

## **E-Learning Satisfaction and Learning Performance During COVID-19 Pandemic from Students' Perspective**

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**Abstract:** E-Learning implementation during the closure of higher education institutions due to COVID-19 pandemic without measurement and evaluation of its effect on the students engaged is one of the problems arise nowadays. E-Learning system which forced students to adapt the changes will indirectly lead to the dissatisfaction of students and their learning performance. Thus, this research aimed to identify the level of student's E-Learning satisfaction during the closure of the higher education institution due to COVID-19 pandemic, to determine the relationship of E-Learning dimensions toward E-Learning satisfaction and lastly, to determine the relationship of E-Learning satisfaction towards student's learning performance. The quantitative research approach was used to obtain data from respondents via an online survey questionnaire. There was a total of 285 students at the Academy of Language Studies, UiTM Shah Alam, Selangor as the respondent. In order to fulfil the aims, the analysis of descriptive statistics and the Spearman correlation have been utilized to analyze the information. The primary results of this study showed that student's E-Learning satisfaction were in a moderate and low level and there is a significant, positive and strong relationship between E-Learning dimensions toward E-Learning satisfaction and also E-Learning satisfaction toward learning performance. Findings of this research are able to help and provide the higher education institutions in Malaysia to be more understanding on student's E-Learning satisfaction and learning performance during COVID-19 pandemic which allow the technology improvement, updating of the system and provide flexibility in implementation of E-Learning system.

**Keywords:** E-Learning, Student satisfaction, Learning performance, COVID-19 pandemic, Higher education institution

## 1. Introduction

The World Health Organization (WHO) has classified COVID-19 as pandemic. The first COVID-19 cases were discovered in Malaysia on January 25, 2020 (Nurhizam *et al.*, 2020). The Malaysian government has announced the enforcement of the Movement Control Order (MCO) in order to isolate the source of COVID-19 by restriction of domestic and international travel, the closure of all gathering sites, public areas, offices, schools, college and academic institutions. The fast pandemic is seen as the world's most critical health disaster of today's period and the biggest human threat since the Second World War (Chakraborty & Maity, 2020). Many governments have given state-wide orders asking citizens to remain at home to help prevent virus spread. One of the sectors affected by MCO during pandemic of COVID-19 includes education sector.

E-Learning is a term for IT and communication related learning and training (Huynh *et al.*, 2020). The E-Learning lecture is a product created from authoring tools, capable of integrating multimedia including videos, images, graphics, animation and sound. From the term of E-Learning, it is possible to understand the E-Learning course as an internet-based course that can be used offline or online, interact with learners, help learners to learn by themselves without the need for direct instructor and without going to the educational institution. Information technology and communication are the foundation for E-Learning system. More specifically, they are network technology, graphic techniques, simulation techniques and computing technology. In E-Learning, it offers a great deal of versatility in teaching methodology, curriculum management, synchronous and asynchronous contact between lecturers and students, the arrangement and layout of classes, educational initiatives and student evaluation (Nurhizam *et al.*, 2020). According to S. Ali *et al.* (2018), the modes can be synchronous in real time with direct student-instructor interaction with resources like video conferences and asynchronous without student-instructor interaction in real time.

The use of technology in higher education has fundamentally changed the dynamics of learning. This has been primarily encouraged by electronic learning, including the use of E-Learning to increase performance of student (Tsekea & Chigwada, 2020). Meanwhile, students will profit greatly from the introduction of E-Learning in the educational system. However, the changed of the learning system or method may affect the students' satisfaction and learning performance towards the E-Learning implementation during COVID-19 pandemic (Joshi *et al.*, 2020). Some studies have measured student satisfaction with E-Learning but the findings are still different. These variations are an interesting topic to study especially during COVID-19 pandemic due to the use of E-Learning become vital when many higher education institutions implementing it as a main medium.

E-Learning method at home environment setting has numerous problems compared to doing E-Learning at the university (Joshi *et al.*, 2020). In general, the community especially parents, are still unaware of the efficiency of E-Learning due to feel that traditional way of learning is better. Next, numerous multimedia components are required for the atmosphere content of E-Learning however, the download of engaging learners' content is slow because of bandwidth and connectivity limitations. This leads to frustration and boredom among students and helps to make learning easier. The environment of the university is ideal where all the facilities are accessible easily. Unfortunately, the implementation of E-Learning system during the closure of education sector due to COVID-19 pandemic without measurement and evaluation of its effect on the students, engaged is one of the serious problems arise nowadays.

According to Datuk Zahidi Zainul Abidin, Deputy Communication and Multimedia Minister, the government would convene to draft a National Digitisation Plan on internet connection, particularly in rural regions (Choong, 2020). With the poor internet connectivity, some students cannot access to E-Learning platform anywhere and facing difficulty when uploading big size of assessments that may impact to user satisfaction level and learning performance. The change from traditional learning to E-

Learning system which forced students to adapt the change during COVID-19 pandemic will indirectly lead to the dissatisfaction of student towards the E-Learning system (Hasan & Bao, 2020).

Therefore, this study aims; (i) to identify the level of student's E-Learning satisfaction during the closure of the higher education institution due to COVID-19 pandemic, (ii) to determine the relationship of E-Learning dimensions toward E-Learning satisfaction during COVID-19 pandemic, and (iii) to determine the relationship of E-Learning satisfaction towards student's learning performance during COVID-19 pandemic.

## 2. Literature Review

### 2.1 Electronic Learning (E-Learning)

Improvements in different areas such as economics, industry, health and education have been driven by latest ICT technologies. This helped to increase education exponentially and enabled the usage of E-Learning. The direct outcome of education and technology convergence and is a powerful learning tool (Al-Fraihat, Joy & Sinclair, 2017). E-Learning has begun in the Malaysian context in the late 1990s. The functionality of E-Learning has extended to include all forms of students, whether they are full-time, part-time or distance students in institutions of higher education (Adams *et al.*, 2018).

Furthermore, the E-Learning system provides students with space or place to browse through a multitude of electronic tools, including electronic books and many other useful links (Shahzad *et al.*, 2020). Students and lecturers will disseminate messages, announcements, notes, questions, answers via the E-Learning system and integrate sources of location search and distribution materials in any format, physical or digital (Ghaderizefreh & Hoover, 2018).

The modes of E-Learning are categorised in different ways. The timing of contact is also the basis of certain classifications. E-Learning has been divided into two basic forms by Algahtani (2011), consisting of computer-based and internet-based E-Learning. Computer-based learning is a full range of widely available ICT hardware and software are required, and any part can also be employed in two ways: computer-managed instruction and computer-assisted learning. For internet-based learning, computer-based learning is further improved and the material is made accessible on the internet, with links to similar sources of information available.

Furthermore, Algahtani (2011) has defined E-Learning types as "synchronous" or "asynchronous" through the application of optional interaction timing. The synchronous timing requires alternative online access between teachers and students and enables all participants to post messages over the internet to every other participant. The asynchronous mode allows students at different times to communicate with the instructors or lecturers as well as with each other over the internet. Therefore, with the use of tools such as thread discussion and emails, it is not contact at the same time but with the advantage, that learners will learn at a time that suits them.

### 2.2 E-Learning Implementation in Higher Education Institutions (HEI) during COVID-19

E-Learning is a replacement for face-to-face learning that is suitable for the education environment of the 21st century to promote connections, engagement in learning, student performance and satisfaction level (Arifiati *et al.*, 2020). Based on previous study by Hodges *et al.* (2020), E-Learning implementation in HEI should take into consideration to ensure that system can easily be used, effective and tackles different considerations such as student experiences, the required facilities, the skills of personnel to operate E-Learning, the need to understand, difficulties faced by the students, the result of E-Learning and finally, reviews from students. By reviewing the relevant literature, there are some challenges that might be face by student in the implementation of E-Learning system during COVID-19 pandemic which will lead to student dissatisfaction.

### 2.3 Student Satisfaction

User satisfaction was described by Kim and Malhotra (2005) as the expected amount of learning accrued through a specific E-Learning system. It is crucial to place the needs and expectations of students as a core concern when planning, creating and implementing distance education courses. A course that does not meet student expectations and needs may result in low levels of student participation. (Al-Fraihat *et al.*, 2020).

Student satisfaction is the subjective understanding of how well a learning environment promotes academic achievement on the part of students (Landrum *et al.*, 2020). The role of the instructor of the students is likely to concern important elements of student satisfaction and these elements may be essential to student learning. In order to begin recognising the most beneficial elements to ensure the academic performance of students, the present study analysed some of these components (Agbanu *et al.*, 2018).

### 2.4 Theories Related to the Framework

Sun *et al.* (2008) found that the six dimensions previously described, as well as 13 components, were involved in empirical research of the essential factors determining E-Learning satisfaction. The dimensions and factors of perceived E-Learning satisfaction as given by previous researcher are reviewed in Table 1.

**Table 1: Dimension and factors of perceived E-learning satisfaction (Sun *et al.*, 2008)**

Dimension	Factor
Learner	Learner attitude toward computers Learner computer anxiety Learner internet self-efficiency
Instructor	Instructor response timeliness Instructor attitude toward E-learning
Course	E-learning course flexibility E-learning course quality
Technology	Technology quality Internet quality
Design	Perceived usefulness Perceived ease of use
Environmental	Diversity in assessment Learner perceived interaction with others

Meanwhile, according to Eom *et al.* (2006) regarding the determinants of students' perceived learning outcomes and satisfaction in university online education, the six dimensions previously identified to perceived student satisfaction and learning outcomes. The dimensions consist of student self-motivation, student learning style, instructor knowledge and facilitation, instructor feedback, interaction and course structure. From previous study about determinants of student satisfaction in online tutorial by Harsasi & Sutawijaya (2018), researchers conducted research by merging the dimensions in research of Sun *et al.* (2008) and research of Eom *et al.* (2006), especially in the use of variables.

#### (a) Course Structure

The structure of course is seen as a key variable influencing the performance of the E-Learning system. The course structure, according to Moore (1991), is an "expression of the rigidity or flexibility of the education objective of the plan, teaching strategies and evaluation methods," and represents "the extent to which the education programme can fulfil and respond to the individual needs of each learner".

According to Eom *et al.* (2006), there are two aspects of the course structure; course objectives and course infrastructure. In the meantime, the overall accessibility of the course website and the arrangement of the course content into coherent and comprehensible components are concerned in course infrastructure.

*(b) E-learning System Flexibility*

The definition of E-Learning system flexibility is learners' perception of the efficiency and effects of adopting E-Learning system in their learning, working and communication hours (Sun *et al.*, 2008). The elimination of physical obstacles allows for more dynamic interactions that promote constructive and cooperative learning opportunities (Salmon, 2000). Students can communicate instantaneously, anytime and anywhere without restrictions on time and space in E-Learning system.

*(c) E-learning System Quality*

The efficiency of a well-designed E-Learning framework is the primary consideration when considering E-Learning for learners. Another significant factor affecting learning outcomes and satisfaction in E-Learning is consistency (Piccoli *et al.*, 2001). The virtual features of E-Learning, including online interactive discussion and brainstorming, digital presentation of course materials and learning process management, help students effectively build learning models and inspire continuous online learning (Sun *et al.*, 2008). Therefore, the quality of the E-Learning system is also considered important in terms of learning satisfaction.

*(d) Technology Quality*

The meaning of technology quality is the perceived IT quality of the learners used for electronic learning (Sun *et al.*, 2008). Several researchers suggest that the quality of technology influences E-Learning system satisfaction (Piccoli *et al.*, 2001). A user-friendly software tool, like learning and memorising a few sample ideas and meaningful keywords, needs little effort from its users. With few challenges, users will be prepared to take such a toll and satisfaction will be increased (Amoroso & Cheney, 1991). Therefore, the greater the consistency and reliability of IT, the greater the impact on learning (Piccoli *et al.* 2001).

*(e) Learning Performance*

According to Law *et al.* (2019), the performance of learning can be assessed in terms of enhancing critical thinking and problems after taking the course. Students with strong cognitive presence are clearly more likely to achieve higher academic success (Alamasi and Chang, 2020). The gap between learning and performance is a behavioural principle that underlines the difference between behavioural learning and behavioural success (Tan, 2020).

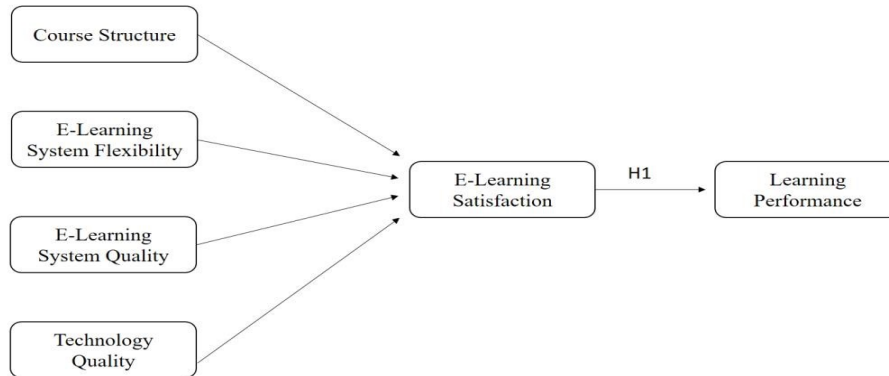
*(f) E-learning Satisfaction*

E-Learning satisfaction is widely used both academically and practically to test the outcomes of learning experiences and activities (Alavi, 1994). It also used a key indicator whether students want to pursue a method of learning or not (Arbaugh, 2000). This study is about analysing the results of student's E-Learning satisfaction during COVID-19 pandemic. E-Learning satisfaction is seen as the degree of satisfaction of students with the entire E-Learning system (Sun *et al.*, 2008).

## 2.5 Conceptual Framework and Hypotheses

Based on the literature review, a conceptual framework is developed and the following hypotheses were generated in order to meet the research objectives:

- H1 : E-Learning course structure has a positive relationship with E-Learning satisfaction  
 H2 : E-Learning system flexibility has a positive relationship with E-Learning satisfaction  
 H3 : E-Learning system quality has a positive relationship with E-Learning satisfaction  
 H4 : E-Learning technology quality has a positive relationship with E-Learning satisfaction  
 H5 : E-Learning satisfaction has a positive relationship with learning performance



**Figure 1: Conceptual framework**

### 3. Research Methodology

#### 3.1 Research Design

The study was conducted among Malaysian undergraduate students who used an E-Learning system during COVID-19 pandemic. To collect data from respondents, this study used a quantitative research approach. The quantitative research relies on gathering, generalising and explaining numerical data by groups of individuals. The survey was conducted to get the information about student’s background and to evaluate student’s E-Learning satisfaction rate. The research is carried out by integrating Sun *et al.* (2008) and Eom *et al.* (2006), in particular with the use of variables in both studies. In order to determine the learning performance, researcher adapted the indicators from research of Law *et al.* (2019) to see how it relates with student’s E-Learning satisfaction.

#### 3.2 Data Collection

On the questionnaire's designation, descriptive studies were conducted. The questionnaire was delivered to respondents through Google Form as an online survey. In this research, a Google Form link will be sent via WhatsApp groups to undergraduate students from first year to fourth year. The online survey consists of seven sections which divided into section A, B, C, D, E, F and G. Section A is about the demographic of respondent and section B until G is about the variables used. A five-point Likert scale was used to create the questionnaire ranging from 1=strongly disagree to 5=strongly agree.

In this research, the technique of probability sampling (random sampling) was used. It is a method in which the researcher takes a sample that has been selected using random selection so that each unit the population has a known chance of being selected. The aim of probability sampling is to keep sampling error to a minimum. The data was collected using a basic random sample approach, which is one of four types of probability sampling methods. The most basic type of probability sampling is simple random sampling, which selects sample items from the frame using a statistically random

selection method. Each unit of the population has an equal chance of being included in the sample when using random sampling (Bryman, 2012). The sample size for this study was determined using the Krejcie & Morgan (1970), with a minimum sample size of 285 for a total sample size of 1100 (population). As a result, 285 responses are an appropriate sample size for this study.

### 3.3 Data Analysis

IBM Statistical Package for Social Science (SPSS) Version 22 was used in this study to analyse data obtained from the survey. In this study, the reliability test (Cronbach Alpha) was carried out using SPSS software analysis to ensure data quality (Mohajan, 2017). After that, to identify the level of student's E-Learning satisfaction, descriptive statistics analysis was used for getting the mean, variance and standard deviation for each variable to find out which variable is score higher across all the variable (Taber, 2018).

### 3.4 Pilot Test

Table 2 shows the results of Cronbach-Alpha Reliability test for pilot test by using the first 33 respondents in this research. The first variable, E-Learning course structure that consist of 4 items have achieved alpha coefficient value of 0.914 which indicate all the items were strongly reliable and accepted for analysis. The second variable, E-Learning system flexibility that consist of 4 items have achieved alpha coefficient value of 0.801 which indicate all the items were very reliable and accepted for analysis. The third variable, E-Learning system quality that consist of 5 items have achieved alpha coefficient value of 0.890 which indicate all the items were very reliable and accepted for analysis.

Next the fourth variable, E-Learning technology quality that consist of 5 items have achieved alpha coefficient value of 0.828 which indicate all the items were very reliable and accepted for analysis. The fifth variable, E-Learning satisfaction that consist of 4 items have achieved alpha coefficient value of 0.913 which indicate all the items were strongly reliable and accepted for analysis. The sixth variable, learning performance that consist of 3 items have achieved alpha coefficient value of 0.836 which indicate all the items were very reliable and accepted for analysis. No item has been deleted means all of the items were reliable and acceptable. In summary, the reliability test indicates this survey is trustworthy.

**Table 2: Results of Cronbach Alpha reliability test**

Variables	No. of item	Cronbach's Alpha	Interpretation
E-learning course structure	4	0.914	Strongly reliable
E-learning system flexibility	4	0.801	Very reliable
E-learning system quality	5	0.890	Very reliable
E-learning technology quality	5	0.828	Very reliable
E-learning satisfaction	4	0.913	Strongly reliable
Learning performance	3	0.836	Very reliable

## 4. Results and Discussion

### 4.1 Response Rate

The population for this research was the undergraduate students from Akademi Pengajian Bahasa located at UiTM Shah Alam. Survey questionnaires were distributed to the respondents by Google Form by shared the link in student WhatsApp Group. The respondents gained from this research is 285 respondents same with targeted respondents for this research. Therefore, this constituted a return rate of 100%. The researcher has received very good cooperation from the Akademi Pengajian Bahasa management especially from the Deputy Dean of Student Affairs, Dr. Zaidi Zakaria who has helped to get the respondents from this faculty during COVID-19 pandemic.

## 4.2 Data Cleaning

Data cleaning was performed after the data was entered into the data file to identify any problems. One of the challenges with survey-based research is missing value (Azeroual, Saake, & Abuosba, 2018). As a result, missing value handling is required. There were no missing values in the data gathered, according to Table 3.

**Table 3: Missing value**

Dimension	Cases					
	Valid		Missing		Total	
	N	%	N	%	N	%
Demographic of respondents	285	100.0	0	0.0	285	100.0
E-learning course structure	285	100.0	0	0.0	285	100.0
E-learning system flexibility	285	100.0	0	0.0	285	100.0
E-learning system quality	285	100.0	0	0.0	285	100.0
E-learning technology quality	285	100.0	0	0.0	285	100.0
E-learning satisfaction	285	100.0	0	0.0	285	100.0
Learning performance	285	100.0	0	0.0	285	100.0

## 4.3 Demographic Information

From result of 285 responders, 176 (61.8%) were female, while the remaining 109 (38.2%) were male. The majority of the respondents in this survey are between the ages of 21 to 23, accounting for 167 (58.6%) of the total. Following that are the respondents aged 27 and above, who account for 66 respondents (23.5%). The respondents between the ages of 24 to 26 (a total of 37) came in third with 13.0%. Finally, there is a 5.3% rate of people aged 18 to 20 years old (15 respondents).

Majority of the respondents in this study are from Bachelor Degree which is 270 respondents (94.7%) from the overall. Followed by the respondents from Diploma which is 14 respondents (4.9%) and lastly, respondent from Foundation with only one respondent (0.4%).

Majority of the respondents in this study are students from year 2 which is 101 respondents (35.4%). Followed by students from year 3 which is 95 respondents (33.3%) and students from year 1 which is 54 respondents that included 18.9% from total percentage. Lastly, the percentage of year 4 which is 12.3% (12.3%).

Majority of the respondent currently at their hometown with frequency 275 respondents out of 285 that represents 96.5%. 7 respondents (2.5%) currently at their campus located in Shah Alam. Lastly, 3 respondents tick 'others' in the questionnaire for their current location that represents 1.1%.

Majority of the respondents who participated in this research assumed their internet coverage are 'good' with frequency 136 respondent (47.7%). Followed by 'moderate' internet coverage which is 131 respondents that represents 46%. Lastly, 18 respondents in this research labelled their internet coverage as 'poor' with percentage 6.3%.

## 4.4 Sample Size Adequacy

The Krejcie and Morgan table was used to determine the appropriate sample size for this study. According to Krejcie and Morgan (1970), there is a link between sample size and population, whereby as the population grows, the sample size grows at a slower rate and remains practically constant at a small level. Table 4 shows that the sample size for 1100 (population) are 285 (sample size). There are 285 respondents participated in this research which exceed the acceptable sample size number. As a result, the sample size for this study is acceptable.



#### 4.5 Descriptive Statistics

##### (a) E-learning Course Structure

Table 4 indicates the mean and standard deviation for the E-Learning course structure variable.

**Table 4: Mean result of E-learning course structure**

Statement	Mean	Std. Deviation	Interpretation
Course material is presented in a well structure	2.08	0.753	Low
The learning objectives in the E-Learning has been conveyed properly	2.16	0.797	Low
The material in the E-Learning has been arranged in a logical sequence and understandable	2.11	0.780	Low

##### (b) E-learning System Flexibility

Table 5 indicates the mean and standard deviation for the E-Learning system flexibility variable.

**Table 5: Mean result of E-learning flexibility**

Statement	Mean	Std. Deviation	Interpretation
Learning through E-Learning system gave me the flexibility to adjust my learning time	2.31	0.934	Low
Learning through E-Learning system benefit me	2.30	0.953	Low
Learning through E-Learning system made have the flexibility to divide the time between learning activities and other jobs	2.37	0.994	Moderate
There is no disadvantage I get through E-Learning system	2.83	1.070	Moderate

##### (c) E-learning System Quality

Table 6 indicates the mean and standard deviation for the E-Learning system quality variable.

**Table 6: Mean result of E-learning system quality**

Statement	Mean	Std. Deviation	Interpretation
Learning through E-Learning system make me able to improve my learning quality	2.56	1.010	Moderate
E-Learning system as a whole has a good quality	2.50	0.959	Moderate
The appearance of E-Learning system is interesting	2.38	0.862	Moderate
I have no difficulty using the feature in E-Learning system	2.58	0.991	Moderate
The appearance of E-Learning system is up to date	2.30	0.826	Low

##### (d) E-learning Technology Quality

Table 7 indicates the mean and standard deviation for the E-Learning technology quality variable.

**Table 7: Mean result of E-learning technology quality**

Statement	Mean	Std. Deviation	Interpretation
I can access E-Learning anywhere	2.28	0.960	Low
I do not experience any problems when using E-Learning	2.87	1.075	Moderate
I do not encounter any difficulty in responding to the discussion	2.62	1.011	Moderate
I do not see any difficulty when uploading task	2.66	1.047	Moderate
E-Learning technology is easy to use	2.30	0.905	Low

*(e) E-learning Satisfaction*

Table 8 indicates the mean and standard deviation for the E-Learning satisfaction variable.

**Table 8: Mean result of E-learning satisfaction**

Statement	Mean	Std. Deviation	Interpretation
I am satisfied with the whole system of E-Learning	2.48	0.951	Moderate
Overall, E-Learning system is already well	2.43	0.911	Moderate
Learning through E-Learning system enable me to learn independently	2.28	0.868	Low
I will keep learning through the E-Learning system in the future	2.51	1.083	Moderate

## 4.6 Test of Significance

*(a) Normality Test*

Normality test of data which is Kolmogorov-Smirnov and Shapiro-Wilk tests which are displayed in SPSS. Kolmogorov-Smirnov test was considered in this research because the dataset for this research is 285 which is more than 50 elements. Kolmogorov-Smirnov test is a nonparametric method carried out to examine whether the test variable is normally distributed by comparing the sample scores with the same mean and standard deviation (Narotama, 2019). If p value of Kolmogorov-Smirnov is greater than 0.05, null hypothesis is accepted and the data is assumed to be approximately normally distributed. On the other hand, if p value is less than 0.05, the null hypothesis is rejected and the data is said to be deviated from the normal distribution (Field, 2000). In SPSS, the p-value is labelled as "Sig." under Kolmogorov-Smirnov. In this research, the p-value of all items are below 0.05, which considered as not normal meanwhile, Spearman's rho correlation coefficient was used in this research as the data distributions are not normal.

*(b) Bivariate Correlation Analysis*

Due to the data distributions are not normal, Spearman's rho correlation coefficient was utilized in this study. To establish the strength of the monotonic relationship between the independent factors and the dependent variable, the correlation was calculated using IBM SPSS software. The term "monotonic relationship" refers to a function in which the y variable never decreases when the x variable increases, and vice versa. Spearman's rho correlation coefficients range from -1 to +1. The greater the link between the variables, the higher the coefficient value (Schober & Schwarte, 2018). The table of absolute value r and associated indicator is shown in Table 9.

**Table 9: Spearman rho coefficient strength**

Spearman rho coefficient, r	Indicator
0.00 – 0.20	Negligible
0.21 – 0.40	Weak
0.41 – 0.60	Moderate
0.61 – 0.80	Strong
0.81 – 1.00	Very strong

*(c) Relationship Between E-learning Dimensions and E-learning Satisfaction*

Table 10 shows the relationship between E-Learning course structure and E-Learning satisfaction by using Spearman correlation test. The Spearman's correlation coefficient shows a positive and strong relationship between E-Learning course structure and E-Learning satisfaction which is 0.631. Furthermore, because the value of p (0.000), which is shown in the table as Sig., is less than 0.01, there is a significant relationship between variables at the 0.01 level of significant.

**Table 10: Correlation of E-learning dimensions and E-learning satisfaction**

				E-learning course structure	E-learning satisfaction
Spearman's rho	E-learning course structure	Correlation coefficient		1.000	0.631**
		Sig. (2-tailed)			0.000
		N		285	285
	E-learning satisfaction	Correlation coefficient		0.631**	1.000
		Sig. (2-tailed)		0.000	
		N		285	285

\*\* Correlation is significant at the 0.01 level (2-tailed)

Table 11 shows the relationship between E-Learning system flexibility and E-Learning satisfaction by using Spearman correlation test. The Spearman's correlation coefficient shows a positive and strong relationship between E-Learning system flexibility and E-Learning satisfaction which is 0.751. Furthermore, because the value of p (0.000), which is shown in the table as Sig., is less than 0.01, there is a significant relationship between variables at the 0.01 level of significant.

**Table 11: Correlation of E-learning flexibility towards E-learning satisfaction**

				E-learning system stability	E-learning satisfaction
Spearman's rho	E-learning system stability	Correlation coefficient		1.000	0.751**
		Sig. (2-tailed)			0.000
		N		285	285
	E-learning satisfaction	Correlation coefficient		0.751**	1.000
		Sig. (2-tailed)		0.000	
		N		285	285

\*\* Correlation is significant at the 0.01 level (2-tailed)

Table 12 shows the relationship between E-Learning system quality and E-Learning satisfaction by using Spearman correlation test. The Spearman's correlation coefficient shows a positive and very strong relationship between E-Learning system quality and E-Learning satisfaction which is 0.830. Furthermore, because the value of p (0.000), which is shown in the table as Sig., is less than 0.01, there is a significant relationship between variables at the 0.01 level of significant.

**Table 12: Correlation of E-learning system quality towards E-learning satisfaction**

			E-learning system quality	E-learning satisfaction
Spearman's rho	E-learning system quality	Correlation coefficient	1.000	0.830**
		Sig. (2-tailed)		0.000
		N	285	285
	E-learning satisfaction	Correlation coefficient	0.830**	1.000
		Sig. (2-tailed)	0.000	
		N	285	285

\*\* Correlation is significant at the 0.01 level (2-tailed)

Table 13 shows the relationship between E-Learning technology quality and E-Learning satisfaction by using Spearman correlation test. The Spearman's correlation coefficient shows a positive and strong relationship between E-Learning technology quality and E-Learning satisfaction which is 0.771. Furthermore, because the value of p (0.000), which is shown in the table as Sig., is less than 0.01, there is a significant relationship between variables at the 0.01 level of significant.

**Table 13: Correlation of E-learning technology quality towards E-learning satisfaction**

			E-learning technology quality	E-learning satisfaction
Spearman's rho	E-learning technology quality	Correlation coefficient	1.000	0.771**
		Sig. (2-tailed)		0.000
		N	285	285
	E-learning satisfaction	Correlation coefficient	0.771**	1.000
		Sig. (2-tailed)	0.000	
		N	285	285

\*\* Correlation is significant at the 0.01 level (2-tailed)

*(d) Relationship Between E-learning Satisfaction and Learning Performance*

Table 14 shows the relationship between E-Learning satisfaction and learning performance by using Spearman correlation test. The Spearman's correlation coefficient shows a positive and strong relationship between E-Learning satisfaction and learning performance which is 0.739. Furthermore, because the value of p (0.000), which is shown in the table as Sig., is less than 0.01, there is a significant relationship between variables at the 0.01 level of significant.

**Table 14: Correlation of E-learning satisfaction towards learning performance**

			E-learning satisfaction	Learning performance
Spearman's rho	E-learning satisfaction	Correlation coefficient	1.000	0.739**
		Sig. (2-tailed)		0.000
		N	285	285
	Learning performance	Correlation coefficient	0.739**	1.000
		Sig. (2-tailed)	0.000	
		N	285	285

\*\* Correlation is significant at the 0.01 level (2-tailed)

#### 4.7 Summary of Hypotheses Testing

Table 15 shows the hypotheses testing results based on the results of Spearman's rho correlation coefficient. All the hypotheses in this research were accepted because the p value which was given as Sig. (two-tailed) in Table 10 until Table 14 were less than 0.05.

**Table 15: Hypotheses testing results**

	Hypotheses	Correlation coefficient	Hypotheses Accept/Reject
H1	E-Learning course structure has a positive relationship with E-Learning satisfaction	0.631	Accepted
H2	E-Learning system flexibility has a positive relationship with E-Learning satisfaction	0.751	Accepted
H3	E-Learning system quality has a positive relationship with E-Learning satisfaction	0.830	Accepted
H4	E-Learning technology quality has a positive relationship with E-Learning satisfaction	0.771	Accepted
H5	E-Learning satisfaction has a positive relationship with Learning Performance	0.739	Accepted

#### 4.8 Discussion

From the data above, it is clear that the E-Learning dimensions has a significant relationship with E-Learning satisfaction and E-Learning satisfaction has a significant relationship with learning performance. Table 16 shows the summary of this research findings based on the research objectives.

**Table 16: Summary of research findings**

No,	Objective	Results
1	To identify the level of student's E-Learning satisfaction during the closure of the higher education institution due to COVID-19 pandemic	From the results has shown 12 out of 22 statements recorded as "Moderate" with 54.45% according to the level of agreement with mean by Wiersma (1995). Lastly, "Low" level recorded a frequency 10 out of 22 statements that equivalent to 45.45%.
2	To determine the relationship of E-Learning dimensions toward E-Learning satisfaction during COVID-19 pandemic	From the results: <ul style="list-style-type: none"> <li>E-Learning course structure has a positive relationship with E-Learning satisfaction (<math>rs = 0.631</math>, <math>p &lt; 0.05</math>)</li> <li>E-Learning system flexibility has a positive relationship with E-Learning satisfaction (<math>rs = 0.751</math>, <math>p &lt; 0.05</math>)</li> <li>E-Learning system quality has a positive relationship with E-Learning satisfaction (<math>rs = 0.830</math>, <math>p &lt; 0.05</math>)</li> <li>E-Learning technology quality has a positive relationship with E-Learning satisfaction (<math>rs = 0.771</math>, <math>p &lt; 0.05</math>)</li> </ul>
3	To determine the relationship of E-Learning satisfaction towards student's learning performance during COVID-19 pandemic	From the results, E-Learning satisfaction has a positive relationship with learning performance ( $rs = 0.739$ , $p < 0.05$ )

## 5. Conclusion

In conclusion, the findings of the study have some important implication for the education industry especially for higher education institution due student nowadays have to go through with different learning situation due to COVID-19 pandemic. This study can investigate whether students are now able to adapt the new method of learning by using E-Learning system or vice versa. Therefore, in order to increase user perceived net benefit, the higher education institution or government should need to developed E-Learning system with better system and service quality which in turn, it will increase the student satisfaction and also their learning performance during COVID-19 pandemic.

Thus, higher education institution attention might more fruitfully focus on the development of these psychological and behavioural processes. Besides, an awareness can be conveyed to all higher education institutions in Malaysia to develop latest technology, provide appropriate training, information or instruction to their staffs to ensure that they can offer the best system of E-Learning platform to student not only during COVID-19 pandemic period but continued as a new era learning method in future. In addition, not only for higher education institutions, the findings of this research are able to provide some important implication for other education sectors such as primary and secondary level of school which intent to stepping on to Industrial Revolution 4.0 since E-Learning system which integrated with technology advance of ICT.

Although this research has provided some interesting findings, however, there were several limitations in this research. One of the limitations that cannot be avoided was the accuracy of the data collected or the results. This was due to the respondents might answered the survey questionnaire dishonestly. Besides that, some of the respondents might not understand the questionnaire and pick the answer which did not really represented what they think. Secondly, there is a limitation to collect more samples due to time constraint. During the data collection process, it was time consuming to collect data from students due to COVID-19 pandemic situation and also the Movement Control Order (MCO) by our government. Therefore, the samples were only collected from one faculty in UiTM Shah Alam that located nearest with the researcher's location.

Electronic Learning (E-Learning) system is not only implemented in higher education institutions, and therefore, the future researcher may expand the research scope by conducting their research in different types of education sector such as primary and secondary level or industries that may be use the E-Learning to offer training for their employees. This is important to provide a comparison between different sectors and industries. Furthermore, the sample size of this research was limited due to the time constraint and Movement Control Order (MCO) by government of Malaysia now, thus, future researchers are recommended to increase the sample size by conduct the research in different public universities, private universities and also colleges in Malaysia which had implemented E-Learning system especially during COVID-19 pandemic in order to improve the accuracy and reliability of data collected. Other than that, future researchers are suggested to apply mix method which is combining qualitative and quantitative method by focusing on students and academic management during the data collection process to avoid bias in data collected.

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