

# Exploring the User Experience (UX) of University Learning Management System (LMS)

Emma Nuraihan Mior Ibrahim, Eda Aliah Athirah Abdul Aziz

Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA, 40450, Shah Alam, Selangor, Malaysia.

Corresponding Author Email: emmanuraihan@uitm.edu.my

To Link this Article: <http://dx.doi.org/10.6007/IJARPED/v11-i3/14454>

DOI:10.6007/IJARPED/v11-i3/14454

**Published Online:** 24 August 2022

## Abstract

During the Covid19 pandemic, universities around the world had to transformed from the classroom learning into an online learning environment. Varieties of learning Management System (LMS) were developed by respective universities and software companies to assist the learning process. In Universiti Teknologi MARA (UiTM), UFuture platform is developed to assist in the teaching and learning process. However, there is little information on the user experience (UX) among the students interacting with UFuture. This paper attempt to address the user experience of UFuture usage. The data were gathered from a focus group study consists of 50 postgraduate students that has experiences using UFuture platform for learning. The study used a standard User Experiences Questionnaire (UEQ) comprised of 26 questions in measuring six (6) scales which are Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty. The descriptive analysis result indicates neutral evaluation, where the mean values of each scale within -0.8 to 0.8. In addition, the benchmarking between UiTM UFuture against UEQ dataset shows that the learning platform scored "below average". For future work it is suggested, element of attractiveness, efficiency, stimulation and dependability of UFuture platform should be enhanced to heighten the overall student's user experience (UX).

**Keywords:** User Experience (UX), Learning Management System (LMS), User Experience Questionnaire (UEQ), Online Learning, UFuture

## Introduction

The Covid-19 pandemic has affected the worldwide in various ways. It caused all sectors paralyzed including the education field. Due to this situation, it forces academic institution to embrace new learning style from face to face to online learning (Chakraborty et. al., 2020; Selvanathan et. al., 2020). Hence Learning Management System (LMS) becomes so resourceful and needed by educators around the world. LMS is an open-source framework used for all kinds of e-learning for example blending learning, distance education and workplace training. LMS reinforce the learning process through collaborative-group learning, discussion, monitoring students' progress, assessment, and evaluation through online learning environment (Bradley, 2020). There are various types of LMS offered such as Edmodo, Moodle, WebCT, BlackBoard, Canvas and Google Classroom. Although some of

these platforms are made open source and easily accessible however, many universities do developed their own LMS respectively according to their own set of requirements. In Universiti Teknologi MARA (UiTM), one of the largest universities in Malaysia which comprises of 14 branches in different states utilised UFuture platform (<https://ufuture.uitm.edu.my/login>) (Refer to Figure 1.) for teaching and learning during the pandemic period. UFuture was implemented since 2014 but was used as a complement to the physical classroom especially for the distance education students. However, during the pandemic, it has made compulsory for every instructor to utilise the platform and up till the post-pandemic, this platform is still heavily in used.

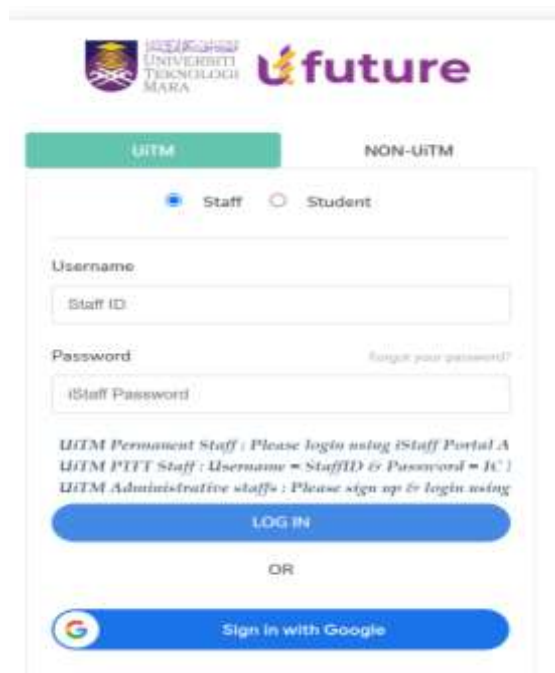


Figure 1: UFuture at UiTM (<https://ufuture.uitm.edu.my/login>)

User experience (UX) augments the subjective, focusing on hedonic aspects, such as user's emotions and stimulations while interacting with a product (Hassenzahl et al., 2006). UX is important as it attempt to increase better user satisfaction and builds user loyalty to use a product or services. In the literature numerous studies has been made in investigating the successful of LMS implementation from either the learner or the instructor's perspectives (Chaw and Tang, 2018; Susano and Khasanah 2022; Dhawan, 2020, Rodzi et.al., 2020). In addition, there are also studies on the usability and user experience (UX) of interacting with LMS platform (Maslov et. al., 2021; Maslov and Nikou, 2020; Nakamura et. al., 2017; Saleh et. al., 2022). However, in the context of UFuture operationalisation within UiTM, there are less research investigate the user experience (UX) from the student's perspectives in utilising UFuture as the learning platform. As LMS shift it focus from design-centric to user centric which is the key to successful positive user experience (UX), it is essential to investigate what are the possible issues relating to ease of use, user satisfaction and the appropriateness of its overall features and functions. By investigating the UX, the results were foreseen could benefits to the UFuture designer and developer for further enhancement. This is because the success of an online learning or e-learning depend not only on the learner's perception towards the e-learning but also the quality, reliability, and usefulness of the overall e-learning platform (Maslov et. al., 2021). Hence, the objectives of this paper are:

- To measure the user experience (UX) of UFuture learning platform from the postgraduate student's perspectives.
- To recommend future enhancement of UFuture learning platform features and functions.

### Literature Review

-learning is an effective sustainable learning solution and offers tremendous opportunities for learning beyond the traditional boundaries. For example, increased reach to thousands of learners, facilitating the interaction between learners and educators, collaborative learning, and facilitating the A Learning Management System (LMS) is a web-based environment that provides educational content in a form of a software package by a digital means platform which disseminate and facilitate the interaction between the instructor and learners. LMS as part of an e-learning tool enable teaching and learning activities takes place for example, delivery of learning content, communication, distribution of resources, assessment, and evaluation (Rodzi et. al 2020). The aim of LMS establishment is to improve the quality of education by reducing additional costs to provide appropriate learning in physical space. LMS are sometimes associated with distance-learning in universities as it provides benefits in the form of flexibility, such as offering options in self-study activities, extension activities, the types of learning activities available and in the monitoring of the students' achievement. According to Collis and Moonen, 2001 they stated majority of the LMS have similar features which are general course organizations, content, self study, assignments, test and communication (group, learner, instructor). There are two types of LMS: open source and closed source. Open source is generally free of charge and can be personalised based on the user needs at a low cost whereas the close source or known as proprietary software is simply limiting its access and utilisation. There are many open-source platforms, such as Moodle, Sakai, ATutor, Claroline, MyGuru2, and MyLMS. Meanwhile, examples of commercial LMS are Blackboard, SuccessFactors, SumTotal, Litmos, Angle learning, Geo learning, Cornerstone and Connect Edu. Despite of varieties of LMS platform available, different feature (components) of an LMS may impact the student's perceptions when evaluating their UX of an LMS. This is because each platform might differ in terms of its design, features, and functionalities (Zanjani, 2017).

User experience (UX) or sometimes referred as UX/UI in its commercial terms is a multidimensional construct defined differently in many studies according to its pretext hence there is no consensus in its definite meaning (Hellweger and Wang, 2014). According to the definition given by ISO in 2008, User Experience (UX) is defined as a person's perception and response that results from anticipated use of a product, system or services. Whilst, Hassenzahl, 2010 assess UX from two dimensions when user interacts with a product (a) pragmatic quality that refers to the product's ability to support an accomplished goal (b) hedonic quality refers to the ability of the product to support the achievement of the accomplished goal which focus on why the user owns or use a particular product. However, for this research, we defined UX as an emotional response of a user towards a product or service. This emotional response is adherence to the design and the use of an interactive product (Garett, 2010). In the literature, UX is often associated with the user interface (UI). Nevertheless, UX and UI are two different terms carries its own meaning. UI refers to how a user interacts with the technology whereas UX focus on the interaction process with the technology. A user interface of a product is considered good if the user can achieve desired

results with minimum input and it is the experience of that interaction determines the success of an interactive product (Norman, 2013).

In the design field, UX is often centred around usability of a product or services. UX comprises of elements such as visual design, navigation design, information design, information architecture, content requirements, user needs and product/service objectives. There are many advantages optimizing UX in the creation of product and services despite of the difficulties in managing different user preferences. A good user experience product or services enable positive emotional experience hence to help make a designed artifact successful. In the past, there are few research investigate UX and usability in the context of LMS. Studies shows UX play important role in the quality of LMS design and development and in the learning process (Nakamura 2017; Zaharias and Pappas, 2016; Maslov and Nikou 2020; Adzharuddin 2013). Besides learning the content of a particular subject, the learner also needs to learn how to use the platform. If the LMS do not provide a good usability, the user might need more time to learn on how to use the platform. Similarly, a good UX is essential to make the platform more pleasuring and satisfactory to the learner. Being usable and interesting at the same time is the key to successful of any product design (Hassenzahl et al., 2010). Furthermore, there is a need for more knowledge of student experiences with digital technology, such as LMSs and especially regarding how LMSs can contribute to student engagement and learning. Previous research has observed an association between the use of LMSs and student satisfaction (Redmond et al. 2018) and technology does have direct positive impact on student's engagement, self-directed learning and desirable learning outcomes (Bond et al., 2020).

### **Methodology**

-source LMSs are

generally free of charge and customisable based on the user preferences at a low cost (Bansode and Kumbhar, 2012, p. 415). Al-Ajlan (2012, p. 193) outlined a list of features of an LMS, which may be considered as components of an LMS, as shown in Table 1. We would expect different features (components) of an LMS which impacts students' perceptions when evaluating their UX of an LMS.

User Experience Questionnaire (UEQ) Instrument

The ready-made template of User Experience Questionnaire (UEQ) available at URL: <https://www.ueq-online.org/> was used as the survey instrument developed by (Schrepp et al, 2014; Schrepp and Thomaschewski 2017). UEQ template is a well validated questionnaire, popular and quick evaluation technique used in web-based products UX evaluation. It has been applied in various research context such as the evaluation of business software, social network, and web services Schrepp et al, 2014; Hinderks et al, 2019). The User Experience Questionnaire consists of six scales with 26 items. The six scales are Attractiveness, Dependability, Perspicuity, Efficiency, Novelty and Stimulation (refer to Figure 2).

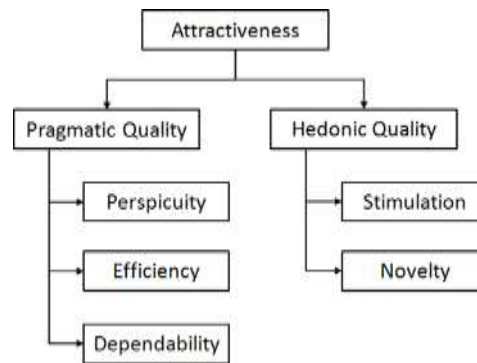


Figure 2. Scale structure of User Experience Questionnaire (UEQ) (Schrepp et. al., 2014)

Each item of User Experience Questionnaire (UEQ) consists of a pair of terms with opposite meaning.

For this study, we used both Malay and English languages for the UEQ. Figure 3 shows the UEQ questionnaire in dual languages. The UEQ were represented in 7-points of Likert scales. The range to answer an item is from -3 (fully agree with negative term) to +3 (fully agree with positive terms). For this study the UX elements were contextualised from the perspective of UFUTURE platform described as follows:

**Attractiveness:** It is a common impression towards the UFUTURE learning platform user experience (UX). Do the respondent like or dislikes the UFUTURE learning platform?

Items: annoying/enjoyable, good/bad, unlikable/ pleasing, unpleasant/pleasant, attractive/unattractive, friendly/unfriendly.

**Efficiency:** It is referred to the use of the UFUTURE learning platform fast and effective and looking user interface organization.

Items: fast/slow, insufficient/efficient, impractical/ practical, organized/ cluttered.

**Dependability:** It is related to the user feeling in control, safe and predictable during interaction with the UFUTURE learning platform.

Items: unpredictable/predictable, obstructive/supportive, secure/not secure, meets expectations/does not meet expectations.

**Perspicuity:** It is connected to easiness and familiarity about UFUTURE learning platform.

Items: not understandable/ understandable, easy to learn/difficult to learn, complicated/easy, clear/confusing.

**Stimulation:** It is to answer exciting and interesting users to use the UFUTURE learning platform. It also explores how the respondent feels motivated for a further using UFUTURE learning platform.

Items: valuable/inferior, boring /exciting, not interesting/interesting, motivating / de motivating.

**Novelty:** It is to examine the inventively and creativity of UFUTURE learning platform design. It also determines the UFUTURE learning platform attracts the respondent's attention.

Items: creative/dull, inventive/conventional, usual/leading-edge, conservative/innovative.

	1	2	3	4	5	6	7			1	2	3	4	5	6	7		
menjengkelikan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	menyeronokkan	1	annoying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	enjoyable	1
sukar difahami	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	mudah difahami	2	not understandable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	understandable	2
ada kreativiti	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	tidak bersifat kreatif	3	creative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	dull	3
mudah dipelajari	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	sukar dipelajari	4	easy to learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	difficult to learn	4
bermutu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	kurang bermutu	5	valuable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	inferior	5
membosankan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	menyeronokkan	6	boring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	exciting	6
tidak menarik minat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	menarik minat	7	not interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	interesting	7
tidak boleh diramalkan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	boleh diramalkan	8	unpredictable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	predictable	8
cepat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pertahanan	9	fast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	slow	9
terdapat rekaan baharu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	bertasarkn kebiasaan	10	inventive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	conventional	10
menghalang	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	menyokong	11	obstructive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	supportive	11
baik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	tidak baik	12	good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	bad	12
menyulitkan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	mudah	13	complicated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	13
tidak disukai	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	disukai	14	unlikable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pleasing	14
biasa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	mempunyai kelebihan	15	usual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	leading edge	15
tidak menyenangkan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	menyenangkan	16	unpleasant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pleasant	16
terjamin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	tidak terjamin	17	secure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not secure	17
mendorong	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	tidak mendorong	18	motivating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	demotivating	18
memenuhi jangkaan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	tidak memenuhi jangkaan	19	meets expectations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	does not meet expectations	19
tidak berkesan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	berkesan	20	inefficient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	efficient	20
jerbas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	mengelirukan	21	clear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	confusing	21
tidak praktik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	praktik	22	impractical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	practical	22
teratur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	serabut	23	organized	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	cluttered	23
menarik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	tidak menarik	24	attractive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	unattractive	24
senang digunakan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	sukar digunakan	25	friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	unfriendly	25
konservatif	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	inovatif	26	conservative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	innovative	26

Figure 3. UEQ questionnaire in Malay and English languages (source: <https://www.ueq-online.org/>)

### Sampling Technique and Selection of Participants

For this study, simple random sampling is one of probability sampling technique that allowed the researcher randomly selects a subset of participants from a population. As the postgraduate students are geographically dispersed and mostly are working adults, it will be difficult to gather data from multiple postgraduate programs at large. We choose the postgraduate students because research have found they have different views regarding their own responsibility for using the LMS to prepare before on-campus activities (Steindal et al 2021).

There are 50 postgraduate students enrolled in the Master of Science in Information Technology (Msc.IT) CS770 program at the Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA (UiTM) Shah Alam, Malaysia. The targeted respondents are the overall Master of Science in Information Technology (Msc.IT) students of Fakulti Sains Komputer and Matematik (FSKM) in UiTM Shah Alam whereby they have experiences in using Ufuture. For this study, the sample size is 50 respondents. Each member of the population has an equal probability of inclusion sample that are being selected. Data is then collected after target population, sampling technique and sample size have been established (Taherdoost, 2016). The total of target respondent is calculated using URL: <https://www.qualtrics.com/au/experience-management/research/determine-sample-size/>. We create a WhatsApp group as the medium to distribute the UEQ survey link. The participant's response was closely administered to ensure all questions are answered within 3 weeks time.

Calculation:

$$\text{Sample Size} = (Z\text{-score})^2 * \text{StdDev} * (1\text{-StdDev}) / (\text{margin of error})^2$$

$$\text{Sample Size} = (1.96)^2 * 0.5 * (0.5) / (0.08)^2$$

$$\text{Sample Size} = 50 \text{ samples}$$

Justification



*Z-Score = 1.96*

*Standard Deviation = 0.5*

*Margin of error = 80%*

#### *Data Analysis*

Analysis of the data in this study was carried out with the help of the ready-made UEQ statistical software tool using Microsoft Excel to measure the results of UEQ answers via <https://www.ueq-online.org/> platform. Hence the validity and reliability tests need not to be done anymore considering UEQ has been used several times as a tool to evaluate LMS. UEQ Data Analysis Tools provide descriptive analysis also a benchmark dataset that is used to measure the scale of mean. The data set contains data from 20190 persons from 452 studies in different product. Based on benchmark dataset, we can see how UiTM UFuture learning platform can be compared with 452 products from UEQ store evaluation data.

### **Results and Discussions**

#### **Demographic Profiles**

In this study, the number of answers collected and analysed was derived from 50 respondents. The total number of respondents consists of 26 males and 24 females with the range aged between 25 to 40 years old. Figure 4 shows majority of the respondents (25.5%) have at least one to two years' experience of using UFuture as the learning platform.

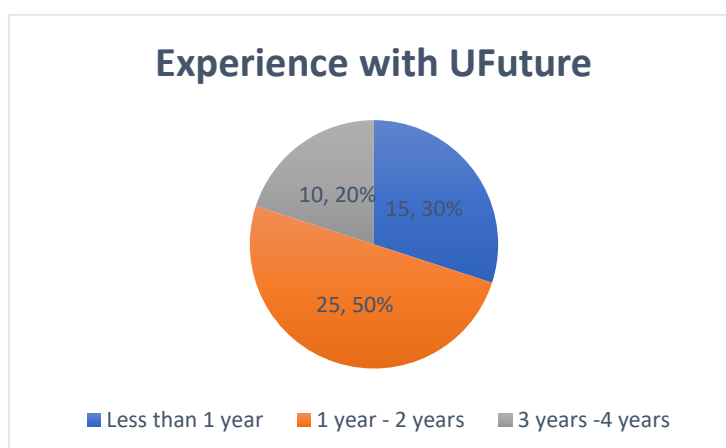


Figure 4. Experience with UFuture platform

#### **UEQ Results by Scale**

UEQ Results by scale in Table 1. stated that the mean value that has a value of -0.8 and +0.8 is considered as neutral value. While the mean value that has a value >0.8 is considered as positive evaluation and the value <0.8 is considered as negative evaluation. All six (6) scales given a neutral evaluation. The highest mean value was Perspicuity (0.75), where it indicates students feel easy to understand and very familiar using the UFuture as their learning platform. This followed by attractiveness (0.403) which indicates a good impression of the UFuture. In addition, the Stimulation (0.38) represent the students feels motivated to use the UFuture whereas Efficiency (0.145) indicate that UiTM UFuture are fast, and its user interface is well organized. Finally, the lowest mean value was Novelty (0.065) which indicate the UFuture platform is less in innovative meaning lack of creativity and invention in design.

Table 1

*UEQ Result by Scale*

Scales	Mean	Variance
Attractiveness	0.403	1.66
Perspicuity	0.750	1.66
Efficiency	0.145	0.98
Dependability	0.300	0.68
Stimulation	0.380	1.18
Novelty	0.065	0.50

## UEQ Results by Group Scales

UEQ Result in Table 2. shows the mean of three (3) qualities, attractiveness, pragmatic, and hedonic aspects are calculated. The pragmatic quality consists of Perspicuity, Dependability and Efficiency where hedonic quality consists of Stimulation and Novelty. Pragmatic quality defined as task-related quality dimension. While Hedonic quality refers to quality dimensions such as beauty that are not task related.

Table 2

*UEQ Result by Grouped Scales*

Grouped Scales	Mean
Attractiveness	0.4
Pragmatic Quality	0.4
Hedonic Quality	0.22

Based on Table 2 all group shows neutral evaluation. Attractiveness and pragmatic quality show same value of 0.4. The mean value of hedonic quality is 0.22. This shows that all group are related to each other. This also shows that all the scales are neutral evaluation which indicate the students have no major user experience (UX) issues while using UiTM UFuture learning platform. In summary, even though all the scales show neutral evaluations, Perspicuity receives highest scores of 0.75. Based on grouping the scales into Attractiveness, Pragmatic Quality and Hedonic quality also reveals that Perspicuity is under of pragmatic quality scores highest at 0.4 which is have same value with Attractiveness. Thus, it can be concluded that Attractiveness and Perspicuity are the significant user experience elements in using UFuture learning platform.



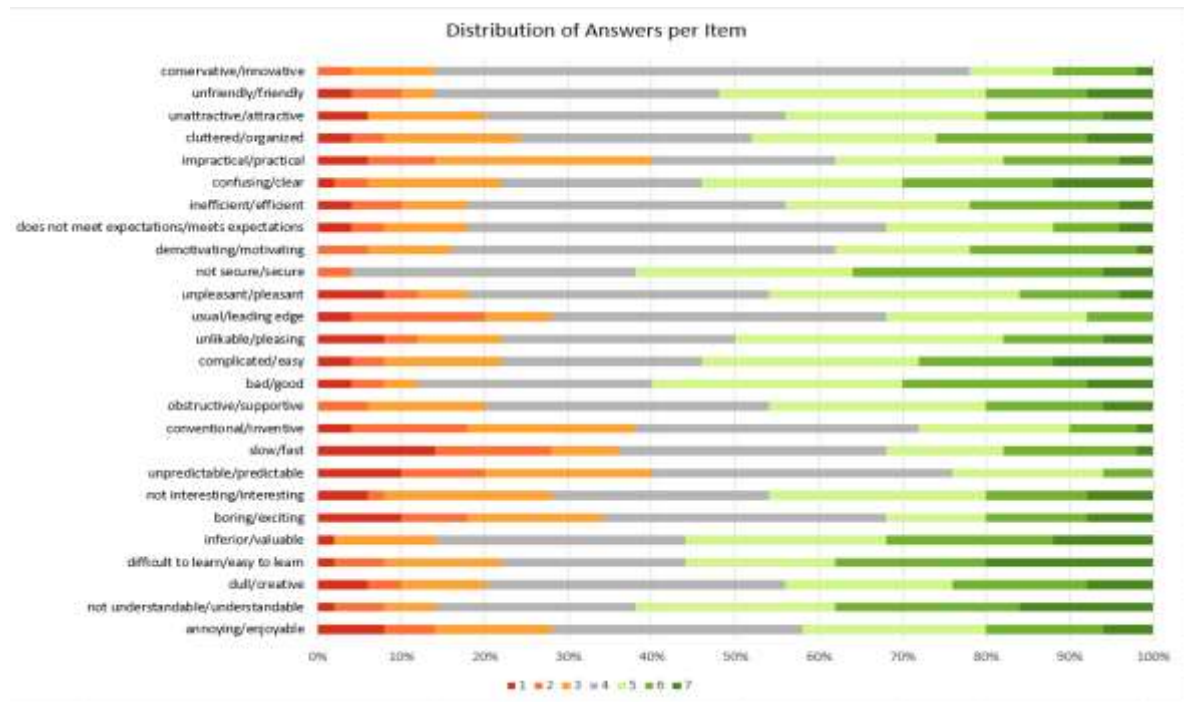


Figure 5. Distribution answers per item

Figure 5 show the distribution of answer for all 26 items in the UEQ, a summary of the response from 50 respondents. most of the respondent answer are between four (4) to five (5). This shows that all the scales are neutral in evaluation which indicate the students have no major issues interacting with UFuture platform.

#### Benchmark Graph Analysis

Within UEQ Analysis Tools, it also provides benchmarking data sets from previous product evaluation done by other researchers. The current data set from 20190 persons from 452 studies on different product which include business software, web pages, web shop and social network. Table 3 show the benchmark data breakdown into five (5) categories.

Table 3

*Benchmark Results*

UEQ Scales	Mean	QualityLevel	Interpretation
Attractiveness	0.403	Bad	In the range of the 25% worst result
Perspicuity	0.750	Below Average	50% of result better, 25% of result worse
Efficiency	0.145	Bad	In the range of the 25% worst result
Dependability	0.300	Bad	In the range of the 25% worst result
Stimulation	0.380	Bad	In the range of the 25% worst result
Novelty	0.065	Bad	In the range of the 25% worst result

As shown in Table 3. The UFuture learning platform is categorized 'below average' which is the Perspicuity element. This mean that the product is in the range of 50% of result better, 25 % worst results from the previous 452 product evaluation in benchmark data. Other scales, Attractiveness, Efficiency, Dependability, Stimulation and Novelty are categorized 'Bad'. Whilst against the previous 452 products evaluations in benchmark data, UFuture learning platform is in the range of 25% worst result. Nevertheless, considering this UX evaluation revolves around the product of university's LMS, it is not fair to compare it with other products and rely solely on this benchmarking results. But from this analysis, we can conclude that elements of attractiveness, efficiency, dependability, stimulation and novelty of UiTM Ufuture platform need further enhancement and improvement.

**Conclusion and Future Work**

This research is conducted to evaluate the user experience (UX) and measurement of a university learning management system (LMS) which is the UiTM UFuture platform. The

research used a validated UEQ questionnaire as well as its analysing tool to evaluate the product as it is simple and efficient. The results indicate the need for design improvement of UiTM UFuture platform for better user experience particularly addressing the elements of attractiveness, stimulation, dependability, efficiency and novelty of UFuture platform. Nevertheless, the results from this study does not represent the entire perception of the postgraduate students in UiTM because it only focusses on one particular programme from a single faculty. For future work, we aimed to conduct similar study with different methodology. Future studies may attempt to have a large-scale sampling technique to gauge holistic view on the user experience (UX) from both undergraduates and postgraduates from different faculties. In addition, further elicitation on the improvement of the UX on Ufuture is also needed through in-depth qualitative study. This will help the researcher to improve and enhance on the UX properties, not only restricted to UEQ template.

## References

- Adzharuddin, N. (2013). Learning Management System (LMS) among University Students: Does It Work? *International Journal of e-Education, e-Business, e-Management and e-Learning*.
- Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2020). Mapping research in student engagement and educational technology in higher education: A systematic evidence map. *International journal of educational technology in higher education*, 17(1), 1–30.
- Chaw, L., & Tang, C. M. (2018). What Makes Learning Management Systems Effective for Learning? *Journal of Educational Technology Systems*. 47.
- Collis, B., & Moonen, J. (2001). *Flexible learning in a digital world*. London Kogan Page
- Dhawan S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. *Journal of Educational Technology Systems*. Sep;49(1):5–22.
- Garrett, J. J. (2010). *The elements of user experience: user-centered design for the web and beyond*. Pearson Education.
- Hassenzahl, M., Law, E. L-C., Hvannberg, E. T. (2006). User Experience – Towards a unified view. In: *User Experience – Towards a Unified View: Second International COST294-MAUSE Open Workshop – NordICHI'06*, pp. 1-3.
- Hassenzahl, M. (2010) 'Experience Design: Technology for All the Right Reasons', *Synthesis Lectures on HumanCentered Informatics*, 3(1), pp. 1–95.
- Hellweger, S., & Wang, X. (2014). What is User Experience Really: towards a UX Conceptual Framework. 10.6084/M9.FIGSHARE.1319576.
- Hinderks, A., Schrepp, M., Mayo, D. F. J., Escalona, M. J., & Thomaschewski, J. (2019). Developing a UX KPI based on the user experience questionnaire.
- Maslov, I., Nikou, S., and Hansen, P. (2021), "Exploring user experience of learning management system", *International Journal of Information and Learning Technology*, Vol. 38 No. 4, pp. 344-363.
- Maslov, I., & Nikou, S. (2020). Usability and UX of Learning Management Systems: An Eye-Tracking Approach. 10.1109/ICE/ITMC49519.2020.9198333.
- Nakamura, W. T., Oliveira, E. H., & Conte, T. (2017). Usability and User Experience Evaluation of Learning Management Systems - A Systematic Mapping Study. *ICEIS*.
- Norman, D. A. (2013). *The design of everyday things: Revised and expanded edition*. Basic books

- Redmond, P., Abawi, L.-A., Brown, A., Henderson, R., & Heffernan, A. (2018). An online engagement framework for higher education. *Online learning*, 22(1), 183–204.
- Rodzi, N. M., Kumar, J. A., Osman, S., & Masykuri, E. S. (2020). Exploring Lecturers' Acceptance of Learning Management Systems in Malaysian Higher Educational Institution. *Proceedings of the 2nd International Conference on Education, ICE 2019*, 27-28 September 2019, Universitas Muhammadiyah Purworejo, Indonesia.
- Saleh, A. M., Abuaddous, H. Y., Alansari, I. S., & Enaizan, O. (2022). The Evaluation of User Experience on Learning Management Systems Using UEQ. *International Journal of Emerging Technologies in Learning (iJET)*, 17(07), pp. 145–162.
- Schrepp, M., Hinderks, A., & Thomaschewski, J. (2014). Applying the User Experience Questionnaire (UEQ) in Different Evaluation Scenarios. In: Marcus, A. (Ed.): *Design, User Experience, and Usability. Theories, Methods, and Tools for Designing the User Experience. Lecture Notes in Computer Science*, Volume 8517, pp. 383-392, Springer International Publishing.
- Schrepp, M., Hinderks, A., & Thomaschewski, J. (2017). Construction of a benchmark for the User Experience Questionnaire (UEQ). *International Journal of Interactive Multimedia and Artificial Intelligence*, Vol. 4, No. 4, pp. 40-44
- Sharma, M., & Srivastav, G. (2020). Study and Review of Learning Management System Software.
- Steindal, S., Ohnstad, M., Landfald, O., Solberg, M., Sorensen, A. L., Kaldheim, H., Mathisen, C., & Christensen, V. (2021). Postgraduate Students' Experience of Using a Learning Management System to Support Their Learning: A Qualitative Descriptive Study. *SAGE Open Nursing*. 7.
- Susano, A., & Khasanah. (2022). Delone and Mclean on the Success of Learning Management Systems in Distance Learning. *International Journal of Social Science*. 2. 1125-1132.
- Taherdoost, Hamed, *Sampling Methods in Research Methodology*. (2016). How to Choose a Sampling Technique for Research (April 10, 2016). Available at SSRN: <https://ssrn.com/abstract=3205035>
- Zaharias, P., and Pappas, C. (2016) 'Quality Management of Learning Management Systems: A User Experience Perspective', *Current Issues in Emerging eLearning*, 3(1), pp. 60–83.
- Zanjani, N. (2017), "The important elements of LMS design that affect user engagement with e-learning tools within LMSs in the higher education sector", *Australasian Journal of Educational Technology*, Vol. 33 No. 1, pp. 19-31.