User Difficulties in E-Learning System

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Abstract—**An interface is very effective to encourage the users intention and engage them to achieve their destination in e-learning process. This research aims to explore the user needs through learner experience on using e-learning interface. The case study is needed to identify and to collect the learner problem in e-learning, especially in User Interface. It took three months to get the user interface problems, such as login page, choice menus, and table of contents, content presentation, interactive media, and presentation of exercises, example solutions, and self-assessment. The research took three months data collection of forty-seven students in Mulawarman University. Based on this research, it shows that the communicativeness of the interface is the most difficult part, followed by choices menu, and self-assessment. Meanwhile, the example solutions and login page are among the least difficult of the menu.**

Keywords---e-learning; user interface; user requirement; user difficulties

I. INTRODUCTION

E-Learning is one of the alternative methods in the education world. It is expected to cover the weakness that existed or found in the conventional education. E-learning may provide fun, better access, cheaper education. In fact, some students are not interested in using it then try to retrieve their references from other websites [1].

The e-learning inefficiency is due to the developer unawareness in perceiving the user needs [2]. The use of e-learning may simplify the learning process but not answer the difficulties [3]. Usability should be used to determine whether the application is useful or not.

There are several models to analyze and to understand the user acceptance of e-learning [3], among others; Theory of Reasoned Action, Theory of Planned Behaviour, and the Technology Acceptance Model. Some developed psychological theory, which describes the behavior of computer users are based on the beliefs, attitudes, desires and relationships user behavior [1]. The purpose of this model for explains the main factors of user behavior on user acceptance of the technology. These factors put the attitude of user's

behavior variables: ease use, utility, use. keep using, the real conditions of use of the system [1].

The interface could be very effective to encourage the users' intention and engage them to achieve their goal in e-learning process. The e-learning interface acceptance model is very crucial since it can help the e-learning developer and stakeholder to recognize user needs and requirement in e-learning interface

This research aims to understand the user needs as an integral part of information system design that it is critical to the success of e-learning interactive system. It is now generally understood that the success of the system and products begins with understanding what the user needs and requires. The system will benefit if it is developed with understanding the user needs and requirement. The advantage can cover; increased productivity, enhanced quality of work, reduced support and training costs, encouraging their knowledge and helping them finishing their task, and improving user satisfaction.
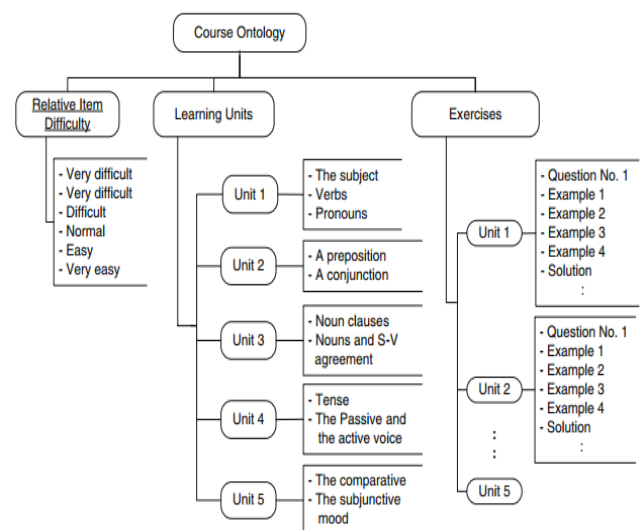

Fig. 1. English course e-learning model

Fig. 1 some of web based educational course do not have interactions that support meaningful learning and providing learning contents simply and repeatedly [4]. It presents learning contents and method separately according to learning ability of individuals. A learner was given to choose the learning step by the relative difficulty. In order to process and combine, all the learning contents are based on Sharable Content Object Reference Model (SCORM) with Learning Management System [4].

In this research, we collected the learner problem in the user interface, especially in user difficulties and e-learning acceptance. The research activities such as; gathering information, identifying user needs, envisioning and evaluation, then formulating the user requirement specification for the next research hypothesis. We did the literature reviews, case study and observational method to identify and collect the learner problem in e-learning, especially in User Interface. The system quality covering usability, accessibility, and social acceptability factors, depends on possessing a very good understanding of the context of use of the system.

II. LITERATURE REVIEW

Usability research discusses about user know-ability, system operability, efficiency, robustness, safety and subjective Satisfaction [5]. Some researchers already describe a clear, detailed taxonomy that fully reflects each of the attributes that confirm the usability of a product in a structured and non redundant way. His taxonomy is designed to support different stages in a product's life cycle and provides a framework for focusing on the specific aspect that need to be prioritized in the specification, [6] design, and evaluation phases, also facilitating the development of more usable products.

We also used User Learning Style and Motivation that will increase knowledge-ability and makes learning easier for students. To develop an e-learning system, one should understand the importance of learning style and motivation to enhance student achievement. Only a student with higher motivation struggle towards success in e-learning will cause higher self-ability than low motivation to struggle [7]. E-learning system provides an opportunity to achieve the goals by considering factors of learning style, motivation, and knowledge-ability to personalize learning process. The student's ability can be seen from the level of knowledge in their learning performance.

Based on the study, it was found that the student's expectation confirmation would have the positive effect on their perceptions in experiencing e-learning process, an interaction between peers and tutor, and design of course after they have adopted the system of e-learning [8]. The degree of students' expectation of the benefit they obtained by using e-learning can be referred as the expectations confirmation [9]. From the studies, it indicates that positive effect on user's satisfaction can be achieved when there is confirmation. Furthermore, the satisfaction will drive to an intention of continuance e-learning. A framework for user expectation was introduced describing structures, processes interaction and individual learning, and outcomes of a course [10]. Similar

frameworks can be found in quality assurance systems describing desirable characteristics of e-learning. But in this research, we propose the User Benefits using three fields of instruction; media elements, communicativeness and user expectation.

This research involves user-based assessment about e-learning user interface with qualitative and quantitative criteria. Descriptive analysis and Pearson correlation were used to filter possible alternative interfaces to a reasonable subset. The e-learning website was evaluated for e-learning user interface testing is englishteststore.net.

III. RESEARCH METHOD

A. User Need Identification

The research aimed to identification user difficulties of e-learning system. This is the first step of three phases experiment was conducted in this research to get more information about user interface requirements to develop User Interface Acceptance model [5]. In this case, the researcher should build some questioner for evaluation and formulate the hypothesis to encourage the e-learning interface acceptance. Based on the previous evaluations and theories about the interface acceptance, we developed hypotheses and some questioners to collect, to prove and to support our research objectives.

These are the research problem questioners:

- Which parts of E-Learning (Englishteststore.net) are difficult to understand?

- What is the user requirement to develop the successful e-learning system?

- What factors have significant influences to e-learning usability and user benefits?

B. Data Collection Technique

Respondents used E-learning for over three months. We shared the questioners to identify user difficulties using the e-learning website. The questioners contain three types question; open answer, Lickert scales and demographic. Besides that, the questioner also consisted of user learning style; usability evaluation and user benefit questions
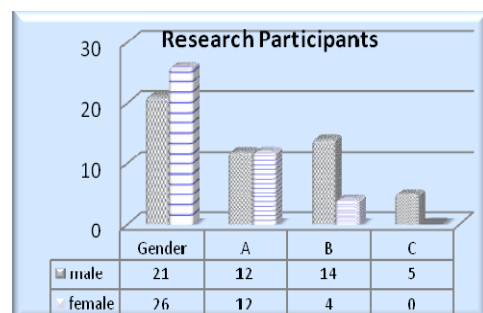
1) Research Participants

Fig. 2. Research Participants

This research involved forty-seven students as respondents (twenty-one males and twenty-six females) from Communication and Information Technology Department of Teacher Training and Education Faculty in Mulawarman University (Fig. 2). They have previous experience using e-learning system.

2) Evaluation Setup

All the evaluation process was conducted during the class meeting in the Teacher Training and Education Faculty at Mulawarman University in East Kalimantan. The evaluation was done in every week until 3 months before the data research was collected by using questioners. The e-learning website was used for this research is englishstore.net. To identify their difficulties used several approach, namely:

- Asked the respondents to use e-learning website: for their reference to prepare English exercises and testing for over three months.
- Asked the respondents to comprehend the system and evaluate it when they used it.
- Shared the research questioners to all respondents what their difficulties and expectation after using e-learning system.

These are the following user interface states and components that had to be user-tested: login page, choice menus, and table of contents, content presentation, interactive media, and presentation of exercises, example solutions, and self-assessment.

IV. RESEARCH RESULTS

A. User Interface Difficulties

This is the research result about user interface difficulties using englishstore.net. The e-learning website that we used to find user interface difficulties in this research is the specialist for English lesson to help the user from any mindkind. The research was taken in February until April. Fig. 3 is the sub main menu of englishteststore.net for the practice user competency in English.

Fig. 3.   Englishteststore.net

Fig. 4 describe the user difficulties that we found from the research questioners. The several e-learning user interface difficulties, such as; user communication (20%), choice menu (16%), self-assessment (15%), interactive media (13%), content presentation (12%), exercise of presentation (10%), login page (9%) and example solution (5%). We can see the detail information form in Fig. 4.
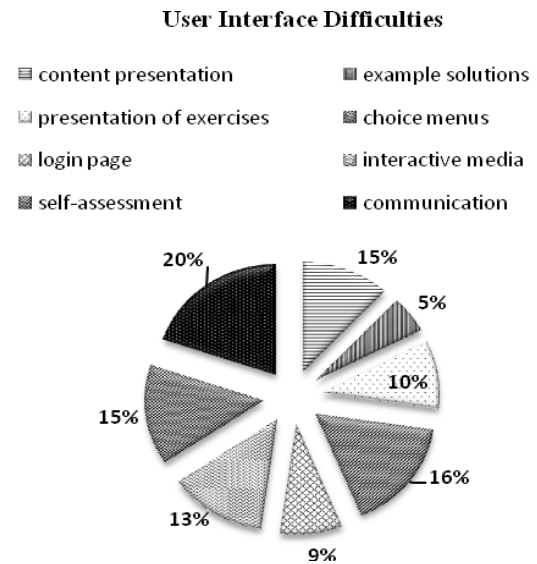

Fig. 4.   E-learning User Interface Difficulties

Fig. 5 describe the user interface difficulties according to Usability and User benefit theory
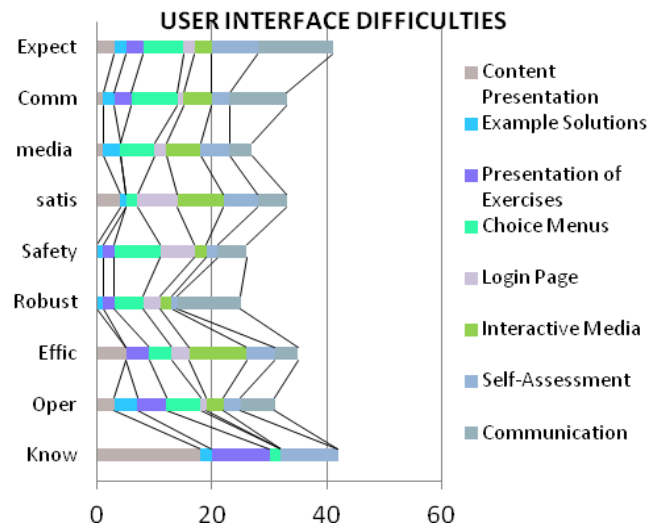

Fig. 5.   User Interface Difficulties

From Fig. 5, we can see user difficulties in each part of e-learning. The content of presentation has thirty-five problems, most of problems is knowability, has eighteen problems. An example of solutions has sixteen problems which four in operability and three in media elements. Presentation of exercises has twenty-nine problems which the

most problems are knowability in ten problems. Login pages have twenty-five problems, six in safety and seven in satisfaction. Choice menus have forty-eight problems, eight problems in safety, eight problems in communicativeness and seven problems in user expectation. Interactive media have thirty-nine problems, ten problems in efficiency and eight problems in user expectation. Self-assessment has forty-three problems, ten in knowability, eight in user expectation and six in satisfaction. The last, communication have fifty-eight problems which most problems are in user expectation has thirteen and robustness have eleven and communicative ten problems.

B. Descriptive Analysis

To describe what the respondents got after using englishteststore.net for over three months experience, we used SPSS for analysis. Beside statistic descriptive, we used Pearson Correlation analysis to measure each variables correlation.

Fig. 6 describes about what the respondents got after using englishteststore.net for over three months. From this figure, we can see that the user knowledge is the best level in 1.81 and then followed by media element in 1.19. On the other hand, we can see there are many factors of user interface got the lower grade from respondents, such as; expectation, communicativeness, motivation and satisfaction. To get more clearly about the user interface acceptance, we can see in Table I.
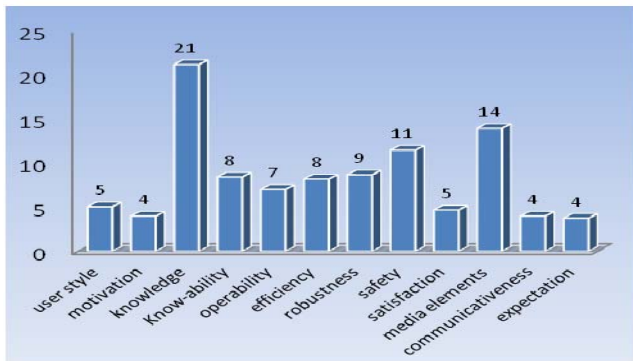

Fig. 6. User Interface Evaluation Factors

TABLE I.　USER INTERFACE ACCEPTANCE FACTORS

Usability	N	Min.	Max.	Mean	Std. Dev.
user style	47	-1	1	.43	.827
motivation	47	-1	1	.34	.731
knowledge	47	0	3	1.81	.770
know-ability	47	-2	3	.72	.949
operability	47	-1	2	.60	.798
efficiency	47	-1	3	.70	.858
robustness	47	-1	3	.74	.988
safety	47	-1	3	.98	.897
satisfaction	47	-1	2	.40	.876
media elements	47	-1	3	1.19	.947
communicativeness	47	-2	3	.34	.939
expectation	47	-2	2	.32	.980

From Table I, we can see there are many factors of user interface got the lower grade from respondents such as, expectation, communicativeness, motivation, and satisfaction. To get more clearly about the user interface acceptance, we can see some factors from this research have significant correlation by using Pearson Correlation Analysis in Table II. These are the correlation between interface factors.

TABLE II.　CORRELATION BETWEEN INTERFACE FACTORS

	style	motiv	know	ability	opera	effect
style	1.000					
motiv	.503**	1.000				
knowl	.405**	.389**	1.000			
ability	.236	.160	.117	1.000		
opera	-.007	.082	.052	.282	1.000	
effect	-.039	-.021	-.093	.090	.533**	1.000
robus	-.149	-.053	-.072	.403**	.567**	.436**
safety	.132	.177	.244	.325*	.351*	.212
Satis	.041	.066	.109	.190	.472**	.391**
media	.098	.046	.161	.270	.199	.463**
comm	-.028	.138	.119	.199	.517**	.362*
expect	-.001	.200	.000	.265	.491**	.343*
	robus	safety	Satis	media	comm	expect
robus	1.000					
safety	.404**	1.000				
Satis	.293*	.147	1.000			
media	.298*	.132	.147	1.000		
comm	.331*	.176	.132	.243	1.000	
expect	.272	.241	.176	.689**	.446**	1.000

We can get conclusion that user learning style has significant correlation to user motivation and knowledge. Usability has significant correlation to user benefit especially in communicativeness, user expectation, and media element. Also user benefit has correlation to usability in operability, effectiveness, robustness, and user satisfaction.

C. User Interface Requirements

User requirement is any simple statements describing any functionalities and behaviors that someone expected of the system. The more details we have in requirement, the easier for us to test. The acceptance of a system means you are confident it will give benefit to the organization. There are many respondent suggestions in this research such as; content presentation, example solution, exercise presentation, choice menus, login page, interactive media, self-assessment and communication facilities. We can see the user requirements in Fig. 7.

The user requirement in Fig. 7 describes the e-learning user interface was divided into three categories Media Elements, Communicativeness and User Expectation. The first user requirement in Media Elements are game for learning the practice, do not have an unclear button and relevant tools to support their task. The second user requirement in Communicativeness is group discuss, facilities to share and to get Information, and personal communication. Then the third user requirement in User Expectation is to prepare their exam, to get the best grade, to finish their work rapidly, to complete their tasks, to practice some material, to enhance their knowledge, and to save their password in the login page.
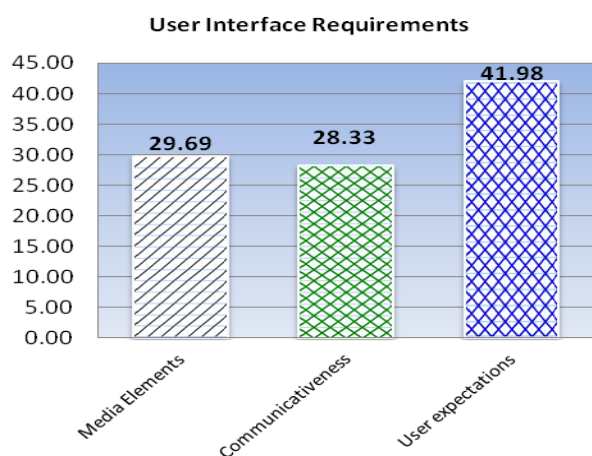
Fig. 7. User Interface Requirements

V. CONCLUSIONS

Based on this research regarding user interface difficulties in the perspective of Usability and User benefit, it shows that the menu communicativeness of the interface is the most difficult part (20%), followed by choices menu (16%), and self-assessment (15%). Meanwhile, the example solutions and login page are among the least difficult of the menu, which 5% for accounts and 9% for respectively. According to User benefit, User Learning style, and Usability, the content of englishstore.net has the highest benefit in user knowledge (20%), followed by media element (14%). On the other hand, user expectation, communication, and motivation are among the lowest factors in respondents' point of view.

Based on three categories, user expectations are most needed by the respondents, followed by elements of the media and communicativeness. In the end, the study of the user difficulties in e-learning system generated can be an alternative model to get an overview of the level of acceptance of e-learning interface. So hopefully it could be one of the important elements considered in developing the model and the implementation of e-learning in the future.

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