European Proceedings of
Social and Behavioural Sciences
EpSBS

www.europeanproceedings.com
e-ISSN: 2357-1330

DOI: 10.15405/epsbs.2024.05.19

INCOMAR 2023
The 9th International Conference on Marketing and Retailing

EXPLORING USER EXPERIENCE AND EMOTION DURING OPEN DISTANCE LEARNING AMONG UNIVERSITY STUDENTS

Zan Asma Nasruddin (a), Aida Wati Zainan Abidin (b)*, Nor Hapiza Mohd Ariffin (c), Mohd Khairul Azmi Hassan (d), Rahmah Mokhtar (e)
*Corresponding author

(a) School of Computer Sciences, College of Computing, Informatics and Media, Universiti Teknologi MARA, Shah Alam, Malaysia, zan069@uitm.edu.my
(b) School of Computer Sciences, College of Computing, Informatics and Media, Universiti Teknologi MARA, Shah Alam, Malaysia, aida018@uitm.edu.my
(c) School of Computer Sciences, College of Computing, Informatics and Media, Universiti Teknologi MARA, Shah Alam, Malaysia, hapiza@uitm.edu.my
(d) Kulliyah of Information and Communication Technology, International Islamic University Malaysia, Gombak, Malaysia, mkazmi@iium.edu.my
(e) Faculty of Computing, Universiti Malaysia Pahang, Pekan, Malaysia, drrahmah@ump.edu.my

Abstract

During the COVID-19 pandemic, schools and universities in the affected countries were shut down to combat the spread of the virus. Institutes of higher learning have no choice but to use open distance learning (ODL) to stay in business. A pilot study to test the reliability of the survey instrument was conducted among 100 students from Universiti Teknologi MARA in order to assess the students' user experience and emotions towards ODL platform features. The instrument comprises two parts: a 27-item questionnaire measuring user experience and a 48-item questionnaire measuring user emotions. The user experience was evaluated based on four factors: the usefulness, desirability, accessibility, and usability of the ODL platform's features and functions. The instrument's alpha values for all 27 items measuring user experience and all 48 items measuring user emotions were 0.954 and 0.963, respectively. Consequently, the usability, desirability, and younger age of students contribute to the user experience. Usability has the highest correlation with user experience, while usefulness has the lowest correlation, albeit still significant.

Keywords: Open distance learning features, relationship, user experience, user emotions

https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

1. Introduction

The global economy and the lives of individuals could be affected by any catastrophic event, such as the coronavirus (COVID-19) pandemic. To fight the spread of the coronavirus, some governments have issued statewide directives asking citizens to remain at home. Starting at the end of February 2020, when the rising transmission of the COVID-19 virus was unmanageable, a few schools and academic institutions in impacted nations enforced social distance through operation closures. More countries followed suit a few weeks later (OECD, 2020). Due to these decisions, schools have been closed for varying lengths of time, affecting nearly one billion students worldwide (Viner et al., 2020), including 67% of the world's Institute of Higher Learning (IHL) students, according to Romeo et al. (2021)

In comparison to school, the IHL faces a greater challenge due to the participation of international students, where universities must cater the education process globally. However, due to the readiness and ease of using technology in education, all types of Web 2.0-based ICT resources were immediately used in the education system to mitigate the impact of the outbreak (Zeng, 2020). Advances in technology have made it possible for new ways of learning and teaching in higher education. This means that traditional methods of learning are no longer the only ones available. ODL, which stands for "open distance learning," is a gateway for people to get education through various delivery systems and learning resources.

Most IHL programmes around the world have shifted away from traditional or blended learning and moved toward online learning (Crawford et al., 2020; Hayatie et al., 2020). Consequently, learning assistance and sufficient learning materials are especially crucial in ODL learning interactions. This is to satisfy the assumption that students should have independent learning abilities and the capacity to engage in activities that require self-direction and self-management of learning (Chhetri, 2020). Many distance learners are currently experiencing a new learning environment. Remote learning presents more challenges for students who prefer in-person instruction, especially when their self-efficacy affects their performance (Nuruddin et al., 2020).

1.1. User Experience (UX) and UX Honeycomb

User experience refers to the feeling that a person has when interacting with a system. It encompasses all aspects of the end-user's interaction with services and products (Solomon, 2022). In today's rapidly growing interface industry, UX design is becoming increasingly important because it attempts to satisfy the user's needs by delivering positive experiences that encourage users to stick with the product or brand. So, a good user experience (UX) is needed to make any platform more user-friendly and effective (Nakamura et al., 2017). A product's success or failure on the market is also largely based on its UX (Morville, 2014).

The principles of human-computer interaction (HCI) are based on the idea that a good design should centre on the user. There are tools available that we can use to help explain UX design to clients, and one of those resources is the user experience honeycomb created by Morville (2014), as shown in Figure 1. The UX Honeycomb currently represents how users interact with the product, such as how they think, feel, and use it. The characteristics that influence UX are useful, usable, desirable, findable,

https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

accessible, and credible. The element of opinion, according to Karagianni (2018), is what users perceive as useful or valuable. On the other hand, the elements of what individuals thought of the products, including whether or not they were accessible, credible, or desirable. Finally, the third element of use is whether the product is findable, accessible, and usable. Some UX-related studies look at the factors that affect the adoption of learning management systems (Ariffin et al., 2014) and the evaluation of user experience in mobile spirituality apps (Ahmad et al., 2015).

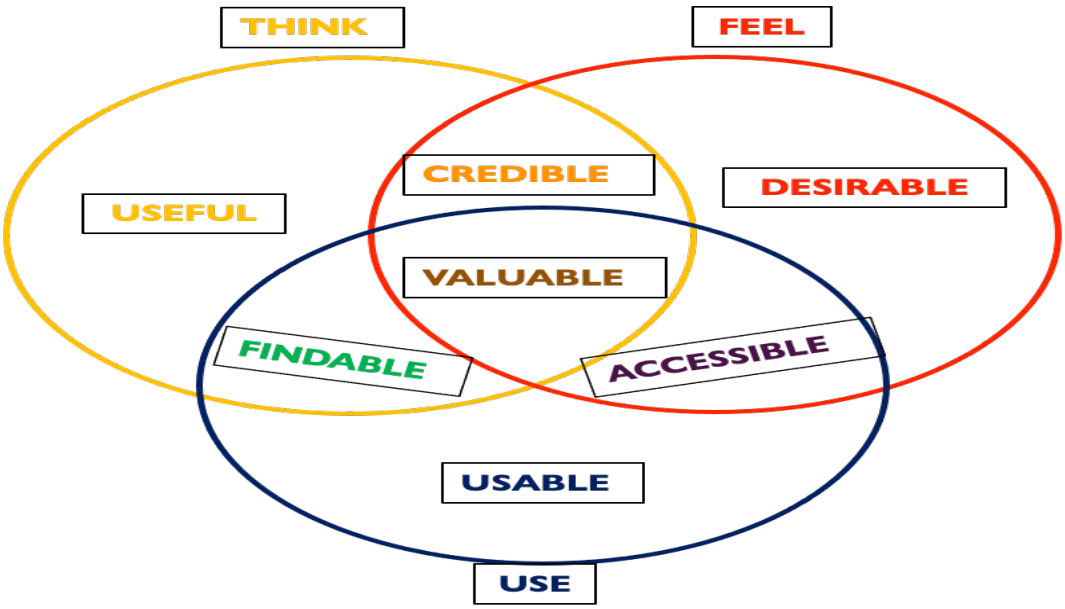


Figure 1. UX Honeycomb Peter Morville's

1.2. User Emotion and The Circumplex Model

Level of activation, valence, and object focus are three categories that a taxonomy uses to categorise emotions in terms of their relationship to achievement acts or accomplishment results, according to Pekrun and Stephens (2010). Therefore, through encouraging the application of flexible learning strategies, task-related attention, and motivation-boosting tactics, positive activating emotions can generally promote educational activity. Many studies have proven that there is a psychological impact on students through ODL (Chafouleas et al., 2019; Chandra, 2020; Irawan et al., 2020; Kamaludin et al., 2020; Sutarto et al., 2020). (Arnold, 2018) sought to determine how distinct emotions were related, as displayed in Figure 2.

https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

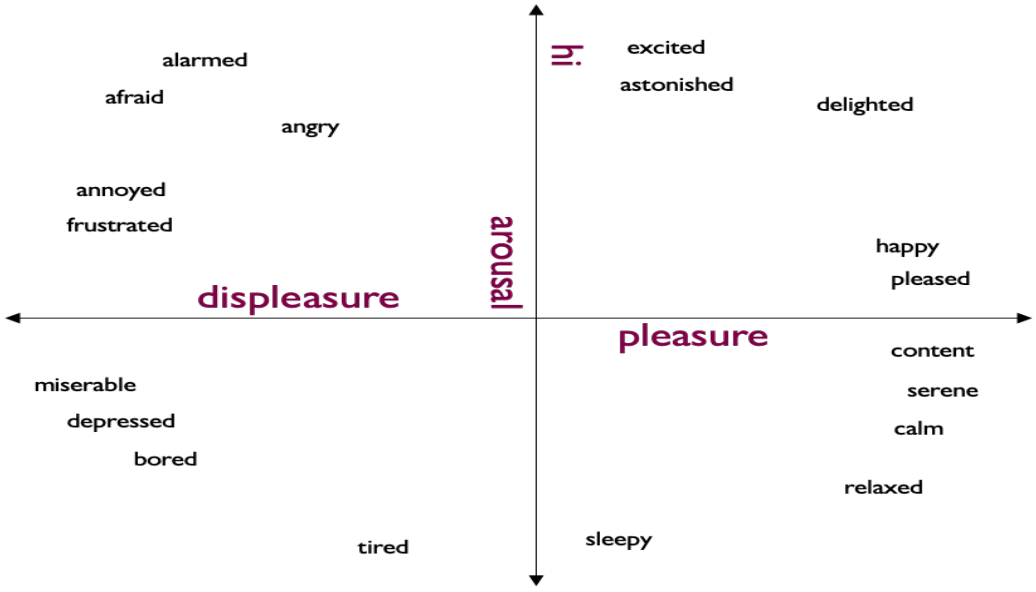


Figure 2. Circumplex Model Source

Negative emotional impacts such as anxiety, stress, mental exhaustion, and depression among students will affect how they perceive learning online. This is due to problems that arise during their learning process (Thandevaraj et al., 2021). The problems, such as internet connection, student computer facilities, and their readiness to accept the online learning challenge, make them fall behind others and prevent them from following the lesson (Kalok et al., 2020; Odriozola-González et al., 2020).

Despite all the negative emotional impacts, the ODL also encourages positive emotional impacts. The emotions that are directly linked to learning processes and achievement outcomes are classified as achievement emotions (Pekrun & Stephens, 2010). Emotional achievement can be provoked by attention, self-regulation, and motivation (Pekrun, 2006; Pekrun et al., 2011); positive emotions such as enjoyment, hope, and pride were positively associated with student effort, to do well in their studies and self-regulation to achieve a good grade. The positive emotions facilitate self-regulated learning that can lead to independent learning (Boekaerts et al., 2000; Carver & Scheier, 1990)

2. Problem Statement

i. In order to implement distance education courses and programmes effectively and efficiently, many factors must be taken into account when creating and delivering ODL courses. Any ODL provider's main responsibility is to create and provide distance learning opportunities that promote learning. As a result, ODL providers must comprehend that their educational goods and services are intended to support and give students a motivating educational experience. As the user experience (UX) of a product determines its market success or failure, it is critical to assess the practicality and efficiency of the online platform used during ODL in order to ensure effective delivery of teaching and learning.

https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

3. Research Questions

This study has two goals. The first is to make sure that the survey tool used in the research is valid and reliable. The instrument was developed by the researcher with the aim of relating the components of a good platform in terms of their usefulness, desirability, accessibility, and usability to the experiences users have when using the platform. This will be done through a pilot study. The second goal is to confirm the relationship between user experience and open distance learning (ODL) before the actual study.

The research questions are:

ii. Is the research instrument developed by the researchers valid and reliable?

iii. Is there a link between the user experience and the online learning platform's features in terms of usability, desirability, accessibility, and perceived usefulness?

4. Purpose of the Study

This paper focused on the platform components that influence how well students perform in open distance education. These are the usability, desirability, accessibility, and usefulness of the learning support made available to students by the institution through the ODL platform as a factor that affects successful experiential learning. So, the goal of this study is to find out how user experience (UX) and different types of emotions affect ODL towards university students, as well as how different emotions, both positive and negative, are related to ODL.

5. Research Methods

5.1. Pilot Study

A pilot study was conducted on a sample of 100 students from the Faculty of Computer and Mathematical Sciences at Universiti Teknologi MARA (UiTM) Shah Alam. The selection of the students was based on the following inclusion and exclusion criteria: inclusion criteria include those who were registered as full-time students in fully ODL mode for at least a semester. Students enrolled in hybrid learning (both online and in-person classes) were excluded from the study.

Multi-sampling is used to select respondents in the Faculty of Computer and Mathematical Sciences for the pilot study. There are two types of students in the faculty: those with a background in mathematical sciences and those with a background in computer sciences. In the first stage, stratified sampling was used to ensure a balanced number of students from both backgrounds were selected. In the second stage, a total of four groups of students were selected from 12 groups of students. One group out of four groups has a mathematical sciences background, and three groups out of eight groups have a computer sciences background. During the final stages, a random sample of 120 students was selected to participate in the pilot study. The instrument was administered via a Google Form and distributed to respondents via their official student email. However, only 102 students responded and answered the questionnaire. Two respondents were excluded from the pilot sample because of age eligibility; therefore, only 100 were included in the pilot study. In order to optimise the students' experience during ODL, a

https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

pilot study was conducted after the semester ended. The duration of the data collection was one month (mid-July to mid-August 2022).

5.2. Research Instrument

The research instrument used consists of two parts. The first part of the instrument assesses the user's experience while participating in open distance learning (ODL), while the second part assesses their emotions in relation to that experience. On a five-point Likert scale, where 1 means "strongly disagree" and 5 means "strongly agree," respondents are asked to rate their level of agreement with each of the 27 items related to their experience. For the user emotions that relate to how the students felt while experiencing the ODL, the students were asked to rate their level of agreement for all 48 items using a ten-point Likert type scale ranging from "totally disagree" (1 point) to "totally agree" (10 points). The emotions measured by the instrument could be classified as either positive emotions (excited, happy, at ease, and pleased) or negative emotions (tired, bored, tensed, and frustrated). It was noted that the respondents required 25 to 40 minutes to complete the instrument. The arrangement of the items is shown in Table 1 and Table 2.

Table 1. The items related to the user experience (UX)

Item	User experience
1 - 5	The usefulness of the functions and materials of the platform.
6 - 11	The desirability of features and functions of the platform.
12 - 16	The accessibility of internet connectivity.
16 - 21	The usability of the user interface of the platform.
17 – 27	The experience on ODL.

Table 2. The items related to the user emotions (EX)

Item	User Emotions (Task)
1 - 8	Eight emotions related to the usefulness of the functions and materials of the platform. (Collaborating with friends/ group members)
9 - 16	Eight emotions related to the desirability of features and functions of the platform. (Current environment during ODL)
17 - 24	Eight emotions related to the first aspect of accessibility of the internet connectivity. (Internet connectivity)
25 - 32	Eight emotions related to the second aspect of accessibility of the internet connectivity. (Accessing learning material at any time and from anywhere)
33 - 40	Eight emotions related to the first aspect of usability of the user interface of the platform. (Re-watching the pre-recorded materials at own convenience time)
41 – 48	Eight emotions related to the second aspect of usability of the user interface of the platform. (Accessing the globally shared learning materials)

https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

5.3. Exploratory Factor Analysis

A factorial analysis was performed to investigate the construct validity of the instrument scale. To examine the components of each construct, namely the four characteristics of the user experience mentioned previously, primary axis factor analysis was utilised. An analysis was conducted to assess the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy. Subsequently, the factors underwent rotation in order to get a more optimal alignment with the data. The Varimax rotation method was used due to its capacity to generate factor loadings that are either very high or significantly low, hence facilitating the alignment of items with their respective constructs. The employed mechanism for rotation was Varimax. A high value of communalities implies a strong relationship between the item's value and the other items in the construct. Conversely, a high value of factor loadings suggests that the items are part of that construct. The rotation eigenvalues were computed in order to ascertain the optimal number of elements to extract. A single incision was made.

The instrument's dependability was assessed by calculating the Cronbach Alpha value. The Cronbach's alpha coefficient was computed for each dimension of the user experience scale, as determined in the previous exploratory factor analysis. Cronbach's Alpha is a statistical measure that falls within the range of 0 to 1. A higher value indicates a stronger level of internal consistency among the items on the scale. George and Mallery (2019) provide guidelines for interpreting the value of Cronbach's alpha: A score over 0.9 indicates excellence, a score between 0.8 and 0.9 indicates goodness, a score between 0.7 and 0.8 indicates acceptability, a score between 0.6 and 0.7 indicates questionability, a score between 0.5 and 0.6 indicates poorness, and a score below 0.5 indicates unacceptability.

5.4. Bivariate Analysis

The gathered data was scrutinised for any discrepancies to guarantee the analysis of just top-notch data. The data that had been cleansed was subsequently examined using IBM SPSS Statistics V. 29.0, in accordance with the study's goals. Before conducting data analysis, the average values for each of the aspects were computed. The experience score was determined by summing the points from the six items. The amount of usability, desirability, accessibility, and usefulness of the ODL increases as the mean value of all items increases. Furthermore, a higher experience score signifies a positive learning experience, suggesting the efficacy of the ODL in facilitating proficient pedagogical approaches.

The descriptive analyses involved calculating the frequencies and percentages for categorical variables. For continuous variables, such as the experience score, their means and standard deviations were used to summarise the data. T-tests and ANOVAs were employed to ascertain if there were any significant differences in the means of pertinent subgroups. Pearson The study also utilised Product Moment Correlation Analysis to investigate the inter-relationship among four factors that impact the user experience: the functionality and material usefulness of the platform, the desirability of platform features and functions, the accessibility of internet connectivity, and the usability of the platform's user interface. A multiple linear regression analysis was performed to investigate the impact of all the characteristics on the user experience.

https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

6. Findings

6.1. Validity and Reliability of the Survey Instrument

6.1.1. User Experience (UX) Component

This section will explore the validity and reliability analysis of the survey instrument on the user experience aspects, namely the usefulness, desirability, accessibility, and usability of the features and functions of the ODL platform. Table 3 showed that the KMO for the sample data was found to be 0.879, suggesting that the correlations among items are good for conducting factor analysis. Bartlett's Test of Sphericity equals 1423.524, with a p-value < 0.001, indicating that the correlation matrix among the items was not an identity matrix, as shown below.

Table 3. The items related to the user experience (UX)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.879
Bartlett's Test of Sphericity	Approximate Chi-Square	1423.524
	df	210
	Sig	<.001

All the initial communalities and the extracted communalities were larger than 0.5. Four factors were extracted. The rotation eigenvalues for all four factors were 4.035, 3.260, 2.681, and 2.681, respectively. Three of the 27 items were eliminated due to very low and cross factor loadings. 70.32% of the total variance in the 24 included items accounted for all four factors. For each factor, the factor loadings were high, ranging from 0.432 to 0.844. The factor loadings, averages, variances for each item were shown in Table 4. The Cronbach's alpha value for each factor indicates that the user experience (UX) scale has acceptable levels of internal consistency as the coefficients ranged from 0.752 to 0.889.

Table 4. User Experience Factor Loading, Variances and Cronbach's Alpha Values

	Factor Loadings	Average	Standard Deviation
Factor 1: Usability			
Signing on to the Online platform features makes me more secured in using the platform.	.737	4.22	.719
Friendly platform enable me to complete my task efficiently.	.794	4.25	.744
Timely feedback from friends and teachers makes me more excited to learn.	.692	4.17	.726
Easy to navigate the system.	.844	4.16	.801
Easy to understand the system.	.703	4.14	.752
Cronbach Alpha = .889			
Percentage of Variance Explained = 22.41			
Factor 2: Accessibility			
The documentation in handling online platform is very helpful.	.702	4.24	.683
I am able to learn according to my own self-paced scheduling.	.708	4.19	.706
Dragging and clicking ease me to navigate the online platform.	.665	4.23	.664
Giving access for someone to control someone else's device help me to learn effectively.	.667	3.94	.983

https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

Cronbach Alpha = .828			
Percentage of Variance Explained = 18.11			
Factor 3: Usefulness			
Online platform enable me to have effective communication for social interaction between teachers and students.	.842	3.89	.886
Online platform enable me to have effective communication for social interaction among students.	.822	3.83	1.006
Flexibility of ODL help me use my time efficiently.	.556	4.16	.849
Allocation of marks for assessment in ODL is transparent for me.	.572	3.86	.899
Cronbach Alpha = .752			
Percentage of Variance Explained = 14.90			
Factor 4: Desirability			
Flexible features in the online platform allows me to be more independent.	.456	4.33	.667
User Friendly online platform layout attract me to participate actively during ODL.	.697	4.14	.829
Switching to other task/subject is easy for me during ODL.	.432	4.09	.830
Online platform could enhance my technological skills and knowledge.	.673	4.27	.763
Participating in online platform able to improve my creativity.	.730	4.04	.920
Cronbach Alpha = .841			
Percentage of Variance Explained = 14.90			

6.1.2. User Emotion (EX) Component

This section will explore the validity and reliability analysis of the user emotions (EX) component related to their experience during ODL. The respondents were asked to state their level of agreement with the emotions while completing tasks during ODL based on a 10-point scale. Scores range from 1 to 10, with 1 indicating "totally disagree" and 10 indicating "totally agree". A total of eight emotions were measured: four positive (excited, pleased, happy, and at ease) and four negative (tired, bored, frustrated, and tensed). The task asked are all related to four user experience (UX) features from an earlier section.

Table 5 showed that the KMO for the second component of the sample data was found to be 0.810, suggesting that the correlations among items are good for conducting factor analysis. Bartlett's Test of Sphericity equals 9212.415, with a p-value < 0.001, indicating that the correlation matrix among the items was not an identity matrix, as shown below.

Table 5. The items related to the user emotions (EX)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.810
Bartlett's Test of Sphericity	Approximate Chi-Square	9212.415
	df	1128
	Sig	<.001

Since the emotions were divided into two categories—positive and negative—two factors were extracted. The rotation eigenvalues for both factors were 17.522 and 14.447, respectively. None of the items were excluded. 66.60% of the total variance in all 48 items accounted for both factors. The factor loadings were high, ranging from 0.573 to 0.944. The Cronbach's alpha value in Table 6 for each factor

https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

indicates that the user emotions (EX) scale has high levels of internal consistency, as the coefficients ranged from 0.969 to 0.982.

Table 6. Internal consistency coefficients (Cronbach's Alpha) of the user emotions (EX)

	Value
Factor 1: Positive emotions (Excited, Happy, At Ease & Pleased)	
Cronbach Alpha	.982
Percentage of Variance Explained	36.50%
Factor 2: Negative emotions (Tired, Bored, Tensed & Frustrated)	
Cronbach Alpha	.969
Percentage of Variance Explained	30.10%

6.2. User Experience (UX) Score

The overall mean score, standard deviation, and associated 95% confidence interval of the UX score are shown in Table 7. According to the table, the overall mean UX score is 25.95 ± 3.647. The mean UX scores of males (n=37), and females (n=63) were 26.24 ± 3.286 and 25.78 ± 3.858 respectively. The difference is insignificant (assuming equal variance). The mean UX score for age group below 21 years old (n=15), 21 years old to 22 years old (n=69) and above 22 years old (n=16) were 27.07 ±3.432, 25.64 ± 3.589 and 26.25 ± 4.074 respectively. The one-way ANOVA test result implies that the difference in the mean UX score insignificantly different across age groups (assuming equal variance).

Table 7. Results of User Experience (UX) Score

Variable	*N*	*M* (*SD*)	95% CI	*p*
Overall	100	25.95 (3.647)	(25.23, 26.67)	-
Gender				
Male	37	26.24 (3.286)	(25.15, 27.33)	.540
Female	63	25.78 (3.858)	(24.81, 26.08)	
Age Group				
Below 21yo	15	27.07 (3.432)	(25.17, 28.97)	
21yo – 22yo	69	25.64 (3.589)	(24.78, 26.50)	.368
Above 22yo	16	26.25 (4.074)	(24.08, 28.42)	

6.3. Level of User Experience (UX) Features of ODL Platform

Table 8 shows the overall mean level of usefulness, accessibility, desirability, and usability of the features of the ODL learning platform. Each aspect has a value between 3.94 and 4.19. The students agreed that the platform used during ODL is somewhat useful, accessible, desirable, and usable.

Table 8. Level of User Experience (UX) Features of the ODL Platform

Variable	Minimum	Maximum	Mean ± SD	95% CI
Usefulness	2.25	5.00	3.94 ± .691	(3.80,4.07)
Accessibility	2.75	5.00	4.15 ± .626	(4.03,4.27)
Desirability	2.60	5.00	4.17 ± .630	(4.05,4.30)
Usability	2.60	5.00	4.19 ± .623	(4.06,4.31)

https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

6.4. Relationship of User Experience with the features and functions of ODL Platform

This study attempted to examine if all four aspects of the ODL learning platform are associated with the learning experience. The correlation analysis was carried out, and the result is shown in Table 9. The relationship between UX and all four aspects of the learning platform was significant. The platform's usability was found to be highly positively correlated with UX ($r(99) = 0.749$, $p < .001$).This indicates that when the level of usability of the platform increases, the learning experience among the students will also increase. All other aspects: desirability ($r(99) = 0.671$, $p < .001$), accessibility ($r(99) = 0.641$, $p < .001$) and usefulness ($r(99) = 0.391$, $p < .001$) of the learning platform are also significantly associated with the UX, though usefulness was weakly correlated to UX.

Table 9. Pearson Correlation Coefficients of UX and all UX features (Usefulness, Accessibility, Desirability and Usability)

Variable	UX	Usefulness	Accesibility	Desirability	Usability
UX	-				
Usefulness	0.391* (< 0.001)	-			
Accessibility	0.641* (< 0.001)	0.619* (< 0.001)	-		
Desirability	0.671* (< 0.001)	0.624* (< 0.001)	0.650* (< 0.001)	-	
Usability	0.749* (< 0.001)	0.514* (< 0.001)	0.734* (< 0.001)	0.753* (< 0.001)	-

*Significant at 5% level of significance

6.5. Influence of ODL Platform Features to User Experience (UX)

This study also aims to investigate how all four aspects and the respondents' characteristics contribute to the user experience. Since user experience is significantly correlated with all four features of the ODL learning platform, further investigation is needed to look at how these features, along with the respondents' demographics (age and gender), could predict the user experience. Multiple linear regression using the stepwise method was performed to accomplish this aim, using all the variables as predictors and the user experience score as the dependent variable.

Table 10. Type your title here

Model (Stepwise)	Unstandardized	Standard Error	*T*	*p*	Collinearity Statistics	
					Tolerance	VIF
Intercept	5.957	1.677	3.546	< .001		
Usability	3.487	.573	6.084	< .001	.424	2.359
Desirability	1.239	.567	2.335	.031	.424	2.358
Less than 21yo	1.532	.656	2.185	.022	.976	1.024

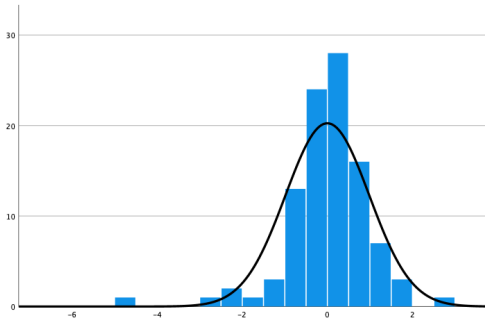
Notes: Adjusted $R^2 = .597$, $F(3,96) = 49.931$ $p < .001$

The final model obtained using the stepwise method for variable selection is displayed in Table 10. The model is statistically significant ($F(3,96) = 49.931$ $p < .001$). With the adjusted R^2 of 0.597, all three predictors could explain 59.7% of the UX variation. The usability and desirability aspects of the ODL

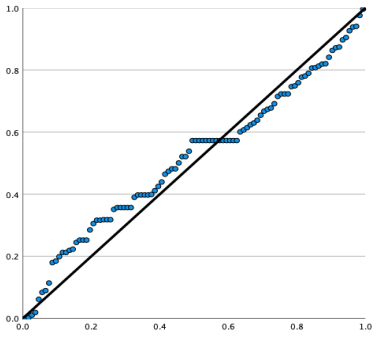
https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

learning platform were significant in predicting the user experience. The t-statistics and p-value also showed that usability was the most significant predictor. Only students younger than 21 years old were significant in terms of age group, indicating that younger students have a better experience during ODL.

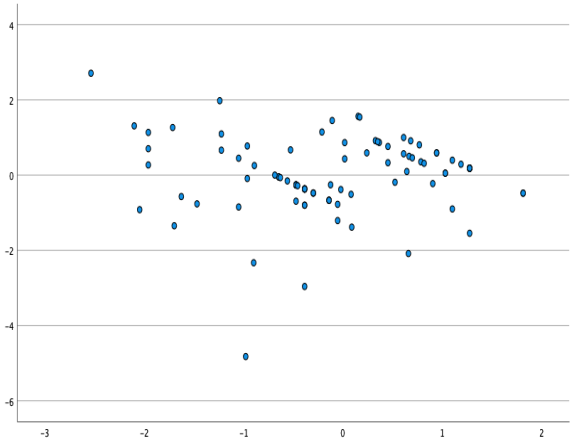
Several assumptions, including the independence of the observations, normality, linearity, and homoscedasticity, were checked (Figure 3). The histogram and normal *P-P* plot of the residuals seem to be normally distributed around the user experience scores. The plot of regression-standardised residuals and regression standardised predicted values suggests that the homoscedasticity assumption is not violated. The residuals have constant variance. Lastly, the assumption of linearity was also met. Checking for the multicollinearity problem, none of the independent variables showed an alarming value of VIF, suggesting that regression with all the predictors is appropriate.



(a) Histogram of the residuals



(b) Normal *P-P* Plot



(c) Plot of regression standardized residuals and regression standardized predicted

Figure 3. (a), (b) & (c) Multiple Linear regression Assumptions Diagnostic

7. Conclusion

During the COVID-19 pandemic, there is no doubt that many people were impacted by the unprecedented event. Among those who were affected are the students and also the education providers like the Institutes of Higher Learning (IHL). In order to measure the effectiveness of the open distance learning (ODL) platform used to ensure the learning process would continue, this research study

https://doi.org/10.15405/epsbs.2024.05.19
Corresponding Author: Aida Wati Zainan Abidin
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

attempted to model the user experience among university students from three different institutions during ODL. The analysis showed that the instrument developed by the researchers for measuring the user experience is appropriate and reliable to be used in the larger scope of the study. The instrument identified four main constructs to measure the user experience; the usefulness of the functions and materials of the platform, the desirability of features and functions of the platform, the accessibility of internet connectivity, and the usability of the user interface of the platform.

The study focused on the delivery aspects of the platform, such as the quality that could be reached and used (accessibility), how appealing the platform is in engaging the students to learn (desirability), the level to which the ODL platform is able to be used (usability), and the practicality and functionality of the platform in delivering the knowledge (usefulness). According to Rapanta et al. (2020), with ODL, most students feel difficult to interact with lecturers because they feel less connected. A negative interaction scenario during the class session was claimed to be a poor internet connection, such as audio delay or being disconnected. Communication is more limited through video meetings and online chat rooms (Kapasia et al., 2020; Lim, 2020). Due to that, students have difficulty doing their tasks in teamwork because it is difficult to agree on schedules as group members have their chores at home.

From the findings, all these constructs were associated with the experiences of users during open distance learning, with the usability of the platform contributing the most. Though all four aspects were correlated with user experience, only usability, desirability, and accessibility influenced the learning experience. The usefulness of the platform was not a significant contributor to the user experience. This finding is consistent with a study by Muthuprasad et al. (2021), which reported that gadgets are crucial in the educational field, especially during the COVID-19 pandemic, since they help students enhance their knowledge and skills with online lectures, assignment submissions, digital open books, online examinations, and engagement in virtual spaces. Despite the COVID-19 situation, students can successfully comprehend their studies with the proper knowledge delivered (Muda & Bit-Lian, 2019). Ag-Ahmad (2020) stated that flexibility in learning through ODL supports students' understanding because they can watch or hear the recording video repeatedly as they like. Students feel more at ease in ODL in an informal setting because they can wear casual clothes in their homes while attending the class (Shah et al., 2020; Saidalvi et al., 2021).

Gender was found to be insignificant. However, age is significant, especially among younger students which is consistent with Yoon et al. (2020) and Hallewell Haslwanter et al. (2022) which found that age plays an important role in the user experience. However, the results were consistent with their study in terms of gender differences.

As a result, it is critical to optimise all four aspects of the learning process to ensure quality virtual teaching and learning. The experience obtained should at least be on par with the traditional face-to-face learning experience, if not more effective. Any educational institution could use the findings of this study to improve the usefulness, desirability, accessibility, and usability of a chosen online platform in order to maximise the user experience. From the findings, all these constructs were associated with the experiences of users during open distance learning, with the usability of the platform contributing the most. As a result, it is critical to optimise all four aspects of the learning process to ensure quality virtual teaching and learning. The experience obtained should at least be on par with the traditional face-to-face

learning experience, if not more effective. The result of this study could be used by any learning institution to enhance the usefulness, desirability, accessibility, and usability of an online platform chosen in order to maximise the user experience.

Acknowledgments

We would like to express our deepest appreciation to financial support for both research and publications through the internal funding Grant Scheme 600-RMC/SRC/5/3 (033/2020). A great thanks to all staffs and members of Research Management Institute (RMI), School of Computing Sciences, College of Computing, Informatics and Media, Universiti Teknologi MARA (UiTM) Malaysia for supporting this research.

References

Ag-Ahmad, N. (2020). Open and Distance Learning (ODL): Preferences, Issues and Challenges amidst Covid-19 Pandemic. *Journal of Creative Practices in Language Learning and Teaching (CPLT)*, *8*(2).

Ahmad, N. A., Zainal, A., Hanis, F., Razak, A., Adilah, W., Adnan, W., & Osman, S. (2015). User Experience Evaluation of Mobile Spiritual Applications for Older People: An Interview and Observation Study Assisted Technology for the Visually Impaired Users. *Journal of Theoretical and Applied Information Technology*, *10*(1). https://www.researchgate.net/publication/269576922

Ariffin, N. H. M., Rahman, H. A., Alias, N. A., & Sardi, J. (2014). A survey on factors affecting the utilization of a Learning Management System in a Malaysian higher education. *2014 IEEE Conference on e-Learning, e-Management and e-Services* (IC3e). https://doi.org/10.1109/ic3e.2014.7081246

Arnold, G. (2018). *Circumplex Model of Affect*. https://study.com/academy/lesson/circumplex-model-of-emotion.html

Boekaerts, M., Pintrich, P. R., & Zeidner, M. (2000). Self-Regulation: An Introductory Overview. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of Self-Regulation* (pp. 1–9). Academic Press. https://doi.org/10.1016/B978-012109890-2/50030-5

Carver, C. S., & Scheier, M. (1990). *Principles of self-regulation: action and emotion: Action and emotion*. The Guilford Press.

Chafouleas, S. M., Koriakin, T. A., Roundfield, K. D., & Overstreet, S. (2019). Addressing Childhood Trauma in School Settings: A Framework for Evidence-Based Practice. *School Mental Health, 11*(1), 40-53. https://doi.org/10.1007/s12310-018-9256-5

Chandra, Y. (2020). Online education during COVID-19: perception of academic stress and emotional intelligence coping strategies among college students. *Asian Education and Development Studies, 10*(2), 229-238. https://doi.org/10.1108/aeds-05-2020-0097

Chhetri, C. (2020). "I Lost Track of Things": Student Experiences of Remote Learning in the Covid-19 Pandemic. *SIGITE'20: Proceedings of the 21 St Annual Conference on Information Technology Education*, 314–319.

Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., Magni, P. A., & Lam, S. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *Journal of Applied Learning & Teaching*, *3*(1), 1–20. https://doi.org/10.37074/jalt.2020.3.1.7

George, D., & Mallery, P. (2019). *EBOOK : IBM SPSS Statistics 26 Step by Step A Simple Guide and Reference* (16th Ed.).

Hallewell Haslwanter, J. D., Takacs, C., & Gaisch, M. (2022). How Age and Gender Affect the Opinions of Computing Students Regarding Computer Usage and Design Needs. *Informatics, 9*(3), 52. https://doi.org/10.3390/informatics9030052

Hayatie, W. N., Aziz, W. A., Idham, N., Hasan, A., Hafiz, M., Hamzah, M., Wan, R., Aziz, A., & Wan, W. N. H. (2020). Pearson correlation coefficient of the student perception and challenges towards open and distance learning during COVID-19. *Mathematical Sciences and Informatics Journal*, *1*(1), 96–103. http://www.mijuitmjournal.com

Irawan, A. W., Dwisona, D., & Lestari, M. (2020). Psychological Impacts of Students on Online Learning During the Pandemic COVID-19. *KONSELI : Jurnal Bimbingan Dan Konseling (E-Journal)*, *7*(1), 53–60. https://doi.org/10.24042/kons.v7i1.6389

Kalok, A., Sharip, S., Abdul Hafizz, A. M., Zainuddin, Z. M., & Shafiee, M. N. (2020). The Psychological Impact of Movement Restriction during the COVID-19 Outbreak on Clinical Undergraduates: A Cross-Sectional Study. *International Journal of Environmental Research and Public Health, 17*(22), 8522. https://doi.org/10.3390/ijerph17228522

Kamaludin, K., Chinna, K., Sundarasen, S., Khoshaim, H. B., Nurunnabi, M., Baloch, G. M., Sukayt, A., & Hossain, S. F. A. (2020). Coping with COVID-19 and movement control order (MCO): experiences of university students in Malaysia. *Heliyon, 6*(11), e05339. https://doi.org/10.1016/j.heliyon.2020.e05339

Kapasia, N., Paul, P., Roy, A., Saha, J., Zaveri, A., Mallick, R., Barman, B., Das, P., & Chouhan, P. (2020). Impact of lockdown on learning status of undergraduate and postgraduate students during COVID-19 pandemic in West Bengal, India. *Children and Youth Services Review, 116*, 105194. https://doi.org/10.1016/j.childyouth.2020.105194

Karagianni, K. (2018). *Optimizing the UX honeycomb*. UX Collective.

Lim, I. (2020, May 30). reality for Malaysia's university students: Online learning challenges, stress, workload: possible solutions for fully digital future until Dec. *Malay Mail*. https://www.malaymail.com/news/malaysia/2020/05/30/reality-for-malaysias-university-students-online-learning-challenges-stress/1870717

Morville, P. (2014). *Semantic studios: User Experience Design*. https://semanticstudios.com/user_experience_design/

Muda, S., & Bit-Lian, Y. (2019). Perceived challenges in open and distance learning among nursing students of Open University Malaysia: A descriptive analysis. *ICE 2019 – Procedings of the International Conference on Education.*

Muthuprasad, T., Aiswarya, S., Aditya, K. S., & Jha, G. K. (2021). Students' perception and preference for online education in India during COVID -19 pandemic. *Social Sciences & Humanities Open*, *3*(1), 100101. https://doi.org/10.1016/j.ssaho.2020.100101

Nakamura, W. T., de Oliveira, E. H. T., & Conte, T. (2017). Usability and user experience evaluation of learning management systems a systematic mapping study. *ICEIS 2017 - Proceedings of the 19th International Conference on Enterprise Information Systems*, *3*, 97–108. https://doi.org/10.5220/0006363100970108

Nuruddin, M., Noor, C. N., & Zainan Abidin, A. W. (2020). Exploring the Relationship between Self-efficacy and Mathematics Performance in Integral Calculus among Applied Science University Students. *Journal of Physics: Conference Series, 1496*(1), 012018. https://doi.org/10.1088/1742-6596/1496/1/012018

Odriozola-González, P., Planchuelo-Gómez, Á., Irurtia, M. J., & de Luis-García, R. (2020). Psychological effects of the COVID-19 outbreak and lockdown among students and workers of a Spanish university. *Psychiatry Research, 290*, 113108. https://doi.org/10.1016/j.psychres.2020.113108

OECD. (2020). Education and COVID-19: Focusing on the long-term impact of school closures. In *OECD Policy responses to Coronavirus (COVID-19)*. OECD Publishing, Paris. https://doi.org/10.1787/2cea926e-en

Pekrun, R. (2006). The Control-Value Theory of Achievement Emotions: Assumptions, Corollaries, and Implications for Educational Research and Practice. *Educational Psychology Review, 18*(4), 315-341. https://doi.org/10.1007/s10648-006-9029-9

Pekrun, R., & Stephens, E. J. (2010). Achievement Emotions: A Control-Value Approach: Achievement Emotions. *Social and Personality Psychology Compass, 4*(4), 238-255. https://doi.org/10.1111/j.1751-9004.2010.00259.x

Pekrun, R., Goetz, T., Frenzel, A. C., Barchfeld, P., & Perry, R. P. (2011). Measuring emotions in students' learning and performance: The Achievement Emotions Questionnaire (AEQ). *Contemporary Educational Psychology*, *36*(1), 36–48. https://doi.org/10.1016/j.cedpsych.2010.10.002

Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2020). Online University Teaching During and After the Covid-19 Crisis: Refocusing Teacher Presence and Learning Activity. *Postdigital Science and Education*, *2*(3), 923–945. https://doi.org/10.1007/s42438-020-00155-y

Romeo, M., Yepes-Baldó, M., Soria, M. Á., & Jayme, M. (2021). Impact of the COVID-19 Pandemic on Higher Education: Characterizing the Psychosocial Context of the Positive and Negative Affective States Using Classification and Regression Trees. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.714397

Saidalvi, A., Nooezam, M., Zakaria, N., Sa'adan, N., & Rasdi, N. N. (2021). University students' perception of Online Distance Learning (ODL) mode during Covid-19 pandemic. *International Conference of Research on Language Education (I–Role) 2021*.

Shah, A. U. M., Safri, S. N. A., Thevadas, R., Noordin, N. K., Rahman, A. A., Sekawi, Z., Ideris, A., & Sultan, M. T. H. (2020). COVID-19 outbreak in Malaysia: Actions taken by the Malaysian government. *International Journal of Infectious Diseases*, *97*, 108–116. https://doi.org/10.1016/j.ijid.2020.05.093

Solomon, R. C. (2022). Emotion. In *Britannica*. https://www.britannica.com/science/emotion/The-structure-of-emotions.

Sutarto, S., Sari, D. P., & Fathurrochman, I. (2020). Teacher strategies in online learning to increase students' interest in learning during COVID-19 pandemic. *Jurnal Konseling Dan Pendidikan*, *8*(3), 129. https://doi.org/10.29210/147800

Thandevaraj, E. J., Gani, N. A. N., & Nasir, M. K. M. (2021). A Review of Psychological Impact on Students Online Learning during Covid-19 in Malaysia. *Creative Education*, *12*(06), 1296–1306. https://doi.org/10.4236/ce.2021.126097

Viner, R. M., Russell, S. J., Croker, H., Packer, J., Ward, J., Stansfield, C., Mytton, O., Bonell, C., & Booy, R. (2020). School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *The Lancet Child & Adolescent Health, 4*(5), 397-404. https://doi.org/10.1016/s2352-4642(20)30095-x

Yoon, J., Kim, C., & Kang, R. (2020). Designing for Positive User Experience. *International Journal of Design*, *14*(2), 85–102. www.ijdesign.org

Zeng, L. (2020). Which kind of learning form do students want in China during COVID-19 outbreak. *ACM International Conference Proceeding Series*, 51–56. https://doi.org/10.1145/3416797.3416811