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Barriers of e-Learning Perceptions Among University Students and Lecturers During the COVID-19 Crisis: A Cross-Sectional Study in Malaysia, 2021

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ABSTRACT

The COVID-19 pandemic disrupted teaching and learning in a variety of institutions. During the pandemic, e-learning replaced traditional classes to prevent transmission among lecturers/teachers and university students. The study's main objective was to identify the attitude and barriers to e-learning perceptions among university students and lecturers during the COVID-19 pandemic in Malaysia in 2021. The specific objectives were to identify the infrastructure, attitudinal, technical expertise, and human and educational skill barriers to e-learning implementation during the COVID-19 pandemic and to identify significant differences in e-learning perceptions among university students and lecturers. A cross-sectional study collected closed-ended questionnaires from university students and lecturers shared via electronic platforms. The minimum sample size required in this study was 462; 847 respondents (217 were lecturers/teachers and 630 university students) voluntarily participated. Cronbach's alpha coefficient of the questionnaire of attitudes and barriers and its values was 0.851 and 0.96, respectively. Findings were tabulated with mean scores for the attitudes toward the use of e-learning, and barriers to e-learning included five categories: infrastructure barriers, attitudinal barriers, technical expertise barriers, human barriers, and educational skill barriers. University students and teachers/lecturers did not prefer replacing traditional teaching methods with e-learning as it affects their interaction. Administration, faculty admins, and the department of education should take note of the improvement and the necessary measures that can be applied for effective and better teaching and learning during the lockdown due to COVID-19.

Keywords: COVID-19, e-learning, University Students, Lecturers/Teachers, Perceptions

CORRESPONDING

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INTRODUCTION

COVID-19 was declared a global pandemic in March 2020 (1). It was first identified on 25th January 2020, and cases increased exponentially from March onwards. The Malaysian Prime Minister made an effort to flatten the pandemic curve and reduce the number of cases by introducing a movement control order (MCO) (1). The MCO had a positive effect for two months. However, due to certain cluster origin, cases began to surge again and overall confirmed cases in Malaysia increased to 12,813 and 137 deaths by 5th October 2020 (2, 3).

Studies done on e-learning showed the impact of e-learning during the COVID-19 pandemic. Among nursing students and teachers in Nepal, there was a significant association of selected demographic variables of the respondents with most of the statements (attitude and problems or activities) (p-value <0.05) (4). In another study of the effects of the COVID-19 pandemic on e-learning in higher education students (comparison between male & female), there was a significant positive association between the quality of e-learning and user satisfaction among male and female students (p-value < 0.05). For the next hypothesis on information quality, there was a significant positive association between male and female students' satisfaction (p-value < 0.05) (5). The quality of e-learning means that the outcome of an educational process is a result of the production process of an educational institution. Therefore, e-learning quality has to do with empowering and enabling learners (5).

Institutions were closed to control the viral spread among the public. Students and teachers were at high risk of coming into contact with the coronavirus (6). Thus, the Ministry of Education of Malaysia advised all institutions to practice e-learning (7). Therefore, our study was conducted to investigate the attitudes and barriers to e-learning based on university students' and lecturers' perceptions.

During the COVID-19 pandemic crisis, the need for continuing academic and educational institutions rapidly shifted to online and distance learning (4,8). Consequently, it could provide an opportunity for lecturers/teachers to choose better learning techniques for students during the COVID-19 pandemic. (9-13) However, further research was needed to ensure the education system's quality, especially on e-learning among lecturers/teachers and students in Malaysia. Therefore, our study aimed to identify the attitude and barriers to e-learning perceptions among university students and lecturers during the COVID-19 pandemic in Malaysia in 2021.

METHODS

Study Context and Sample

A cross-sectional study surveyed university students, teachers, and lecturers in Malaysia to obtain information about attitudes and barriers to e-learning. Convenient sampling method was used in this

study. The sample size for university students and lecturers in Malaysia was calculated using Raosoft software with a margin error of 5%, confidence level at 95%, response distribution at 50%, and population size of 500,000. The calculated sample size was 385. Considering the 20% attrition rate for non-respondents, the estimated minimum sample size required in this study was 462.

Data Collection

This study used a quantitative research approach with a cross-sectional survey and predetermined questionnaires. Data was collected from 20th February 2021 until 30th March 2021 during the first wave of the COVID-19 pandemic, when the MCO order was initiated in Malaysia. The type of data used in this study is primary data. The data-gathering instrument in this research was a questionnaire developed from previous literature. (8, 9) There were 44 items divided into two parts. Part A (Socio-Demographic Variables) comprised seven items: age, gender, race, occupation, educational level, and faculty. Part B comprised 37 items. (8, 9) Seven items of the questionnaire covered participants' attitudes toward e-learning, 30 items covered barriers to e-learning implementation during the COVID-19 pandemic. Five out of 30 items were infrastructure barriers, nine out of 30 were attitudinal barriers, seven out of 30 were technical expertise barriers, four of 30 were human barriers, and five of 30 were educational skill barriers. The scale for part B is based on a 5-point Likert scale: 1-strongly disagree, 2-disagree, 3-neutral, 4-agree, 5-strongly agree. This method was suitable for answering the study's research questions measuring the attitudes and barriers of e-learning with expressions/opinions, suggestions/improvement, and skills. Experts approved the questionnaire's face and content validity before the questionnaire was distributed among university students and lecturers/teachers. A pilot test was also run on 20 participants. The Cronbach's Alpha coefficient was used to test the reliability of the questionnaire, and its value was 0.96, which means that the questionnaire we used in our study was excellent internal consistency. All participants provided written informed consent.

Data Analysis

The questionnaire's confidentiality was assured by ensuring no personal identifiers on any data instrument and only research personnel had access to the data. The data were processed and analyzed with SPSS software version 27 and an independent t-test. We used an independent t-test to compare the attitudes and barriers of e-learning perceptions between university students and lecturers during the COVID-19 crisis in Malaysia. The number of respondents (n), percentages (%), mean scores, and p-value were used to present the data results.

Ethical Consideration

The Human ethics committee of the Center of Research and Development from Asia Metropolitan University, Johor, Malaysia, granted ethical approval. The approval number was HEC20032021FOM002.

RESULTS

A total of 217 lecturers/teachers and 630 university students participated in the study, including 94.4 % of university students and 12 % of lecturers/teachers. Among them, 6% of lecturers/teachers and 71.1% of students were female. Almost 95.4% of lecturers/teachers were tertiary educated, as were 77.9% of university students (Table 1).

Table 1: Socio-demographics factors of participants among participants (n = 847)

Variable	Lecturers/teachers n (%)	University students n (%)	Total
Age (years)			
<25	26 (12.0)	595 (94.4)	621
26–39	100 (46.1)	32 (50.8)	132
>40	91 (41.9)	3 (4.8)	94
Gender			
Male	66 (30.4)	182 (28.9)	248
Female	151 (69.6)	448 (71.1)	599
Educational level			
Post-secondary education (pre-university)	12 (4.6)	145 (22.1)	157
Tertiary education (Degree/ Master/ PhDs)	205 (95.4)	485 (77.9)	690

The average total score for an attitude of the e-learning of lecturers/teachers and university students was 22.28 (21.83–22.73) and 21.87 (21.61–22.14). The attitude scale was divided into seven items, and the mean scores for each attitude question were presented in Table 2. The question “e-learning has no significant impact on me in anyways” had the lowest score, 2.66 (2.54–2.79), among lecturers/teachers, while questions on “e-learning is better than the traditional method of teaching” had the lowest score, 2.50 (2.42–2.58), among university students. University students’ and lecturers’ attitudes were significantly different on Attitudes 1,2,3,4, and 7 (Table 2).

Table 2: Attitudes of participants toward the use of e-learning among participants using t-test (n=847)

Variables	Mean (SD)		p-value
	Lecturers/ Teachers	University Students	
I find that e-learning is overall useful for me	3.53(3.40–3.66)	3.28(3.21–3.36)	<0.01
I think e-learning can be used as a future learning preference	3.64(3.48–3.79)	3.30(3.21–3.38)	<0.01
I think e-learning is better than traditional method of teaching	2.69(2.55–2.83)	2.50(2.42–2.58)	<0.05
I satisfied with the quality of e-learning	3.12(3.00–3.25)	2.95(2.87–3.03)	<0.05
I find that e-learning has no significant impact on me in anyways	2.66(2.54–2.79)	2.74(2.66–2.82)	0.319
I think there is less effective communication between students and lecturers due to e-learning	3.82(3.67–3.96)	3.95(3.87–4.03)	0.102
I felt e-learning is not secure for me	2.82(2.70–2.95)	3.16(3.08–3.24)	<0.01

Table 3 presents the mean scores for each barrier question. Further barriers were divided into five categories named infrastructure barriers, attitude barriers, technical expertise barriers, human barriers, and educational skill barriers. The lowest Infrastructure barriers among lecturers were “Financial problem to buy gadgets to be used for e-learning,” 2.65 95%CI (2.52–2.78). However, among university students, “I felt that there is no opportunity given for university students and lecturers to experience and explore e-learning” 2.87 (2.80–2.95). Similarly, the lowest mean score among attitudinal barriers among lecturers was for the question “I have low self-confidence and ability to take part in e-Learning,” 2.2 (2.06–2.34). On the other hand, among students’ lowest average barriers score for the question “I am not sharing the information and knowledge via e-learning” 2.72 (2.64–2.80). Likewise, technical expertise, human, and educational skill barriers were presented in Table 3 for lecturers and university students.

Table 3: Barriers to e-Learning implementation during the Covid-19 pandemic among participants using t-test (n = 847)

No.	Variables	Mean (SD)		p-value
		Lecturers/Teachers	University students	
A. Infrastructure barriers				
1	I have financial problems buying gadgets to be used for e-Learning.	2.65(2.52–2.78)	2.89(2.80–2.97)	<0.01
2	I felt there is no opportunity given for university students and lecturers to experience and explore e-Learning.	3.11(2.94–3.27)	2.87(2.80–2.95)	<0.01
3	I think it cost high for updating the required blogs and preparing educational	3.19(3.05–3.32)	3.36(3.28–3.44)	<0.05

	information technology equipment for e-Learning.			
4	I have no access to common e-Learning resources with other universities.	3.22(3.08–3.36)	3.02(2.94–3.10)	<0.05
5	I think there is a lack of suitable information acquired by the universities for developing e-learning.	3.24(3.09–3.38)	3.30(3.23–3.37)	0.400
B. Attitudinal barriers				
1	I doubt the usefulness of e-learning.	2.72(2.59–2.86)	2.96(2.88–3.04)	<0.01
2	I had low self-confidence and ability to take part in e-learning.	2.20(2.06–2.34)	2.97(2.88–3.06)	<0.01
3	I am not sharing the information and knowledge via e-learning.	2.32(2.19–2.46)	2.72(2.64–2.80)	<0.01
4	I am not ready to start e-Learning courses.	2.29(2.16–2.43)	2.78(2.69–2.86)	<0.01
5	I felt there is a lack of changes made in e-learning and its teaching methods.	2.96(2.82–3.11)	3.32(3.24–3.59)	<0.01
6	I think there is a lack of belief in individual interests and need variables in learning process.	3.28(3.15–3.42)	3.52(3.45–3.58)	<0.01
7	I think there is a low access chance for all students to e-Learning circumstances.	3.33(3.18–3.48)	3.50(3.43–3.58)	<0.05
8	I am not accepting e-learning as a substitute for traditional classes.	3.30(3.14–3.47)	3.38(2.29–3.47)	0.423
9	I cannot recognize the benefits of using communications and information technology in different socio-cultural dimensions.	2.65(2.50–2.79)	2.84(2.76–2.92)	<0.05
C. Technical expertise barriers				
1	I think the software used for e-learning is of low quality.	2.73(2.60–2.87)	2.75(2.68–2.82)	0.825
2	I find that e-learning contains low quality curriculum content.	2.80(2.66–2.93)	3.08(3.00–3.16)	<0.01
3	I think lecturers lack skills in e-learning planning.	2.93(2.79–3.07)	2.95(2.87–3.03)	0.808
4	I think there is a lack of coordination between the presented content volume and teaching methods.	3.17(3.04–3.30)	3.32(3.25–3.39)	<0.05
5	I lack access to different suitable curriculum materials in e-learning.	2.93(2.79–3.06)	3.07(2.99–3.15)	0.063

6	I think universities are not using blended learning methods.	2.88(2.74–3.02)	2.99(2.92–3.06)	0.147
7	I think there is a lack of coordination between curriculums and e-learning plans.	3.03(2.89–3.16)	3.29(3.22–3.37)	<0.01
D. Human barriers				
1	I lack technical consultation on using the electronic education system.	2.77(2.64–2.91)	3.06(2.98–3.14)	<0.01
2	I find that there is no/less commenting and answering among students and lecturers during e-learning.	3.66(3.50–3.82)	3.56(3.48–3.64)	0.235
3	I think there is lack of supporting the development of e-learning.	3.27(3.13–3.41)	3.43(3.36–3.50)	<0.05
4	I find that there is lack of administrative support for keeping e-Learning equipment.	3.18(3.04–3.32)	3.26(3.19–3.33)	0.285
E. Educational skill barriers				
1	I think there is lack of planning for the human resources to start and protect e-Learning systems.	3.27(3.14–3.41)	3.29(3.22–3.36)	0.830
2	I think there is a lack of necessary education for students with educational technology.	3.31(3.17–3.46)	3.30(3.23–3.38)	0.894
3	I personally felt that there are inadequate fellow members on new educational technologies.	3.28(3.14–3.41)	3.33(3.27–3.40)	0.424
4	I think students are not familiar with the English language to use it in e-learning.	2.85(2.70–3.01)	2.84(2.76–2.92)	0.881
5	I think e-learning courses not presenting as a classroom teaching supplement for improving teaching quality.	3.41(3.26–3.55)	3.34(3.26–3.42)	0.418

DISCUSSION

The key outcome of the results on participants' attitudes toward using e-learning was slightly more than neutral for university students and lecturers. Findings on the overall usefulness of e-learning were more neutral, with a mean score of 3.53 among lecturers, whereas it was 3.28 among university students. The difference in perception between university students' and lecturers' attitudes toward the use of e-learning was significant ($p < 0.01$). This finding was compatible with the study conducted by Sirtongthaworn and Teo in Thailand found that Thailand students' acceptance of e-learning was above average, with a mean score of 3.05, particularly among younger students (10, 11). Furthermore, according to Jamil B et al., e-learning can be a future learning preference based on a study conducted on Slovenian nurses matched with the findings of our study where both lecturers (3.64) and university students (3.30) had a mean score toward a positive attitude. The difference in their perceptions was significant ($p < 0.01$) (12). Numerous studies found that e-learning and traditional learning are

significantly different (13-15). In our study, e-learning was considered better than traditional methods of teaching, with a mean score 2.69 among lecturers and 2.50 among university students toward negative attitude with significant difference ($p < 0.05$). This finding differs from the study conducted by Dr. Nahid on the impact of e-learning vs. traditional learning, with a mean score of neutral, which was 3.2 (16). Improving and enhancing the quality was crucial to the success of higher education institutions that were involved in e-learning (17). Moreover, satisfaction with the quality of e-learning had a mean score of 3.12 among lecturers and 2.95 among university students, with a significant difference ($p < 0.05$). This matched the findings from the study conducted by Dr. Itedal on students' performance and attitude due to e-learning, with a mean score of 3.60 ($p < 0.05$) (16). Dynamic and challenging environments would increase the quality of e-learning (18). Furthermore, Jamil B et al. showed there was a negative attitude toward the impact of e-learning, with a mean score of 2.86 matched with our results that the perception of university students, with a mean score of 2.74 and lecturers of 2.66, and their perceptions were not significantly different ($p > 0.05$) (12). The classroom learners performed better than students using the e-learning platform, and also it all depended on the motivation of students and instructors to deliver lectures via e-Learning (19). Alharbi et al. found that interaction between students and teachers was not effective through e-learning compared with traditional learning, with a mean score of 3.87. This was consistent with our results with a mean score of 3.82 among lecturers and 3.95 among university students, but their perception was not significant in our study ($p > 0.05$) (20, 21). However, misuse of several users' identities was considered a major issue, and it can be with or without done by students by online teaching, as evident with the results obtained where university students with a mean score of 3.16 felt insecure when using e-learning but the perception varied with lecturers with mean score 2.82 and the significant difference ($p < 0.01$) (22).

According to Table 3, 5 variables had been loaded to the infrastructure barriers. The perception of university students and lecturers varied with the mean score. Mousavi et al found seven barriers in their studies regarding identification and analysis of barriers of use and development of e-learning found that data analysis has led to recognize the seven barriers including lack of skill, cultural, attitude, method and content, financial problem, and infrastructure barriers (23). Furthermore, findings of Farhadi on e-learning as new paradigm and Rabiee on internet used obstacles concerning e-learning confirmed the results obtained where "high cost for updating the required blogs and preparing educational information technology equipment for e-learning" one of the most important barriers with mean score by lecturers 3.19 and university students of 3.36 with significant difference ($p < 0.05$) (24, 25).

Moreover, many studies have shown that attitude and self-efficacy are important factors that affect learners' interest, motivation, and performance in e-learning (8). Timothy et al. found that perceived usefulness is significantly estimated by several independent variables like learning environment, course delivery, tutor attribute, and facilitating conditions (9). Smeets et al. showed that Information and Communications Technology (ICT) contributes to powerful learning environments in primary education, and Piccola et al. found that "not accepting e-learning as a substitute for traditional classes" was one of the important barriers, with the second highest mean score by lecturers/teachers of 3.30 and the highest mean score by university students of 3.38, with significance difference ($p < 0.01$) (26, 27). From the findings of Barbour et al. on students' experience in an online learning environment opposed to the results obtained were "unable to recognize the benefits of using communications," with a mean score of 2.65 among lecturers/teachers and 2.84 among university students with significance difference ($p < 0.05$) (28). Furthermore, Mei et al. found that 46% of respondents were interested, 40% were willing to consider e-learning as Continuing Nursing Education, and only 4% were not interested in e-learning (29). Hence, interest in e-learning was positively associated with attitudes toward e-learning (29). The findings of Mei et al. opposed the result obtained in this study, where "lack of belief in individual interests and need variables in the learning process" was one of the important barriers, with a mean score of 3.28 among lecturers/teachers and 3.52 among university students with significant difference ($p < 0.01$).

Inexperienced users were more likely to be afraid of the technology itself and be embarrassed in front of the students (11). A common technical barrier was the lack of user-friendliness in learning management systems (11). A study by Lin Y. Muilenburg and Zane L. Berge stated that technical problems and cost/access to the internet were the less important barriers. The least respondents rated a lack of technical skills as a very low obstacle to learning online (30). Thus, this study supported the results obtained in our study where “Lecturers lack skills in e-learning planning,” with a mean score of neutral among both lecturers/teachers of 2.93 and university students of 2.95; the difference in their perceptions was not significant ($p > 0.05$). Moreover, Jose et al. found an improvement in students’ academic performances when taught anatomy via blended learning (31). According to Wang Y., applying blended learning to teacher education maintains and improves the quality of teaching preparation (32). Hence, these findings opposed the results of our study where “universities are not using blended learning methods,” with a mean score among lecturers/teachers of 2.88 and university students of 2.99; the difference in their perceptions was not significant ($p > 0.05$). Afyuni S et al.’s feasibility study of implementing e-learning courses and Frazeen B.’s evaluation of technology to enhance the learning experience confirmed the results, where “Low quality of used software” had a mean score among lecturers of 2.73 and university students of 2.75. The difference in their perceptions was not significant ($p > 0.05$); “e-learning contains low quality of curriculum’s content” with a mean score among lecturers/teachers of 2.80 and university students of 3.08 with significant difference ($p < 0.01$) (33, 34).

In our study, the lack of support in e-learning development was one of the most significant findings, with a mean of 3.27 for the lecturers, 3.43 for the students, and a significant difference ($p < 0.05$). This finding was also supported by a study done in Indonesia by Mailizar et al. (2020), where lack of technical support was the second most important barrier to successfully implementing e-learning (35). Zahra et al. (2016) showed that lack of technical consultation on the electronic education system was one of the most crucial human barriers to e-learning implementation (36, 37). This study supported the result in Table 3, where there was a lack of technical consultation on using the electronic education system, with a mean of 2.77 among the lecturers and 3.06 for the students, which was significantly different ($p < 0.01$). However, regarding the perception between lecturers and university students regarding educational barriers, the study showed no significant difference, as shown in Table 3 with ($p > 0.05$).

Our study has some limitations. Barriers to e-learning perceptions among university students and lecturers were assessed in a cross-sectional study. Therefore, we could not observe changes in perceptions throughout the pandemic. Regarding the demographic data, we only focused on the participant’s age, gender, occupational status, whether they are a lecturer or university students, and educational level. Hence, we could not differentiate participants’ perceptions from rural and urban areas. Future studies should explore the perception of students and lecturers in rural and urban areas that might expose different perspectives and experiences.

CONCLUSION AND RECOMMENDATIONS

The perceptions of e-learning among university students and teachers/lecturers were significantly different based on their attitudes and the barriers to using e-learning. Attitudinal barriers seemed to be the biggest discrepancies between these two groups since four out of five variables in this section showed significant differences. Hence, the university students and lecturers/teachers needed to improve more in the basis of e-learning’s quality, software, and updating blogs that would cost high and effective administrative support for a balanced education system. Moreover, the Malaysian government needed multiple collaborations to build engagement and motivation with course content and activities to overcome the challenges due to attitudes and barriers of e-learning perceptions among university students and lecturers, especially during the COVID-19 pandemic. Administration, faculty

admins, and the department of education should note the improvement and the necessary measures that can be applied for an effective and better teaching and learning platform for both university students and lecturers/teachers for successful academic performances during the lockdown due to COVID-19. Further research focusing on the perceptions and experiences of students and lecturers/teachers on the usage of e-learning may identify factors affecting them and whether these factors were modifiable to improve e-learning.

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