activity. The stark difference is observed in activities such as playing games, chatting, and online shopping. It is also noted that a student's engagement with web surfing and non-academic/non-recreational usage was also significantly higher when compared to the teacher. This table further indicates that the students are far more engaged with technology-related activities than teachers.

**Table 2.** Technology usage for recreational purposes among pre-clinical teachers and students

Activities	Participants	Mean	SD	Significance* (ANOVA)
Games	Lecturers	1.24	0.577	0.000
	Students	2.65	1.408	
Downloading Media	Lecturers	2.52	1.214	0.001
	Students	3.31	1.230	
Chat	Lecturers	2.69	1.391	0.000
	Students	4.07	1.007	
Email	Lecturers	3.97	1.149	0.005
	Students	3.33	1.113	
Web Surfing	Lecturers	3.38	1.374	0.029
	Students	3.86	1.062	
Online Shopping	Lecturers	1.83	1.256	0.000
	Students	2.84	1.310	
Online Business/ Banking	Lecturers	2.76	1.573	0.026
	Students	2.22	1.153	

**Table 3.** Perception of usage of technology for TLA Activates

	Questions	Mean (Standard Deviation)			Kruskal-Wallis test	
		Lec.	Year 1 Stud.	Year 2 Stud.	Gender (Sig*.)	Lec. Vs. Stud. (Sig*.)
1	I spend most of my free time on gadgets and technology.	3.17±1.11	3.90±1.02	3.73±1.10	0.064	0.002*
2	Technology allows me to communicate with colleagues/parents/lecturers more efficiently.	4.17±1.02	4.08±0.86	4.34±0.77	0.720	0.920
3	I use smartphone to take photos and videos.	3.97±0.96	4.33±0.86	4.19±0.95	0.735	0.078
4	I use technology to send or receive instant messages.	4.53±0.73	4.41±0.86	4.41±0.73	0.029	0.412
5	Technology allows me to participate in group discussions.	3.93±1.01	4.22±0.87	4.17±0.81	0.167	0.194
6	I enjoy using technology.	4.03±0.89	4.34±0.80	4.04±0.94	0.027	0.326
7	I am using ICT to search for what I want to learn.	4.10±0.96	4.25±0.96	4.23±0.83	0.089	0.388
8	I am using ICT to look for pictures for better imagination and better memory.	4.10±1.09	4.14±1.02	4.14±0.87	0.043	0.964
9	I am using ICT to watch videos for a better understanding of a concept.	3.93±1.17	4.04±1.05	4.10±0.89	0.247	0.711
10	I am using ICT to listen to music to gain focus during the study.	2.80±1.34	3.43±1.38	3.77±1.18	0.246	0.002*
11	I use my computer to make my notes during lectures.	4.63±0.66	2.34±1.31	2.24±1.16	0.001	0.000*
12	I am keeping all my data, notes, files on my computer.	4.30±1.11	3.73±1.22	3.84±1.13	0.005	0.008*
13	I believe that I can improve my language skills using the benefits of the Internet.	3.83±1.20	3.74±1.07	3.77±0.89	0.326	0.497
14	The Internet is especially useful in completing assignments.	4.33±0.84	4.32±0.79	4.23±0.84	0.141	0.604
15	I can understand new concepts more easily when I use web services such as YouTube.	3.93±1.01	4.10±0.89	4.14±0.93	0.367	0.314
16	The Internet can reduce the duration of information lookup.	4.10±0.92	4.11±0.98	4.10±0.99	0.002	0.861
17	Technology can increase my daily productivity.	4.07±0.94	3.77±1.14	3.75±1.04	0.735	0.165
18	Smartphones can relieve my stress.	2.87±1.16	3.60±1.21	3.45±1.13	0.535	0.006

Likert Scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

\* = Significance with p < 0.05

### 3.5. Usage of Technology for Teaching and Learning related Activities

The relationship between all the items for the perception of usage of technology for TLA was tested by Kruskal-Wallis test, and the results are shown in Table 3. The meaningful relationship was found between mean of questions 4, 6, 8, 11, 12, & 16 between males and females in the study population. Whereas questions 1, 10, 11, 12, & 18 were significantly different when tested between teachers and students.

### 3.6. Usage of Technology for Teaching and Learning related Activities

Table 4 shows the value of mean & SD along with the relationship between all the items for Perception on the Use of E-education Tools and Implementation of E-courses was tested by Kruskal-Wallis test. A meaningful relationship was found between mean of question 7, 12, 16, & 17 between males and females in the study population. Whereas questions 2, 3, 5, 6, 7, 10, 11, 12, 13, 15 & 17 were significantly different when tested between teachers and students.

**Table 4.** Perception of the Use of E-education Tools and Implementation of E-courses

	Questions	Mean $\pm$ Standard Deviation			Kruskal-Wallis test	
		Lec.	Year 1 Stud.	Year 2 Stud.	Gender (Sig*.)	Lec. Vs. Stud. (Sig*.)
1	A mix-up between traditional and online learning would provide students with more help and support.	4.30 $\pm$ 0.79	4.13 $\pm$ 0.83	4.00 $\pm$ 0.77	0.484	0.120
2	Clear vision, mission, and objectives should be set for the online curriculum.	4.30 $\pm$ 0.75	3.98 $\pm$ 0.85	3.87 $\pm$ 0.79	0.209	0.018
3	Rules should be set for delivering online pre-clinical medical courses regarding online communications, culture, methodology, and process.	4.50 $\pm$ 0.77	3.96 $\pm$ 0.81	3.65 $\pm$ 0.82	0.183	0.000
4	Online assessment tools can be used to assess the success of online pre-clinical medical courses.	3.83 $\pm$ 0.95	3.87 $\pm$ 0.83	3.58 $\pm$ 0.89	0.181	0.470
5	Clear policy and bylaws should be developed concerning the implementation of online learning courses in the pre-clinical medical education.	4.10 $\pm$ 0.88	3.79 $\pm$ 0.90	3.56 $\pm$ 0.81	0.123	0.012
6	Online learning courses require students to be more self-disciplined, independent, and more organized.	4.13 $\pm$ 0.93	3.80 $\pm$ 0.92	3.71 $\pm$ 0.92	0.564	0.027
7	A strategy and clear plan should be set on how to implement and integrate online learning courses into the pre-clinical medical education.	4.37 $\pm$ 0.80	3.94 $\pm$ 0.77	3.72 $\pm$ 0.82	0.023	0.000
8	E-education system is more suitable for theoretical courses.	3.43 $\pm$ 1.16	3.59 $\pm$ 0.88	3.23 $\pm$ 1.00	0.173	0.849
9	Online courses would provide remote learners with an opportunity for mid-level qualifications.	3.50 $\pm$ 0.90	3.58 $\pm$ 0.86	3.39 $\pm$ 0.91	0.975	0.983
10	Online learning courses are more convenient and more compatible with students' and tutors' lifestyle.	3.07 $\pm$ 0.78	3.60 $\pm$ 1.02	3.57 $\pm$ 0.92	0.949	0.001
11	Resources and tools that support online courses are always available.	3.03 $\pm$ 1.033	3.56 $\pm$ 1.00	3.30 $\pm$ 1.02	0.510	0.037
12	Online learning courses would provide the same quality of face-to-face courses.	2.37 $\pm$ 0.96	2.90 $\pm$ 1.04	2.67 $\pm$ 1.03	0.011	0.030
13	Technical support for online courses is always available.	2.67 $\pm$ 0.92	3.20 $\pm$ 1.02	3.08 $\pm$ 0.95	0.769	0.013
14	Lab or practical courses can be taught online.	2.03 $\pm$ 0.96	2.66 $\pm$ 1.19	2.35 $\pm$ 1.23	0.274	0.063
15	Online learning courses are too complicated for my computer skills.	2.00 $\pm$ 0.98	2.54 $\pm$ 1.13	2.58 $\pm$ 1.023	0.168	0.007
16	Online learning courses would provide the student with a degree that is somehow equal to the on-campus degree.	2.50 $\pm$ 0.82	2.74 $\pm$ 0.91	2.59 $\pm$ 0.97	0.018	0.426
17	The phase 1 modules can be taught online.	2.33 $\pm$ 1.06	3.00 $\pm$ 1.04	2.86 $\pm$ 0.99	0.001	0.007

Likert Scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

\* = Significance with  $p < 0.05$

## 4. Discussion

The Fourth Industrial Revolution (IR 4.0) is expected to change how we live, work, and communicate; it is also likely to change the things we value and the way we value them in the future. The impact of this change has already been observed in various sectors, including the healthcare industry. Button D (2014) and others in their article showed that over the last two decades, the educational sector had been significantly invaded by ICT (22, 23). The use of digital technologies and social networking has grown rapidly over the last decades, and these technologies are increasingly being incorporated into the teaching of higher education (1, 2, 24). As a result, both medical educators and medical students are expected to incorporate and use digital technologies to facilitate teaching and learning in undergraduate medical curricula. This is of greater relevance in integrated curricula when compared to the traditional curriculum as the latter demands the students to use TLA to investigate, gather resources, segregate, compile the learning materials and present them in various forums such as PBL and ECE sessions.

In this era of digital explosion, innovative devices have flooded the market over the last decade. Both teachers and students alike are spoilt for choices. The results in this study show that among these devices used to explore TLA, the usage of laptop and desktops was commonly preferred by teachers, while smartphones and laptops were used by students while engaging in various teaching and learning activities. This indicates that students are mobile learners engaging in learning activities in their time and place of choice (25). This further indicates that the TLA activities that are used to deliver medical curricula should use such platforms to deliver the resources and learning contents compatible with these devices. Studies showed that medical teachers, especially in an integrated curriculum are primarily involved in the process of integration of ICT however, belonging to the category of digital immigrants they are yet to garner the potential in the use of these devices (26,3). Understanding this divide will help us resolve the issues over the hesitancy that exists over a particular section of the teacher's population in adapting to this new teaching and learning environment.

With the abundant availability of free information on the internet, it has been often commented that the choice of teaching and learning content should be carefully screened. In our study, we found that students used web services like Wikipedia, YouTube, Osmosis and Khan Academy more frequently than lecturers in engaging with TLA while on the other hand, the lecturers preferred services like Udemy and online journals. These results indicate that students are more likely to use quick and easily readable resources like Wikipedia and YouTube where the information is easy to comprehend and less reliable while lecturers prefer using resources like journals and the National Library of Medicine of The United States for teaching activities. It could be reasoned that the student's approach towards TLA could be

innate to the curricula which further can be due to various factors such as cognitive load, timetable constraints, assessment strategies etc. (27) in their article mandate that medical curricula should be developed with ICT integration as a core component and also report the challenges in changing the medical teaching process. Hence increased usage of videos taken from these students' preferred resources may prove to be helpful in the lecture hall as well, since that would support the lecture's theoretical information with a visual idea in the video format.

It is widely accepted that the digital revolution has not only impacted the learning process but also has an undeniable effect on the usage of this technology to foster our social needs. Table 2 shows the involvement of both students and teachers with various non-academic activities. It is noted that students have significantly spent more time on such extra-curricular activities when compared to teachers. However, activities such as downloading media, chatting, emailing, and web surfing have been frequently used, indicating the willingness of the teachers to adapt to new technology. This further indicates that acceptance and usage of ICT can be nurtured among teachers who are the most important contributors for integrating ICT into the curricula.

Item numbers 10, 11 & 12 from table 3 show that students have been utilizing information and communication technology to enhance their learning, especially while taking notes and storage of data. Both teachers and students have strongly agreed that they enjoy using technology, indicating the acceptance and willingness to explore its potential. However, as indicated in item 15, students preferred web services such as YouTube to understand new concepts more readily when compared to a teacher who continues to engage in using hardcopies in the form of textbooks and journals. It is also noted that choice to actively use technology in the classroom, storage of data, and internet to lookup for information was more commonly used by males.

The results indicated in Table 4 show that the teacher believed that clear objectives, rules, and policies should be set up to implement online learning courses and to integrate ICT in MBBS Phase 1 modules. Students, on the other hand, choose to be flexible towards the rules and regulations that can restrict their autonomy for learning. Teachers also agreed that the challenge in the extensive use of ICT is that it requires students to be more self-organized and disciplined (28). It is observed in Table 4 that teachers appear to be cautious regarding online courses being integrated into pre-clinical MBBS. This could be because they are either not equipped with the necessary skills or enthusiastic about considering the change (26, 29).

Based on the results it is inferred that students support the view that most of the MBBS Phase 1 modules teaching content including lab or practical courses could be taught online, whereas the majority of teachers rejected this idea. This indicates that students' general perception regarding the possibility of integration of ICT (Information and Communication Technology) into pre-clinical modules is

better than that of lecturers, as shown in table 3. This shows a gap between the perception of ICT integration into teaching and learning activities among lecturers and students. (29) also showed that there is a gap between the teachers and the curricula that are implemented in higher education.

More students also perceived online learning courses to be more convenient and compatible with their lifestyles and also indicated that online courses would provide the same quality that face to face courses provide, hence showing that according to their opinions, online courses or classes would be easier to participate in. Exploring this possibility might lead to higher engagement with selected learning content, especially in an integrated curriculum. (30) showed the need to engage in online TLA such that the students are ready for their workplace challenges, which are fast integrating artificial intelligence(AI) for better performance. The study also shows that in both years 1 & 2 medical students there are students who have technological barriers due to issues like ineffective internet connection, or slow website loading problems that may hinder students' ability to perform their best.

Although the sample size calculated was for students and teachers in integrated medical curricula, we suggest a large sample to validate this study further. Our study looked into the perception of usage of ICT in one curriculum; this could be further compared for those teaching in integrated and traditional medical curricula. Thus data across different curricula and regions could further help us understand the perception of the use of ICT and investigate the extent of the digital divide between teachers and students.

## 5. Conclusions

This study has conclusively shown that the use of ICT is prevalent between both medical teachers and staff; the difference was only in the degree of usage and also both the groups enjoyed the use of technology. It was also clear that both medical teachers and students viewed the use of ICT to be integral in delivering the curricula. The incorporation of ICT in classroom activity was far more prevalent with students than teachers. Students widely used technology for non-academic activities such as gaming, online shopping, and downloading media. The use of smartphones to relieve stress was also prevalent among students.

On the other hand, teachers were content to use technology for activities such as email and banking; they further choose to use Wikipedia and YouTube sparingly when compared to students. Although both students and teachers indicated their willingness to engage in online courses for their learning needs, students preferred autonomy and flexibility in delivering these contents. This indicates that although there has been the migration of teachers towards incorporating ICT in their TLA, there still exists a significant digital divide between them

Understanding this divide can help the effective

integration of ICT into the medical curricula and thereby better prepare our students to meet the 21<sup>st</sup>-century workplace demands.

## Conflict of Interest

We hereby declare that this project in part or full has no conflict of interest or financial obligations towards any individual or organization.

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