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# Analysis Measurement Usability for Supporting a Hybrid Learning Model Using a Questionnaire with Learning Management Systems Based on Moodle.

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The learning process of a hybrid learning model is performed as a process of acquiring knowledge and skills by integrating the system digitally. This is where students become the main part in the learning process as lecturers only facilitate by providing all forms of learning materials and resources in order to support the activities of this learning model. The 4.0 industry revolution has brought people's lives to the mastery of technology and the learning process has shifted according to its era, namely by combining a learning model between traditional and modern methods based on technology that demands students to think critically, creatively and independently. This allows students to have the ability to have higher order thinking skills to face the era of revolution 4.0 in the future. In order to support the process of hybrid learning, the Learning Management System (LMS) was used. This system is used to manage all online learning activities by distributing learning materials and collaboration between lecturers and students which is the most important part of hybrid learning. To measure the satisfaction of users, LMS and existing systems must be presented as best as possible, as user satisfaction is part of the measuring instrument to determine the success of the existing system. Usability is the level of quality of a good system where users can assess functionality effectively and efficiently. Results from the questionnaire obtained measured how easy the use of LMS that consist easy to learn, Efficient on use, easy Remember, low error rates and user satisfaction. Based on the results of the overall study (901 sample), the LMS used today, has an average rate of overall system 84.36%.

**Key words:** *Hybrid learning, LMS, Usability, Satisfaction.*



## Introduction

Human and computer interactions are disciplines that study the relationship between humans and computers which includes the design, evaluation and implementation of computer user interfaces for easy use by humans. Human Computer Interaction System Study related design, implementation and evaluation of computer system, makes it easier for human use. The design of a website interface should be simple but good, easy to learn, easy to use and users feel comfortable interacting. The design of a good interface provides convenience for its users. User Interface (UI) is a system that is the most important part of each program, because it determines how easily the program provides response or reciprocity from the user ordered, in addition to the User Interface things Note is Usability. Usability is essentially useful or usable. Usability in relation to the Human Computer Interaction is a system that can fully work well when used by users, so that all system capabilities can be beneficial to the fullest through existing functions on the designed system.

The Usability in this regard relates to the user satisfaction of the system which includes 5 pieces of components namely: The Learnability component is related to the first time the user is in the system, the user feels the ease to use the existing system. Efficiency is a component related to how fast and responsive the system can respond to any given input. The third component is no memorability, when the user is no longer using the existing system, but the system is made easy to remember and run. The next component is the error, this relates to the amount of errors that have emerged when the system is used. The last component is satisfaction, which is related to the flexibility and comfort of each function and interface designed. The research related to usability and satisfaction is examined by (Fauziah, Norleeza, 2017). The result is expressed by the students was contentedly with all the components that exist on hybrid learning, valuing the high interaction learning, which all finding suggests that even students are satisfied.

Interactions are between the user and the system as the user focuses primarily on the search process and finds useful information and interactions between users and system content. The results showed that users were initially impressed and satisfied with the website. Also, they find satisfaction levels with the hybrid course format were relativity low. In addition, the researcher's experience shows that it improved online teaching and student learning (Pinto, M. B., 2013).

The purpose of this study is to test whether the usability of the existing applications and systems provide satisfaction and if the digital-based application affects the satisfaction of online student courses. This suggests that developers need to consider themselves (such as ease of use and user friendliness) to increase effectiveness. E-Learning System designers are recommended to incorporate different analytical and/or stochastic methods in assessing the

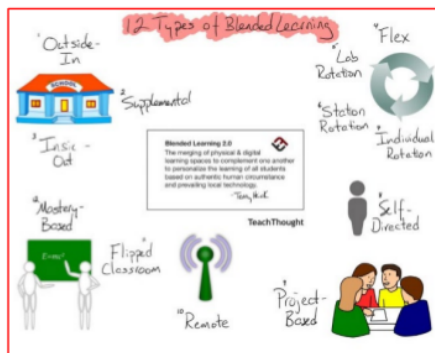
degree of customer expectations and their level of satisfaction. A holistic approach based on the user satisfaction level and appropriate measurement analysis should provide support to designers in improving system performance (Bauk, S. K, M. Scepanovic, S. 2014). An approach to evaluating the satisfaction level of a web-based system usability has been proposed. The results achieved are satisfactory, because in the website are identified and recommended solutions to improve the accuracy and well rated website (Nortvig, A., M. Petersen, A., K. & Balle, S., H. 2018).

## Literature Review

### A. Hybrid Learning

Hybrid Learning is supported by an effective combination of teaching and learning styles and is found in open communication among all the parts involved with training. The benefit of using hybrid learning is the combination of direct teaching (face-to-face) and teaching online, and an element of social interaction is: Interaction between lecturer and students, lecturer can also be online or face-to-face, combining instructional modalities (or delivery media) and combining instructional methods. It also provides flexibility in choosing the time and place to access the lessons. Students do not need to travel to the subject where they are delivered, e-learning as it can be done from anywhere either with or without access to the Internet. Figure1 shows types of blended or hybrid learning:

<sup>6</sup>  
**Figure 1.** 12 types of blended/hybrid learning



(Source: <https://www.teachthought.com/learning/12-types-of-blended-learning>)

Figure 1 explains 12 types of hybrid/blended learning station rotations; lab rotation, remote, project based learning, flipped classroom, inside-out, outside-in, individual rotation, self-directed, supplemented, flex and mastery based learning.



## B. Usability

ISO 9241 – 11 (1998), Usability is the extent to which a product can be used by a specific user to achieve a specific goal effectively. Efficiency and the user become satisfied in the context of use. In general, the sense of Usability is the attribute of the quality used to evaluate how easy an interface can be used. The usability is determined by users. Basically, if the user doesn't like it, they will not use it. Good usability leaves a good impression on the user and gives the user a reason to want to come back again and again. Bad usability, on the other hand, will only give the user a headache trying to look for ways to use the application. In Usability there are several criteria that must be created are:

- Effectiveness (Effective for use)  
The system must be used to perform certain the tasks.
- Efficiency (Efficiency for use)  
Efficiency is attributed to how quickly a user can achieve a goal when using the system.
- Safety (Safety for use)  
The security includes preventing users from the danger and unexpected situations, so the user feels safe when using the system and also there is a user prevention of the danger.
- Utility (good utility)  
The Utility in question relates to the extent to which the product can provide a good function the user can do or that it wants to do.
- Learnability (easy for learn)  
Easy to learn a system before use and users should not spend a lot of time studying the products that will be used.
- Memorability (easy to remember)  
Once a user has learned a system, then it will remember how to use it.  
Usability is the extent to which a task is easy to work with, a system and minimize to the stage that is done to achieve a specific goal through the system and how the user is working on a task with the system. There is a usability navigation: makes the site in the LMS clear (easy to understand and can explain the purpose of the website), understand and know what the user needs, explain the contents of the website and has a visual design that is easy to understand. Questionnaires were used to see the level of usability and user satisfaction of the hybrid learning web.

## C. Questionnaire

To determine the usability level of web learning used in a hybrid learning model, a questionnaire is needed to provide value to the level of satisfaction and learning model used. Data collection process is used to provide the value of certainty of a system designed, with



the presence of data sets and processing to produce information. The questionnaire is one part of the data collection process where results can be used as a source of information after processing and a decision can be produced (Abawi, K, 2013). The following are characteristics of the data collection instrument:

- a. Research takes accurate and systematic data so that it can produce a suitable decision, in this case with regards to usability and user satisfaction of the web hybrid learning in the process of learning in the revolutionary era Industry 4.0.
- b. The collection of data can provide all objects and information relating to the research conducted.
- c. Data collection process depends on the type of research conducted, in this study used a questionnaire that can assist in the assessment process related to hybrid learning model.

#### **D. User Satisfaction**

An assessment of web views, particularly web e-learning, that can help the hybrid learning system, is one of the most interesting topics related to human and computer interactions. Views and interactions that occur within the web system can also be used to view the user satisfaction of a hybrid learning-based system. Use of e learning is the most important part of the education process as many studies are conducted to examine matters relating to the effectiveness of e learning in the learning process (Harrati, N. Imed, B. Tari, A. & Ladjailia, A., 2016). E-Learning is the most feasible way to conduct distance learning by providing learning materials on the internet, so trends become popular in developed and developing countries (Shahid, S., Abbasi, M., S., 2014). Hybrid learning user satisfaction can be seen by the activation of students to access and use the learning model that is a combination of face-to-face methods and E learning methods (Ahmad, Z & Ismail, I. Z. 2013). User satisfaction is a key to the success of a system, users feel comfortable and will continue to visit the system that is created and give the best input for the system.

#### **Research Method**

##### **A. Stages of Research Method**

The method of research completed is to use the question model in the form of a questionnaire as a measuring instrument to determine the extent of the usefulness of the hybrid learning models used today and know how far the student satisfaction of the existing learning model. The stages shown in the following figure are:

**Figure 2.** stages of research method (Source: research documentation)

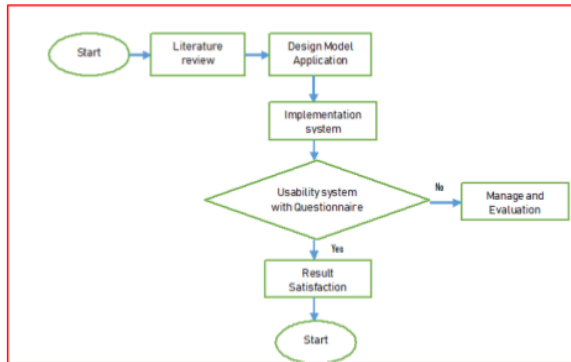


Figure 2 explains the stages of research methods from the literature review and design model application for hybrid learning models and the implementation of the system for students. The last stages of measurement regarding the usability of the system with the questionnaire results in satisfaction with the hybrid learning model and the Learning Management System based on Moodle.

## **B. Respondents and Materials Questionnaire**

The respondents used in this study were 901 respondents consisting of 634 male students and 267 female students who used hybrid learning models (29.6% woman and 70.4% man). The questionnaire provided relates to the usability of a model-based hybrid learning system that has been presented in the form of learning media using the Moodle-based Learning Management System. The list of questions relating to questionnaires arranged by several criteria include:

- a. Connection with the services provided to the student as a Moodle based Learning Management System for user at the current lecture Web.
- b. User Interface and User Experience on Moodle based Learning Management System
- c. Operation and process of Moodle-based Learning Management System
- d. Speed of response when accessing the Moodle-based Learning Management System

**Figure 3.** Model Questionnaire (Source: research documentation)

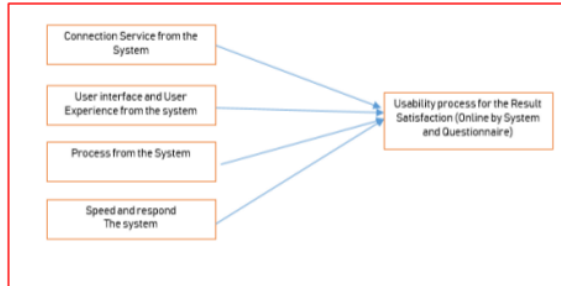


Figure 3 is the model questionnaire for the usability process and satisfaction from the Learning Management System. The questionnaire included:

- a. Connection service from the system (the current Moodle based Learning Management System supporting a hybrid learning, Learning Management System based on Moodle easy to use, satisfied use the Learning Management System based on Moodle, flexible and no confuse the Learning Management System)
- b. User Interface and User Experience From the system (text displayed on the LMS system is very easy to read, the group category in the Moodle based on Learning Management System appropriate, the layout structure in Learning Management System on Moodle good looking, understanding the language in the Learning Management System based on Moodle, the structure of navigation appropriate, view of the message already and existing category, design input and output, message error from the system)
- c. Process From the system (process for the Learning Management system Easy to use, information feedback clear and quickly respond from the Learning Management System).
- d. Speed and respond The System (quickly respond from the Learning Management System, performance the system, clear information and quickly access and good of use in the hybrid learning process).

### **Discussion and Conclusion**

The information and opinions from users was collected to measure the level of satisfaction with questionnaires and this technique asks the user about their opinions using a simple scale [Agree and disagree]. Respondents used as much as 901 consist of 29.6% woman and 70.4% man. From the hybrid learning system with Learning Management System based on Moodle Can be seen in the following table:





### A. Connection and Services from The System

Questions relating to how well the services provided the system in the form of Moodle-based Learning Management System are currently in hybrid learning media process. This can be seen in Table 1 below:

**Table 1:** Connection and services from the system

No	Questionnaires	Agree	Disagree
1	Learning Management System Support for hybrid learning	86.7%	13.3%
2	Learning Management System Based on Moodle easy of used	90%	10%
3	Satisfaction with Learning Management System for Hybrid Learning based on Moodle as special connection	69.4%	30.6%
4	Boring and static for views Learning Management System based on Moodle for hybrid learning	60.5%	39.5%
5	Learning Management System Based on Moodle is flexible and not confusing for hybrid learning	88%	12%

Table 1 shows the result of the Moodle-based Learning Management System in order to support the Hybrid learning of the 5 average questions respondents provide good value by expressing a sense of satisfaction towards the services With an average value of 78.92%.

### B. User Interface and User Experience From the system

This section relates to the user interface displayed from the Learning Management System based Moodle to support hybrid learning. The intended user interface is related to the display or layout of the text that is on the screen, the language used, the navigation structures, the order of the category of any material both for tasks, modules, quiz and services other related user interface views.



**Table 2:** User Interface and User Experience from the system

No	Questionnaires	Agree	Disagree
1	Layout from the text easy to read in Learning Management System Support for hybrid learning	91%	9%
2	Category of Learning Management System Based on Moodle is appropriate	85.7%	14.3%
3	Structure and Layout on Learning Management System for Hybrid Learning based on Moodle good looking and structure	82.7%	17.3%
4	Languages used in Moodle-based Learning Management System views are easy to understand for support hybrid learning	89%	11%
5	Structure navigation in the Learning Management System for hybrid learning appropriate	79%	21%
6	In the currently used Moodle-based Learning Management System, it provides a view of the messages that are accessible and already in line with the existing categories for support hybrid learning	89.5%	10.5%
7	Input and output design of the Moodle-based Learning Management System is compliant for the support hybrid learning	86.4%	13.6%
8	Error message from the Learning Management System clear for support hybrid learning	79.8%	20.2%

Table 2 results shows the user interface and user experience type of Moodle-based Learning Management System in order to support the Hybrid learning of the 8 average questions respondents provide good value by expressing a sense of satisfaction towards the services With an average value of 85.39%.

### C. Process from the Learning Management System Based On Moodle

This section is related to the feedback process, response and fast information from the system. The questions relate to the convenience of accessing the system and used



simultaneously and at the same time, the speed of the information received when Concurrent access. This is shown in table 3 below:

**Table 3:** Process from the Learning Management System Based On Moodle

No	Questionnaires	Agree	Disagree
1	Information feedback from Learning Management System good and appreciate for Support for hybrid learning	90.3%	9.7%
2	Process from Learning Management System for Hybrid Learning based on Moodle fast and easy	91.8%	8.2%

The Table 3 results show the process from Learning Management System based on Moodle in order to support the Hybrid learning of the 2 average questions respondents provide good value by expressing a sense of satisfaction towards the services; with an average value of 91.05%.

#### **D. Speed and Respond the Learning Management System Based On Moodle**

Things related to the speed of response from the LMS-based Moodle to support Hybrid learning related to performance of the system used is shown in Table 4 below:

**Table 4:** Speed and Respond the Learning Management System Based On Moodle

No	Questionnaires	Agree	Disagree
1	Response from Learning Management System to access is very fast for Support for hybrid learning	79.5%	20.5%
2	Performance from Learning Management System for Hybrid Learning based on Moodle very good	81.3%	18.7%
3	Clear information and quick access from Learning Management System for Hybrid Learning based on Moodle	85.4%	14.6%

Table 4 shows the results of the Speed and Response from Learning Management System based on Moodle in order to support the Hybrid learning of the 3 average questions. Respondents provided good value by expressing a sense of satisfaction towards the services with an average value of 82.07%.



From Table 1 to Table 4 all questions can be given the average satisfaction value is 84.36%.

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## **Conclusion**

The conclusion of this research is as follows:

1. Hybrid learning models help students and lecturers in a digital era for learning processes and support the era of the 4.0 Industrial Revolution special for long life learning.
2. Results obtained from the Learning Management System based on Moodle had various questions relating to user satisfaction especially students and lecturers who use this system to support hybrid learning to tighten the level of satisfaction. Overall average value is 84.36%.
3. Results obtained are comprehensively attributed and quite satisfied, but in the Learning Management System based on Moodle improvements are needed from the network infrastructure in the form of internet connection and display less attractive.



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