Impact, Effectiveness and Satisfaction of Online Learning among Undergraduate Students During the Covid-19 Pandemic

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ABSTRACT

Introduction: Physical distancing measures to safeguard against airborne virus transmission during the Covid-19 pandemic has heightened the need for online teaching and learning methods as alternatives to conventional face-to-face classrooms. While online learning has become commonplace in developed countries prior to the pandemic, local institutions of higher learning while less ubiquitous, were in fact gaining momentum towards adopting more online teaching and learning methods. Curb measures implemented by the local authorities during the pandemic had inadvertently left educators with little choice but to adopt online learning to continue engaging their students in learning.

Objective: To determine the impact, effectiveness, and level of satisfaction of online learning during the Covid-19 pandemic among university students.

Methods: A quantitative cross-sectional study with convenience sampling study was conducted among 349 students in one of a public university in Malaysia. Data was gathered using an online questionnaire that was disseminated to students via Google Form. The data was analysed with SPSS version 24 using descriptive statistics, Independent T-test and One-Way Anova.

Results: Majority of the respondents felt that online learning did not affect their study and learning performance. They also felt satisfied with the usage of online learning during Covid-19 pandemic. There were no significant association between gender, age, year of study, university program, living in or out campus and experience of online learning before lockdown with the satisfaction level (p>0.05).

Conclusion: Online learning does not impact the students' academic performance during the Covid-19 pandemic. Students also reported that online learning is suitable, effective, and they felt satisfied with the usage of online learning. Therefore, online learning could be considered as a useful and practical tool for teaching and learning delivery during Covid-19 among undergraduate university students.

Keywords: Online learning, Impact, Effective, Satisfaction, University students

INTRODUCTION

The novel Corona virus diseases (Covid-19) which was first prevalent in Wuhan, China in December 2019 has become one of the worst infectious disease outbreaks of its time. By August 22, 2022, the Covid-19 disease reached pandemic status having spread to 223 countries and territories across the globe with a total of 591 million confirmed cases and a total of 6.44 million deaths (1). In Malaysia, it was reported about 4.76 million confirmed cases with 36,145 related deaths at the time of writing this paper (2). This pandemic situation challenged the education system across the world including Malaysia to shift to an online mode of teaching and learning in order to reduce the risks to students, faculty members and the community. Online learning is a term used to describe learning experiences in synchronous or asynchronous environments using different devices such as mobile phones, laptops with internet access (3) Another tool that supported online learning applications is the software such as the use of teleconferences or video call applications, such as WhatsApp, Zooms and others (4) Thus, online learning is a method of education that enables the students learn in a virtual environment.

Literature review

Impact of online learning on academic performance

Several studies reported that online learning had a positive impact on academic performance. Suresh et al.(5) found that 38% of the respondents stated that online learning helped in improve academic performance and 87% of them claimed that online learning helps them to prepare well for their examinations. Another study conducted by Gonzalez et al(6) reported that the students obtained a better score in all the tests that were conducted after the lockdown period with online learning. A similar result had been reported by Oye at al. (7) in which online learning improves the students' academic performance in their GPA.

Effectiveness of online learning

As online learning started to be used widely in educational institutions due to Covid-19 pandemic, several studies started to rule out the effectiveness of online learning for the first-time students. In Malaysia, Khoo et al. (8) found that the college students (n=140) prefer face to face learning more as compared to online session due to slow internet speed, lack of skill in technology use, and still not adapt with the new way. In contrast, Bahasoan et al. (9) reported that online learning conducted during Covid-19 is effective among university students (n=115) in Indonesia. In the same study, almost 98% of the respondents felt great with the implementation of online learning during the pandemic. Another study by Olszewska ((10)reported that half of the students (n=734) admitted that they are independent learners and generally evaluate online learning as effective.

Satisfaction in online learning

Malkawi et al. (11) had conducted a study among university students in the United Arab Emirates and found a high satisfaction level towards online learning. In the same study, the students stated that they had increased their confidence in online learning and felt it was a reliable platform for them during Covid-19. The same finding was reported by Zaheer et al. (12)in Pakistan, in which majority of the students are satisfied from the education received in online learning mode. In Indonesia, Surahman & Sulthoni (13) reported that 19% of the students in very satisfying level, 41% satisfied, 30% dissatisfied and 10% very dissatisfied with the online learning. Surahman & Sulthoni (13) also mentioned that several factors had been identified as causes of dissatisfaction towards the online learning such as problem in access internet for students in rural areas or low economic, low lecturer guiding in learning, lecture services in providing the material are not clear, and learning environment not suitable.

Problem statement

The predominance of online learning is being implemented across most if not all institutions of higher learning in the short span of time due to its feasibility to meet teaching and learning needs given the situation during the pandemic. The unexpected shift from face-to-face learning to online will face a few difficulties for the students and lecturers (14). Moreover, it is not clear whether students are satisfied with current system functionalities and content or not (15).

The scrutiny of the literature shows that many researchers have examined the impact, effectiveness, and satisfaction with online classes during the pandemic period of Covid-19. However, none of the studies had examined these three domains in one study. Thus, this study was conducted to answer the research question:

1) What is the impact of online learning on academic performance among the university students during Covid-19 pandemic?
2) What is the effectiveness of online learning among the university students during Covid-19 pandemic?
3) What is the level of satisfaction of online learning among the university students during Covid-19 pandemic?
4) Is there any relationship between demographic background with online learning satisfaction among the university students during Covid-19 pandemic?

METHODS

Study design

This study applied a cross-sectional study design and was conducted from March 2021 until June 2021 among undergraduate students with approximately 3750 students enrolled during the study period. The Kulliyyah of Nursing Post-Graduate and Research Committee (KNPGRC) and IIUM Research Committee (IREC) approved the research protocol. A participant information sheet detailing the purpose of the study was disseminated to respondents along with the online questionnaire. A link to the online questionnaire created using Google Forms was disseminated to respondents via email. Informed consent was obtained from each individual respondent with assurance of their anonymity and confidentiality.

Study sample/population

The respondents in this study were health and science students. The inclusion criteria were: i) male and female students, ii) age 18 years and above, iii) full time student, iv) ability to understand English language while students with no or poor internet access during data collection period were excluded. Convenience sampling was applied, and respondents were recruited from six different Kulliyyah such as

Medicine, Nursing, Dentistry, Sciences, Allied Health Sciences and Pharmacy. The sample size was calculated using Raosoft software with the population size of 3750, 5% margin of error, 95% confidence level and 50% of response distribution. An additional 10% dropout was added and made the sample size for this study was 384 respondents.

Study instrument

The self-administered questionnaire consisted of four parts. Part A consisted of respondent's sociodemographic information which included gender, age, living in or outside campus, year of study, kulliyyah and experience with online learning and applications used in online learning. Part B consisted of 4 items that assessed the impact of online learning on academic performance measured on a five points of Likert scale adopted from study by Haider & Al-Salman (16). Part C consisted of 11 items that evaluated the effectiveness of online learning during Covid-19 measured using a five points of Likert scale adopted from study by Olszewska (10). Part D consists of 8 items related to level of satisfaction in online learning measured on a five points of Likert scale adopted from study by Malkawi et al. (11). The level of satisfaction was categorised as weak = 1.00-2.33; medium = 2.34-3.67 and Strong = 3.68-5.0. A pilot study was conducted among 30 respondents in one selected Kulliyah only with the same inclusion and exclusion criteria and were excluded in the actual study. Cronbach's Alpha value of 0.795 for the section on impact, 0.761 for the section on effectiveness and 0.712 for the section on satisfaction. This result indicated that the questionnaire has an accepted level of reliability.

Data analysis

All data were entered and analysed using SPSS version 24. Descriptive analysis was used to describe sociodemographic particulars and the level of online learning satisfaction. For continuous data, the results were presented as mean and standard deviation. Results for categorical data were presented as frequency and percentage. The level of significance was set at 0.05. Independent t-test and One-Way Anova test were conducted to determine the association between sociodemographic

background with the level of online learning satisfaction.

RESULTS

A total of 349 respondents participated in this study with a response rate of 90.8% from all Kulliyyah. Majority of the respondents were female (70.2%), stayed in campus (75.4%), age of 21-23 years old (55%), year 4 (36.4%) and had experience of online learning before lockdown (58.7%). The details of the distribution of sociodemographic characteristics of the respondents were presented in **Table 1**.

Table 1: Sociodemographic data of the respondents (n= 349)

Variables	Frequency (N)	Percentage (%)
Gender		
Male	104	29.8
Female	245	70.2
Age		
18-20	84	24.1
21-23	192	55.0
24-26	73	20.9
Living in or outside campus		
In campus	263	75.4
Outside campus	86	24.6
University program		
Medicine	83	23.8
Nursing	110	31.5
Dentistry	26	7.4
Sciences	30	8.6
Allied Health Sciences	40	11.5
Pharmacy	60	17.2
Level of study		
Year 1	69	19.8
Year 2	68	19.5
Year 3	85	24.4
Year 4	127	36.4
Experience of online learning before lockdown?		
Yes	205	58.7
No	144	41.3

Impact of online learning on academic performance

Table 2 summarizes the findings on the impact of online learning on academic performance among the respondents. A total of 48.1% of respondents chosen disagreed (35.2%) and strongly disagreed (12.9%) with the statement, "Use of digital learning tools is responsible for

my low academic performance" and a total of 36.3% of them disagreed (28.9%) or strongly disagreed (7.4%) with the statement, "The volume of assignments via online learning led to confusion, frustration, and poor performance". These two items showed that the respondents felt that online learning during pandemics did not affect their study. However, respondents agreed (46.1%) and strongly agree (39.3%) with the statement, "Face-to-face interaction contributes significantly to boosting the students' academic achievement and they also agree (37.8%) and strongly agree (16.6%) with the statement "Taking quizzes and exams online from home was not comfortable and made me nervous". These two items showed that the respondents prefer to face to face learning as they feel nervous when taking exams or quizzes online.

Effectiveness of online learning during pandemic Covid-19

Table 3 reported the findings on the effectiveness of online learning during pandemic Covid-19 among the respondents. A total of 44.7% of respondents stated disagreed (30.4%) and strongly disagreed (14.3%) with the statement, "I like to learn from home" in this pandemic while 31.2% of them disagreed and 12.3% strongly disagreed with the statement, "I can organize the time for effective learning". They also disagreed (35.5%) and strongly disagreed (18.3%) with the statement, "I was able to participate in fully in all classes remotely without any technical problems" while 33% of them disagreed and 14.3% strongly disagreed with the statement, "My academic performance is better when I study at home".

Satisfaction level of online learning during pandemic Covid-19

Table 4 shows that the overall mean satisfaction level in online learning is 3.01 (medium category). It can be concluded that the respondents felt moderately satisfied in using online learning during the pandemic.

The relationship between sociodemographic and satisfaction level of online learning

The results demonstrated that there was no significant association between gender, age, year of study, university program, living in or

Table 2: Impact of online learning on academic performance (n=349)

No	Statement	Frequency (%)				
		Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1.	Use of digital learning tools is responsible for my low academic performance	45 (12.9)	123 (35.2)	43 (12.3)	111 (31.8)	27 (7.7)
2.	The volume of assignments via online learning led to confusion, frustration, and poor performance.	26 (7.4)	101 (28.9)	57 (16.3)	98 (28.1)	67 (19.2)
3.	Face-to-face interaction contributes significantly to boosting students' academic achievement.	0 (0%)	10 (2.9)	41 (11.7)	161 (46.1)	137 (39.3)
4.	Taking quizzes and exams online from home was not comfortable and made me nervous.	32 (9.2)	99 (28.4)	28 (8.0)	132 (37.8)	58 (16.6)

Table 3: Effectiveness of online learning during pandemic Covid-19 (n=349)

No	Items	Mean	SD
1.	Online learning lectures and virtual classes save my time and effort.	3.33	1.010
2.	Online learning and virtual classes give me self-confidence.	2.93	1.187
3.	Online learning and virtual classes develop my research and investigation skills.	2.97	1.219
4.	Online learning and virtual classes help me in understanding the main concepts.	2.89	1.098
5.	Online learning and virtual classes are suitable for cooperative learning (groups).	2.47	1.102
6.	Online learning and virtual classes develop my ability to solve problems.	2.94	1.088
7.	Online learning and virtual classes do not take into account the diversity among learners (individual differences, patterns of thinking, motivation, ...)	3.32	1.203
8.	Internet speed at home is enough and reliable.	3.26	1.227
	Overall mean	**3.01**	**0.651**

out campus and experience of online learning before lockdown with the satisfaction level (Refer **Table 5**).

DISCUSSION

Findings from this study revealed that many of the respondents disagreed that online learning affected their academic performance even though they agreed that the method caused confusion and frustration with online assignment. The results suggest that students were generally receptive towards online learning, and they felt that the method did not affect their academic performance and abilities.

Table 4: The satisfaction level of online learning during pandemic Covid-19 (n=349)

No.	Statement	Frequency (%)				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1.	I like to learn from home	50 (14.3)	106 (30.4)	82 (23.5)	77 (22.1)	34 (9.7)
2.	I can organize the time for effective learning	43 (12.3)	109 (31.2)	114 (32.7)	61 (17.5)	22 (6.3)
3.	Distance learning helped me get organized	53 (15.2)	127 (36.4)	109 (31.2)	44 (12.6)	16 (4.6)
4.	I need a tutor to explain things I do not understand	6 (1.7)	18 (5.2)	75 (21.5)	139 (39.8)	111 (31.8)
5.	I was able to participate in fully in all classes remotely without any technical problems	64 (18.3)	124 (35.5)	79 (22.6)	61 (17.5)	21 (6.0)
6.	I feel safer being able to learn online than in a classroom	37 (10.6)	88 (25.2)	87 (24.9)	104 (29.8)	33 (9.5)
7.	Online learning is a good alternative to classroom learning	21 (6.0)	55 (15.8)	86 (24.6)	137 (39.3)	50 (14.3)
8.	In my opinion, most people have no problem using the Online learning platform	93 (26.6)	147 (42.1)	61 (17.5)	36 (10.3)	12 (3.4)
9.	My university well prepared technologically to online teaching	42 (12.0)	78 (22.3)	93 (26.6)	109 (31.2)	27 (7.7)
10.	My academic performance is better when I study at home	50 (14.3)	115 (33.0)	81 (23.2)	80 (22.9)	23 (6.6)
11.	I am motivated to undertake additional research activities when I learn remotely.	64 (18.3)	105 (30.1)	124 (35.5)	42 (12.0)	14 (4.0)

Table 5: Association between sociodemographic and satisfaction level of e-learning during pandemic COVID-19.

Variable	t-statistic (df)	p-value
Gender	- 0.061 (347)	0.951
Experience of e-learning before lockdown	-0.191 (347)	0.849

Independent T- test, p < 0.05 as significant level 95% CI

Variable	F- Statistics (df) [a]	p-value
Age	0.311 (2)	0.733
Year of study	1.547 (3)	0.202
University program	1.937 (5)	0.088
Area of living	3.321 (2)	0.125

One Way ANOVA, p < 0.05 as significant level 95% CI

Hamdan & Amorri (17) found that learning outcomes are similar for both virtual and conventional learning among university students in the United Arab Emirates, although the assessment methods are different. Additionally, several studies emphasize the pivotal role that student satisfaction plays in determining the success or failure of online education (18-19). A possible explanation may be the flexibility of online learning, in which students have the freedom to communicate with instructors, address classmates, study

materials, and complete assignments from any Internet-accessible point (20).

More than half of respondents agreed that online learning was a good alternative during this pandemic. The same finding was reported by Bahasoan et al. (9) in which about 98% of the respondent (n=115) are feeling great with the implementation of online learning during a pandemic. College students in Oman viewed online learning as an effective tool during teaching and learning experiences (21). However, this study reported that many of the respondents were unable to organize their time effectively even though they felt that the university is well prepared to change into the new method of teaching and learning. This finding is in contrast with study by Olszewska and time to learn based on their individual learning needs and autonomy (23). Poor internet connection hinders learners from properly connecting with the online educational activities during the pandemic period that leads to impact on the learners' satisfaction (24). However, many respondents

This study also found that there was no significant association between gender, age, year of study, university program, living in or out campus and experience of online learning before lockdown with the satisfaction level. This indicates that these factors may not matter as much as other factors that were not included in this study. As this study was conducted amongst students from only one university, the results cannot be generalized to the wider undergraduate student population. Moreover, convenience sampling possibly does not produce representative results because the feedback received based on individual's standpoint that has highly vulnerable to selection bias.

CONCLUSION

In conclusion, respondents agreed that online learning was a good alternative during Covid-19 pandemic and did not affect their academic performance and learning process when studying at home even though they preferred face-to-face learning. They are also satisfied with the university effort when conducting online teaching and learning. There was no association between age, gender, year of study, Kulliyyah, and previous experience in online

(10), in which half of the students (n=734) admitted that they generally evaluate online learning as effective because they able to organize their time to study as stayed at home.

Overall, most of the respondents were moderately satisfied with online learning during pandemic Covid-19. They also felt that online learning boosts their confidence and ability to solve problems. Possible explanation regarding the successful implementing online learning is receiving timely feedback, teachers' efforts to be organized, delivering online lectures (and recording them), adapting instructions to this learning model, and helping students follow the courses and look for feedback on their experiences (22). Moreover, students have more control over the content in this study were moderately satisfied with internet speed at home. It means that they have acceptable coverage and accessibility of internet since the government had made an initiative to upgrade the internet coverage in all areas.

learning with satisfaction level. Future work on how respondents maintained their focus while attending online teaching and learning should be explored through qualitative study that became important information.

CONFLICT OF INTEREST

The authors have no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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