

## **Students' Perception Towards e-Learning During Covid-19 Pandemic in Malaysia: An Empirical Study**

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**Abstract:** Covid-19 has disrupted most of the industries in the world. Malaysia's first case of Covid-19 has started in December 2019 shows that this pandemic has restructured the most of Malaysian's lifestyle. However, accessibility issues and a lack of digital technologies in their local areas continue to have an impact on certain students. The objectives of this study are 1) to investigate the implementations trend of e-learning before and after Covid-19; 2) to analyse the benefits of e-learning mode from student perspective during Covid-19 pandemic; and 3) to analyse the students' perceptions of e-learning during Covid-19 lockdown period. The data was collected from all UTHM students via online questionnaire. The google form survey are spread out by using WhatsApp and Telegram. Around 109 of the 141 respondents, or 77.3%, are female, while 22.7% are male, with women constituting most respondents overall. Result shows that most of the students think e-learning achieved its aim during the Covid-19 pandemic and only one pair of variables that give benefit of e-learning mode from student perspective during Covid-19 pandemic which is e-learning is structured learning method with different due date to submit assignment. From the analysis, most of the students does not interest with the idea behind the e-learning process during Covid-19. In conclusion, most of UTHM students does not agree with the idea of the e-learning process during Covid-19 pandemic in Malaysia and they did not enjoy the environment of online learning.

**Keywords:** Student Perception, e-Learning, Covid-19 Pandemic, UTHM.

## 1. Introduction

Covid-19 has disrupted most of the industries in the world [1]. The need for education updating was required due to the fast advances in technology. Due to the closure of educational institutions, which creates obstacles for students' learning, the contribution of information technology has gained momentum in the current Covid-19 pandemic situation [2]. They need to be able to learn at anytime and anywhere to be successful. During Covid-19 pandemic, the students from worldwide being forced to follow e-learning due to movement control order (MCO). From the problem mentioned previously, all universities decided to conduct online classes through e-learning [3].

The effectiveness and accessibility of digital technology have an impact on the quality of online learning. However, accessibility issues and a lack of digital technologies in their local areas continue to have an impact on certain kids [4]. There is no denying that the Covid-19 pandemic has had an impact on people's mental health in general, with an increase in people's levels of stress, anxiety, and sadness [5]. The Covid-19 epidemic has changed many aspects of human life around the world, including the traditional classroom setting, which has changed to e-learning method [6].

The objective for this research is to investigate the implementations trend of e-learning before and after Covid-19. The second objective is to analyse the benefits of e-learning mode from student perspective during Covid-19 pandemic and lastly to analyse the students' perceptions of e-learning during Covid-19 lockdown period.

Malaysia's first case of Covid-19 has started in December 2019 shows that this pandemic has restructured the most of Malaysian's lifestyle. It's critical to discover students' opinions and points of view at this phase regarding the online teaching and learning strategy [7]. It would be interesting to investigate whether the learners are comfortable with the new methods, would like any alterations, or would prefer to return to traditional learning entirely. The necessary computer hardware is needed to run the online learning platforms for e-learning. While with obsolete hardware and software, this might cause issues for students [8]. The effectiveness and accessibility of digital technology have an impact on the quality of online learning. However, accessibility issues and a lack of digital technologies in their local areas continue to have an impact on certain students. The students in this study encountered e-learning drawbacks such as a language barrier, challenging e-learning tasks, internet issues, technological issues, and incorrect interactions [9].

## 2. Materials and Methods

### 2.1 Description of Data

The questionnaire consists of five sections. Part A consists of demographic questions which have 8 questions. Part B is research objective 1 which is to investigate the implementations trend of e-learning before and after Covid-19. Next, Part C is research objective 2 which is to analyse the benefits of e-learning mode from student perspective during Covid-19 pandemic. For research objective 3 which is in Part D is to analyse the students' perceptions of e-learning during Covid-19 lockdown period. Lastly, Part E is about the opinion section.

Table 1 shows the distribution section with items in the survey questions. There are 8 questions in Part A, 6 questions Part B, 8 questions Part C, 7 questions Part D and lastly 2 questions in Part E. A modified questionnaire after pilot test has spread to the respondent through WhatsApp and e-mail among Universiti Tun Hussein Onn Malaysia (UTHM) students which are in Parit Raja and Pagoh. Campus which involves all faculties. The study's technique is quantitative. Data that has been used was obtained from the questionnaire by using google form survey.

**Table 1: The Distribution Section with Items In The Survey Questions**

Parts	The variables to be identified	Total items
A	Demography questions	8
B	Concept e-learning	6
C	Benefits of online mode learning	8
D	Students' perceptions of e-learning	7
E	Opinion section	2

## 2.2 Methods

This study involved all students of UTHM that is in both locations, Parit Raja and Pagoh campus. The study's technique is quantitative. The data was collected from all UTHM students via an online questionnaire. The google form survey consists of five parts which are Part A, Part B, Part C, Part D and Part E. Part A presents respondent demography while Part B is specific for the first objectives. Besides, Part C will explore the answer for the second research objective. Finally, Part D focusing on the third research objective and Part E is open answer from respondent. The data collection method used the questionnaires while the data will be analysed by using the Chi-square analysis and logistic regression.

The first objective is to investigate the implementations trend of e-learning before and after Covid-19 using crosstabulation analysis. Most frequently, categorical data, which has a nominal measurement scale, is analysed using crosstabulation analysis, also known as contingency table analysis. The second objective is to analyse the benefits of e-learning from the student's perspective during the Covid-19 pandemic using Chi-square analysis. Lastly, for objective three is to analyse the students' perceptions of e-learning during Covid-19 lockdown period by using logistic regression.

A chi-square ( $X^2$ ) test of independence is a type of Pearson's chi-square test. Pearson's chi-square tests are nonparametric tests for categorical variables. This method is used to the most significant contribution to the modern theory of statistics is the Chi-square distribution and test, usually referred to as the test of independence and the test for goodness-of-fit. A statistical technique called the Chi-square test is frequently used to analyse categorical data. It serves two key objectives. First, determining whether there is a link between two or more groups, populations, other groups, or standards. This is frequently used to establish the independence of two variables. The likelihood that the observed data distribution matches the anticipated distribution is then determined. This is used to gauge how well the data fits the model [10]. Chi-square analysis can be used in survey and questionnaire research to assess the association between various answer choices. For instance, chi-square analysis can be used to evaluate whether there is a significant correlation between the responses and another variable, such as age or gender, when respondents to a survey are asked to express their level of agreement with a statement. When comparing the observed frequencies of responses in various subgroups to the anticipated frequencies on the assumption that the responses were subgroup-independent, one can apply the chi-square test. This can assist determine whether different subgroups agree with the statement to a greater or lesser extent, which can shed light on the attitudes or opinions of the population under study [11].

Logistic regression is an analysis of the relationship between a binary dependent variable and one or more independent. It is used to simulate the likelihood that a specific event will occur, for as the likelihood that a person would get a disease given particular risk factors. Given a collection of independent variables, the logistic regression model calculates the likelihood that the outcome variable will take a specific value (Yes or No). It can be used to many different research problems and disciplines, including the social sciences, business and economics, engineering, and medical research.

## 2.3 Logistic Regression

Logistic regression, which offers an estimation range of 0 to 1, is one of the most popular estimation methods. To explain the relationship between two or more independent factors and dependent variables (pass = 1 and fail = 0), this statistical analysis technique is utilised. As a quantitative analytical tool and a method for problem-solving, the binary logistic regression approach was used. Binary logistic regression is used to model the binary variable (0, 1) based on one or more predictor factors and is a straightforward statistical model for complex and messy data. The multiple binary logistic regression shown in Eq 1;

$$\ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} \quad \text{Eq. 1}$$

where:

$$p_i = Pr(Y_i = 1)$$

$B_0$  = Constant  
 $B_k$  = Coefficient Regression  
 $X_{ki}$  = Variables

### 3. Results and Discussion

#### 3.1 The Implementation Trend Of E-Learning Before and After Covid-19

The effects of Covid-19 will be felt for a long time, affecting the global economy permanently and imparting valuable lessons. During this pandemic, it makes it possible to communicate with students more effectively and efficiently through chat rooms, video conferences, voting, and document sharing. This divide is present across nations and between income levels within nations, and some students struggle to participate in digital learning because they lack dependable internet access and or technology. This section discusses the first objective which is to investigate the implementation trend of e-learning before and after Covid-19 using crosstabulation analysis. Most frequently, categorical data, which has a nominal measurement scale, is analysed using crosstabulation analysis, also known as contingency table analysis. The crosstabulation of the e-learning implementation trend before and after Covid-19 is shown in Table 2.

**Table 2: The Crosstabulation Table for The Implementation Trend of E-Learning Before and After Covid-19**

			Year of Study				
			1	2	3	4	Total
Q1b. Which of the following could describe e-learning in your point of view?	Learning at our own pace.	Count	2	5	8	25	40
		(%)	28.6	55.6	25.8	26.6	28.4
	Online learning with lecturer assistance.	Count	2	1	14	52	69
		(%)	28.6	11.1	45.2	55.3	48.9
	Watching pre-recorded videos prepared by lectures.	Count	3	3	9	17	32
		(%)	42.9	33.3	29	18.1	22.7
Q2b. Did e-learning that you used achieve its aim during Covid-19 pandemic?	Mostly achieved.	Count	2	3	7	29	41
		(%)	28.6	33.3	22.6	30.9	29.1
	No.	Count	0	0	4	12	16
		(%)	0	0	12.9	12.8	11.3
	Not sure.	Count	2	2	8	18	30
		(%)	28.6	22.2	25.8	19.1	21.3
Yes	Count	3	4	12	35	54	
	(%)	42.9	44.4	38.7	37.2	38.3	
Q3b. Rate your information technology skills at the moment after Covid-19 pandemic learning process.	High	Count	3	4	11	40	58
		(%)	42.9	44.4	35.5	42.6	41.1
	Low	Count	0	0	1	3	4
		(%)	0	0	3.2	3.2	2.8
	Moderate	Count	4	5	19	51	79
		(%)	57.1	55.6	61.3	94	56
Q4b. Have you participated in any type of e-learning studies before Covid-19 pandemic started?	No	Count	1	3	13	43	60
		(%)	14.3	33.3	41.9	45.7	42.6
	Yes	Count	6	6	18	51	81
		(%)	85.7	66.7	58.1	54.3	57.4
Q5b. Choose among the devices that you	Both smartphone and laptop	Count	4	7	21	54	86
		(%)	57.1	77.8	67.7	57.4	61
	Both smartphone and laptop, Tablet	Count	0	0	2	20	22
		(%)	0	0	6.5	21.3	15.6

used for e-learning process.	Laptop	Count	0	0	2	6	8
		(%)	0	0	6.5	6.4	5.7
	Laptop, Smartphone	Count	1	0	0	2	3
		(%)	14.3	0	0	2.1	2.1
	Laptop, Smartphone, Both smartphone and laptop	Count	2	1	2	7	12
		(%)	28.6	11.1	6.5	7.4	8.5
	Laptop, Smartphone, Both smartphone and laptop, Tablet	Count	0	0	3	3	6
		(%)	0	0	9.7	3.2	4.3
	Laptop, Tablet	Count	0	0	0	1	1
		(%)	0	0	0	11.1	0.7
	Smartphone	Count	0	1	1	1	3
		(%)	0	11.1	3.2	11.1	2.1
Q6b.	Both mobile data and Wi-Fi	Count	3	5	21	65	94
Choose the source of internet that you might used in the whole Covid-19 pandemic learning process.		(%)	42.9	55.6	67.7	69.1	66.7
	Mobile data	Count	3	1	3	17	24
		(%)	42.9	11.1	9.7	18.1	17
	Mobile data, Wi-Fi	Count	0	0	0	1	1
		(%)	0	0	0	1.1	0.7
	Mobile data, Wi-Fi, Both mobile data and Wi-Fi	Count	0	1	3	3	7
		(%)	0	11.1	9.7	3.2	5.0
	Wi-Fi	Count	1	1	4	8	14
		(%)	14.3	11.1	12.9	8.5	9.9
	Wi-Fi, Both mobile data and Wi-Fi	Count	0	1	0	0	1
	(%)	0	11.1	0	0	0.7	

Based on Table 2, it shows that most students, which is 69 students (48.9%) answered online learning with lecturer assistance for Question 1 which is the description of e-learning based on their point of view. This answer is from the students that already had e-learning before Covid-19 occurred. Next, for Question 2 most students answered yes which is 54 students out of 141 to the question about e-learning achieved its aim during Covid-19 pandemic and 41 students answer mostly achieved to those questions. Furthermore, Question 3 is about the rating the information technology skills now after the Covid-19 pandemic learning process. There are about 79 students answer moderate to that question which is 56% which is more than half students think that technology skills during the e-learning help to increase their skills.

Next, Question 4 is about is about the participation in any type of e-learning studies before the Covid-19 pandemic started. About 81 students (57.4%) answered yes to that question. Question 5 is the devices that the students used for the e-learning process which is most students used both smartphone and laptop as their main devices which is 86 students answered to that question. Lastly, Question 6 is about the source internet that they used during the Covid-19 pandemic and 94 students (66.7%) used both mobile data and Wi-Fi as their source of internet.

According to Table 2, it shows that there are advantages of e-learning because it can help to increase the skills after the Covid-19 pandemic so most of students know how to use laptop more proficiently. Before the Covid-19 pandemic, the students always attended the class face-to-face so the students do not usually used the laptop because they learn in the class.

### 3.2 Benefits of E-Learning Mode from Student Perspective During Covid-19 Pandemic Using Chi-Square Analysis

Objective 2 is to analyse the benefits of e-learning from the student perspective during the Covid-19 pandemic using Chi-square analysis. For this objective, there are 8 questions with a Likert scale, where 1 is "strongly disagree," 2 is "disagree," 3 is "agree," and 4 is "strongly agree." The test of independence was chosen for this analysis because each question that needs to analyse the participation of any type of e-learning study prior to the start of the Covid-19 pandemic has two independent variables: not participating (which is no) and participating (which is yes).

Table 3 shows the Case Processing Summary which is, a summary of the cases that were processed when crosstabs analysis was analysed. There are 141 valid cases and no missing cases.

**Table 3: Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent (%)	N	Percent (%)	N	Percent (%)
Participated e-learning * Different due date	141	100	0	0	141	100
Participated e-learning * Level of understanding	141	100	0	0	141	100
Participated e-learning * Communication session	141	100	0	0	141	100
Participated e-learning * Comfortable in preparing answer	141	100	0	0	141	100
Participated e-learning * Technical skills	141	100	0	0	141	100
Participated e-learning * Timing for completed homework	141	100	0	0	141	100
Participated e-learning * Tolerance lecturer during e-learning	141	100	0	0	141	100
Participated e-learning * Flexibility time	141	100	0	0	141	100

Table 4 shows the Pearson's chi-squared test for participated e-learning and the different due date to submit assignment. The  $p$ -value is 0.01471. The  $p$ -value is less than 0.05 so it rejects the null hypothesis that asserts the two variables are independent of each other. The value of calculated chi-square ( $X^2$ ) is 10.507. For a test of significance at  $\alpha = 0.05$  and degree of freedom,  $df = 3$ , the critical value is 7.815. The  $X^2$  value is greater than the critical value then it is statistically significant. The benefits of e-learning for the participated e-learning and different due date are not related and provides support for the alternative hypothesis which is the benefits of e-learning for the participated e-learning and different due date are related.

$H_0$ : The benefits of e-learning for the participated e-learning and different due date are not related.

$H_1$ : The benefits of e-learning for the participated e-learning and different due date are related.

**Table 4: Pearson's Chi-Squared Test for Different Due Date**

	Value	df	$p$ -value	Critical Value
Pearson Chi-square	10.507	3	0.01471	7.815

Table 5 shows the Pearson's chi-squared test for participated e-learning and increase understanding to the course materials compared to classroom learning. The  $p$ -value is 0.9325. The  $p$ -value is more than 0.05 so it failed rejects the null hypothesis that asserts the two variables are dependent of each other. The value of calculated chi-square ( $X^2$ ) is 0.4369. For a test of significance at  $\alpha = 0.05$  and degree of freedom,  $df = 3$ , the critical value is 7.815. The  $X^2$  value is smaller than the critical value then it is not statistically significant. The data does not allow to reject the null hypothesis which is the benefits of e-learning for the participated e-learning and level of understanding are not related and does not provide support for the alternative hypothesis which is the benefits of e-learning for the participated e-learning and level of understanding are related.

$H_0$ : The benefits of e-learning for the participated e-learning and level of understanding are not related.

$H_1$ : The benefits of e-learning for the participated e-learning and level of understanding are related.

**Table 5: Pearson's Chi-Squared Test for Level Of Understanding**

	Value	df	$p$ -value	Critical Value
Pearson Chi-square	0.4369	3	0.9325	7.815

Table 6 shows the Pearson's chi-squared test for participated e-learning and increase communication session with lecturer compared to the classroom environment. The  $p$ -value is 0.6812. The  $p$ -value is more than 0.05 so it failed rejects the null hypothesis that asserts the two variables are dependent of each other. The value of calculated chi-square ( $X^2$ ) is 1.5045. For a test of significance at  $\alpha = 0.05$  and degree of freedom,  $df = 3$ , the critical value is 7.815. The  $X^2$  value is smaller than the critical value then it is not statistically significant. The data does not allow to reject the null hypothesis which is the benefits of e-learning for the participated e-learning and communication session are not related and does not provide support for the alternative hypothesis which is the benefits of e-learning for the participated e-learning and communication session are related.

$H_0$ : The benefits of e-learning for the participated e-learning and communication session are not related.

$H_1$ : The benefits of e-learning for the participated e-learning and communication session are related.

**Table 6: Pearson's Chi-Squared Test for Communication Session**

	Value	df	$p$ -value	Critical Value
Pearson Chi-square	1.5045	3	0.6812	7.815

Table 7 shows the Pearson's chi-squared test for participated e-learning and more comfortable in preparing answer for continuous assessment compared to face-to-face. The  $p$ -value is 0.5676. The  $p$ -value is more than 0.05 so it failed rejects the null hypothesis that asserts the two variables are dependent of each other. The value of calculated chi-square ( $X^2$ ) is 2.0234. For a test of significance at  $\alpha = 0.05$  and degree of freedom,  $df = 3$ , the critical value is 7.815. The  $X^2$  value is smaller than the critical value then it is not statistically significant. The data does not allow to reject the null hypothesis which is the benefits of e-learning for the participated e-learning and comfortable in preparing answer are not related and does not provide support for the alternative hypothesis which is the benefits of e-learning for the participated e-learning and comfortable in preparing answer are related.

$H_0$ : The benefits of e-learning for the participated e-learning and comfortable in preparing answer are not related.

$H_1$ : The benefits of e-learning for the participated e-learning and comfortable in preparing answer are related.

**Table 7: Pearson's Chi-Squared Test for Comfortable In Preparing Answer**

	Value	df	$p$ -value	Critical Value
Pearson Chi-square	2.0234	3	0.5676	7.815

Table 8 shows the Pearson's chi-squared test for participated e-learning and technical skills include in using email and internet applications have increased since attending e-learning process. The  $p$ -value is 0.3215. The  $p$ -value is more than 0.05 so it failed rejects the null hypothesis that asserts the two variables are dependent of each other. The value of calculated chi-square ( $X^2$ ) is 3.4941. For a test of significance at  $\alpha = 0.05$  and degree of freedom,  $df = 3$ , the critical value is 7.815. The  $X^2$  value is smaller than the critical value then it is not statistically significant. The data does not allow to reject the null hypothesis which is the benefits of e-learning for the participated e-learning and technical skills are not related and does not provide support for the alternative hypothesis which is the benefits of e-learning for the participated e-learning and technical skills are related.

$H_0$ : The benefits of e-learning for the participated e-learning and technical skills are not related.

$H_1$ : The benefits of e-learning for the participated e-learning and technical skills are related.

**Table 8: Pearson's Chi-Squared Test for Technical Skills**

	Value	df	<i>p</i> -value	Critical Value
Pearson Chi-square	3.4941	3	0.3215	7.815

Table 9 shows the Pearson's chi-squared test for participated e-learning and spend more time to complete the homework compared to regular classroom learning. The *p*-value is 0.2491. The *p*-value is more than 0.05 so it failed rejects the null hypothesis that asserts the two variables are dependent of each other. The value of calculated chi-square ( $X^2$ ) is 4.1173. For a test of significance at  $\alpha = 0.05$  and degree of freedom,  $df = 3$ , the critical value is 7.815. The  $X^2$  value is smaller than the critical value then it is not statistically significant. The data does not allow to reject the null hypothesis which is the benefits of e-learning for the participated e-learning and timing for completed homework are not related and does not provide support for the alternative hypothesis which is the benefits of e-learning for the participated e-learning and timing for completed homework are related.

$H_0$ : The benefits of e-learning for the participated e-learning and timing for completed homework are not related.

$H_1$ : The benefits of e-learning for the participated e-learning and timing for completed homework are related.

**Table 9: Pearson's Chi-Squared Test for Timing For Completed Homework**

	Value	df	<i>p</i> -value	Critical Value
Pearson Chi-square	4.1173	3	0.2491	7.815

Table 10 shows the Pearson's chi-squared test for participated e-learning and lecturer more understands the online environment and makes it easy to learn continuously. The *p*-value is 0.1767. The *p*-value is more than 0.05 so it failed rejects the null hypothesis that asserts the two variables are dependent of each other. The value of calculated chi-square ( $X^2$ ) is 4.9341. For a test of significance at  $\alpha = 0.05$  and degree of freedom,  $df = 3$ , the critical value is 7.815. The  $X^2$  value is smaller than the critical value then it is not statistically significant. The data does not allow to reject the null hypothesis which is the benefits of e-learning for the participated e-learning and tolerance lecturer during e-learning are not related and does not provide support for the alternative hypothesis which is the benefits of e-learning for the participated e-learning and tolerance lecturer during e-learning are related.

$H_0$ : The benefits of e-learning for the participated e-learning and tolerance lecturer during e-learning are not related.

$H_1$ : The benefits of e-learning for the participated e-learning and tolerance lecturer during e-learning are related.

**Table 10: Pearson's Chi-Squared Test for Timing For Tolerance Lecturer During E-Learning**

	Value	df	<i>p</i> -value	Critical Value
Pearson Chi-square	4.9341	3	0.1767	7.815

$H_0$ : The benefits of e-learning for the participated e-learning and tolerance lecturer during e-learning are not related.

$H_1$ : The benefits of e-learning for the participated e-learning and tolerance lecturer during e-learning are related.

Table 11 shows the Pearson's chi-squared test for participated e-learning and e-learning enable to provide flexibility time for student to study. The *p*-value is 0.6075. The *p*-value is more than 0.05 so it failed rejects the null hypothesis that asserts the two variables are dependent of each other. The value



of calculated chi-square ( $X^2$ ) is 1.8343. For a test of significance at  $\alpha = 0.05$  and degree of freedom,  $df = 3$ , the critical value is 7.815. The  $X^2$  value is smaller than the critical value then it is not statistically significant. The data does not allow to reject the null hypothesis which is the benefits of e-learning for the participated e-learning and flexibility time are not related and does not provide support for the alternative hypothesis which is the benefits of e-learning for the participated e-learning and flexibility time are related.

$H_0$ : The benefits of e-learning for the participated e-learning and flexibility time are not related.

$H_1$ : The benefits of e-learning for the participated e-learning and flexibility time are related.

**Table 11: Pearson’s Chi-Squared Test for Flexibility Time**

	Value	df	p-value	Critical Value
Pearson Chi-square	1.8343	3	0.6075	7.815

### 3.3 Students’ Perceptions of E-Learning During Covid-19 Lockdown Period using Logistic Regression Analysis

This section presents the objective three; to analyse the students’ perceptions of e-learning during Covid-19 lockdown period.

Table 12 shows the Omnibus Tests of Model Coefficients.

**Table 12: Omnibus Tests of Model Coefficients**

	Chi-square	df	Sig
Step	32.635	7	0.00
Block	32.635	7	0.00
Model	32.635	7	0.00

Based on Table 12, the  $p$ -value of the model is which is less than 0.05 so the model is fit and significant.

**Table 13: Logistic Regression Model**

	Estimate	S.E	Wald	df	Sig.	Exp(B)
Interactive and active communication	0.415	0.568	0.000	1	0.466	0.000
Friendly Platforms	0.573	0.686	0.000	1	0.404	0.000
Easy to search necessary information	1.165	0.892	0.000	1	0.192	0.000
Easy to study	0.572	0.986	0.000	1	0.562	0.000
Innovative concept	3.457	0.866	0.000	1	0.000	0.000
Fun to be used	0.475	1.064	0.000	1	0.656	0.000
Students Perceptions	-2.269	1.217	0.000	1	0.062	0.000
Constant	-1.829	1.061	0.000	1	0.085	0.000

Based on Table 13, since the  $p$ -value for innovative concept is less than 0.05, we can conclude that is only one variable that significant to students’ perceptions of e-learning during the Covid-19 lockdown period. It shows that there is a negative perception of e-learning.

$$\ln = B_0 + B_1X_1$$

$$\ln = - 1.829 + 3.457(\text{Innovative concept}) \quad \text{Eq 2}$$

Eq. 2 shows the logistic regression equation. Based on equation 2, most of the students do not agree with the idea of e-learning. Only the innovative concept and the students' perceptions give significance to the students' perceptions of e-learning.

#### 4. Conclusion

The finding of the study shows that the first objective, which was to investigate the implementation trend of e-learning before and after Covid-19, was achieved. The Covid-19 consequences will last for a very long period, having a lasting impact on the world economy and teaching important lessons. Chat rooms, video conferencing, voting, and document sharing can all be used to connect with students more effectively and efficiently during this pandemic. This divide exists between wealth levels inside nations as well as across them, and some students find it difficult to engage in digital learning because they do not have reliable internet access or technology. It's because most students believe that the Covid-19 pandemic was successful for e-learning. Besides, most of them have increased the use of information technology skills now after the Covid-19 pandemic learning process. They also stated that during the e-learning process, they used a smartphone and a laptop.

The benefits of e-learning from the student perspective during the Covid-19 pandemic were analysed. Only one pair of variables is statistically significant, rejecting the null hypothesis that the benefits of e-learning for participants and different due dates are unrelated and supporting the alternative hypothesis that the benefits of e-learning for participants and different due dates are related, according to the Chi-square test for independence. Furthermore, according to the Chi-square test for independence there are seven pairs of variables that are not statistically significant. The data does not support either the alternative hypothesis, that the variables are related or the null hypothesis that the benefits of e-learning are for the participants and that the level of understanding, communication session, comfort with preparing an answer, technical skills, timing for completed homework, lecturer tolerance during e-learning, and flexibility of time are unrelated. In conclusion, only one pair of variables that give benefit of e-learning mode from student perspective during Covid-19 pandemic which is e-learning is structured learning method with different due date to submit assignment.

Finally, the third goal is to examine students' perceptions of e-learning during the Covid-19 lockdown. Most of the students do not like the idea of the e-learning process during Covid-19. Only the innovative concept gives significance to the students' perceptions of e-learning. Additionally, they believe that it is challenging to find the appropriate knowledge when they do not comprehend what they have learned in class. They can, however, address the professor directly with questions. Furthermore, because they must spend more time in front of the screen, using it is not enjoyable.

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