

Usability Evaluation of Learning Management System

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Abstract— In the current era of globalization, there are a lot of things have been done with technology. One of them is education. LMS is an example implementation of technology in Education. LMS is a platform that provided by schools or universities, to support teaching and learning activities. Many literatures show that with the LMS, online learning can be fulfilled properly. To make an LMS comfortable and easy to use, it is necessary to have a good user interface design and user experience. User interface and user experience are a very important part of developing an LMS. Without a good user interface and user experience, the LMS cannot be used by the user properly. Based on the research, there are two methods commonly used to evaluate user interface design and user experience. Usability measurement and heuristic evaluation are two methods that are always used to evaluate user interface and user experience. In addition, there is an important part of the LMS, it was features. Based on the research, the most common features in LMS are discussion forums and learning materials. Therefore, users can discuss the materials each other and also share learning materials.

Keywords—User Interface; User Experience; Learning Management System

I. INTRODUCTION

In the current era of globalization, the development of digital technology continues to increase rapidly which makes communication and information exchange activities become easy. This has an impact on various sectors including education. So it is hoped that the development of digital technology in the education sector can help and simplify the learning process for all aspects.

One technology application in education is the Learning Management System (LMS), which is a system designed to support learning activities which are owned by each university. In the Learning Management System, users can access learning schedules, collect assignments, share material between friends and lecture, and collaborate on discussion forums [1]. With a learning system like this, students and lecturers can have material without having to print it first because it was costly and not environment friendly. The use of a Learning Management System are materials that will be an effective way to solve problems in learning material needs [2].

Regarding the use of the website, User Experience (UX) is an important factor in estimating whether a website that is created is adequate and accepted by its users, such as users seeing what its uses are, what their needs are or the limitations of a website. This makes UX become a form of describing user interaction with a website that involves the entire product process design including aspects of the design and function or usability of a product, where UX itself is formed due to user interaction with the user interface of a product. User Interface (UI) is an important component in an application or software. An unattractive user interface will cause users to feel uncomfortable using an application.

The purpose of conducting this research is to analyze the user interface of a Learning Management System. So that users can find out the evaluating and analyzing method used from the website through this research. Then, this research can also provide assistance to developers to be able to customize their website to suit the user's wishes.

II. LITERATURE REVIEW

A. Learning Management System

Learning Management System or LMS is a system where users can access several things that support the learning system. The Learning Management System can be accessed by users via computers and cell phones as long as it is connected to the internet network. LMS can be accessed by teachers or students to support learning. Currently, students want an LMS that is mobile-friendly so that it can attract students' attention to use it [3]. LMS becomes a media, platform or special service which contains activities, content, and other things that can support the process of educational programs that are carried out by combining technological developments so that they can expand the learning process in the world of education in different spheres[4].

B. User Interface

User interface is a design that helps users to make it easier to do activities, where the user interface affects the user experience for users in accessing a system especially in Learning Management Systems (LMS) for doing learning activities. A good user interface design when the user can easily and intuitively interact with the application or the

system [5]. Therefore, there are three important principles guide the design of effective user interfaces:

- (1) place the user in control,
- (2) reduce the user's memory load, and
- (3) make the interface consistent.

To achieve an interface that abides by these principles, an organized design process must be conducted. User interface design begins with the identification of user, task, and environmental requirements [5].

C. User Experience

User experience is one of the important factors that can support success in building a website. A good website is a website that considers and pays attention to user convenience so that it does not cause difficulties for users when accessing the website. UX ensures that the website created can meet the needs and can be used by users with a pleasant experience. If a website that is used is not designed by taking into account the aspect of a good user experience, it will result in the needs of users in using the website being unfulfilled[6].

TABLE I. LEARNING MANAGEMENT SYSTEM FEATURES

Ref.	Discussion Forum	Grade book	Assignment	Learning Materials	Announcement
[11]	v			v	
[12]	v	v		v	v
[13]	v	v	v	v	v
[14]	v		v	v	
[15]		v	v	v	
[16]	v	v	v		
[17]				v	
[18]	v		v	v	
[19]		v	v		v
[20]	v				

III. STUDY REVIEW

Learning Management System is an application that helps students to provide learning materials easily. So the Learning Management System must have several main features to support the system. Some basic features usually exist on a Learning Management System such as download and upload materials, assignments by lecture or teacher. Because of that, students can easily access the materials everywhere and anytime they can. Then, there are other features on the Learning Management System such as discussion forum which help student and lecture to discuss the material easily[7].

The UI element that makes a good LMS is that in the LMS there are things such as a design that is easy to understand so that users feel interested to see it. In addition

to the easy-to-understand design, the LMS is very efficient to use so that users are not confused about how to use the LMS [8]. LMS is also responsive to this, so users know about the deadlines for upcoming tasks or projects by notification from LMS [9]. There are also competencies on LMS to be achieved, supporting materials and links to related learning resources. The LMS also displays all the scores that have been achieved or achieved by the students and the average of these scores [10].

The table shows that mostly there are some features on a Learning Management System, such as discussion forums and learning materials. These two features are important on a Learning Management System. So we can say that a good Learning Management System must have those two features.

A. Usability Measurement

Usability consists of several characteristics that will be the point of whether a system has a usability element or not, the usability characteristics used according to [21] are shown in Table II.

TABLE II. USABILITY MEASUREMENT TABLE

No	Usability Attribute	Usability Measurement Aspect
1	Learnability	Ease of use and adjustment to a system
2	Efficiency	Time and speed in completing work when using the system
3	Memorability	Ability to remember feature functions without re-leaving the guide
4	Error	Anticipation of errors that occur due to users and systems
5	Satisfaction	Level of user satisfaction during and after using the system

B. Heuristic Evaluation

Heuristic Evaluation is a method used to find problems in a system related to usability with various aspects of the assessment to make it easier to find problems both in usability and overall to improve the system for the better [22]. The following aspects of the heuristic evaluation proposed by Nielsen are shown in Table III.

TABLE III. HEURISTIC EVALUATION TABLE

No	Heuristic Evaluation	Evaluation Aspect
1	Visibility of system status	Inform users of what is going on, through appropriate feedback in a reasonable time.
2	Match between system and the real world	The concept of features or language used in daily life
3	User control and freedom	The ability of users to easily control or perform activities in the system, either selecting or canceling
4	Consistency and standards	Use of the same features or functions as other systems that comply with industry standards for system manufacture

5	Error prevention	Designing features well to reduce errors that can be caused by users
6	Recognition rather than recall	Ease for users to recognize in the system compared to remembering processes or information in the system
7	Flexibility and efficiency of use	Provides elements of usability and ease of use for both new and experienced users
8	Aesthetic and minimalist design	Display important information that is relevant according to the needs and purposes of its manufacture
9	Help users recognize, diagnose, and recover from errors	Recognize errors or problems that occur by displaying messages or notifications by the system
10	Help and documentation	Provide useful help and documentation as a guide for users in using the system

IV. RESULT AND DISCUSSION

The results of our research show that there are several LMS features that are generally always present in LMS such as discussion forums and learning materials. These features are needed to support the needs of students and lecturers in conducting online teaching and learning activities. The discussion forum feature is one of the most common features found in an LMS. This feature is commonly used by teachers and students to discuss learning material. So if students do not understand the learning material, they can directly ask questions and discuss through the discussion forum. Then there is also a learning material feature in which students and lecturers can access learning materials that will be used during teaching and learning activities in LMS. Besides these two features, there are other features such as gradebook, assignment, and announcement that can also support the needs of users who use LMS.

We are also doing research about the evaluation method used to assess an LMS running well or not with several aspects of usability measurement. Usability measurement aims to convince users on the UX of an LMS. So when an LMS is used by the user, the user does not hesitate to use the LMS because it has been evaluated by the usability measurement. There are several usability attributes that are commonly used to evaluate UX such as Learnability, Efficiency, Memorability, Error, and Satisfaction. In addition to evaluating the UX of an LMS, evaluation of the UI of an LMS is also important. The method used to evaluate UI is Heuristic Evaluation. There are also several aspects that are used to evaluate the UI which can be seen in table 3.3.

V. CONCLUSION

Based on the results of the research that has been done, the conclusion is that the User Interface and User Experience are important parts of an LMS. Without a good User Interface and User Experience, an LMS will not be perfect. So, there are several methods used to User Interface and User Experience so that they can be implemented properly in an LMS. In this study, we found two methods that are always used to evaluate the User Interface and User Experience of an application. Both of these methods can be applied to evaluate User Interface and User Experience in LMS. The two methods are Usability Measurement and Heuristic Evaluation. By evaluating using these two methods, it is

hoped that the appearance of the LMS can be better and easier to use.

One of the most important on an LMS are features. An LMS cannot run if there are no features anymore. Based on the research, there are several features that are usually present in LMS. But, there are two features that are most used in LMS. Discussion Forum and Learning Materials. These features are important to support the LMS so people who use the LMS can download and upload learning materials either lectures or students. Discussion forums are also useful for students who don't understand the materials, so they can discuss the materials with their friends or lectures easily. There are also other features that are useful for the LMS such as gradebook, assignment, and announcement. Therefore, the conclusion of the research is a good LMS is an LMS that has good features and design of the LMS following the evaluation method especially using usability measurement and heuristic evaluation.

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