Comparative Analysis of Usability of Online Classrooms using different scoring techniques

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APPROVAL

This thesis titled on "Comparative Analysis of Usability of Online Classrooms using different scoring techniques", submitted by Mahmuda Akter Lubna, ID: 181-35-2503 to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Software Engineering and approval as to its style and contents.

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It hereby declares that this thesis has been done by us under the supervision of **Ms. Syeda Sumbul Hossain**, Lecturer, Department of Software Engineering, Daffodil International University. It is also declared that neither this thesis nor any part of this has been submitted elsewhere for award of any degree.

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Abstract

Nowadays in this modern technology world, smart phone is easily available in everyone's house. In 2020 we all are facing a critical situation because of covid-19 virus. As the global coronavirus outbreak spreads, many governments are implementing non-therapeutic preventive measures such as travel bans, remote office operations, country lockdown, and, most crucially, social separation. Because of lockdown our education system also gets closed. Countries have implemented remote education programs to keep the world's student educated. In Bangladesh, students are using many systems to continue their education. We are collected data through a survey to check which system student are using mostly are they usable or not to improve their quality. Students' goal is to check relevant information about e-learning that is satisfactory to them, as well as to ensure the quality of the app, identify areas where it is lacking, and provide recommendations for future action using the SUS, SUPR-Q, UMUX, UMUX_LITE approach. In this survey we are collecting data from reputed daffodil international university. They are mostly using BLC, Google classroom. Despite significant deficiencies, some e-learning apps receive high application scale ratings. Those that recognized tourism apps had their usability examined and reported that they did not meet the SUS benchmark score, therefore they were given suggestions on how to improve them. The goal of this research is to figure out how these apps become top-rated despite poor usability comments. Researchers will learn about the lack of e-learning apps/system that was discovered using SUS, SUPR-Q, UMUX, UMUX_LITE and what steps future researchers in the sector should take.

Keyword:

Usability testing, E-learning, SUS, SUPR-Q, UMUX, UMUX_LITE,

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CHAPTER 1: INTRODUCTION

1.1 Background

In times of crisis, in-person learning may be unsafe or impossible. In response to the COVID-19 pandemic, schools and classrooms nationwide have shut down indefinitely. Although many academic units have also started blended learning, still a lot of them are stuck with old procedures. The World Health Organization declared it as a pandemic. This situation challenged the education system across the world and forced educators to shift to an online mode of teaching overnight. Many academic institutions that were earlier reluctant to change their traditional pedagogical approach had no option but to shift entirely to0 online teaching–learning.

1.2 Problem outline

Over 150 countries have been touched by the COVID-19 epidemic, which has affected 1.6 billion students. As a result, several countries have established some type of distance education. During the early stages of COVID-19, the education reaction centered on creating remote learning system. To ensure that students receive uninterrupted education, the Ministry of Education (MoE) has encouraged teachers to undertake online lessons, and in addition, the concerned authority has begun telecasting distance learning programs for students in schools and universities. Online education has primarily been concentrated on the country's higher education levels. There are 46 public and 105 private universities in Bangladesh that provide higher education to students. Aside from that, around 1500 colleges associated with Bangladesh's national university offer a diverse range of higher education courses and programs. In these extraordinary days, online teaching and learning is the only method to address the global academic crisis caused by the coronavirus pandemic. A reputed varsity using mostly these two system BLC and google classroom for education.

BLC: https://elearn.daffodilvarsity.edu.bd/

Google classroom: https://classroom.google.com/

1.3 Motivation

- Want to analyze the usability for online learning system in Bangladesh deeply as there are many platforms created now a days.

- Also want to find best online learning system using usability testing.

- Provide some favorable suggestion regarding this issue.

  Hopefully, this research would be helpful for the varsity authority to take the future steps.

1.4 Elements of our study

We studied about SUS, SUPR-Q, UMUX, UMUX_LITE questionnaire approach to check the usability score of e-learning system such as BLC, google classroom.

1.5 Interest behind our research

To discover the e-learning getting to know improved scholar perceptions, conversation, nice of training, crucial thinking, self-mastering, and also want to know that the impact of instructor's responsibility and college students' pleasure in higher education.

1.6 Research question

Question: What is your main reason for using the system/app?

1.7 Research Objective

To determine the student's satisfaction with the online learning system so that education authority can work on their learning system wisely.

1.8 Research scope

Specifically, in this study, we looked into and compared the Usability of

Bangladesh's online education system. Students will be the ones to tell us which system they use, with the majority of students utilizing BLC and Goggle Classroom. Which have a high rating We notice several flaws in those apps, but they receive high ratings. These apps aren't up to par because they can't meet the genuine needs of users. There was not very well functioned after we completed end user research.

As a result, the goal of this study is to help varsity to improve the ability to integrate a variety of features, clear information, and good user connectivity. These thesis studies suggest that this eLearning capabilities be improved and made more usable.

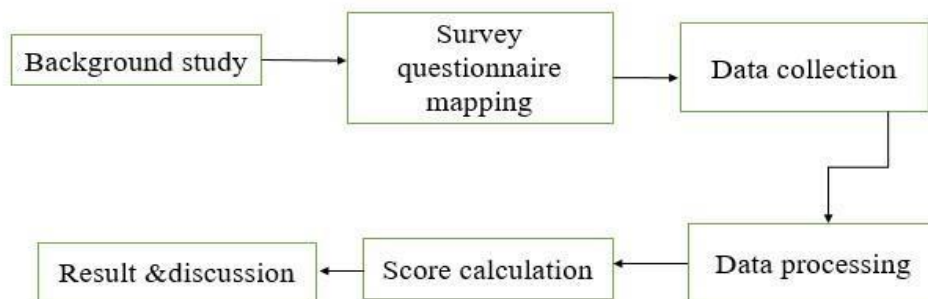## 1.9 Research design

Figure 1: Research Process Model

This research has been divided into 6 segments. In the very first part of this research is background study.in background study we are looking the root behind this problem. 2nd segment will show the survey questionnaire technique such as SUS, SUPR_Q, UMUX, and UMUX_LITE. Then we are collecting data through a survey form. After collecting data

manually, we will process the data and find out the score of these data. after finding the score we will discuss the result.

1.10 Thesis organization

This thesis documentation has five chapter.

Chapter 1 is basically an introduction. In this chapter there are brief discussion about the root of this problem. Where it has clarified the purpose of this study and why it is necessary. Then, based on the research scope, present a procedure to accomplish this research, including certain research questions and research objects defined.

Chapter 2 is literature review. In this part it shown researcher point of view towards online learning system. Here also describe briefly the variables of usability and last but not least the summery of literature review

Chapter 3 is about research methodology. collecting data procedure also the way we preprocess the data is shown clearly. we collect data through survey and preprocess it manually. here we used four questionnaire method which are SUS, SUPR-Q, UMUX, UMUX-LITE and make a result of this questionnaire.

In the chapter no 4, Discussion of the survey's findings and their implications. When all of the data has been analyzed, create a final result based on the research goal and verify the final destination before archiving.

In Chapter 5, discuss the research's future recommendation and conclusion.
What is the most important result we've obtained, and what will be the next step in solving this study problem?

Provide an appropriate solution to the problem or make a decision on how to construct an excellent and user-friendly tourism and travel-related mobile app.

CHAPTER 2: LITERATURE REVIEW

2.1 Literature review

Bangladeshi educational institutions, such as that in other nations, have been closed down where social distance is an issue. To ensure that students receive constant education, the Ministry of Education (MoE) has encouraged teachers to undertake online lessons, and in addition, the regulatory authority has begun telecasting distance learning services for students in schools and universities. Online education has primarily been concentrated on the country's higher education levels. There are 46 public and 105 private universities in Bangladesh that provide higher education to students. Aside from that, around 1500 colleges associated with Bangladesh's national university offer a diverse range of higher education courses and programs. In these extraordinary days, online teaching and learning is the only method to address the global academic crisis caused by the coronavirus outbreak. (Md. Alaul Alam,2020).

Universities are creating e-learning as a method of learning in order to attain more effective and efficient learning objectives. The construction of an e-learning system must be in line with the institution's goals, as well as the wants and uses of both teachers/lecturers and students. Students are one of the key players in the success of e-learning implementation. Furthermore, lecturers play a significant role in the adoption of e-learning systems as instructors. (Didi Supriyadi*1, S. Thya Safitri2, Daniel Yeri Kristiyanto3 2020).

The adoption and effectiveness of e-learning systems are heavily influenced by usability. If the usability of the system is inadequate, students will spend time becoming familiar with the system's functions rather than learning. The usability of e-learning systems is a challenge for developers and has been found to have a significant impact on student performance (Khaled Abuhlfaia, Ed De Quincey 2019).

One of the key issues for e-learning system developers is ensuring usability. According to Norman, a formative product should be interactive and provide feedback, as well as have clear goals to reflect a pleasant experience. Also motivate by conveying a constant sense of difficulty. Consequently, give appropriate resources to avoid any distractions from the learning process Moreover, it should be pedagogically suitable, though attractive and engaging (C. Ardito,

M. De Marsico, R. Lanzilotti, S. Levialdi, T. Roselli, V. Rossano, M. Tersigni ,2004)

In the field of human–computer interaction, assessing website user satisfaction is a fascinating topic (HCI). Since the late 1980s, practitioners have used standardized usability questionnaires to assess user satisfaction, one of the three major parts of usability (ISO, 1998). Satisfaction analysis is an important method of gathering information more about user experience (UX), described as "person's views and expectations resulting from the use and/or anticipated use of a product" before or after the release of a product. (Simone Borsci,Stefano Federic, Silvia Bacci, Francesco Bartolucci,2015)

The SUS's ten items were created to form a uni - dimensional measure of perceived usability (Brooke,1996). The standard section of the questionnaire contains a mix of positively and negatively tone items, with odd-numbered items being positive and even-numbered items being negative. Participants rated the strength of their memorandum of understanding with each item on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) (strongly agree). To calculate the overall SUS score, (a) every item is converted to a 0–4 scale, with higher numbers indicating more perception usability, (b) this same converted scores are added, and (c) the total is multiplied by 2.5. This procedure generates scores ranging from 0 to 100.

Even though the SUS is a fast and easy scale, practitioners may need to use reliable scale items that are even shorter than the SUS in order to save time, money, and user effort. "When standardized usability measurement is part of a larger post-study or online questionnaire, this need is most pressing" (Lewis,2014, p. 676). As a result, two additional scales have recently been suggested as shorter proxy variables of the SUS: the Usability Metric for User Experience, a four-item tool developed and validated by Finstad (2010,2013), and the UMUX-LITE, which consists of only the UMUX's two positive-tone questions (Lewis et al.,2013, this issue). The UMUX items are scored on a 7-point scale, with 1 being strongly disagree and 7 being strongly agree (strongly agree)

The Standardized User Experience Percentile Rank Questionnaire (SUPR-Q) is a set of 8 standardized questions. The SUPR-Q contains four factors: usability, trust, appearance, and loyalty. (Jeff Sauro,2015)

2.2Variables of usability

Usability measure of how easy it is for people to use systems successfully and without stumbling blocks. Learnability, efficiency, memorability, errors, and satisfaction are the five characteristics of usability, according to Nielsen (1993).
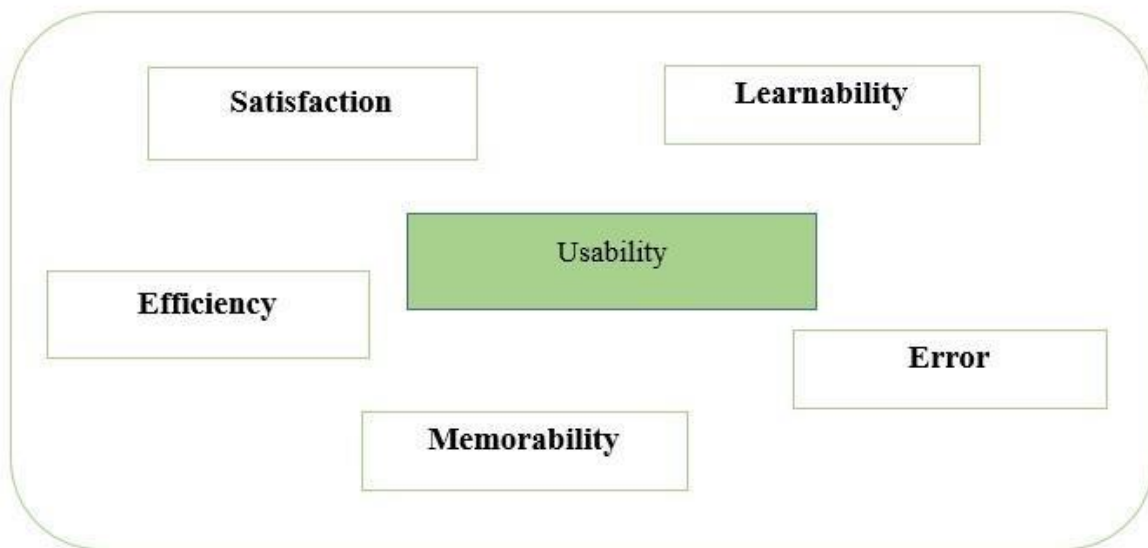
Figure 2: Usability criteria for E-learning system.

Satisfaction is when users are content and delighted with how systems work

 Efficiency is the metric by which the completeness and precision with which users achieve their goals is compared to the resources required to do so

Memorability refers to how well users remember a system after not using it for a long period of time and whether they can use it again without difficulty.

Error refers to the frequency of errors users encounter when using a system and if these errors are easy to recover from.

Learnability refers to how simple it is for a user to utilize software and whether or not they can quickly learn how to use it. In addition, whether or not they can solve an issue the first time they use a system.

2.3 Summery of literature review

In this research, the summery of the literature is that e-learning system is very new for country like Bangladesh. when because of covid-19 our educational system has been shut down totally as social distance matters everywhere then Bangladesh started their online learning process mostly in higher education. As it's very new system for a country like Bangladesh. People still trying to accept that fact they can't go and join their classes physically. All they can do is adjusting themselves for elearning system. Students are accepting that fact very nicely. But still there are some lacking in those system. Students can't connect with the system properly because poor information, also interface are not that great. Rating is not that as it was expected.

CHAPTER 3: METHODOLOGY

3.1 Quantitative research

Quantitative research is the procedure of accumulating and studying numerical records. it can be used to find patterns and averages, make predictions, take a look at causal relationships, and generalize outcomes to wider populations.

Quantitative research is widely used in the natural and social sciences: biology, chemistry, psychology, economics, sociology, marketing, etc.

Advantage of quantitative research

1. Calculate population estimates at a big scale.
2. Describes the wide range of behaviors that people engage in.
3. Take measurements that can be reduced to statistics.
4. Enables statistical comparisons between different groups.
5. Is precise, determinate, and well-balanced.
6. Assesses the frequency of occurrences, activities, and trends, among other things. 7. Be able to answer inquiries like "How many?" and "How frequently?"

In a nutshell, quantitative research aims to measure social reality.

Quantitative research and/or queries are used to look for quantities in anything and to conduct numerical research. Quantitative researchers see the world as objectively defined reality, therefore tight guidelines in the data collecting and analysis process are crucial.

Quantitative research is divided into several categories. It can, for example, be classified as,

- **Descriptive studies**: You honestly are seeking for an average precis of your take a look at variables.
- **Correlational studies:** You investigate relationships between your look at variables.
- **Experimental research:** You systematically examine whether or not there may be a motive a defect courting between variables.

3.2 survey methodology

Our study based on recent data of e-learning from a reputed varsity that has 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Each candidate goes through this survey which has 33 question and 4 specific questionnaire technique. This survey will take approx. 10 minute to accomplish. In these covid situation either by means of force or no longer we continued our education in online. This survey divided into two parts in the very first part it has e-mail, age, gender ratio. In last part have questions about e-learning system. Each participant goes through the age between these four ranges (<20, 20- 25, 25-30, 30<). First thing first they have to go through the e-learning website (BLC) and login their system. Also enroll the courses they want to do or they have downloaded the app from goggle play store (goggle classroom). without using this system, they can't rate this app/system. We decided to collect data through a reputed varsity so that we can get that actual data. As they are using this system, they can rate these app undoubtedly.

Survey link: https://forms.gle/fR4ebzB11gBVPj3z7

3.3 Data description:
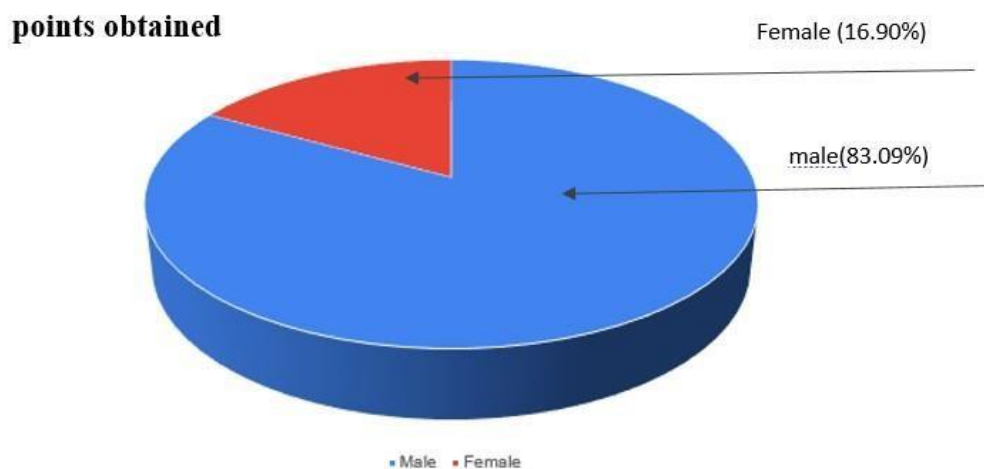
Figure 3: Gender ratio

Participants were able to complete all tasks during E-learning system/application usability testing, but usability issues were recognized by calculating SUS, SUPR-Q, UMUX, UMUX-LITE mean score as well as standard deviation against these SUS, SUPR-Q, UMUX, UMUX-LITE questions, whether the data was collected from general users who used an E-learning system from a reputable varsity. Male and female users were also present.

Out of 278 participants, there were 231 females and males 47. Males made up 83.09%percent of the population, while females made up 16.90%percent.

This information could be more useful in future studies.

Points obtained

26-30(1.07%)

20-25(98.92%)

Age group ■20-25 ■26-30 ■31-35 ■41-45 ■>50
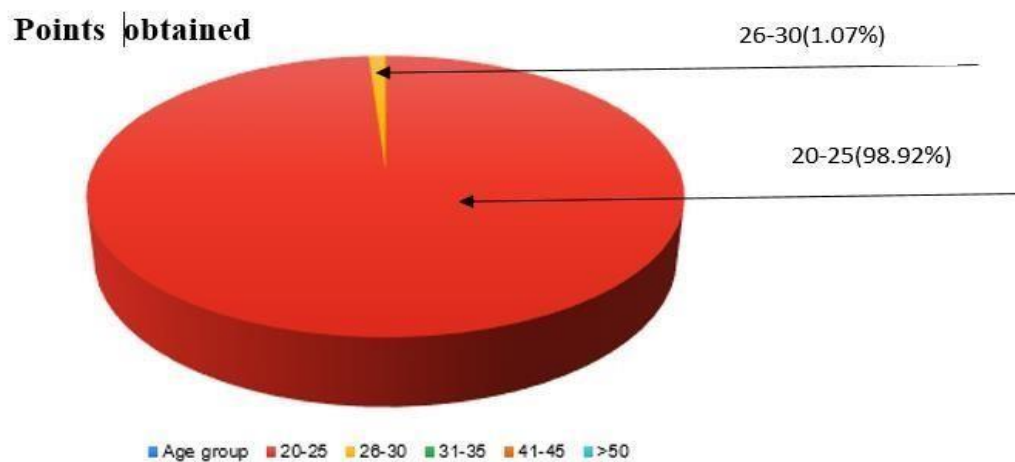
Figure 4: Age ratio

Figure 3 depicts five age criteria for E-learning program usability testing.

The findings of the facilitated discussion were used to make the best recommendations for future features to seriously consider. Depending on the outcomes of the usability debate, different

usability engineers advised different things. Between 100 users, age criteria were discussed. They each provided their responses on their own.

Each age group has a percentage of 20-25 (98.92%), 26-30(1.07%), 30-35(0%)), 4145(0%),>50(0%)

Points | obtained
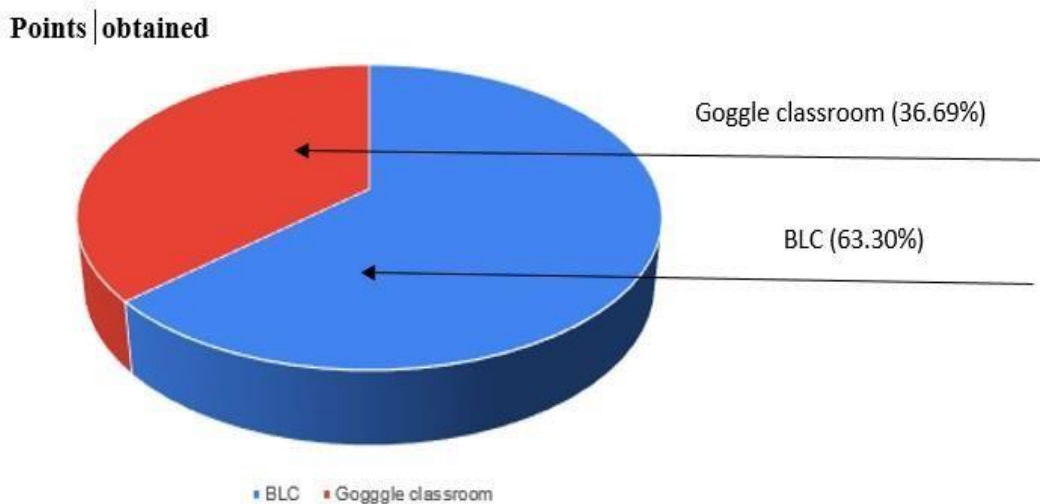
Figure 4: Age ratio

In figure 4, we can see most of the people using two E-learning system which are BLC and goggle classroom from a reputed varsity. Among 278 people 63.309 % of using BLC e-learning system and 36.69% people using Google classroom app.

3.4 Data preprocessing system

The initial stage is to collect data. Starting with research questions, Data generated during user research and usability testing is becoming a more typical activity for UX practitioners to collect, sort, and comprehend. Data is sorted by manually whether it's null value or incorrect value.

specifically, when any variable value is null, we fill it with a proper right value. If some value written in incorrect way, then we also correct it manually

3.5 Research methodology

Convert the scale to a number.

Strongly Disagree=1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5 were the scale values.

3.5.1 System usability scale (SUS) Method

For reading statistics, the "SUS" is used. It is a 10 questions Likert Scale in which - each question rated from 1 to five to gauge a person's satisfaction on different things. we are able to examine each solution on its own, like a traditional survey. After calculating a user's solutions, the scale installation a score. Clearly that offers us a good expertise of ways programs examines to a mean throughout the industries. System Usability Scale (SUS) score want to be calculated first for each of the respondents. The subsequent steps want to be taken into consideration for calculating SUS rating.

Step1: calculation

The calculation's logic is simple to understand. The total score is 100, with each question carrying a ten-point weighting.

X = Sum of the points for all odd-numbered questions – 5

$Y = 25$ – Sum of the points for all even-numbered questions SUS Score = $(X + Y)$ x 2.5

The user can determine which level of agreement the statement has. As a result, the user responds to each question with a number between 1 and 5. After then, the person evaluating the data must apply a simple formula to the number. You must deduct 1 from the odd statements. So, questions 1, 3, 5, 7, and 9 are all correct. For instance, if statement 5 is assessed as 3, 3 –1 = 2, you will compute 2. You must remove 5 from the even statements, 2, 4, 6, 8, and 10. Let's pretend the fourth

statement's value was 3. Then we'll compute 2 because 5–3=2. Finally, add all of these numbers together and multiply by 2.5.

As odd-numbered questions are all in a positive tone, if the response is strongly agreed, we are able to need to present the ones the maximum point which is 10 for every question. If the reaction is strongly to disagree, we are able to need to give the ones the minimum point which is zero. With the aid of subtracting 1 from every one of the unusual-numbered questions, we make certain that minimal is zero. And then, with the aid of multiplying by means of 2.5, we make sure that the maximum is 10 for each of the questions.

Vice versa, for the even-numbered questions in a negative tone, if the response is strongly agreed, we will need to offer them the minimum point that's zero for each question. If the reaction is strongly to disagree, we can need to offer them the minimal point that is 0. As such, by using subtracting the factors of every question from five, we make certain that the minimum is zero. After which, through multiplying by means of 2.5, we ensure that the most are 10 for each of the questions.

Step2: System Usability Scale (SUS) Score:

Your usability performance in terms of effectiveness, efficiency, and overall ease of use will be determined by your SUS score. Despite the fact that each response is given a score on a range of 0 to 100. SUS has an average score of 68. Simply expressed, a score of 68 will place you in the 50th percentile. The following is a common guideline for interpreting the SUS score:

>90.1 'best imaginable"

>85.5 'excellent'

68 – 80.3 means Good,

68 means Okay,

51-68 means Poor, and

<51 means Awful.

SUS Score	Grade	Adjective rating
>80.3	A	Excellent
68-80.3	B	Good
68=	C	Okay
51-68	D	Poor
<51	E	Awful

3.5.2 Standardized User Experience Percentile Rank Questionnaire (SUPR_Q) Method

On the other hand, the "SUPR_Q" has 8 questions Likert Scale in which - each question rated from 1 to five to gauge a person's satisfaction on different things. The SUPR-Q questionnaire is made up of eight questions that measure four different areas, with a few exceptions for e-commerce sites. First one is usability secondly credibility thirdly Appearance fourthly Loyalty

Step 1: calculation:

There are two scores that are important when reviewing the results of the SUPR-Q: the percentile score, and the raw SUPR-Q and component scores.

The SUPR-first Q's seven questions are graded on a five-point Likert scale ranging from Strongly Disagree to Strongly Agree. On a scale of 0-10, the usual NPS question "How likely are you to recommend...?" is assessed.

$$\text{Raw SUPR\_Q score} = \frac{Q1+Q2+Q3+Q4+Q5+Q6+Q7+(1/2*Q8)}{8}$$

Average your scores for each category to get the raw component scores. Divide your score for the NPS question by 2 to convert to the same Likert scale for the loyalty category before calculating the average. Simply take the average of the component scores to get your raw SUPR-Q score. Each category will receive a score of 1-5, as well as an overall SUPR-Q score of 1-5.

Step2: Percentile Rank Score:

The percentile rank score compares your raw scores to those of websites listed in the SUPR-Q database. This is calculated on a scale of 0-100, with 50 being the average.

>50 'good'

50= 'average'

<35 'below average'

SUPR_Q score	Grade	Adjective rating
>50	A	good
50=	B	average
<35	C	below average

3.5.3 Usability Metric for User Experience (UMUX) Method:

Step1: Calculation

- Odd items are scored as [user score - 1]. Even items are scored as [7 - user score].
- Add up these differences and divide the sum by 24 (the highest possible score).
- Multiply your quotient by 100.
- Average your results across users.

If you're using a 5-point Likert scale, you will only have to make a few adjustments to the steps above. Even items should be scored as [5 - user score] and you'll have to divide the sum by 16 instead of 24

UMUX = ((UMUX Item1-1) + (5-UMUX Item2) + (UMUX Item3-1) +(5-UMUX Item4))/24*100

3.5.4 Usability Metric for User Experience (UMUX) Method:

Step 1: calculation

- Items are scored by subtracting one from the user response: [user score - 1]. Add the two adjusted scores and divide the sum by 12 (the highest possible score).
- Multiply your quotient by 100.
- Average your results across users.

If you're using a 5-point Likert scale, you only have to make one change to the steps above: divide the sum by 8 instead of 12.

UMUX-LITE $= 0.65$ *((UMUX-Lite Item1 + UMUX-Lite Item2 $- 2$) $*$ (100/12)) $+22.9$.

3.6 Demographic information

Table 1 shows the general facts from three surveys in detail. Males accounted for 82 of the 278 survey participants, while females accounted for 47. According to survey students are mostly using two system. from 278 people, there are maximum number of people using BLC which is 176. On The other hand, 102 people are using goggle classroom.

Also, age range was 20-25, 26-30, 30-35, 41-45, >50. Here maximum people are from 20-25 age group. AS we know maximum people from varsity are at this age group. There are 3% of people who are from 26-30 age group. The other age group like 30-35, 41-45, >50, there are 0% people using e-learning from those age group. Actually, it was accepted as maximum people who are completing this survey are varsity students.

Table 1: Demographic information

Gender	Male=231 Female=47
Age	20-25=275 26-30=3 30-35=0 41-45=0 >50=0
E-learning system	BLC=176 Goggle classroom=102

3.7 Questionnaire design

Information become amassed the use of an established questionnaire. The questionnaire consisted of parts: the primary component focused on demographic questions like age, gender, and enjoy of the usage of tourism software. The second part centered on measurement objects primarily based on pride and revisit intention. The SUS survey protected requests for demographic facts from customers: their age, their education level, their gender by way of the usage of the survey software. The survey then provided the subsequent 10 fashionable statements with 5 response alternatives (5-factor Likert scales with anchors for strongly agree and strongly disagree).

Table 2: SUS Questionnaire

Question (Serial number)	questionnaire	Question adaption
Q1	I think that I would like to use this system/app frequently.	Jeff sauro,2015
Q2	I found the system unnecessarily complex	
Q3	I thought the system was easy to use.	
Q4	I think that I would need the support of a technical person to be able to use this system.	
Q5	I found the various functions in this system were well integrated.	
Q6	I thought there was too much inconsistency in this system.	
Q7	I would imagine that most people would learn to use this system very quickly.	
Q8	I found the system very cumbersome to use	
Q9	I felt very confident using the system	
Q10	I needed to learn a lot of things before I could get going with this system.	

Table 3: SUPR_Q Questionnaire

Question (Serial number)	questionnaire	Question adaption
Q1	I thought the system was easy to use.	john brooke ,1986
Q2	It is easy to navigate within the website.	
Q3	I feel comfortable purchasing from the website.	
Q4	I feel confident conducting business on the website	
Q5	How likely are you to recommend this website to a friend or colleague?	
Q6	The website has a clean and simple presentation.	
Q7	I will definitely use this app many times in the future.	
Q8	I find the app to be attractive	

Table 4: UMUX Questionnaire

Question (serial number)	questionnaire	Question adaption
Q1	I thought the system was easy to use.	Jim lewis,2013
Q2	[These systems] capabilities meet my requirements.	
Q3	Using [this system] is a frustrating experience.	
Q4	I have to spend too much time correcting things with [this system].	

Table 5: UMUX_LITE Questionnaire

Question (Serial number)	Questionnaire	Question adaption
Q1	I thought the system was easy to use.	Jim lewis,2013
Q2	[These systems] capabilities meet my requirements.	

3.8 Data collection procedure

A total of 278 people took part in the survey. Participants came from all around Bangladesh. The very first data was collected in august of 2021. In an online survey, participants were asked to name their e-learning system which they are used as we all know we all are getting familiar with online learning because of covid situation and answer 33 questions for this particular system that they mentioned. Except for the topic "How likely are you to recommend the mobile app to a friend," which utilized an 11-point scale, participants assessed their level of agreement to each item on a 5-point Likert scale (strongly disagree = 1 to strongly agree = 5). (Reichheld, 2003).

For BLC,

SUS score: 57.31

SUPR_Q raw score: 3.82

UMUX: 51.84

UMUX-LITE: 63.57

Table 6: Score for BLC

Matrix	Score
SUS	57.31
SUPR_Q	3.82
UMUX	51.84
UMUX_LITE	63.57

Figure 5: Score chart for BLC

Table 7: Overall System Usability Scale (SUS) score chart of BLC

Question (Serial number)	questionnaire	Mean	Standard deviation
Q1	I think that I would like to use this system/app frequently.	3.6704 54545	1.055289706
Q2	I found the system unnecessarily complex	2.9318 18182	2.931430785
Q3	I thought the system was easy to use.	3.6818 18182	0.997659599
Q4	I think that I would need the support of a technical person to be able to use this system.	3.0056 81818	1.324482256
Q5	I found the various functions in this system were well integrated.	3.5113 63636	1.014121077
Q6	I thought there was too much inconsistency in this system.	2.9431 81818	0.983962305
Q7	I would imagine that most people would learn to use this system very quickly.	3.4261 36364	1.050278256
Q8	I found the system very cumbersome to use	2.8409 09091	1.099468585
Q9	I felt very confident using the system	3.3522 72727	1.151791377
Q10	I needed to learn a lot of things before I could get going with this system.	2.9943 18182	1.207108276

Table 8: Overall SUPR_Q score chart of BLC

Question (Serial number)	questionnaire	Mean	Standard deviation
Q1	I thought the system was easy to use.	3.681818182	0.997659599
Q2	It is easy to navigate within the website.	3.0625	1.037338628
Q3	I feel comfortable purchasing from the website.	3.517045455	1.161154262
Q4	I feel confident conducting business on the website	3.352272727	1.151791377
Q5	How likely are you to recommend this website to a friend or colleague?	6.31372549	2.894105967
Q6	The website has a clean and simple presentation.	3.3125	1.194780315
Q7	I will definitely use this app many times in the future.	3.375	1.114194135
Q8	I find the app to be attractive	3.261363636	1.156292777

Table 9: Overall UMUX score chart of BLC

Question (Serial number)	questionnaire	Mean	Standard deviation
Q1	I thought the system was easy to use.	3.681818182	0.997659599
Q2	[These systems] capabiliti es meet my requirements.	3.323863636	1.142778001
Q3	Using [this system] is a frustrating experience.	2.988636364	1.242065728
Q4	I have to spend too much time correcting things with [this system].	3.051136364	1.201284486

Table 10: Overall UMUX-LITE score chart of BLC

Question (Serial number)	questionnaire	Mean	Standard deviation
Q1	I thought the system was easy to use.	3.681818182	0.997659599
Q2	[These systems] capabiliti es meet requirements. my	3.323863636	1.142778001

For Google classroom,

SUS score: 52.08

SUPR_Q raw score: 3.58

UMUX: 50.30

UMUX_LITE: 58.90

Table 11: Score calculation for Google classroom

Matrix	Score
SUS	52.08
SUPR_Q	3.58
UMUX	50.30
UMUX_LITE	58.90

Figure 5: Score chart for Google classroom

Table 12: Overall System Usability Scale (SUS) score chart of Google classroom

Question (Serial number)	questionnaire	Mean	Standard deviation
Q1	I think that I would like to use this system/app frequently.	3.421568627	1.181007076
Q2	I found the system unnecessarily complex	3.107843137	1.151037954
Q3	I thought the system was easy to use.	3.37254902	1.142531223
Q4	I think that I would need the support of a technical person to be able to use this system.	3.147058824	1.395871273
Q5	I found the various functions in this system were well integrated.	3.294117647	1.223436446
Q6	I thought there was too much inconsistency in this system.	3.058823529	1.079269366
Q7	I would imagine that most people would learn to use this system very quickly.	3.166666667	1.194735426
Q8	I found the system very cumbersome to use	3.205882353	1.171765489
Q9	I felt very confident using the system	2.931372549	1.268505037

Q10	I needed to learn a lot of things before I could get going with this system.	2.833333333	1.320690888

Table 13: Overall SUPR_Q score chart of Google classroom

Question (Serial number)	questionnaire	Mean	Standard deviation
Q1	I thought the system was easy to use.	3.37254902	1.142531223
Q2	It is easy to navigate within the website.	3.137254902	1.30527654
Q3	I feel comfortable purchasing from the website.	3.490196078	1.096755774
Q4	I feel confident conducting business on the website	2.931372549	1.268505037
Q5	How likely are you to recommend this website to a friend or colleague?	6.31372549	2.894105967
Q6	The website has a clean and simple presentation.	3.225490196	1.385260906
Q7	I will definitely use this app many times in the future.	3.196078431	1.290016622
Q8	I find the app to be attractive	3.078431373	1.264020573

Table 14: Overall UMUX score chart of Google classroom

Question (Serial number)	questionnaire	Mean	Standard deviation
Q1	I thought the system was easy to use.	3.37254902	1.142531223
Q2	[These systems] capabilities meet my requirements.	3.058823529	1.265095225
Q3	Using [this system] is a frustrating experience.	2.901960784	1.293623386
Q4	I have to spend too much time correcting things with [this system].	3.166666667	1.298005579

Table 15: Overall UMUX_LITE score chart of Google classroom

Question (Serial number)	questionnaire	Mean	Standard deviation
Q1	I thought the system was easy to use.	3.37254902	1.142531223
Q2	[These systems] capabilities meet my requirements.	3.058823529	1.265095225

CHAPTER 4: RESULT & DISCUSSION

4.1 Result & discussion

Every participant was required to submit their opinion of which e-learning system they are using and their opinion about the particular system through survey from online which was made by us. Basically, Students are the one who are completing the form from a very reputed varsity. Every participant was completing each &every question. some of the participant had to leave early because of this some values were null also some of participant wrote few information incorrectly. Those null value or wrong information were corrected manually. These surveys have two parts. In first part, there are demographic question such as age, gender, designation, average studying hour. in second part of the survey there are 33 questions where are five questionnaire technique that are SUS, SUPR_Q, SUPR_QM, UMUX, UMUX-LITE.

The SUS score of BLC is 57.31, indicating a poor SUS score and a grade of 'D.' The mean SUS score is 3.681818182, while the lowest SUS score is 2.840909091. The highest standard deviation SUS score is 2.931430785 while the lowest mean SUS score is 0.997659599. BLC, on the other hand, SUPR-Q raw score is 3.82. The highest SUPR-Q mean score is 6.31372549 and the lowest SUPR-Q score is 3.0625. The highest SUPR-Q standard deviation score is 2.894105967 and the lowest SUPR-Q score is 0.997659599. Similarly, the UMUX score is 51.84. The highest mean UMUX score is 3.681818182 while the lowest UMUX score is 2.988636364. The highest UMUX standard deviation score is 1.242065728, while the lowest UMUX mean score is 0.997659599. Consequently UMUX-LIT score is 50.01. The highest mean score is 3.681818182. The lowest UMUX-LITE mean is 3.323863636. 1.24 is the highest standard deviation. And the standard deviation with the lowest value is 0.997659599.

Alternatively, SUS score is 52.08 in the google classroom. Which shows poor usability and SUS grade is 'D' The mean SUS score is 3.37254902 and the lowest SUS score is 2.833333333. The highest standard deviation SUS score is 1.395871273 while the lowest mean SUS score is 1.079269366. Likewise, SUPR-Q is 3.58. Which means usability by user is below average. The highest mean SUPR-Q score is 6.31372549 while the lowest SUPR-Q score is 2.931372549. The highest SUPR-Q standard deviation score is 2.894105967 while the lowest SUPR-Q mean score is

1.096755774. Similarly, the UMUX score is 50.30. The highest mean UMUX score is 3.37254902 while the lowest UMUX score is 2.901960784. The highest standard deviation UMUX score is

1.298 while the lowest UMUX score is 1.142531223. On the other hand, The UMUX-LITE is 46.90. Therefore, this score also indicates the awful usability testing. The mean UMUX LITE score is 3.37254902 while the lowest UMUX LITE score is 3.058823529. The highest UMUX LITE standard deviation score is 1.265095225, and the lowest UMUX-LITE score is 1.142531223.

Both of the e-learning platform have poor usability by user. the user of these system is not satisfied with this system. This system should have better interface. The function should be more organized so that student can feel comfortable while using this system. Also, this learning system can be more consistent.

Table 16: Standard table for system usability scale (SUS) score

SUS Score	Grade	Adjective rating
>80.3	A	Excellent
68-80.3	B	Good
68=	C	Okay
51-68	D	Poor
<51	E	Awful

Table 17: Standard table for Standardized User Experience Percentile Rank Questionnaire (SUPR_Q)

SUPR_Q score	Grade	Adjective rating
>50	A	good
50=	B	average
<35	C	below average

CHAPTER 5: CONCLUSION

5.1 conclusion

The findings of this investigation are summarized in the following chapter. The usage of online learning system users in usability assessment was studied in this study. The main goal was to look at different types of usability issues. A usability test with participants on an online learning system was used to conduct the research. In this work, we defined items that defined the efficiency of the usability of an e-learning system that pertained to a particular platform that students were using. SUS is one of four questionnaire techniques. The psychometric features of questions obtained from two different e-learning systems/apps were assessed using the SUPR Q, UMUX, UMUX-LITE analysis. The average score of the e-learning/systems suggests that they are usable. BLC are underdeveloped, and they all receive bad or poorer scores on the SUS questionnaire scale. The SUS score can be used to test the usability of mobile apps, which is an important step in figuring out what works for them and what requires improvement in the fast-developing marketplace. To design more user-friendly apps, anyone can conduct a survey with SUS questioners utilizing those apps that can provide accurate feedback on what exactly needs to be improved in this system to improve its usability. For BLC, SUS score is 57.31 which means poor usability SUPR_Q raw score is 3.82 also this score shows the below average usability. Similarly, the UMUX score is 51.84. on the other hand, UMUX_LITE is 50.014. It reflects awful usability by user. All these questionnaire techniques indicate a bad usability. It's clearly proven that students are not satisfied with this particular e-learning system. The developer should be award about this problem and making their system more usable so that students feel comfortable while using this system.

Now let's talk about another e-learning platform which is google classroom. For Google classroom, SUS score is 52.08 which is also mean a poor usability by user and SUPR_Q score is 3.58. similarly, the UMUX score is 50.30. Additionally, UMUX_LITE is 46.90. It shows an awful usability score. Also, in this usability testing they should focus on their interface and function also so that while student is using this app, they feel more comfortable and consistent without any trouble.

5.2 Recommendations for Future Works

BLC (Blended Learning System):

The SUS score of 57.31 indicates poor usability. The raw score for SUPR Q is 3.8. Similarly, the UMUX score is 51.84. On the other side, UMUX-LITE is 50.014, indicating below-average usability. It reflects the user's poor usability. All of these questionnaire techniques point to a poor usability. Students have clearly demonstrated that they are dissatisfied with this particular eLearning system. The developer should be commended for addressing these issues and making their system more user-friendly so that students feel at ease while using it.

Google classroom:

The SUS score for Google Classroom is 52.08, indicating poor user usability, and the SUPR Q score is 3.58. Similarly, the UMUX score is 50.30. Furthermore, UMUX LITE is 46.90. It has a poor usability rating. They should also focus on their interface and function throughout this usability testing so that when students use this software, they feel more involved and reliable.

5.3 Future Study

Obviously, a positive user experience, such as usability testing, increases the odds of a product being successful on the education system. At the very beginning of this research, we want work with 5 questionnaire technique where SUPR-QM questionnaire technique was also included but we couldn't find enough resources to work on this questionnaire technique. Also, we couldn't find the method of this questionnaire. The SUPR-Qm allows you to quickly and efficiently assess a user experience. With the SUPR-Qm's and quick data collection, you may extend not only the current version of an E-learning system, but also put a long - term monitoring of different eLearning system versions for quality assurance. Another situation made possible by this effective measurement is comparing a e-learning to its immediate competitors in order to obtain information on the online education system competitive position. As a result, our future efforts will be

predominantly focused on user experience (ux) in E-learning systems and other disciplines. Our future work will mostly focus on adapting this strategy to other computer science or other areas of study research domains.

And on the other hand, using comments from randomized scholars who participated in questionnaire surveys, we will enhance the process.

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