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# User Interface Analysis to Increase User Experience on Computer based Test Application: Case Study Smk Negeri 4 Pandeglang

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**Keyword:** Analysis, Usability, CBT, User Experience, Jacob.

**Abstract:** This study aims to analyze Usability to Computer Based Test applications through the User Experience approach in SMK Negeri 4 Pandeglang using Jacob Nielsen method using five variables namely, Learnability, Efficiency, Memorability, Error, and Satisfaction. This study starts from the low value of semester exam results using CBT. The population in this study are students of class XI year lesson 2015/2016 SMK Negeri 4 Pandeglang. The sampling technique of this research is a saturated sample consists of 158 people. The results showed the level of user experience of the Computer Based Test application including the category strongly agree the results of the questionnaire assessment of respondents with an average value of 91.4% consists of variables Learnability, Efficiency, Memorability, Error, and Satisfaction, students feel comfortable when the exam using CBT and able to show the actual ability to do the work.

## 1. INTRODUCTION

Every corporate agency, government, and education today can not be separated from an information system in order to run its work activities, so that more regular and directed with more efficient time. Information systems and computer technology are growing very rapidly in line with the size of the need for information. The development of information technology has made it easier for the world of education in implementing the teaching and learning process one of them is the activity to evaluate the results of learning that usually the exam is only done using paper, but now the test can be done practically using a computer.

Fhadilla (2016) states that the success of an information system is not enough determined by the technology used required the analysis of user experience to determine the needs of users dynamically. The low value of the students' semester test results using CBT below the average score, with the development of Computer Based Test application through usability analysis with User Experience approach is expected to provide comfort during the test and show the actual student ability to the test exams.

Research on the analysis of usability to an application previously been done related to the analysis of User Experience Web-Based Digital Library (I Made Agus OW 2017), and also research entitled Analysis of the benefits of implementation of online exam information system (Erick Andika, et al 2017) .

## 2. RELATED STUDIES

### 2.1 Usability

Usability comes from a usable word that generally means it can be used properly. Something can be said to be useful if the failure to use it can be eliminated or minimized and provide benefits and satisfaction to the user (Wimmi and Lussy, 2016).

Understanding usability according to Nielsen is a user experience in interacting with the application or website until the user can operate it easily and quickly (Nielsen, 1994), while according to I Made Agus Oka Wijaya usability is a term that shows the ease of humans to use a particular tool or other man-made objects to achieve a certain purpose (I Made Agus Oka Wijaya, Dkk, 2017).

According to the theory of Nielsen Model, there are five criteria in analyzing Usability include:

1. Learnability
2. Efficiency
3. Memorability
4. Error
5. Satisfaction

## 2.2 Computer Based Test

Computer Based Test is a computerized evaluation application that aims to assist teachers in conducting an evaluation, whether scoring, test execution, and effectiveness and efficiency of its implementation (Novrianti, 2014).

## 2.3 User Experience (UX)

User experience has a wider domain of User Interface because the realm of UX starts with user research which is then implemented into an interface. User Interface is part of UX where UI is the end product of UX. User experience designer is able to generate a user interface that is easy to use by target users. Because the UX realm looks quite large (www.interaction-design.org). According to David Lawrence (2016), User Experience (UX) can be defined as any experience experienced by users while interacting with digital devices. Any experience or experience, such as physical interactions, sensors, emotions, and mental. In other words, it is the level of user satisfaction gained when they interact with products with technology-based contexts. User experience (user experience) is a term user experience in perceiving ease and efficiency in the interaction human with a computer. Includes one's perception of practical aspects such as usability, ease of use, and efficiency of an existing system (Lilis Dwi Fraida, 2016).

## 2.4 User Interface Design

According to Tintin Chandra (2013), the goal of UID is to design an effective interface for software systems. Effective means ready to use, and the results according to need.

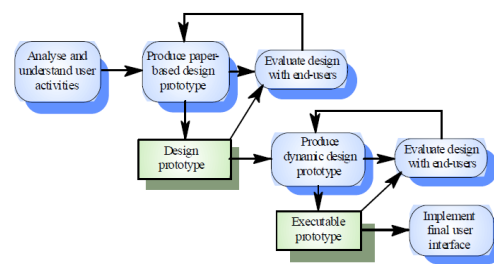


Figure 1: User Interface Principle

Principles In Designing User Interface include:

1. User familiarity
2. Consistency
3. Minimal Surprise
4. Recoverability
5. User Guidance
6. User Diversity

## 3. RESEARCH METHODOLOGY

### 3.1 Research Methodology

Research on Usability Analysis to know User Experience in Computer Based Test application in SMK Negeri 4 Pandeglang is using Jacob Nielsen method which is based on five attributes, that is: learnability, efficiency, memorability, errors, dan satisfaction.

Methods in application development in this research is more to the development of User Interface through User Experience approach.

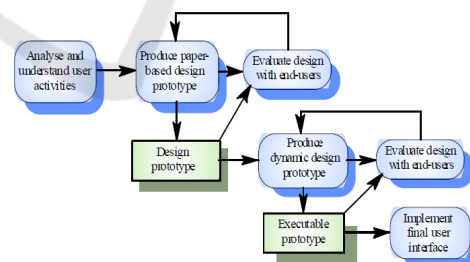


Image 2: User Interface Principle

Population in this research is all active class XII students who have followed the semester test activity by using Computer Based Test in SMK Negeri 4 Pandeglang, which amounted to 158 students. Sampling in this study with the sampling technique saturated with the intention that the sample participants taken actually represent the participating population. According to Sugiyono (2008), saturated sampling is a technique of

determining the sample when all members of the population used as a sample. So the sample of participants in this study was 158 people.

Library study was conducted to find and obtain data that is theoretical and related to the research being done. Observation technique is done by Participant Observation. In this observation, the researcher is directly involved with the daily activities of the person being observed or to be used as the source of research data. To obtain the required data, data collection is also done through a questionnaire or questionnaire in a closed manner where respondents determine the answers based on a number of alternatives provided in the questionnaire instrument.

### 3.2 Research Indicators

The indicator used in this study, the researchers used the Nielsen Usability Criteria Model, which assesses the level of ease of user interface to use.

Table 1. Usability Indicators Nielsen Model

No	Factor Usability	Description
1	Learnability	<ul style="list-style-type: none"> <li>- Easy to understand</li> <li>- Easy to look for specific information</li> <li>- Easy to identify navigational mechanism</li> </ul>
2	Efficiency	<ul style="list-style-type: none"> <li>- Easy to reach quickly</li> <li>- Easy to navigate</li> <li>- Easy to remember</li> <li>- Easy to reestablish</li> </ul>
3	Memorability	<ul style="list-style-type: none"> <li>- Easy to remember</li> <li>- Easy to reestablish</li> </ul>
4	Error	<ul style="list-style-type: none"> <li>- Few numbers of error detected</li> <li>- Easy to fix</li> </ul>
5	Satisfaction	<ul style="list-style-type: none"> <li>- System pleasant to use</li> <li>- Comfort to use</li> </ul>

## 4. DISCUSSION AND RESULT

Testing stage Usability analysis results to determine whether each criteria Usability is appropriate or not,

with this test using the method of User Acceptance Test (UAT).

Based on the results of questionnaire data from the five criteria obtained the following results:

- a. Learnability has an average score of 95%, in which case the student states strongly agree that the developed CBT application is easy to learn.
- b. Efficiency has an average value of 90%, with this factor the student states strongly agree that the CBT application has been developed quickly in the operation of its functions.
- c. Memorability has an average rating of 93%, with this factor the student states strongly agree that the CBT application that has been developed is easy to remember in a certain period of time.
- d. An error has an average value of 90%, with this factor the student states strongly agree that the application of CBT has been developed the occurrence of errors minimally.
- e. Satisfaction has an average value of 89%, with this factor the student stated strongly agree that CBT application that has been developed convenient when used.

Based on the results of application testing through answering questions directly by 158 students on CBT applications that have been developed results obtained as follows:

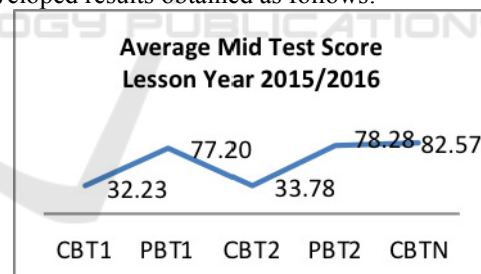


Image 3. Rank Mid Test CBT

Information :

- CBT1 (Computer Based Semester 1)
- PBT1 (Paper-Based Test 1)
- CBT2 (Computer-Based Test Semester 2)
- PBT2 (Paper-Based Semester 2)
- CBTN (Computer Based New)

## 5. CONCLUSION

Based on the result of Usability analysis with User Experience approach on Computer Based Test

application using the User Acceptance Test method, it can be concluded as follows.

1. Of the 158 students of class XII SMK Negeri 4 Pandeglang are actively sampled in the study. In this study using five variables based on the theory of methods taken from Jacob Nielsen such as Learnability, Efficiency, Memorability, Error, and Satisfaction.
2. From the average percentage of five variables is then obtained the average usability rate of 91.4% which belongs to the category Strongly Agree. From the results of application testing through answering activities directly by 158 students on CBT applications that have been developed obtained.

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#### **Image 2: User Interface PrinciplePopulation in this research is all active class XIIst...**

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