International Journal of Education and Knowledge Management (IJEKM) 4(2): 1-28 (2021)
Print ISSN: 2616-5198
Online ISSN: 2616-4698

Research Publishing Academy (RPA)
London, United Kingdom (UK)

IJEKM
International Journal of Education and Knowledge Management (IJEKM)
Journal Homepage: https://rpajournals.com/ijekm

Preliminary Study on Students' Readiness to Learn Online due to Covid-19 Pandemic at a Pre-University in Malaysia

Amirul Mohamad Khairi bin Mannan[1,2*]
Faridah Ibrahim[2]
Norsiah Hashim[2]
Ahmad Zaki bin Mohamad Amin[2]
Faculty of Education, University of Malaya, Malaysia[1]
Center for Foundation Studies in Science, University of Malaya, Malaysia[2]

Abstract

The outbreak of Covid-19 in the early year 2020 has changed the landscape of our educational system. The government of Malaysia announced the Recovery Movement Control Order (RMCO), where no education institutions can practice face-to-face learning. Therefore, the management of the University of Malaya has decided that all students will learn online until 31 December 2020. Hence, this study is conducted to investigate the new students' readiness on online learning before their classes start. The survey was conducted using Google Form focusing on four main aspects of readiness, that is the students' background, hardware readiness, software readiness and behaviour. The behaviour aspect includes experiences, opinions, and expectation on online learning. 1126 students consisting of 546 (48.5%) males and 580 (51.5%) females participated in this survey. From the survey, we found that 1013 (90%) students are ready with online learning. However, action must be taken to assist the remaining 113 (10%) students. Alarmingly, 563 (50%) students have not experienced online learning before. 900 (80%) students claimed that they are ready to learn online. Hopefully, this research will provide some insights on the current situation and problems regarding online learning and its remedy can be prepared to overcome it.

Keywords: Online Learning, E-Learning, Readiness Assessment, Covid-19, Coronavirus, Pandemic, Movement Control Order, Pre-University Students

*Corresponding author: M. Amirul Mohamad Khairi; Email: amirulkhairi@um.edu.my
DOI: https://doi.org/10.37227/ijekm-2020-03-38

Introduction

The Centre for Foundation Studies in Science (CFS), University of Malaya, Malaysia provides a 1-year foundation program for students. This foundation program is a necessary requirement for students before they can pursue their first degree in a university. The subjects taught at CFS are Mathematics, Programming, Physics, Chemistry, Biology, English, Information Technology and Self Development Studies. There are two streams offered to the students which are Life Sciences and Physical Sciences. Programming and Advanced Mathematics are taken by Physical Sciences only, while Biology is taken by the Life Sciences students only. Those aspire to pursue a degree in medical stream must take the Life Sciences. The method of teaching and learning at CFS is by lectures, tutorials, and practical experiments in laboratories. Besides formal classes, students will be evaluated through continuous assessment for example quizzes, mid semester examination and final examination. Students' attendance is also recorded to ensure that the students participated in all learning activities.

On the 30th January 2020, the World Health Organization (WHO) declared a Public Health Emergency of International Concern due to the Covid-19 outbreak. The outbreak which started

from Wuhan, China has caused a major panic worldwide (Munster, Koopmans, van Doremalen, van Riel, & de Wit, 2020). The Covid-19 or also known as the coronavirus which is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Millions of people lost their lives which resulted in WHO to declare it as a pandemic on 11th March 2020 (World Health Organization, 2020). The virus which is mainly spread between people in close proximity via small droplets produced by coughing, sneezing, and talking. The droplets usually fall to the ground or onto surfaces rather than travelling through air over long distances. Taking the safety of the nation as top priority, the Government of Malaysia had imposed a Movement Control Order (MCO) on the 17th March 2020 to curb the spread of Covid-19 (Abdullah, Mansor, Napi, Mansor, Ahmed, Ismail, & Ramly, 2020). This is a very important decision to restrict the movement of the people to reduce the spread. At the same time the health facilities are increased to assist those infected. One of the sectors that is severely affected is the education system. Academic institutions at all levels had to be closed to prevent any possible transmission.

On the 10 June 2020, the Government of Malaysia has announced a Recovery Movement Control Order (RMCO) (National Security Council of Malaysia, 2020a, 2020b) which ordered all educational institutions to be re-opened by stages. One of the educational institutions that has been re-opened is the CFS. The management of the University of Malaya, Malaysia has decided to allow the new session of foundation studies at CFS to commence on the 27 June 2020. Students' registration and learning sessions will be conducted via online. The management of the university has also decided that the students will learn through online until 31 December 2020. To prepare for online learning classes, an online learning model has been suggested to suit the needs of the students.

Prior to this, a blended learning approach was adopted in CFS. Blended learning here refers to the use of traditional classroom and online learning using Learning Management Systems (LMS). LMS are web-based systems that allow instructors and/or students to share materials, submit and return assignments, and communicate online (Bervell, & Arkorful, 2020). The online learning part was only used to disseminate lecture notes, tutorial questions, assignment submission, quizzes and to record attendance. The major part of learning which is verbal communication during lectures and tutorials were conducted by traditional method of face to face. Now teaching and learning have to be done online and therefore, a suitable online application is required to achieve it. Three main LMS provided by the University of Malaya to facilitate online teaching are Spectrum (developed by University of Malaya), MS Teams and Google Classroom (both subscribed by University of Malaya). Table 1 describes the features of these three CMS for learning online in CFS.

Table 1: Features of Spectrum, MS Teams and Google Classroom for online learning

Features / CMS	Spectrum	MS Teams	Google Classroom
Video meetings	No	Yes	Yes
Share contents	Yes	Yes	Yes
Assessments	Yes	Yes	Yes
Assignment submission	Yes	Yes	Yes
Chat/ Forum	Yes	Yes	Yes
Record attendance	Yes	Yes	Yes

The video meetings feature is one of the most important functions required as it is used to replace the face-to-face session. Hence it was decided that the Spectrum will be used to support all the teaching needs except for video meetings. The use of Spectrum is compulsory since it is the official LMS of the university. MS Teams will be used for video meetings. Table 2 describes the blended learning that was used prior to Covid-19 and the proposed full online teaching to be implemented during this period. In terms of hardware, the suggested basic requirements for effective online learning are stable internet connection and a laptop or desktop well-equipped with microphone, camera, and speaker (Shahid et al., 2019). Since the online teaching and learning methods have been prepared, we need to know the level of readiness of the students.

Table 2: Blended Teaching and Full Online Learning Modes

	Blended Learning		**Full Online Learning**	
Activities	**Traditional**	**Online**	**Traditional**	**Online**
Lecture by Face to Face	Yes	No	No	Yes (MS Teams)
Tutorial by Face to Face	Yes	No	No	Yes (MS Teams)
Laboratory	Yes	No	No	Yes (MS Teams)
Lecture Notes	No	Yes (Spectrum)	No	Yes (Spectrum)
Tutorial Questions	No	Yes (Spectrum)	No	Yes (Spectrum)
Quizzes	No	Yes (Spectrum)	No	Yes (Spectrum)
Exam	Yes	No	No	Yes (Spectrum)
Assignment Submission	Yes	Yes (Spectrum)	No	Yes (Spectrum or MS Teams)
Record Attendance	Yes	Yes (Spectrum)	No	Yes (Spectrum or MS Teams)

Literature Review

The evolution of internet technology has changed the world tremendously. According to Bruns (2008), the Web has been radically transformed, shifting from an information repository to a more social environment where users are not only passive receivers or active harvesters of information, but also creators of content, or "producers". Even if the term itself is contentious, "Web 2.0" is used to characterize a web environment that is moving from publishing to participation, contribution, and user-defined content creation and organization through posting, commenting, tagging, and folksonomy creation. The use of social software and social networking has been growing exponentially with applications in social, gaming, media, business, and education contexts. Educational institutions have taken advantage of this technology to utilize it in teaching and learning online. However before implementing the online teaching and learning, stakeholders of the institution need to be assessed in terms of its readiness. These stakeholders such as the management, educators, students, infrastructure, and cost involved.

Several studies have been done to assess the readiness of the students. In a study by Panuwatwanich & Stewart (2014) assessed the online learning readiness (OLR) of a sample group of postgraduate engineering students undertaking a project management course at Griffith

University in Queensland, Australia. The study found that the sampled students had different levels of OLR and can be clustered into three main groups: developed, less developed and developing OLR, and that the higher level of OLR can be associated with the more extensive use of online learning tools. Developed OLR were mostly from students with good learning preferences, high level of technical skills, the older age of students and mostly males. Besides that, having equally higher technical skills, the students from both the Developed and Less-developed OLR clusters tended to be able to use more of these tools than those from the Developing OLR cluster who had much lower level of technical skills. The researchers suggested that online readiness assessment should be conducted early to classify students. To solve the less inclined students to learn online, instructors must have strategies on online tools that should be used, intensive workshops on online tools should be provided to them and lastly trainers should be provided with the fundamental skills on how to effectively design and deliver online courses.

Mehran et al. (2017) evaluated Japanese learners' perceived e-readiness for learning English online prior to designing and developing an online EGAP (English for General Academic Purposes) course at Osaka University. The survey included questions on respondents' ownership of and access to technology tools, their ability in performing user tasks from basic to advanced, their personal educational use of Web 2.0 tools, and their willingness to take online English courses. The results showed that the students have personal ownership and/or adequate access to technological devices and the Internet at home or at the university. In terms of digital literacy and competency, they have low levels of keyboard skills and lack of knowledge on using Web 2.0 tools for education. Most of the students are unaware of the usefulness of Computer Aided Language Learning (CALL) tools in English language education. Further results showed that students were also in general unwilling to take online courses, either fully online or blended. Hence, it is important that digital literacy training is provided before implementing the prospective online course with a focus on EGAP.

Mohammed (2018) investigated the online readiness of medical students at the University of Fallujah in Iraq. There are five main parameters that have been measured which are technological readiness, culture readiness, content readiness, demographics factors and psychological readiness. The results showed that the students are not ready for E-learning. One of the factors is the lack of experience in e-learning. Hence training should be provided to the students. They also found that students at higher levels of study had low levels of readiness. This may be due to clinical training which requires physical presentation. Beside that institutions should be ready to invest in technology to start or sustain E-learning. As important as technological readiness in predicting E-learning readiness are attitudes of students toward E-learning and culture readiness, followed by content readiness.

Utomo, Sudaryanto and Saddhono (2020) conducted a study on university students' readiness to implement online learning in Indonesia. Indonesia is one of the most highly populated countries in the world. Due to a large population with different backgrounds, it is a big challenge for the government to provide equitable infrastructure and cost implications to implement distance learning. Therefore, it is important to identify the most frequently used tools for online teaching, video conferencing, medium for communication and with minimal cost incurred. It was found that 91.8% of the students still access the internet via mobile data, compared to only 8.20% who have access to the dedicated internet. The study recommends self-learning methods utilizing the features available in Google Classroom for theoretical lessons and consider face-to-face meeting for video conference only in important and practical subjects. These tools and strategies suggested will ensure efficient delivery of online learning and minimize the cost in internet data.

Lall and Singh (2020) conducted a study on students' perspective, attitudes, and readiness towards online learning due to the Covid-19 outbreaks. A total of 200 students from Graphic Era Hill University, Dehradun India participated in this study. The study revealed that most students favoured online learning classes. The common reasons are due to flexibility of study time and mobility. There were several negative factors mentioned by students towards online learning. These include lack of co-curricular activities, not able to meet friends physically, language issues, lack of

two-way communication and problems with internet connections. The study also revealed the most common source of the online classes mentioned by students was PowerPoints with audio, followed by videos, webinars or video conferencing and PowerPoints only.

Mohmmed et al. (2020) studied the implementation of Emergency Remote Teaching (ERT) at the Middle East College Oman (MEC) due to the Covid-19 outbreaks. The participants were students and academicians from the mechanical engineering department. The implementation of ERT requires students to have the necessary learning skills, capacity for independent learning, effectiveness to communicate efficiently, motivate themselves, and seek guidance when required. There are different types of students in the department with different nature of learning time. There are full time students, part time students and students that had to complete laboratory sessions and industrial field visits. There are also challenges in online teaching and learning sessions at home as there are distractions in the form of loads of homework, childcare, inadequate workspace and others. These are the challenges that students and academicians are facing and should consider in developing their teaching and learning contents. Asynchronous and synchronous activities were developed to meet the needs of those seeking online interaction and not able to attend the live session. In terms of communications, several factors that hinders it includes less access to internet resources and personal matters. Few students did not respond to the messages from instructors due to several reasons such as less access to internet or other personal matters. The instructors also face difficulties in obtaining students' concentration and attention during the online session. Students also struggle to retain focus due to distraction of other activities like web browsing and messaging online. The study concluded that continuous monitoring on progress and issues should be done.

Reyes-Chua et al. (2020) surveyed 15 professors teaching at different courses from Cavite, Philippines in Region IV-A on their readiness to teach online due to the Covid-19 outbreak. These courses are diverse which are Math, English, History, Social Sciences, NSTP, Marketing, Business, Computer Science and Courses in Professional Education. One of the questions asked to the professors is "How do your students respond to your alternative mode of learning?". In general, the response received was very positive. Students enjoyed the E-learning platforms used by their professors. However, some of the students are facing challenges such as poor internet connection, inability to access the resources, not familiar with the online platform and time intensive to learn new ways of learning. Most of the students perceived the crisis as temporary. There were students who are positive and eager to earn. But there were also students who chose to put their study on hold and take a vacation instead. This study recommends professional development workshops for both faculty members and students and preparation of advanced lessons, slide presentations, and examinations per unit to cope with the prescribed number of hours set by the Commission on Higher Education (CHED).

Ebner et al. (2020) investigated the university readiness to implement e-learning due to the Covid-19 at the Graz University of Technology, Austria, from the perspective of the Educational Technology Department. The paper described the internal procedures, processes and decisions of their university and present figures on the changed usage behaviour of their students and teachers. In short, the enablers that had made it possible is that the learning management system (LMS) was already established since 2015, stakeholders at all levels gave full commitments, these include lecturers, technical engineers, and the university management. The barriers that need to be overcome are the hardware such as internet connections and system issues. Issues that arise such as system needs to be updated in a short time, many requests for interviews and partly incorrect articles contributed to the pressure. The bottleneck was that the small team was exhausted after a few days due to the demand of the workload. Hence, they emphasized that all departments need to be prepared as early as possible, trust and clear communication are needed, identify the next bottleneck and choose effective measures to reach out to students.

Cutri and Mena (2020) has critically reviewed 44 studies documents themes of the affective dimensions and identity disruption surrounding faculty's readiness to teach online and explores their professional vulnerability. From the analysis, they have found the structural and cultural forces that produce and constrain faculty's experiences transitioning to online teaching.

Faculty transitioning to online teaching can be constrained. Academician traditionally measured for advancement in terms of scholarship instead of teaching innovation. Teaching online is time intensive at the expense of other responsibilities such as citizenship and scholarship. Faculty are also facing constraints in cultural forces such as the clash between the traditional cultural milieu of academia and the intense emotional responses that faculty can experience in this process. The study suggested for study to move beyond competency-based assessments. Further encouragement and recognition should be given to the academician to develop innovative online learning methods to attract the students. A scale capable of measuring the affective and identity disruption variables involved in faculty readiness to teach online is needed.

Therefore, based on the literature review, it is important for the CFS to investigate students' online learning readiness assessment based on the needs of the new students during this emergency state due to Covid-19 pandemic (Hodges et al., 2020). It is important to know the demographic of the students which include their current location and previous school. Current location is important as it may affect whether internet connection is provided at that location. Information on former schools is also important as some schools are exposed to online learning. We also want to know the type of online learning experience that they had at their former school. This information will help us to know the level of readiness among students, so that we can identify the students that have difficulties in terms of using online applications. Besides that, we need to know whether they have at least the minimal equipment for online learning which are stable internet connection and any devices well-equipped with microphone, camera, and speaker. This finding is important so that the materials are delivered at a minimum requirement.

Furthermore, we also need to know their experiences, opinions, and expectations towards online learning. This information would be useful to all stakeholders which include management, academicians, and technical staff to ensure adequate preparation is made. The management will be responsible to decide on the mode of learning based on the current situation. They need to communicate regularly to students to explain the conditions and implications. The academicians must design the appropriate teaching pedagogy online so that students are constantly motivated and engaged throughout the online sessions. The software and hardware requirements should also be at the minimum so that all students can take part. Software providers and technical support are equally important to ensure that the university's LMS platforms (Spectrum and MS teams) and stable internet connection to avoid any disruption during the online learning process.

Research Methodology

A valid and reliable student online readiness tool is very essential to identify students who are ready to take online courses, and to reduce withdrawal rate. Factors such as adult learners' fluency and perception in using Information and Communication Technology (ICT), particularly in network literacy, and their Self-Directed Learning Readiness (SDLR) can be critical elements in determining the effectiveness of online learning (Hiemstra, 2006; Song and Hill, 2007; Lema and Agrusa, 2009). Omoda-Onyait and Lubega (2011) has proposed e-learning readiness assessment tools for higher learning institutions in developing countries such as Uganda. At that time most of the assessment tools were developed by and for developed countries. E-Learning has been suggested as an alternative approach that can overcome many of the challenges involved in reaching underserved students. Therefore, it is crucial that assessment must be made prior to implementation to avoid unnecessary failures in terms of manpower, time, and cost. The proposed model for assessing institutional readiness for e-learning is a five-layered triangle, namely: awareness, culture, technology, pedagogy, and content. Awareness which is a key factor is at the base of the triangle, followed by the culture of the society or an institution, then technology available, pedagogy to match with the technology for creating an inviting, demanding, engaging and motivating learning environment for the learner and the content at the apex.

Farid (2014) has conducted a systematic review of 5107 published and unpublished papers identified in a literature search on student online readiness assessment tools between 1990 and

2010. He found that there are no standard tools that exist and that only ten instruments have been developed and published over the past 20 years to assess student's readiness. Many organizations opted for unpublished or homemade tools to address the lack of a self-assessment tool which is standardized, reliable and valid to administer to students who want to enrol in online courses. However, scores obtained through these tools to assess the readiness of a student towards e-learning remain uncertain, because their psychometric properties have not been demonstrated, and these instruments were not developed according to a theoretical and empirical approach (Chen and Edward, 2008).

Hence, we decided to develop our own instruments to assess the students' readiness. Since the students are in remote areas and no physical contacts are allowed, the instrument was developed using Google Form. Google Form was commonly used by other researchers to conduct study on students' readiness on online learning such as Obi, et al. (2018). The questionnaire consisted of four parts which include questions on students' background, hardware readiness, software readiness and the aspect of behaviour. In the first part, participants were asked about the personal information to capture the demographic data of the respondents including gender, location and Malaysian Certificate of Education (MCE) results. The second part is collecting data related to hardware readiness of the students. The third part is to investigate their previous experience with online learning and the last part is to have their opinion and expectation of having online classes for the coming academic session. The questionnaires were provided in dual languages of English and Malay languages. The questionnaire was later tested for validations. The positive feedback was received, and some minor revisions were made to the questionnaire according to their suggestions. Then the survey is distributed to the students through email from 24 to 26 June 2020. The students also were briefed through email on the purpose of the survey. Approximately 1813 new students for the CFS from across 13 states and 3 federal territories of Malaysia were targeted in this survey. Only 1126 (62%) students participated in this survey..

Results and Analysis

The results' data from 1126 respondents to the questionnaire were analyzed using descriptive statistical techniques. The first part of the questionnaire is on the demographic of the students. In terms of gender, 51.5% of the respondents are females and 48.5% are males (refer Table 4). Therefore, the ratio of male to female is almost one to one (1:1).

Table 4: Gender of the study sample

Gender	Frequency	Percentage
Male	546	48.5 %
Female	580	51.5 %

As summarized in Figure 1, the majority of the students are staying with their parents with a percentage of 96.6%. Only about 38 students (3.4%) are staying in their hometown. This probably due to MCO restrictions, either parents working in their hometown or the students are staying with their grandparents. These findings were before the students came to the CFS.

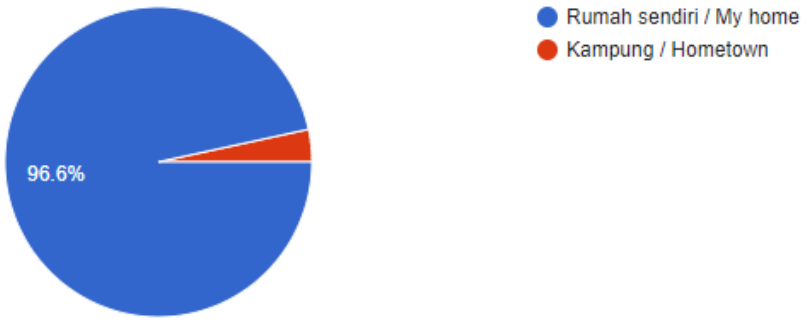

Figure 1: The location of the students (my home or hometown)

The highest percentage of students, at 30% (338), are from Selangor (one of the states in Malaysia). The next highest is the students from Johor with a percentage of 10.8% (122) followed by 8% (90) of the students from Perak. About 9.1% of the students are from East of Malaysia, that is 53 students are from Sarawak and 49 students are from Sabah. While 5.2% (58) and 1% (11) of the students are from Kuala Lumpur and Putrajaya, respectively. These will total up to about 69 of the students only. In this survey, it is found that none of the students are from Labuan (see Figure 2).

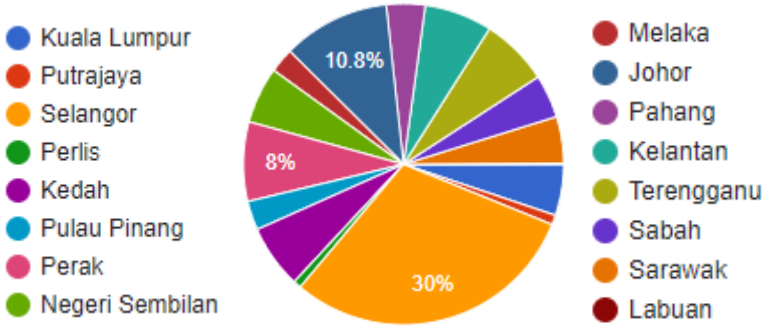

Figure 2: The location of the students according to states

Based on the survey of the Malaysian Certificate of Education (MCE) results, all the respondents got either an A, A+ or A- for Mathematics. 86.7% of the respondents got A+ for Mathematics. Only one student got A- for this subject. However, 227 and 679 of the students got A+ and A respectively for Additional Mathematics. About 125 of them got A- for this subject. The rest of the students got B, B+ and B- for Additional Mathematics.

About 46.9% of the students got A+ for Physics. 92.9% of the students managed to get either an A, A+, or A- in Physics. However, 661 out of 1126 students got A+ for Chemistry. 94.6% of the students got either an A, A+ or A- for Chemistry. Students did slightly better in Chemistry compared to Physics. For Biology, 232 students got A+. About 85.3% of students managed to get either an A, A+ or A- for Biology. 117 students either did not get A or B for Biology, or they did not sit for the paper in MCE.

985 students managed to get A's for English. This includes 395 of them who got A+ for the subject. Only 4% (45 students) got other than grade A's and B's. These results of the survey are depicted in Table 5.

Table 5: The Students' Results for the Malaysian Certificate of Education

Grade/ Subjects	A+	A	A-	B+	B	Not Relevant*
Mathematics	976	149	-	-	-	-
Additional Mathematics	227	679	125	48	20	27
Physics	528	286	233	36	-	40
Chemistry	661	239	165	24	-	33
Biology	232	535	194	40	8	117
English	395	440	150	75	21	45

*Not Relevant means either students get below B or they did not take the subjects.

Analysis on The Device Usage for Online Teaching and Learning (TnL)

Analysis on the Devices

According to the bar chart in Figure 3, all the students except two of them have smartphones. Further, the survey found that most of the students have laptops that is 978 of them. Thus, it shows that they have met the minimal requirement for online classes. Apart from that, 844 students claimed that they have printers at home and probably belong to their parents or siblings. Only about 250 and 197 of the students respectively have a desktop or tablet with them.

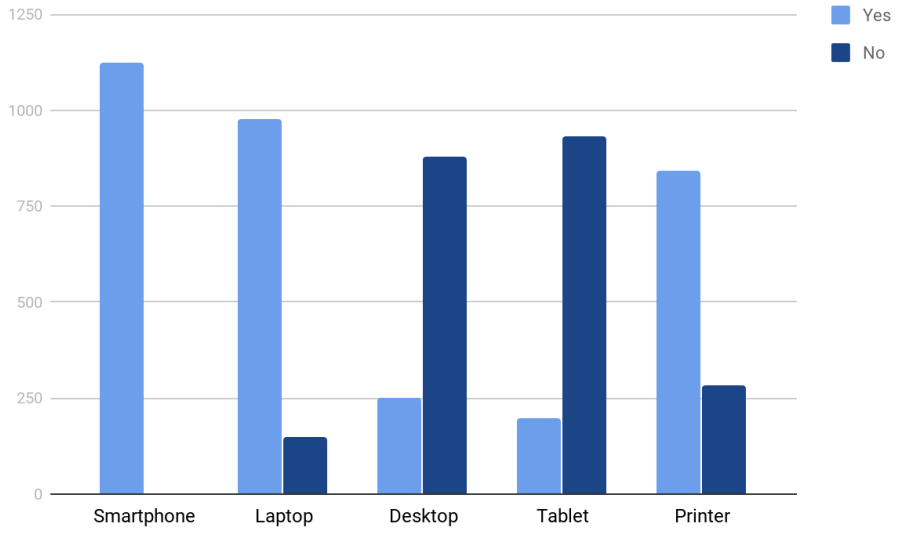

Figure 3: Devices owned by the students

Analysis on Students' Internet Access

In this respect, about 788 (70%) of the students depend on their phone data plan for internet access. While 705 (62.6%) of the respondents have internet access from home internet plan. It is because the survey was done before they came to the campus. 23 (2%) of the students used the public Wi-fi. Apart from that, 7 (0.6%) of the students claimed that they do not have the internet access (see

Figure 4). However, these 7 students have multiple answers: five students claimed that they used phone data plan and no internet access, only one student claimed that he/she used phone data plan, public WiFi and no internet access and another student claimed no internet access only.

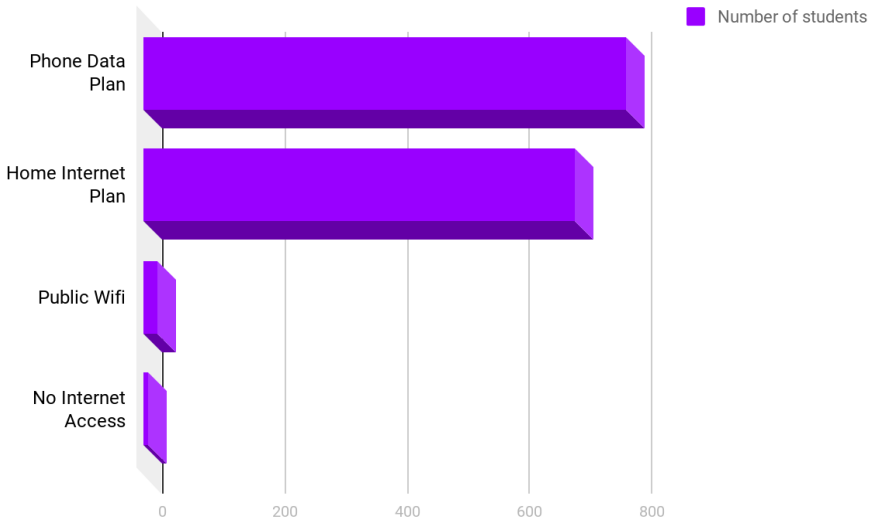

Figure 4: The Internet Access by the Students

Analysis on the Internet Connection Stability

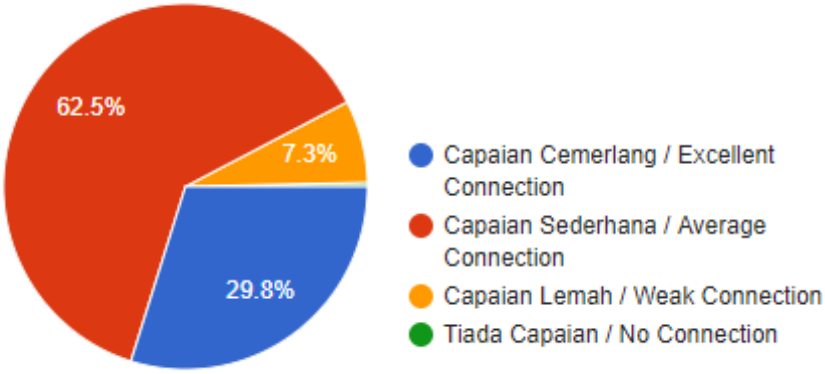

Figure 5: Analysis on Internet Connection Stability

One of the aims of this study is to examine the readiness of the students according to their hardware, specifically their internet connection stability. Therefore, Figure 5 represents the findings of the survey. A total 704 (62.5%) out of 1126 students claimed that they have average internet connection. 336 students (29.8%) have an excellent internet connection. About 82 students (7.3%) have a weak internet connection. Only 4 students (0.4%) claimed that they do not have internet connection. These 4 students are from Ranau and Telupid (Sabah), Kerian (Perak), and Gombak (Selangor). This finding matches with the data on students claiming that there is no internet access at their place of residence.

Online Teaching and Learning (TnL) Experiences

Analysis on the Online Learning in Former School

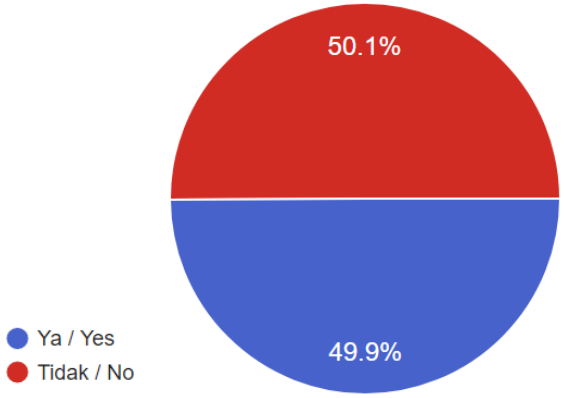

Figure 6: Analysis on Online Learning in School

According to Figure 6, out of 1126 students, 562 (50.1%) claimed that they have experienced learning online in school. However, 564 (49.9%) of the students mentioned that they did have any experience in learning through online during their school days. This information might give a tough time for the academicians to handle.

Analysis on the Experiences of Online Learning in Former School

The results of the survey revealed that most of the students had experienced downloading the notes online, that is 70.5% (794) of the students. While 43.5% (490) of the students had experienced having discussions with friends online regarding their school lessons. Nevertheless, there were 24.1% (271) students who have never experienced online learning. Other experiences that they had in online learning such as online quizzes, hearing short explanations from teachers through voice note, school exercises and assignment submission through online, watching educational videos on YouTube and many more. These results are illustrated in Figure 7.

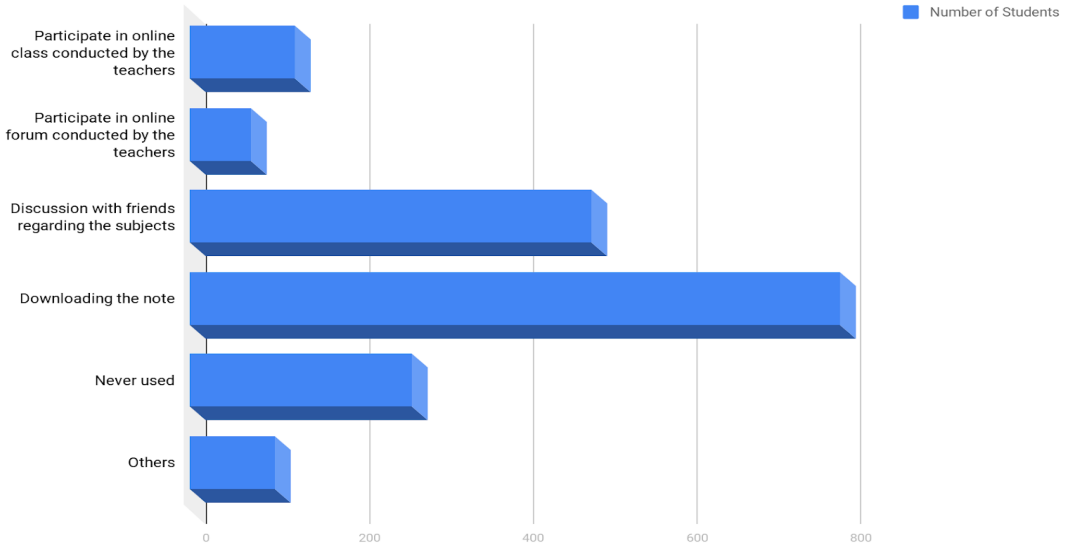

Figure 7: Analysis on The Online Learning Experiences that the Students had in School

Analysis on the Willingness of the Students on Learning Through Online

Online learning refers to an electronic learning environment where there are no physical peer learners, and there is freedom of time and space. Thus, 965 out of 1126 students, which is about 85.7%, claimed that their online learning experience is not forced by anyone but on their own will (see Figure 8). However, 14.3% of the students were against this statement. They answered that it is not on their own willingness to learn online. The overall result shows that the students are motivated towards online learning.

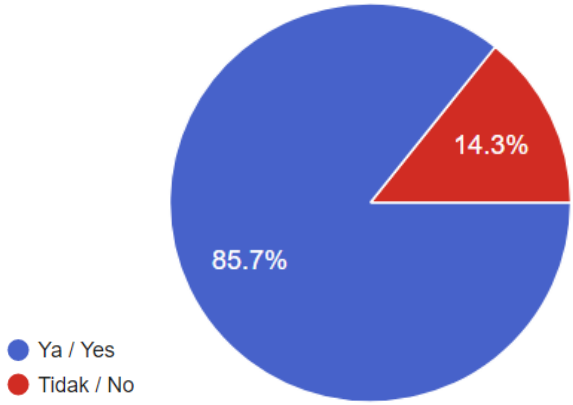

Figure 8: Analysis on whether the students having their online learning with their own willing

Analysis on the Duration of Students' Online Learning in a Day (average)

Figure 9 shows that 42.5% of students which is 479 of them spend less than 1 hour in online learning. Only 3.1% (35 students) of students spend online per day for 5 hours or more studying online. However, average hours of online learning per day in CFS is 5 hours and more. Indeed, these findings are very important to give some insights to all academicians and the management of CFS.

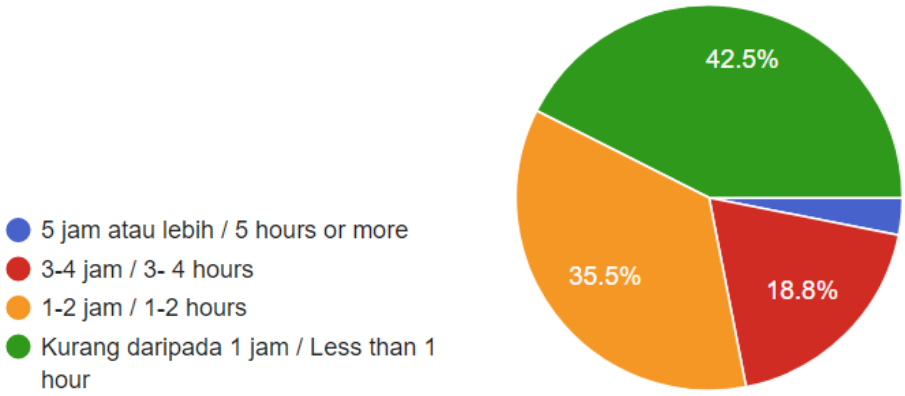

Figure 9: Analysis on the duration of the students online learning experience in a day (average)

Analysis on the Number of Subjects That Have been Taught by the Teachers Through Online

Figure 10 shows that 40.9% (461 students) have no experience of subjects being taught online. 15.5% of the students claimed that they have had one subject taught online during school days. 17.1% of them claimed that two subjects were taught online. However, 19.4% of the students have experienced more than three subjects being taught online in school. In CFS, about seven subjects will be taught online.

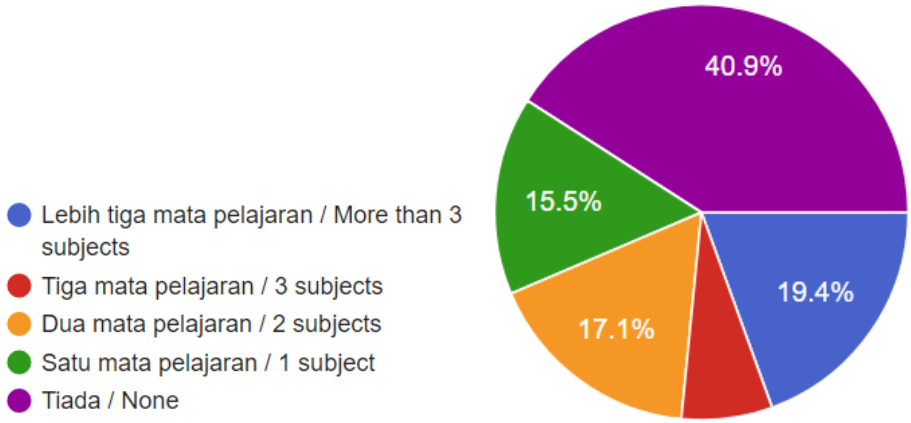

Figure 10: Analysis on the number of subjects that have been taught by their teachers through online classes

Analysis on the Online Platform for Learning

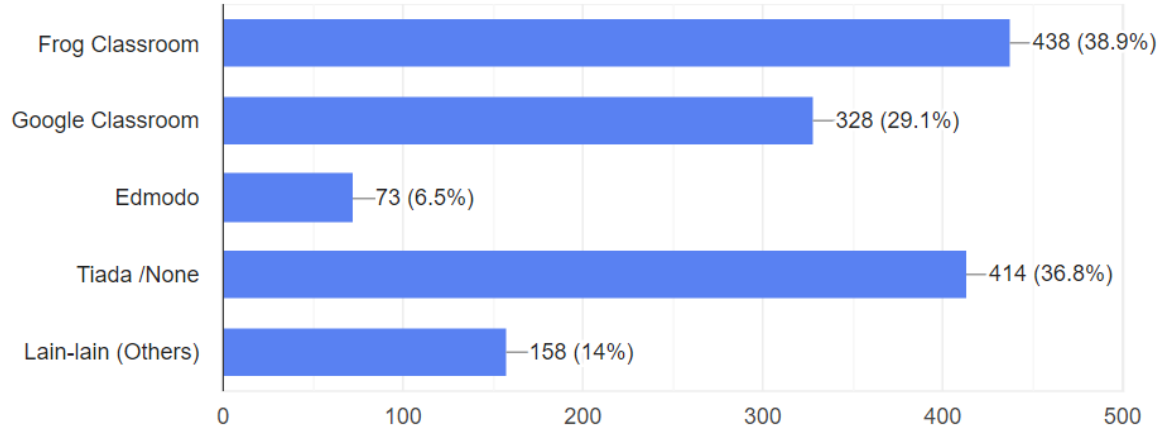

Figure 11: Analysis on the online platform that students used for learning

According to the bar chart (figure 11), 38.9% (438) of the students have experienced using the Frog Classroom apps in school. 29.1% (328 students) have experienced using google classroom. However, 36.8% (414 students) claimed that they did not use any platform for online learning in school. 6.5% of the students have experience in using Edmodo

Analysis on the Video Application During Online Learning

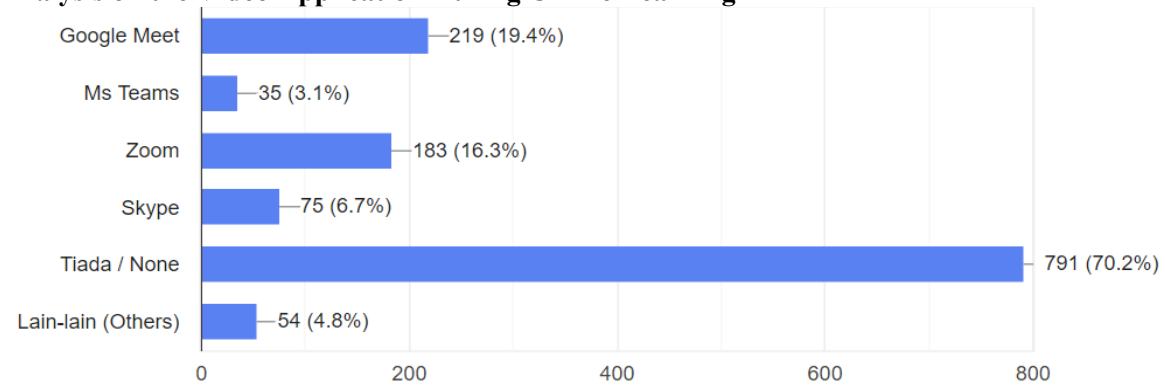

Figure 12: Analysis on whether have used the following video application during online learning

According to the bar chart, 70.2% (791 students) have never used any video application during online learning at school. This is supported by the fact that students are not allowed to bring a smart phone to school and especially to video learners with teachers except outside the school. 19.4% (219) and 16.3% (183) students have used Google Meet and Zoom respectively, during online learning.

Analysis on using the Social Media in School

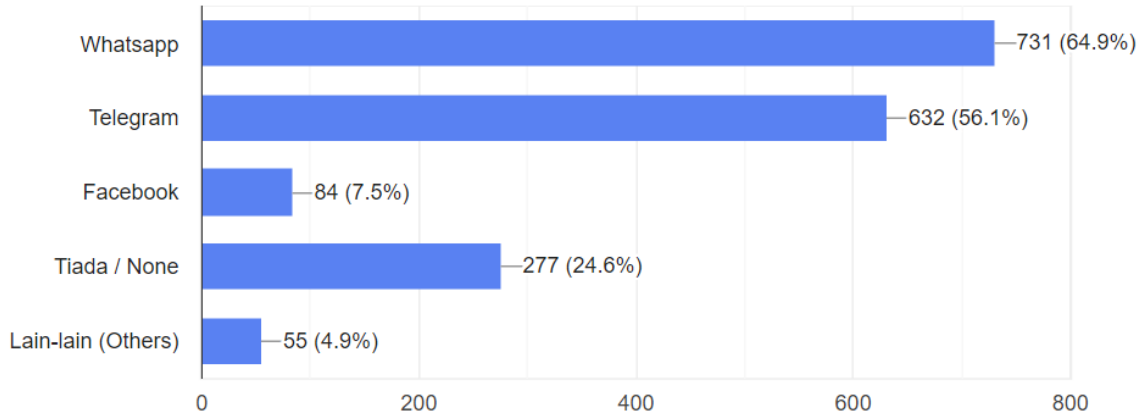

Figure 13: Analysis on whether have used certain social media for online learning in school

According to the bar chart, 64.9% (731) students have used the Whatsapp Application during online learning in school. 56.1% (632) students have used the Telegram Application for the same purpose. 24.6% (277) students have never used any social media for their online learning in school.

Analysis on the Assignments Submission Through Online

Figure 14 shows that out of 1126 students, 852 (75.7%) students have experienced submitting their assignments online. Only about 274 (24.3%) students claimed that they have no experience submitting assignments online. From this information, the academicians can conclude that most of the students will not have problems submitting their assignments in CFS.

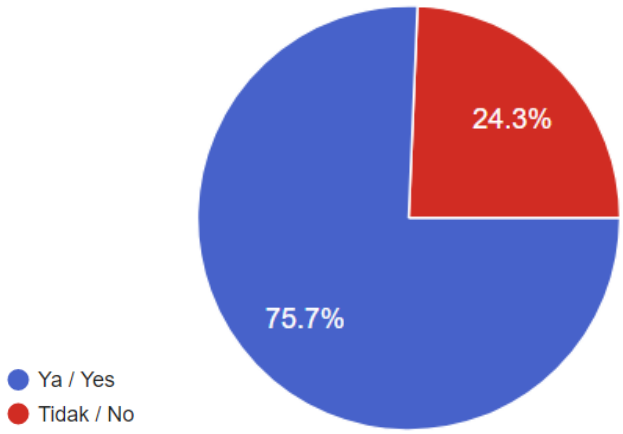

Figure 14: Analysis on whether have submitted assignments online during school days

Analysis on the Submission of the Assignment Format File Through Online

According to the bar chart (Figure 15), most students have experienced submitting the online assignment files in the form of Document Microsoft such as Word, Excel or PowerPoint at

school. 62% that is about 698 students fall in this category. 41.1% (466 students) have submitted assignments in the form of PDF at school. About 297 of the students (26.4%) have submitted their assignments in the form of pictures (GIF/PNG/JPEG). However, 267 of the students (23.7%) have never uploaded any form of assignments online

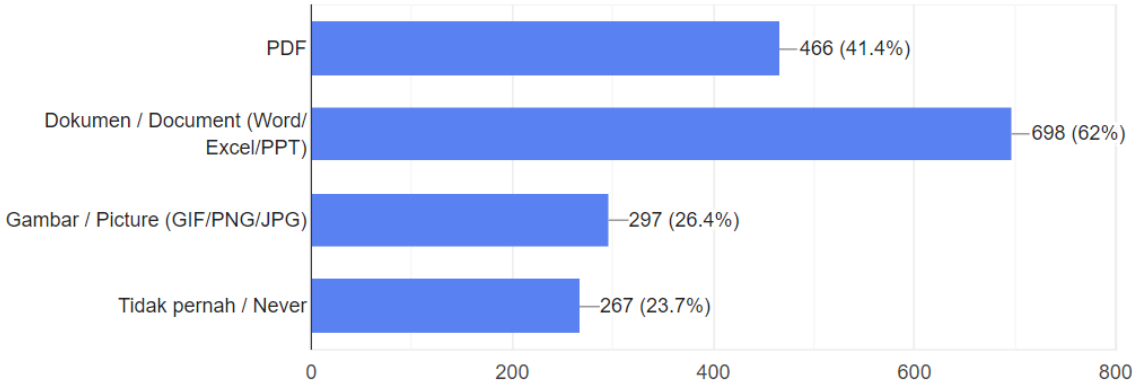

Figure 15: Analysis on the type of assignment that has been submitted online during school

Analysis on the Usage of the Applications for Mathematics Subject in School

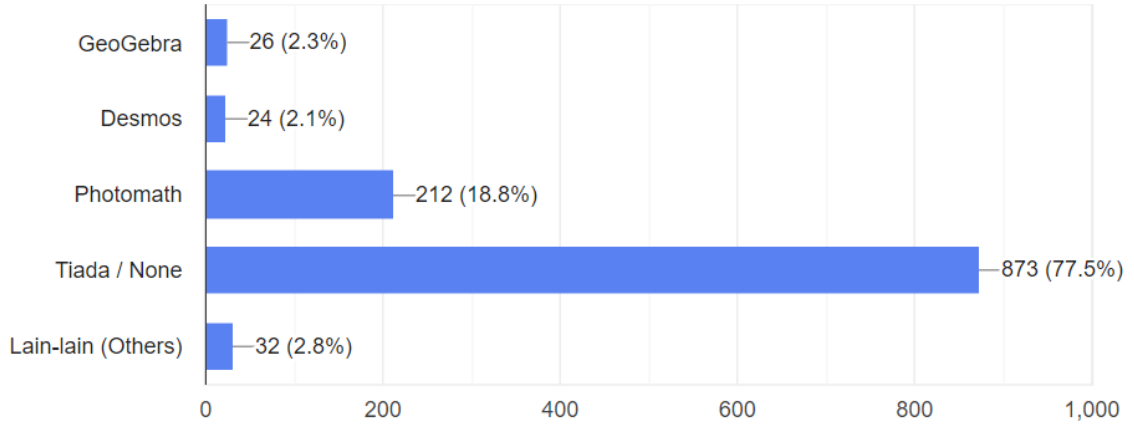

Figure 16: Analysis on (I have used the following applications for Mathematics subject in my school)

Figure 16 shows that 873 (77.5%) students have no experience in using any mathematics apps for their Mathematics lesson. About 212 (18.8%) students claimed that they have used Photomath for this subject. Twenty-six (2.3%) students have used GeoGebra and 24 of the students (2.1%) wrote that they have used Desmos for Mathematics. Other apps which these students have used for Mathematics are SnapAsk, CyMath, Geometer's Sketchpad, ShowMe, Google Classroom, Youtube, Khan Academy, WhatsApp, Formula Frees, ILearn Ace, MathWay, MathPapa, and SymboLab.

Analysis on the Usage of the Applications for Additional Mathematics Subject School

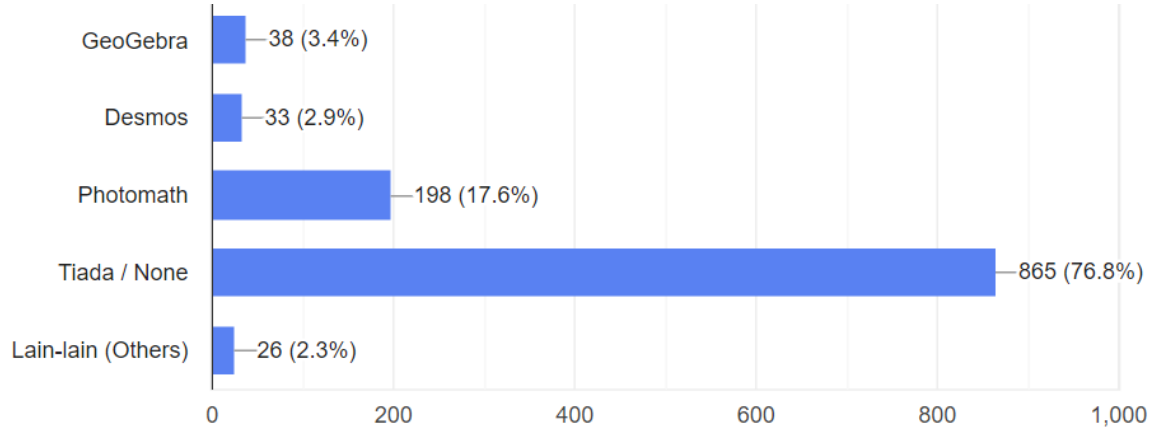

Figure 17 : Analysis on applications used for Additional Mathematics subject in school

The results from figure 17 shows that 865 (76.8%) students have no experience at all in using any apps for their additional mathematics subject. 198 (17.6%) of the students wrote that they have used Photomath for this subject. Thirty-eight (3.4%) students have used GeoGebra and 33 (2.9%) students have used Desmos. Other applications that these pre-University students have used includes SnapAsk, Geometer's Sketchpad, ShowMe, Google Classroom, Youtube, Khan Academy, WhatsApp, Wolfram Alpha, Ilearn Ace, MathPapa, and MathWay, SymboLab.

Analysis on the Usage of the Applications for Physics Subject School

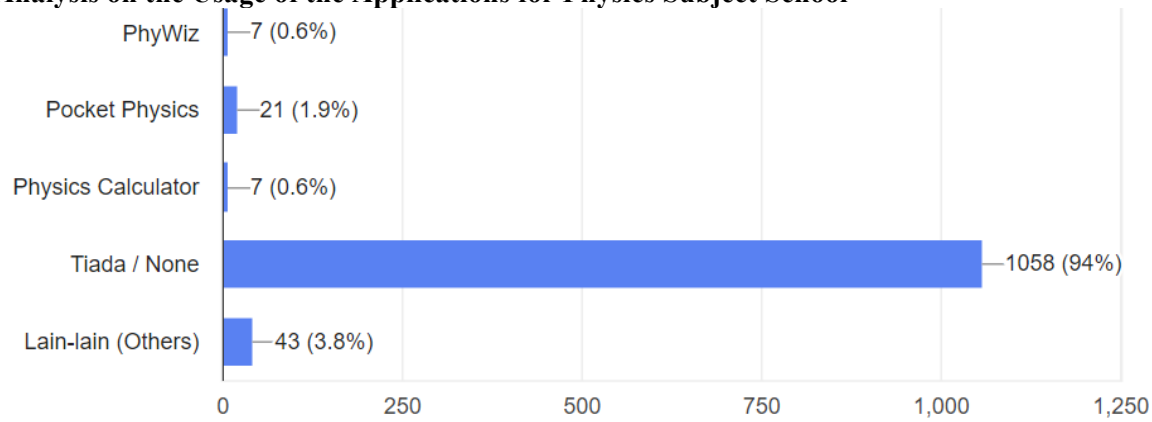

Figure 18 : Analysis on applications used for Physics subject in school

From the above figure it can be concluded that 1058 (94%) students have NO experience at all in using any Physics application. Twenty one (1.9%) of the students have used Pocket Physics, seven of them (0.6%) have used PhyWiz, eleven students have used Youtube and another seven (0.6%) of the students claimed that they have used Physics Calculator for Physics lesson. Other apps these students have used includes Fast Revision - MCE Syllabus, PhysicsLab, Google, Kahoot, Quizizz, MCE Pro Academy, Whatsapp, Wave Workshop, and RippleFree.

Analysis on the Usage of the Applications for Chemistry Subject in School

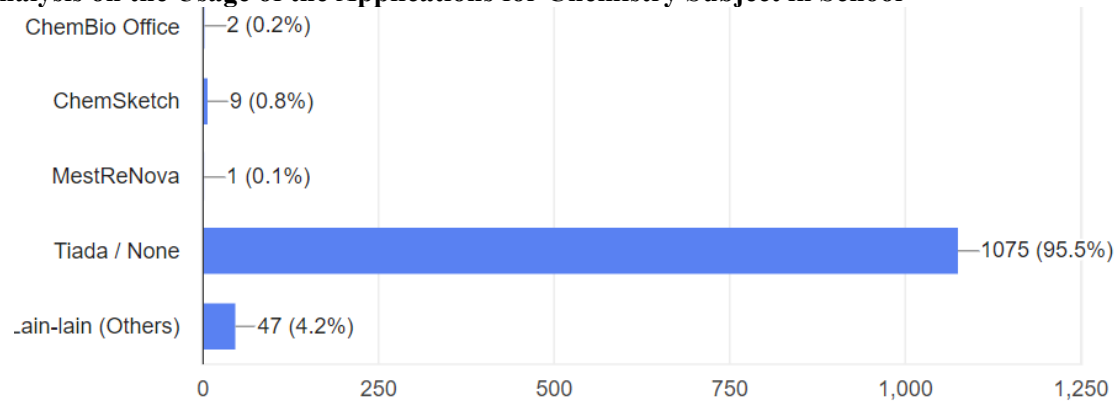

Figure 19: Analysis on applications used for Chemistry subject in school

Figure 19 shows that 1075 (95.5%) have NO experience in using any Chemistry apps. Nine (0.8%) students claimed that they have used ChemSketch, two of them (0.2%) have used ChemBio Office and one (0.1%) student have used MestReNova applications for Chemistry during their school days. Other applications these students have used for Chemistry includes Beaker, Periodic Table Apps, Google, Quizizz, Youtube, Khan Academy, and Write Formula.

Analysis on the Usage of the Applications for Biology Subject in School

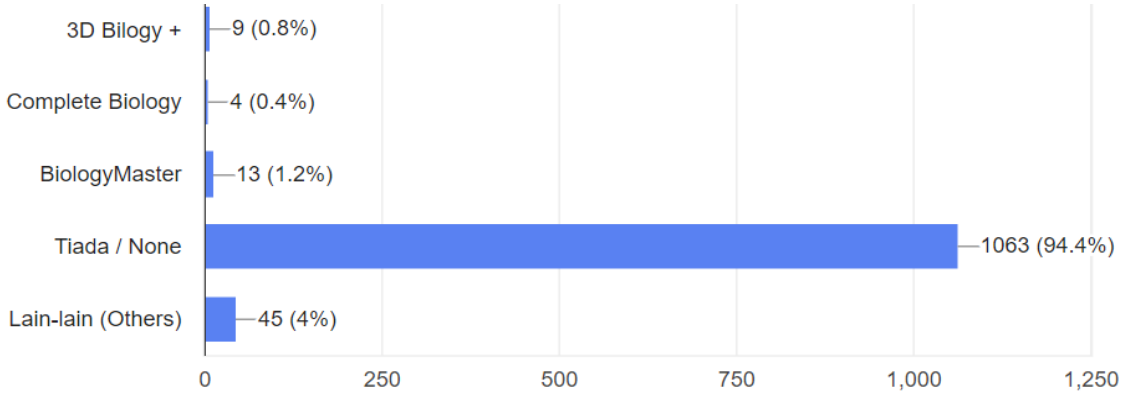

Figure 20 : Analysis on applications used for Biology subject in school

The above figure shows that 1063 (94.4%) students have NO experience in using any Biology apps. About thirteen (1.2%) students used BiologyMaster, nine (0.8%) students used 3D Biology and four students (0.4%) used Complete Biology. Majority of the students must have strictly depended on reference books only for this subject. Other apps include C. Anatomy, Cell World, Frog VLE, Google, Youtube, Itunes, Kahoot, Khan Academy, Meet Biology, MCE 4D Series, MCE Pro Academy, Cell Explorer, and Schoology.

Analysis on the Usage of the Applications for English Language Subject in School

Results from this analysis shows that 702 (62.3%) have used Google Translate for English Language subjects in school. About 392 (34.8%) of the participants said that they have no experience in using any application for this subject. 133 (11.8%) of the students used the apps called English Grammar Test. About fourteen (1.2%) students used the apps called Learn English Daily and 10 (0.9%) of the students used Hello English. Other apps include Grammarly, Google Thesaurus, Learn English British Council, Merriam Webster Dictionary, Oxford Dictionary Apps, Cambridge Dictionary, Short Stories 101, Frog Classroom, WordWeb, and Pocket Thesaurus.

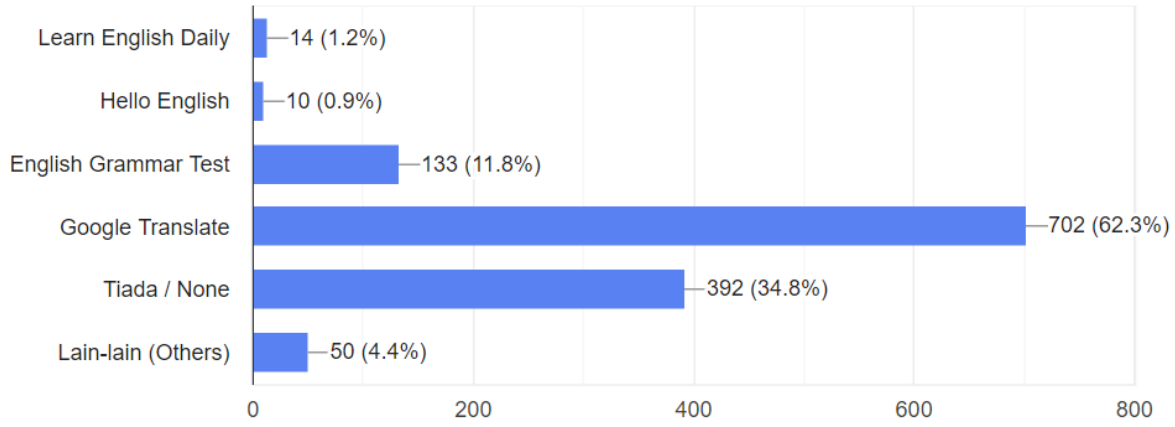

Figure 21 : Analysis on applications used for English Language subject in school

Opinion, Readiness & Expectation

Analysis on Students' Opinion in Learning through Online

The overall results showed that the students have difficulties in learning through online classes. Some of the remarks given by the students about online learning are; less effective, difficult to understand, not conducive, large family members at home might disturb concentration, less satisfaction if the internet access is quite weak, some even claimed that they have to go to the mosque to get a strong internet access. One student said that It is exhausting than you can ever imagine.

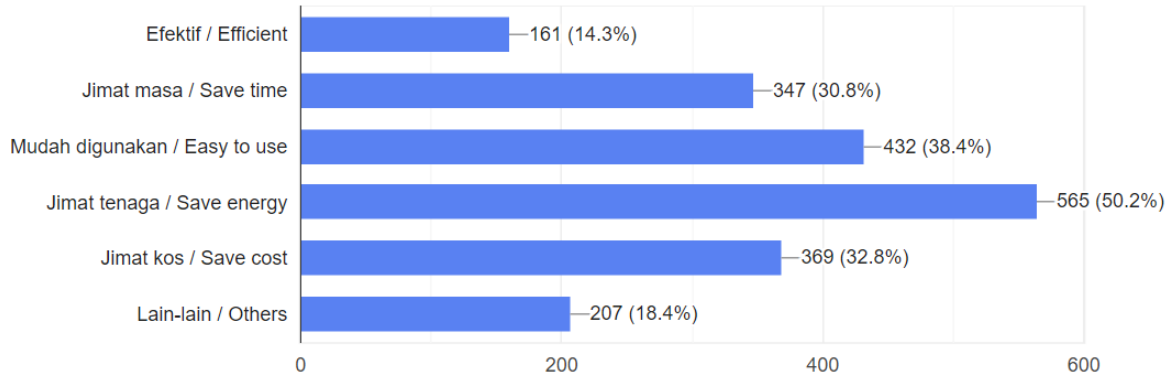

Figure 22: Analysis on students' opinion in learning through online

Analysis on the Students' Readiness for Online Learning in the Institution

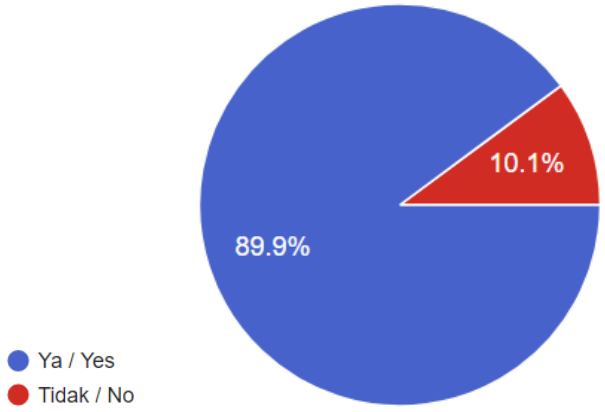

Figure 23: Analysis on the students' readiness for online learning in the Centre for Foundation Studies in Science (CFS), University of Malaya

Figure 23 shows that about 1012 (89.9%) of the students said that they are ready for online learning. However, 113 (10.1%) of students seem to be not ready for online learning. They answered "No" to this question. Probably these students do not have the appropriate devices needed for online classes. Maybe the internet connection at the place where these students are staying is very poor. This adds to the fear of having online classes and makes them not ready for the online learning system. To overcome this problem, necessary action is required and to be done immediately so that no students are left behind.

Analysis on the Students' Expectations for the Online Learning Process in the Institution

Among the answers given by the students about their expectation on online learning are; interesting, hope it works smoothly, will last for a month, will last for three months, will last for six months, effective and easy, going to be fun, quite tough, I can watch the pre-recorded videos repeatedly if I do not understand, I am expecting it to be very thorough and also hoping for frequent interactions between lecturers and students so that we can fully understand the topics learnt as I know there will be a barrier in communication and hoped that the recorded videos will be sent to the students who have poor internet connections.

Research Limitation and Future Direction

Most students could participate in online learning since they have at least a smartphone with internet connection. These are the minimum requirements for online learning. The study also shows that the students have experienced using online applications in various subjects such as English, Mathematics, Physics, Chemistry and Biology in former schools. The students also responded that they are ready to participate in online learning in CFS. To further enhance the findings of this research, we have acknowledged some of its limitations and suggest direction for future research. The quality of the online learning readiness assessment tools used was not investigated thoroughly by using psychometric tests. The use of standardized tools for learning online readiness assessment can be implemented to give a more reliable and comparable results (Farid, 2014).

Future research should consider incorporating such theory as the Technology Acceptance Model (TAM), which may provide a better explanation to the existing findings (Scherer, Siddiq, & Tondeur, 2019). The variables for readiness can be expanded to give a wider view on the level of readiness. In addition, investigation on how emerging technologies can play a role in improving students' online learning experience should be conducted (Shahid, 2019). Research on other stakeholders should also be conducted to give an overall condition on the readiness of online learning implementations. Several research studies have been conducted on stakeholders such as

the institution (Omoda-Onyait and Lubega, 2011), academicians (Ncube, Dube, and Ngulube, 2014) and technical staff (Alshaher, 2013).

Conclusions

Over the past decade, many educational institutions around the world have considered the best way to leverage the power of Information Technology in their education system. The results of a survey conducted at the CFS were data from 1126 students from all the 14 states in Malaysia with different former schools. The instrument was developed using Google Form and the results were analysed using descriptive statistics techniques. Based on our findings, we have found that 1124 (99%) of students have smartphones. We found that there are 2 students from Selangor that have no smartphone. One of them has a laptop while the other has no device. There are 23 (2%) of students dependent on Public Wi-Fi and 7(0.6%) of students have no internet access. Therefore, the majority of the students will have the ability to communicate, share videos, use various applications and shared documents to assist their learning process. This is in line with 21st century learning (Donald, 2003). However, those students without a device and internet access must be reached out instantly. Alternative methods such as courses' content delivered via mail postage to ensure that they can start their learning session at home. Online educational contents must also be delivered at a minimum level of requirements i.e. at low internet bandwidth, basic equipment (a smartphone or computer with speaker) and at the right duration of time. Internet providers also can take the initiatives to help students by providing internet data packages and identify areas that have no internet coverage. By doing this we can reduce failure in adoption of online learning at the early stage.

The study also provides us with the level of online learning competency of the students based on their experience in their former school. We found that only 3.1% (35) students spend 5 hours or more per day studying online. Average hours of online learning per day in CFS is 6 hours. In terms of use of online application, study shows that most students used English applications regularly, with mathematics apps in second place while the other science subject showed a very low number of usages. The results show that 734 (65.2%) students have experience using English applications. We found that 702 (62.3%) students used Google Translate. This indicates that the student depends on the application to translate between languages (i.e. English to Malay) or they have difficulty in understanding English. Mathematics applications have a higher number of students using it, with an average of 257 (22.85%) compared to science subjects (physics, chemistry and biology) where an average of 61 (5.4%) students use applications in learning at CFS. This shows that in school, students regularly used language applications for learning but for mathematics and science subjects, they were more dependent on traditional methods of learning.

In the last section of the study, we examine the students' opinions, perception and readiness towards online learning. The overall results showed that the students have difficulties in learning through online. The results showed a low number of students agreed that learning online is efficient, save time, easy to use, save energy and save cost. Some of the factors that contribute to the results are no experience, does not have the necessary facilities, difficulty in managing the devices and applications, non-conducive environment and time management. Therefore, motivations and technical training on how to learn online should be provided to the students to overcome these challenges. Besides that, each course should identify suitable applications that can be used to facilitate and engage students (Hamdan, Din, & Abdul Manaf, 2012).

Acknowledgement

We would like to thank you to the management, faculty members and students of the Center for Foundation Studies in Science, University of Malaya for the support given throughout this study.

References

Abdullah, S., Mansor, A. A., Napi, N. N. L. M., Mansor, W. N. W., Ahmed, A. N., Ismail, M., & Ramly, Z. T. A. (2020). Air quality status during 2020 Malaysia Movement Control Order (MCO) due to 2019 novel coronavirus (2019-nCoV) pandemic. *Science of The Total Environment, 729*, 139022.

Alshaher, A. A. F. (2013). The McKinsey 7S model framework for e-learning system readiness assessment. *International Journal of Advances in Engineering & Technology, 6*(5), 1948.

Aydin, C. H. & Tasci, D. (2005). Measuring Readiness for e-Learning: Reflections from an Emerging Country. *Educational Technology & Society, 8*(4): 244-257.

Bervell, B., & Arkorful, V. (2020). LMS-enabled blended learning utilization in distance tertiary education: establishing the relationships among facilitating conditions, voluntariness of use and use behaviour. *International Journal of Educational Technology in Higher Education, 17*(1), 1-16.

Bruns, A. (2008). Blogs, Wikipedia, Second Life, and beyond: From production to prod usage. New York: Lang.

Chen, Edward T. "Successful e-learning in corporations." *Communications of the IIMA 8.2* (2008): 5.

Cutri, R. M., & Mena, J. (2020). A critical reconceptualization of faculty readiness for online teaching. *Distance Education, 41*(3), 361-380.

Donald, J.L. (2003). Wireless Messaging Demystified: SMS, EMS, MMS, IM, and Others. United States: McGraw-Hill Professional.

Ebner, M., Schön, S., Braun, C., Ebner, M., Grigoriadis, Y., Haas, M., ... & Taraghi, B. (2020). COVID-19 Epidemic as E-Learning Boost? Chronological Development and Effects at an Austrian University against the Background of the Concept of "E-Learning Readiness". *Future Internet, 12*(6), 94.

Farid, A. (2014). Student Online Readiness Assessment Tools: A Systematic Review Approach. *Electronic Journal of e-Learning, 12*(4), 375-382.

Hamdan, A., Din, R. & Abdul Manaf, S. Z. (2012). Penerimaan M-Pembelajaran dalam Sistem Pendidikan di Malaysia. The Unified Theory of Acceptance and Use of Technology (UTAUT): Satu Analisis Literatur. UKM, Malaysia 1st International Conference on Mobile Learning, Applications, and services (mobilecase2012).

Hiemstra, R. (2006). Is the internet changing self-directed learning? Rural users provide some answers. *International Journal of Self-directed Learning, 3*(2), 45-60.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. Educause Review, 27.

Lai, Horng-Ji. "The influence of adult learners' self-directed learning readiness and network literacy on online learning effectiveness: A study of civil servants in Taiwan." *Journal of Educational Technology & Society 14.2*(2011): 98-106.

Lall, S., & Singh, N. (2020). CoVid-19: Unmasking the new face of Education. *International Journal of Research in Pharmaceutical Sciences, 11*(SPL1), 48-53.

Lema, J., & Agrusa, J. (2009). Relationship of WWW usage and employee learning in the casino industry. *International Journal of Hospitality Management, 28*(1), 18-25.

Mehran, P., Alizadeh, M., Koguchi, I., & Takemura, H. (2017). Are Japanese digital natives ready for learning English online? A preliminary case study at Osaka University. *International Journal of Educational Technology in Higher Education, 14*(1), 8.

Mohammed, Y. A. (2018, November). E-learning readiness assessment of medical students in university of fallujah. In 2018 1st Annual International Conference on Information and Sciences (AiCIS) (pp. 201-207). IEEE.

Munster, V. J., Koopmans, M., van Doremalen, N., van Riel, D., & de Wit, E. (2020). A novel coronavirus emerging in China—key questions for impact assessment. *New England Journal of Medicine, 382*(8), 692-694.

National Security Council of Malaysia. (2020a). [Accessed on 10th June 2020] Retrieved from https://asset.mkn.gov.my/web/wp-content/uploads/sites/3/2020/06/15-Pendidikan-KPM-Final-_-10-Jun-2020.

National Security Council of Malaysia. (2020b). [Accessed on 10th June 2020] Retrieved from https://asset.mkn.gov.my/web/wp-content/uploads/sites/3/2020/06/30-Pengajian-Tinggi-KPT-_-10-Jun-2020.pdf

Ncube, S., Dube, L., & Ngulube, P. (2014). E-learning readiness among academic staff in the Department of Information Science at the University of South Africa. *Mediterranean Journal of Social Sciences, 5*(16), 357.

Obi, I. E., et al. (2018) "E-learning readiness from perspectives of medical students: A survey in Nigeria." *Nigerian journal of clinical practice 21*(3)

Omoda-Onyait, G., & Lubega, J. T. (2011, August). E-learning readiness assessment model: A case study of higher institutions of learning in Uganda. In International Conference on Hybrid Learning (pp. 200-211). Springer, Berlin, Heidelberg.

Panuwatwanich, K., & Stewart, R. A. (2014). Understanding students' use of online learning tools through online learning readiness assessment. In Using technology tools to innovate assessment, reporting, and teaching practices in engineering education (pp. 227-240). IGI Global.

Reyes-Chua, E., Sibbaluca, B. G., Miranda, R. D., Palmario, G. B., Moreno, R. P., & Solon, J. P. T. (2020). The Status of The Implementation Of The E-Learning Classroom In Selected Higher Education Institutions In Region Iv-A Amidst The Covid-19 Crisis. *Journal of Critical Reviews, 7*(11), 253-258.

Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & Education, 128*, 13-35.

Shahid, F., Aleem, M., Islam, M. A., Iqbal, M. A., & Yousaf, M. M. (2019). A review of technological tools in teaching and learning computer science. *EURASIA Journal of Mathematics, Science and Technology Education, 15*(11), em1773.

Song, L., & Hill, J. R. (2007). A conceptual model for understanding self-directed learning in online environment. *Journal of Interactive Online Learning, 6*(1), 27-42.

Utomo, M. N. Y., Sudaryanto, M., & Saddhono, K. (2020). Tools and Strategy for Distance Learning to Respond COVID-19 Pandemic in Indonesia. *25*(3), 383-390.

World Health Organization. 2020. Key considerations for repatriation and quarantine of travellers in relation to the outbreak of novel coronavirus 2019-nCoV. Feb. Geneva (Switzerland): WHO; [accessed 2020 Feb 22]. https://www.who.int/ ith/Repatriation_Quarantine_nCoV-key-considerations_HQ-final11 Feb.pdf?ua=1

Appendix

SURVEY ON STUDENTS READINESS TOWARDS ONLINE LEARNING AT THE CENTER OF FOUNDATION STUDIES IN SCIENCE (CFS), UNIVERSITY OF MALAYA, SESSION 2020/2021.

Based on the official statement announced by the Prime Minister of Malaysia, Tan Sri Muhyiddin Yassin on 7th June where the Recovery Movement Control Order (RMCO) starting 10th June 2020 until 31st August 2020, the top management of the University of Malaya together with Centre for Foundation Studies in Science (CFS), University of Malaya have reached an agreement that all the Malaysian Certificate in Education (MCE) holders who have been successfully accepted to be enrolled at the CFS for the intake session 2020/2021 will have their learning sessions completely online until December 2020.

In line with the decision, this survey is aimed to assemble data about the readiness of the students for the implementation of the online Teaching and Learning (TnL) process in CFS. This readiness includes the access to internet facilities, learning devices and experience of using online learning at former schools.

Personal Information

A	My registration number is…	
B	My email is…	

R	Questions	References	
Personal Information			
1	I am a…	Lelaki / Male	Perempuan / Female
2	Now I'm in…	Rumah sendiri / My home	Kampung / Hometown
3	My house or my hometown is in...	Kuala Lumpur/Putrajaya/Selangor/Perlis/Kedah/Pulau Pinang/Perak/Negeri Sembilan/ Melaka/Johor/Pahang/ Kelantan/Terengganu/Sabah/Sarawak/Labuan	
4	and in the district of...		
5.	I took SPM at....		
6	My SPM result is ...	Matematik/Matematik Tambahan/Fizik/Kimia/Biologi/Bahasa Inggeris	

R	Questions	References	
The Device Usage and the Online Teaching and Learning (TnL) These questions are answered according to the device usage and the reliability in the online Teaching and Learning (TnL).			
7	I have the following devices...		
	Smart phone	Yes	No
	Laptop	Yes	No
	Desktop	Yes	No
	Tablet	Yes	No
	Printer	Yes	No

8	My internet access is from...		
	Phone data plan	Yes	No
	Home Internet Plan. (Example: Unifi, Streamyx, Maxis Home)	Yes	No
	Public Wi-Fi	Yes	No
	No internet access	Yes	No
9	My internet connection stability...		
	Excellent Connection	Yes	No
	Average Connection	Yes	No
	Weak Connection	Yes	No
	No Connection	Yes	No

R	**Questions**	**References**	
Online Teaching and Learning (TnL) Experiences These questions are answered to gauge students' learning experience in online Teaching and Learning (TnL) at school.			
10	I have experienced online learning in school	Yes	No
11	The online learning experience that I had in school… (You can choose more than one answer)		
	Participate in online class conducted by teachers by the teachers	Yes	No
	Participate in online forum conducted by teachers by the teachers	Yes	No
	Discussion with friends regarding the subjects	Yes	No
	Downloading the notes	Yes	No
	Others		
12	I am learning through online is on my own willing	Yes	No
13	The duration of my online learning in a day (average) is about…	Yes	No
	5 hours or more	Yes	No
	1-2 hours	Yes	No
	Less than 1 hour	Yes	No

14	The number of subjects that have been taught by my teachers through online is/are…		
	More than 3 subjects	Yes	No
	3 subjects	Yes	No
	2 subjects	Yes	No
	1 subject	Yes	No
	None	Yes	No
15	I have used the following platform for online learning		
	Frog Classroom	Yes	No
	Google Classroom	Yes	No
	Edmodo	Yes	No
	None	Yes	No
	Others		
16	I have used the following video application during my online learning.		
	Google Meet	Yes	No
	Ms Teams	Yes	No
	Zoom	Yes	No
	Skype	Yes	No
	None	Yes	No
	Others		
17	I have used the following social media during my online learning in school.		
	WhatsApp	Yes	No
	Telegram	Yes	No
	Facebook	Yes	No
	None	Yes	No
	Others		

18	I have submitted my assignments online in my former school.	Yes	No
19	The assignment file that I have submitted through online in my former school is in the form of...		
	PDF	Yes	No
	Document (Word/Excel/PPT)	Yes	No
	Picture (GIF/PNG/JPG)	Yes	No
	Never	Yes	No
20	I have used the following applications for Mathematics subject in my school.		
	GeoGebra	Yes	No
	Desmos	Yes	No
	Photomath	Yes	No
	None	Yes	No
	Others		
21	I have used the following applications for Additional Mathematics subject in my school.		
	GeoGebra	Yes	No
	Desmos	Yes	No
	Photomath	Yes	No
	None	Yes	No
	Others		
22	I have used the following applications for Physics subject in my school.		
	PhyWiz	Yes	No
	Pocket Physics	Yes	No
	Physics Calculator	Yes	No
	None	Yes	No
	Others		

23	I have used the following applications for Chemistry subject in my school.		
	ChemBio Office	Yes	No
	ChemSketch	Yes	No
	MestReNova	Yes	No
	None	Yes	No
	Others		
24	I have used the following applications for Biology subject in my school.		
	3D Bilogy +	Yes	No
	Complete Biology	Yes	No
	BiologyMaster	Yes	No
	None	Yes	No
	Others		
25	I have used the following applications for English Language subject in my school.		
	Learn English Daily	Yes	No
	Hello English	Yes	No
	English Grammar Test	Yes	No
	Google Translate	Yes	No
	None	Yes	No
	Others		
26	In my opinion, learning through online is/are…		
	Efficient	Yes	No
	Save time	Yes	No
	Easy to use	Yes	No
	Save energy	Yes	No
	Save cost	Yes	No

	Others		
27	I am ready for online learning in Centre for Foundation Studies in Science.	Yes	No
28	I am expecting the online learning process at PASUM...		