Evaluating the Usability of University E-Learning Software: A Student Satisfaction Perspective

John Gichuki Ndia
Murang'a University of Technology
School of Computing and Information Technology, Department of Information Technology

ABSTRACT
The advent of covid-19 era led to shift in delivery of curriculum via online. Several e-learning software's such as MOODLE, Google classroom and blackboard were implemented in the institutions of higher learning in Africa to enable continuation of teaching and learning. However, very few studies in the developing countries have focused on evaluation of the e-learning platforms to understand the factors that influence students' satisfaction. Further, there are little efforts to use the updated model of ISO 25010 to derive attributes or factors that can determine software usability also known as interaction capability. This study aims to investigate the students' satisfaction towards e-learning software usability. Stratified random sampling technique was used to select 423 students in a public university in Kenya. Data was collected through an online questionnaire, which had questions on the five selected sub-attributes of interaction capability namely appropriateness recognizability, learnability, operability, user error protection and user engagement. Five hypotheses were defined and their analysis indicated that all sub-attributes apart from operability had significant influence on the students' satisfaction of e-leaning platform hence their usability. A multiple regression model was derived and showed that the user engagement and user-error protection sub-attributes had the highest positive influence on students' satisfaction with the e-learning software as they increase students' satisfaction with 12.5% and 10.6% respectively. Therefore the study posits that institutions of higher learning should give more attention to development of user friendly platforms and systems that guard against errors to increase e-learning usability hence higher levels of satisfaction with students.

General Terms
Software quality, Interaction capability, Covid-19, Developing countries

Keywords
Usability, Satisfaction, E-Learning, MOODLE, ISO 25010, Universities, User Engagement

1. INTRODUCTION
The adoption and use of E-learning platforms has rapidly increased globally and even in developing countries such as Kenya, where we have seen Kenyan universities adopt especially after the Covid-19 pandemic [1]. During the covid-19 period the government shut down all institutions including higher learning institutions and this resulted to institutions using e-learning platforms to ensure continuity of learning amid the pandemic [2]. E-Learning refers to the learning methods based on delivery of electronic instructional content through a web-based software that utilizes the internet to manage data, track relevant information, and distribute content among users [3][4].

The e-learning systems offer several advantages such as reduction of teaching and learning costs and time, and flexibility of delivery, thus allowing access to education anytime and anywhere [5]. The e-learning software supports active engagement and interactivity through formative and summative interactive assessments which provide immediate feedback to assist learners actively test and reinforce their understanding, multimedia content through use of audios, videos, animations, and simulations to make learning engaging, discussion forums and chats to encourage learners share ideas and collaborate, gamification, personalized learning systems, and perform practical's through virtual labs. In addition, learners can engage the e-learning software content at their own pace through access to materials at their own convenient time [6]. Despite the benefits accrued by the e-learning platforms there are several challenges related to interface, content, satisfaction, interaction, consistency, feedback, error management and browsing, poor technological systems, lack of internet access, insufficient infrastructure, inadequate knowledge of e-learning systems, and limited technical support[7].

E-learning software is transforming education by providing accessible, personalized, and engaging learning experiences to learners across the globe. Its scalability enables it to support large numbers of students efficiently. The software is continuously updated and enhanced to incorporate the latest learning resources and innovative features. Moreover, e-learning platforms promote international collaboration and cross-cultural exchange, fostering a more connected global learning community. When integrated with traditional classroom instruction through blended learning approaches, e-learning software further enriches the educational environment and enhances the overall learning experience[8].

There are several E-learning platforms used all over the world, and the most popular ones are Blackboard, Modular Object-Oriented Dynamic Learning Environment (Moodle) and Sakai [9][10]. Though there exists e-learning platforms, Moodle has been adopted by many universities in Kenya, due to the fact that it is an open source software and is deemed to have high level of usability [11].

Though e-learning platforms are becoming inevitable for use in higher education a number of students and lecturers seem not motivated to use the platforms [12]. It's therefore important to investigate the attributes that make for engagement with e-learning platforms. Therefore, more studies are required to understand users perspectives on e-learning software usability [8][13]. The higher learning institutions have the sole responsibility to ensure investments in the required infrastructure and software's to improve content quality while maintaining the interest and satisfaction of the e-leaning platform users [14]. This study has explored the connection between the usability or interaction capability attributes e-learning software and their influence on students and lecturers satisfaction.

The evaluation of software quality is a practice that has been there for many years, its intention is to measure software products in terms of its quality. Towards the assurance of good software quality several software quality models have been proposed such as McCall, Boehm, FURPS, Dromey, ISO 9126, and ISO 25010 [11]. These models capture software quality characteristics such as usability, functionality, maintainability, reliability, security, compatibility, and portability. The characteristics are further divided into sub-characteristics and attributes which can be measured in a software product. Usability is considered as one of the important attributes in majority of the aforementioned software quality models.

Usability quality characteristic which has been renamed as interaction capability in ISO 25010 is defined as the degree to which a product or system can be interacted with by specified users to exchange information in the user interface to complete specific tasks in a variety of contexts of use. Interaction capability quality characteristic has eight sub-characteristics namely appropriateness recognizability, learnability, operability, user error protection, user engagement, inclusivity, user assistance and self-descriptiveness [15]. In evaluation of E-learning platforms usability, the use of a quality model is important to effectively evaluate their usability.

This study will focus on usability of Moodle platform because there are very few studies that focus on usability or interaction capability or usability of these platforms in a developing country, since few studies have focused on such countries. Further, very few existing studies have made use of the latest ISO25010 model to measure level of their usability.

2. RELATED WORKS

In their study [16] did usability evaluation of google classroom using ISO 9126 software quality model. The authors determined the usability of the learning management system (LMS) based on student's perception. The total numbers of respondents were 125, this number was more than 50% of the total number of students enrolled for the online classes via the LMS. The study conclude that Google Classroom makes learning easier and is very useful in assignment and collaborative.

A study by [17] evaluated factors influencing the perceived usability of mobile applications using the PACMAD+3 model. The study found that efficiency was rated as highly important by users, while cognitive load, errors, learnability, operability, effectiveness, memorability, and understandability, were rated as moderately important.

The article by [18] "Perceived usability evaluation of Microsoft Teams as an online learning platform during Covid-19 using system usability scale and technology acceptance model in India". In this work the objectives were to determine whether there is a difference in perceived usability while using the online learning applications based on use of smartphone vis a vis laptop and determine if there is a relationship between the measures of perceived usability in the human computer interaction (HCI) domain and the information systems (IS) area. An online survey was conducted, and the respondents were students of science, engineering, or management disciplines. The total numbers of respondents were 1764 students who were enrolled in at least one course where the classes lasted for about three (3) months. The snowballing sampling strategy was used to get the respondents in 5 different colleges in India. The data collected was analyzed using SPSS and results demonstrated that there is no significant difference in perceived usability whether using smartphone or laptop, it was also determined that there is no significant difference when using SUS (in HCI domain) and TAM (in IS domain).

Research by [9] in their study titled "Evaluating the usability of an E-learning platform within Higher Education from a student perspective" had two objectives, to determine if the E-learning platform (Blackboard) is usable from the student's perspective and to identify common issues that students have when using the E-learning platform. An online based questionnaire using System Usability Scale (SUS) and other related questions related to demographics, experience and concerns was designed. There was a total of 101 respondents and were a mix of undergraduate and postgraduate master's students from Keele University. Descriptive statistics and thematic analysis were used to analyze data, the results showed that E-learning platform had acceptable levels of usability though it was below the recommended usability level by SUS.

In their study [19] of evaluating usability of E-Learning systems in universities, they targeted Moodle E-learning system in one of the universities in Kenya. A case study approach was used and a sample of 20 Lecturers and 30 students were involved in the study. Questionnaires and interviews were used to collect data. Data analysis was carried out using descriptive and inferential statistics. The results show that learnability factors affect usability of e-leaning systems, user friendliness affect usability of e-learning systems, lack of policy affects usability of e-learning systems and that technological infrastructural factors affect usability of e-learning system.

A study conducted effectiveness of e-learning portal from students' perspective using structural equation model (SEM) approach [20]. A total of 469 students enrolled on Coursera website for an e-learning program at universities in North India were considered. A survey method with aid of a structured questionnaire was used to collect data from the students. The questionnaire contained items related to system quality, information quality, service quality, user satisfaction and net benefits. The data was analyzed using SPSS version 17.0 and AMOS version 21.0 and the findings indicated that system quality and service quality contributes more to e-learning systems as compared to information quality In addition, the results showed that system quality, information quality, and service quality contribute to user satisfaction and net benefits to e-learning system users.

[21] in their research for usability evaluation of E-learning systems in the Iraqi higher education institutions. The goal was to gather insights that will assist in improvement of e-learning services. A total of 11 experts were involved in the study, they were chosen based on their expertise in use of e-learning systems. The results presented after analysis of data showed that all participants found the current e-learning system to be clear and straight forward.

3. METHODOLOGY

This methodology section covers the research design, sample size, data collection method, and description of how data was analyzed.

3.1 Research Design

In this study a cross-sectional quantitative research design was employed to analyze aspects affecting usability of the E-Learning platform from students' perspective. This design assists to examine relationships between variables without changing them over time by providing a snapshot of the students' perspectives and experiences related to the usability of e-learning software. Five hypotheses were defined for each of the attributes identified from ISO 25010 namely;

appropriateness recognizability, learnability, operability, user error protection and user engagement

3.2 Sample Size and Data Collection

The sampling strategy employed was stratified random sampling and within each strata the students were selected. Data collection techniques was done by use of a structured questionnaire which was given to the students enrolled in the e-Learning platform in one public university in Kenya. An online questionnaire survey was developed to evaluate the usability of e-learning software among university students to collect the data. The questionnaire was developed based on the five (5) selected attributes of the ISO25010 namely; appropriateness recognizability, learnability, operability, user error protection and user engagement hence inclusivity, user assistance and self-descriptiveness were not included in the study. A total of 433 students participated in the survey. The respondents were asked to rate the extent to which they agreed with various statements about the usability of the e-learning software, and their responses were recorded using a five (5) Likert scale. The scale had options ranging from "Don't Agree" to "Very Strongly Agree". A reliability test was conducted using Cronbach alpha to ascertain the internal consistency of the survey items, and there were reported values fulfilling the threshold of 0.7.

The questionnaire was divided into two sections;

i. Demographics including gender. Name of the school or faculty, and rating of respondents proficiency in use of e-learning software(MOODLE)
ii. E-learning platform usability quality sub-attributes, where each sub-attribute had several questions

The questions asked in section 2 were structured based on five of the usability or interaction capability sub-attributes of the ISO25010 software quality model namely; appropriateness recognizability, learnability, operability, user-error protection and user engagement.

In the context of e-learning software Appropriateness recognizability is defined as the degree to which e-learning users can recognize that the e-learning software is appropriate for addressing their need as they engage it. Learnability is the degree to which the functions of the e-learning software can be learnt to be used by e-learning users within a specified amount of time. Operability is the degree to which the e-learning software has attributes that make it easy to operate and control. User error protection is the degree to which an e-learning software system prevents its users against operation errors. Lastly, User engagement is the degree to which an e-learning software user interface presents functions and information in an inviting and motivating manner encouraging continued interaction.

3.3 Data Analysis

Data cleaning was conducted to identify and correct missing, incorrect, or inconsistent data. Data was analyzed by use of descriptive and inferential statistics with use of IBM SPSS 27 software. To ensure ethical principles in this study confidentiality and anonymity of the participants was maintained and all respondents participated voluntarily.

The reliability results: Appropriateness Recognizability = 0.924, Learnability = 0.817, Operability = 0.714, User Error Protection = 0.710, and User Engagement = 0.890. All the Cronbach's alpha values are reported as greater than 0.7 meaning that the questionnaire was reliable. Therefore, all statement items used in the current research are suitable for use in subsequent studies.

4. RESULTS

4.1 Students Participation

Student's participation in terms of gender was as follows; 152 (35%) participants were female while 278 (64%) participants were male and three (3) participants declare their gender as any other. This indicates good representation of both gender in this study. Majority of the students reported good levels of proficiency with e-learning software as shown in Table 1 below.

Table 1. Student's participation statistics

Variable	Category	Frequency	Percentages (%)
Gender	Male	278	64.2
	Female	152	35.1
	Other	3	0.69
Year of Study	Year 1	210	48.5
	Year 2	121	27.9
	Year 3	92	21.2
	Year 4	10	2.3
Level of Proficiency	Very Poor	23	5.3
	Poor	47	10.9
	Good	203	46.9
	Very Good	93	21.5
	Excellent	67	15.5

4.2 Students Perception on E-learning Software

The students responded to their perception on e-learning software interaction capability or usability as per the following sub-attributes; appropriateness recognizability, learnability, operability, user error protection and user engagement.

The abbreviations used to the tables in section 4.2 are as follows:

VSA - Very Strongly Agree, **SA** - Strongly Agree, **A** – Agree, **S_LA** - Slightly Agree and **D** - Disagree

In Appropriateness recognizability, five questions were posed to the respondents and the responses are as represented below.

i. The e-learning software functions I know enable me to solve my needs.

In terms of responses 8.1% very strongly agreed, 10.9% strongly agreed, 40.9% agreed, 23.8% slightly agreed while 7.4% did not agree. This means majority of the respondents are able to solve their need as they use E-learning software.

ii. It is easy to find the information I need in the e-learning software

13.4% very strongly agreed, 10.6% strongly agreed, 43.9% agreed, 23.3 slightly agreed and 8.8% did not agree. This means most of the respondents can find information in the e-learning software

iii. The instructions and documentation provided in the e-learning software are helpful.

16.9% of the respondents very strongly agree that the instructions and documentation provided are helpful, 15% strongly agree, 51.7% agree, 11.8% slightly agree and only 4.6% respondents who do not agree. This shows majority of the respondents agree that E-learning software instructions and documentation are helpful.

iv. E-learning software consistently solves my needs.

10.2% of the respondents very strongly agreed E-learning software consistently solves their needs, 8.1% strongly agreed, 44.3% agreed, 24.7% slightly agree and 12.7% do not agree. This means that majority of the respondents agree that e-learning software solves their need consistently.

v. I can recommend the e-learning software to other potential users.

Students: 14.3% very strongly agree they can recommend E-learning software to other potential users, 12% strongly agree, 46.7% agree, 17.8% slightly agree while 9.2% of the respondents do not agree. Majority of the respondents indicate they can recommend E-learning software to other potential users implying that the current users are satisfied with the use of E-learning software.

Table 2. Appropriateness Recognizability

Questions	VSA	SA	A	SLA	D
Q1	8.1%	10.9%	40.9%	23.8%	7.4%
Q2	13.4%	10.6%	43.9%	23.3%	8.8%
Q3	16.9%	15%	51.7%	11.8%	4.6%
Q4	10.2%	8.1%	44.3%	24.7%	12.7%
Q5	14.3%	12%	46.7%	17.8%	9.2%

Under learnability sub-attribute of interaction capability, five questions were posed to the respondents and the responses are as represented below.

i. There is need to seek assistance to use E-learning software effectively.

On the need to seek assistance to use E-learning software effectively 14.5% very strongly agreed, 13.6% strongly agree, 37.4% agree, 15.2% slightly agree and 19.2% do not agree. Majority of the respondents agree that there is need to seek assistance to effectively use E-learning software, this implies that there is need to train students on how to use E-learning software.

ii. I needed to learn a lot of things before I could start working comfortably with E-learning software.

13.4% very strongly agreed that they needed to learn a lot before they could work comfortably with E-learning software, 8.8% strongly agree, 33.5% agree, 20.3% slightly agree, and 24% do not agree. This implies that majority of the students take time to learn how E-learning software works and hence need for training of students on its use.

iii. Sometimes I am not sure if am using the right functions for given tasks

On the question whether they are sure that they are using the right functions for given tasks 8.8% of the respondents very strongly agree, the 6.7% strongly agree, 31.2% agree, 16.4% slightly agree and 37% do not agree. Most of the respondents are not sure if they use right functions for specific tasks in E-learning software implying the need to train students on use of various functions to achieve certain tasks.

iv. I find E-learning software unnecessarily complex

6% of the respondents very strongly agree that E-learning software is unnecessarily complex, 5.1% strongly agree, 21.9% agree, 18.9% slightly agree and 48% do not agree. Most of the respondents do not think that E-learning software is complex, this implies if students are well trained in its functions they can easily perform their tasks.

v. It takes too long to learn the E-learning software functions.

7.9% very strongly agree that it takes too long to learn E-learning software functions, 4.4% strongly agree, 19.6% agree, 19.6% slightly agree and 48.5% do not agree. The results show that the students do not take too long to learn E-learning software functions.

Table 3. Learnability

Questions	VSA	SA	A	SLA	D
Q1	14.5%	13.6%	37.4%	15.2%	19.2%
Q2	13.4%	8.8%	33.5%	20.3%	24%
Q3	8.8%	6.7%	31.2%	16.4%	37%
Q4	6%	5.1%	21.9%	18.9%	48%
Q5	7.9%	4.4%	19.6%	19.6%	48.5%

Under operability sub-attribute of interaction capability, five questions were posed to the respondents and the responses are as represented below.

i. There are many steps required to perform certain tasks with E-learning software.

8.3% of the respondents very strongly agree that there are many steps required to perform certain tasks, 6.2% strongly agree, 29.1% agree, 22.2% slightly agree and 34.2% do not agree. The results indicate that most students appreciate that to perform tasks there are no too many steps, meaning they perform their tasks quickly.

ii. It is easy to forget how to perform tasks with E-learning software.

4.6% very strongly agree that it is easy to forget how to perform tasks with E-learning software, 3.7% strongly agree, 14.1% agree, 19.6% slightly agree and 58% don't agree. The results indicate that that they do not forget how to perform tasks with E-learning software implying that E-learning software is easy to learn.

iii. The E-learning software platform sometimes does not perform as expected.

12% of the respondents very strongly agree that E-learning software sometimes does not perform as expected, 9.5% strongly agree, 31.4% agree, 19.6% slightly agree and 27.5% don't agree. The results show that E-learning software is defective since majority agree that sometimes it does not perform as expected.

iv. It is easy to see at glance what the options are at each stage.

8.5% of the respondents very strongly agree that it is easy to see at glance what the options are at each stage in E-learning software, 8.8% strongly agree, 48% agree, 21.9% slightly agree and 12.7% don't agree. The results indicate that the majority of respondents agree it is easy to see at a glance the options available at each stage implying that the users of E-learning software can easily perform their tasks as required.

v. It's easy and simple to use the E-learning software

13.2% of the respondents very strongly agree that it is easy and simple to use E-learning software, 11.3% strongly agree, 40.4% agree, 13.2% slightly agree and 14.5% don't agree. Majority of the respondents agree that E-learning software is easy and simple to use implying that it is not a complex software.

Table 4. Operability

Questions	VSA	SA	A	SLA	D
Q1	8.3%	6.2%	29.1%	22.2%	34.2%
Q2	4.6%	3.7%	14.1%	19.6%	58%
Q3	12%	9.5%	31.4%	19.6%	27.5%
Q4	8.5%	8.8%	48%	21.9%	12.7%
Q5	13.2%	11.3%	40.4%	13.2%	14.5%

Under user error protection sub-attribute of interaction capability, two questions were posed to the respondents and the responses are as represented below.

i. The E-learning software provides help in case of errors and gives error messages that clearly tells how to fix problems.

7.6% very strongly agree that E-learning software provides help in case of errors and gives error messages that clearly tells how to fix problems, 6.9% strongly agree, 31.9% agree, 22.4% slightly agree and 31.2% don't agree. The results imply that users of E-learning software can easily navigate through errors as when they occur with the system.

ii. When I make a mistake using the E-learning software, I recover easily and quickly.

6.9% of the students very strongly agree that when they make mistakes while using E-learning software they recover easily and quickly, 11.5% strongly agree, 38.1% agree, 20.8% slightly agree and 22.6% don't agree. Majority of the respondents indicate that that they recover easily and quickly when they make mistakes while using E-learning software. This implies that the users of E-learning software make negligible mistakes and so results obtained via E-learning software are reliable.

Table 5. User Protection

Questions	VSA	SA	A	SLA	D
Q1	7.6	6.9	31.9	22.4	31.2
Q2	6.9	11.5	38.1	20.8	22.6

Under user engagement sub-attribute of interaction capability, four questions were posed to the respondents and the responses are as represented below.

i. The icons, menus, and content on the E-learning software are clear and organized in a logical style

17.6% very strongly agree that the icons, menus, and content on the E-learning software are clear and organized in a logical style, 14.1% strongly agree, 42.3% agree, 14.1% slightly agree and 12% do not agree. Majority of the respondents agree that E-learning software icons, menu and content are logically organized, meaning the users of E-learning software can logically navigate through the system in performance of tasks.

ii. The E-learning software presentation is very attractive.

16.2% of the respondents very strongly agree that E-learning software is very attractive, 11.8% strongly agree, 35.3 agree, 21.9% slightly agree and 14.8% don't agree. The results imply that majority users of E-learning software like its user interface and can continuously use the system without being bored.

iii. Do you feel comfortable using E-learning software interface?

13.6% of the respondents very strongly agree that they feel comfortable using E-learning software interface, 14.3% strongly agree, 41.6% agree, 15.5% slightly agree and 15% don't agree. The majority of the respondents say that that they are comfortable using E-learning software interface.

iv. The interface of the E-learning software system is pleasant.

12.5% very strongly agree that the interface of the E-learning software is pleasant, 11.8% strongly agree, 42.3% agree, 20.8% slightly agree and 12.7% don't agree. Majority of the participants agree that E-learning software interface is pleasant to use, meaning they like engaging with the system.

Table 6. User Engagement

Questions	VSA	SA	A	SLA	D
Q1	17.6	14.1	42.3	14.1	12
Q2	16.2	11.8	35.3	21.9	14.8
Q3	13.6	14.3	41.6	15.5	15
Q4	12.5	11.8	42.3	20.8	12.7

4.3 Hypotheses Analysis

Five hypotheses were identified as follows:

Hypothesis 1: Appropriateness recognizability would positively influence Students E-learning platform Satisfaction

Hypothesis 2: Learnability would positively influence Students E-learning platform Satisfaction

Hypothesis 3: Operability would positively influence Students E-learning platform Satisfaction

Hypothesis 4: User error protection would positively influence Students E-learning platform Satisfaction

Hypothesis 5: User Engagement would positively influence Students E-learning platform Satisfaction

To analyze the hypothesis, the researcher employed the multiple linear regression analysis at 95% confidence interval level. The analysis showed a good model fit: $F(5,427) = 156.91$, $P<.001$, Adj $R^2=0.64$ and $R^2 = 0.648$.

The analysis of the hypothesis demonstrated that appropriateness recognizability had a significant influence on the students e-leaning platform usability ($\beta=0.23$, $t=4.73$.$p<.001$), hence the hypothesis is accepted. The analysis showed that learnability had a significant influence on the students e-leaning platform usability ($\beta=0.09$, $t=2.53$.$p<.05$),

meaning the hypothesis was accepted. Operability had no significant influence on the students e-learning platform usability (β=0.05, t=1.198.p>.05), hence the hypothesis was rejected. The analysis showed that user error protection had a significant influence on the students e-learning platform usability (β=0.18, t=4.59.p<.001), hence the hypothesis was accepted. Finally the analysis showed that user engagement had a significant influence on the students' e-learning platform usability (β=0.42, t=8.99.p<.001), therefore the hypothesis was accepted.

4.4 Normality Tests

The results of the value inflation factor (VIF) shows no evidence of multicollinearity in the dataset as they had all values less than 10. Figure 1 shows the outcome of a normality test with 433 respondents. All data points are dispersed around the line in a typical Q–Q plot. There are only 5 data points because when there are multiple cases with identical values they map to the same point on the plot. This demonstrates that the data complied with the assumption of normality. This result is also supported by P-P plot as shown in Figure 2.

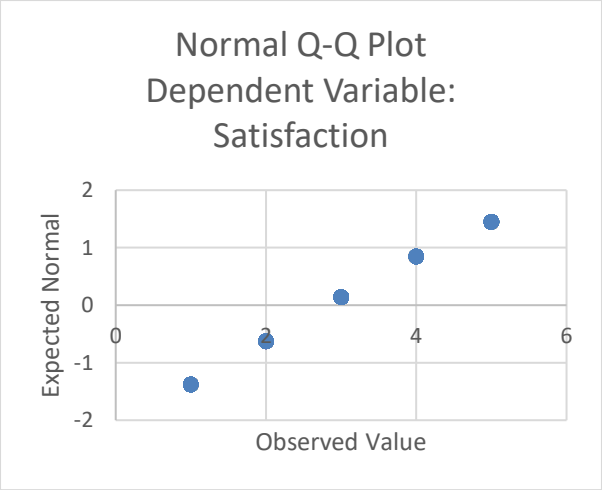

Fig 1: Q-Q plot on students' satisfaction

The P-P Plot confirmed the results of the Q-Q plot meaning the dataset complied with the assumption of normality.

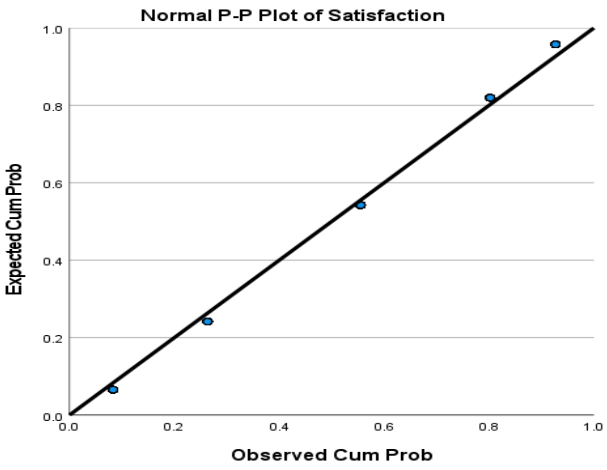

Fig 2: P-P plot on students' satisfaction

The data is roughly normally distributed, balanced around the center, resembling a bell curve. The standard deviation of 0.994 was achieved meaning that the data values are closely clustered around the mean of 433 respondents.

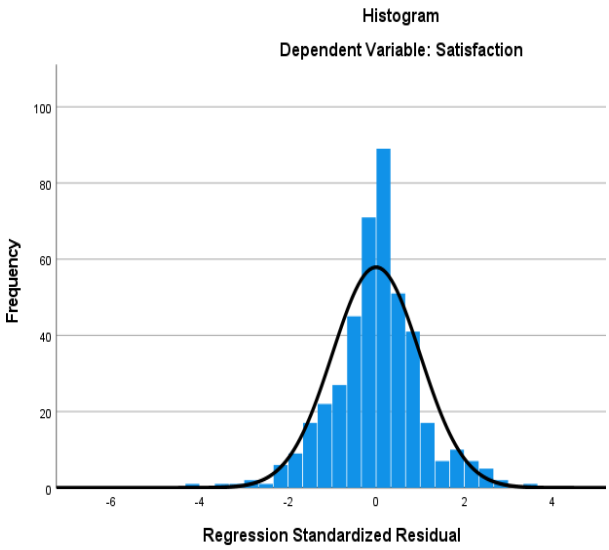

Fig 3: Histogram on students' satisfaction

4.5 Multiple Linear Regression Model

The assumptions were validated and hence a multiple linear regression model equations was developed based on the regression coefficients as listed in Table 7.

Students' Satisfaction = -0.748 + (0.061) Appropriateness Recognizability + (0.024) Learnability + (0.016) + (0.106) User Error Protection + (0.125) User Interface

When the level of each variable increases by 1%, the satisfaction of students using the e-learning platform increases by 6.1% due to appropriateness recognizability, 2.4% as a result of learnability, 10.6% due to user error protection and lastly 12.5% by user interface.

Table 7. Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.748	.170		-4.397	.000		
	AppRecS	.061	.013	.230	4.734	.000	.351	2.849
	LearnS	.024	.009	.091	2.526	.012	.636	1.572
	OperS	.016	.013	.052	1.198	.232	.433	2.308
	UserErrorS	.106	.023	.178	4.589	.000	.550	1.819
	UserIntS	.125	.014	.421	8.999	.000	.377	2.651

5. DISCUSSION

As shown in Table 1, the findings from the descriptive statistics show that the respondents included all gender, all years of study demonstrating inclusiveness of participation in the survey.

Further the study shows that most of the respondents had good level of proficiency in working with the e-learning software, meaning their level of confidence in responding to the questionnaire was acceptable and that the results are believable. The regression coefficient of user engagement was at 0.125 and had the highest positive influence on students' satisfaction with the e-learning software, meaning that it increases students' satisfaction with 12.5%, followed by user error protection at 0.106, then appropriateness recognizability at 0.061, followed by learnability at 0.024. Appropriateness recognizability, user error protection and user engagement had a p-value<0.001,indicating highly strong statistical evidence to reject the null hypothesis, while learnability variable had a p value =.012 which is less than 0.05 indicating the result is statistically significant, hence evidence against the null hypothesis. However the operability variable had p value =0.232 signifying likely event due to random chance, hence it's not significant in this study and was rejected.

The results show that universities should build more engaging and user-friendly platforms to enhance students' usability of e-learning platform. Further, they should ensure that the platforms prevents students against making errors while using the e-learning platforms. This study provides a decision making tool on what the institutions should prioritize while building e-learning software's to achieve the mission of online teaching and learning.

6. CONCLUSION

The findings of this study provide insights into the influence of appropriateness recognizability, learnability, operability, user error protection and user engagement to students' satisfaction with e-learning software usability. The respondents were 433 of whom male were the majority at 64.2%, female at 35.1% and others at 0.69%. The findings showed that e-learning satisfaction among students on e-learning platform usability was positively influenced by appropriateness recognizability, learnability, user error protection and user engagement. Operability was dropped as it was found that it has no significant influence on students' satisfaction while engaging with e-learning software. The study carried out correlation component matrix, normality test, and multicollinearity test, to ensure the accuracy and dependability of the data.

The questionnaire employed in this study was found to be appropriate and passed reliability for use in current and future research based on the Cronbach alpha values of above 0.7. To gain a deeper understanding on e-learning software usability there should be consideration of engaging lecturers in the future studies.

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