Online Exam System to Improve Student Learning Quality in State Vocational School 5 Tangerang City

Aris Martono[1], Arsi Yulianjani *[2], Dewi Immaniar Desrianti [3]

*correspondent

[1,3] Informatics Engineering Study Program, Raharja University Faculty of Science and Technology

[2] Information Management Study Program, Raharja University Faculty of Science and Technology

E-mail: [1]aris.martono@raharja.info, *[2] **arsiyulianjani@raharja.info**, [3]dewi.immaniar@raharja.info

Abstract

The aim of this research is designing an online examination system at SMK Negeri 5 Kota Tangerang. This time, the system used in assessing exam results is done by correcting each question of each student's answers. It is not only increasing the operational costs of schools, but also the risk that leaked exam questions very vulnerable. As well as scheduling the exam must consider the limited number of rooms and require a lot of time. The method of collecting datais used observation, interview and literature study. And the system analysis method is used to determine the number of functional and non functional requirements. The design method uses Unified Modeling Language (UML) with the MySQL database system. This visual paradigm function is to make use-case diagrams, sequence diagrams, and activity diagrams and class diagrams. The use-case diagram of this system consists of use case diagrams of students, teachers, and teachers admin system and PHP programming language, for writing program listings using Dreamweaverand implementing the system. By using online examination system the quality of student learning will be improved, lowering school administration costs and preventing question leakage and exam scheduling to become more flexible.

Keywords: Online Exam System, Learning

1. INTRODUCTION

Examinationis the way to evaluate the results of teaching and learning activities and to measure the level of achievement of teaching and learning activities, in order to know the student abilityin understanding thw lesson.Then the test results will be processed and assessed by the teacher to get the result that will determine the score obtained by students. For this reason, accuracy in providing an assessment is needed to avoid mistake or error in the process. Examination sucsess is usually determined by condusive, fun and creativity in the teaching and learning process, thus the process of teaching and learning activity need to be improved in terms of quality and quantity to achieve good result.

Along with technological advances, teaching and learning activities should be able to take advantage of these technological advancements to improve quality, speed, practicality and convenience, likewise, the measurement of learning outcomes or examinations for students. The advancement of technology is by using computers for learning and testing, one of which is the use of computers for online examinations.Some countries consider online exams, as a tool for measuring assessments. Educational research suggests that students use computers in their schools or classes for daily teaching and learning activities. Nevertheless, in the last five years, the gap in computer access for students has been ignored.

During this time SMK Negeri 5 Tangerangassessess the exam results are done by correcting each question and student answer. This will increase the cost of school operations and the risk of leaking exam problems can occur. Moreover scheduling exams should consider the amount of space that is

65

limited and require a lot of time. Therefore, it is proper for every field of education to use and utilize information and telecommunicationstechnology in the testing of online problems.

The existence of an online exam system can provide a direct score assessment;reduce school administration costs, increased safety of exam materials and more flexible exam scheduling. Thus, the online test system can improve the learning quality of students in school, especially SMK Negeri 5 Tangerang City.

2. RESEARCH METHOD

To obtain the research data, using several methods such as (a) observation method is to conduct a direct review to SMK Negeri 5 Tangerang City to obtain data and information about the data that will be needed. (b) The interview method by questioning some of the speakers at the research site. This question and answer process is carried out directly to the principal. (c) Literatur study method by taking references from previous research.

This method of analysis system with elicitation need analysis is to know how many functional and non-functional requirements of the system. The functional requirement of this system is a facility that is in the system while the requirement of non-functional system is outside the system. To create the system that complies with the results of the elicitation of this final draft, a conceptual design of the system and a detailed design of the system are draft in which this design is implemented in the form of a computer program.

After conducting literature review by comparing some previous research that related and unidirectional in this research, the results can be described as below:

1. Study from (RennyOktapiani,2016)aboutAssessment of Online Exam system acceptance uses Technologi Acceptance Model (TAM) and*Theory Of Plan Behavior* (TPB)in SMKPasim Plus Sukabumi. This studyanalizeswhat factorsthat influence the use of online exam system in SMK PasimPlus Kota Sukabumi. The result test can be concluded that perception of user convenience affects the use of online exam systems significantly is 61,8%.[1]
2. Study from (Erick Andika, et al, 2017)aboutAnalysis of the benefits of online exam Information System implementation: case study in SMK Pasim Plus.Some indicators that affect the benefits of the online examination system are Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Behavioral Intention, and User Statisfaction.Where some of the above indicators to measure the use of the online examination system.Performance expectancy is proven empirically influences on Behavioral Intention. Effort Expectancy is proven empirically influence on Behavioral Intention. Facilitating Condition is proven empirically influence Behavioral Intention.[2]
3. Study from(M. RamaddanJulianti dan PetrusSilalahi, 2015) aboutthedesign of online examination Web-based case study inSTMIK Buna Sarana Global. The purpose of this research is to create a web-based online exam application system in STMIK BINA SARANA GLOBAL using PHP as a programming language and MySQL as a database.[3]
4. Study from(Ade Mubarokdan Mochammad Chandra Kurniawan, 2015)aboutonline Exam application at SMK Ma'arif Bandung Web-based.By this online examination system, the exam process at SMK Ma'arif Bandung runs smoothly and in terms of time and inexpensive financial resources. So that the examination process at SMK Ma'rif Bandung is more effective and efficient.[4]
5. Study from(Ni KadekSukertidan Ni WayanCahyaAyuPratami,…..)aboutonline exam aplication system atSMP Negeri 2 NUSA PENIDA.This research produces several conclusions among others: The system was designed using the PHP programming language used the Yii Framework and the real-time calculations using Ajax. This User interface system was designed like an interface on online games to attract students to work on the available questions. This system can be accessed on the link:[5]

6. Study from(Yohanes Setiawan,2016)about prototypeof online examination and Real-Time Participant answers assessment. A prototype online exam system is built to replace a paper-based exam system and to be accessed by participants using internet networks. This prototype online test system uses a client-server-based platform. With the support of network infrastructure, databases, and open-source programming languages, the test system can be integrated and easy to develop. By the randomization model of the the question on the database, the test questions are expected to be varied, dynamic, not easily memorized, and prevent participants to cheat each other so that transparency on the value obtained can be achieved.[6]

7. Study from(DheruAlam Perkasadkk.,2015)aboutOnline examination system of Essay with assessment using Latent Sematic Analysis (LSA) method.
    The results of this study, include: a functionally built online essay exam system can already run an online exam with assessments using the LSA (Latent Semantic Analysis) method and the proximity measurement between a vector of answers With the answer key using the Cosime similarity algorithm. This system increases the validity of the exam results by randomly displaying of each student based on a package of questions made.[7]

8. Study from (Rogers Pakpahan, 2016) aboutComputer-Based National Exam Model: Its Benefits and Barriers.
    The results of a computer-based national exam implementation have been successfully carried out in 556 schools (SMP/MTs, 42, SMA/MA, 135, SMK 379) in 141 districts/cities and 30 provinces and two Indonesian schools abroad.[8]

9. Study from (Ferro BayuSaputrodkk.,2017) about Development of Diponegoro University Online Lecture system for student interface on Android based mobile device.This Undip online lecture system Android-based is more effective for lecturer users in making and uploading materials at any time without depending on time and place because of the flexibility of mobile devices that can always be ready on smartphones/gaget rather than using a web-based system that requires users to access through a browser. This Android-based UNDIP online lecture system application can be executed in a wide range of mobile operating systems.[9]

10. Study from(Rizka Ella SetyanidanSukmawatiNurEndah, 2014) about a doctoral exam scheduling system at the postgraduate program of Diponegoro University. This research resulted in a doctoral exam scheduling system used to manage all the data needed for the doctoral exam and successfully implemented to facilitate the performance of the administrators who making schedule and managing data students who will conduct a doctoral exam to avoid colliding schedules so that it can be more structured, can be increased the accuracy of data, and can be accelerated the processing of existing data. For students, this system makes it easy to find out the exam schedule, doctor exam statistics, as well as information related to the implementation of doctor exams because it can be accessed online.[10]

The results compare and consider with some previous studies above that the study provided a direct score assessment, reduce the cost of school administration, and increase safety of exam materials as well as more fleksibility of exam scheduling.

To conduct a national standardization test the government implements a national examination in which the question format and assessment criteria are determined by the center and applied in a wide area.

Therefore, teachers should be able to carry out teaching and learning activities to students optimally so that the material is mastered and understood by them. After taking the national exam, the student can achieve a standard value set by the central government. Thus their value results can follow a higher level of education. Their achievements can be used as one of the government's evaluation materials for the enhancement of national education quality.

In order to control the quality of education nationally conducted evaluation as a form of accountability of education organizers to the interested parties.[11]

3. RESULTS AND DISCUSSION

The survey Results from the site and the stakeholders is gained 26 functional needs and 4 non-functional needs. After analysis process with the approach of MDI (mandatory, disable, inessential) is obtained 22 functional needs and 4 non-functional needs.

The Process is continued with the approach analysis of TOE (technical, operational, economical) is obtained remains 22 functional needs and 4 non-functional needs. Finally,the elisitationof final draft was approved by both parties; stakeholders and system makers, it is acquired 22 functional needs and 4 non-functional needs.

The design of this system uses visual paradigm with MySQL database system. This visual paradigm function is for creating use-case diagrams, sequence diagrams, and activity diagrams as well as class diagram. The use-case diagram of this system consists of the use case diagram of students, teachers, and teachers of adminssystem.
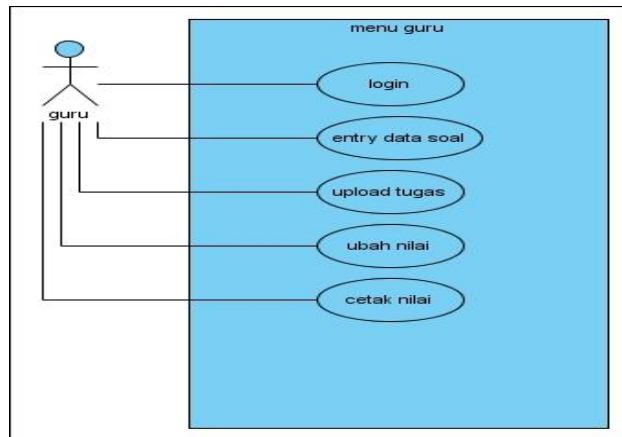
Use Case Diagram of student
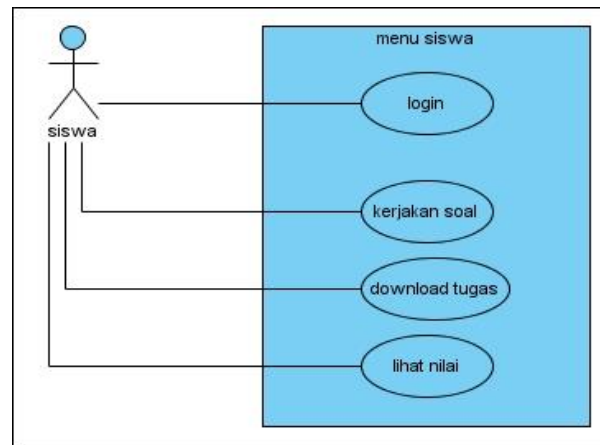
Gambar 1.*Use case diagram* of student

Based on figure 1 above, it can be explained as below:
-1 (one) system that includes online exam processing activities.
-1 Actor who performs activities including: Students
-4 Use cases that are commonly performed by students
-Students login - select work menu to do the test or download task
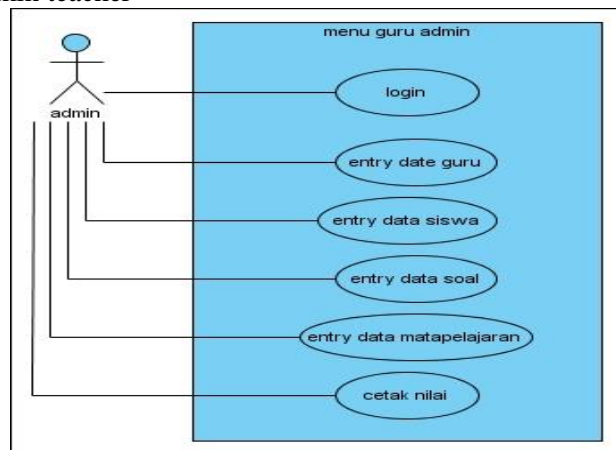
Use Case Diagram of teacher

Gambar 2.*Use Case diagram* of teacher

Based on Figure 2 above, there are:

-1 (one) system that includes online exam processing activities.

-1 Actor who performs activities including: teacher

-5Use case is commonly done by the teacher

-Login and select menu for test or upload task, score change, score print


Use Case Diagram of Admin teacher

Gambar 3.*Use case diagram of*teacher admin

Based on Figure 3 above, it can be explained as below:

-1 (one) system that includes online exam processing activities.

-1 Actor who performs activities including: Teacher Admin

-6 Use cases commonly done by the teacher admin

-Login then select the entry Data menu of teachers and students, entry data exam or upload task assignment, but it can not edit student score.
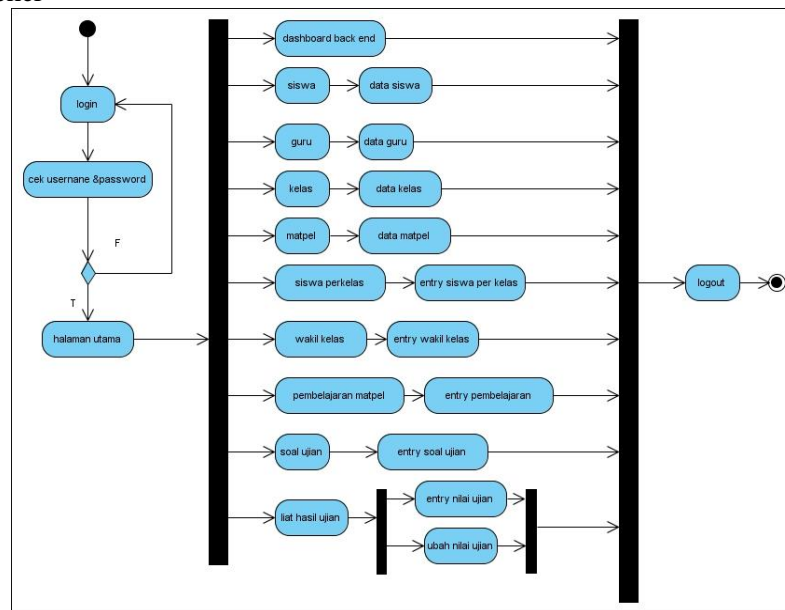
Activity Diagram of student
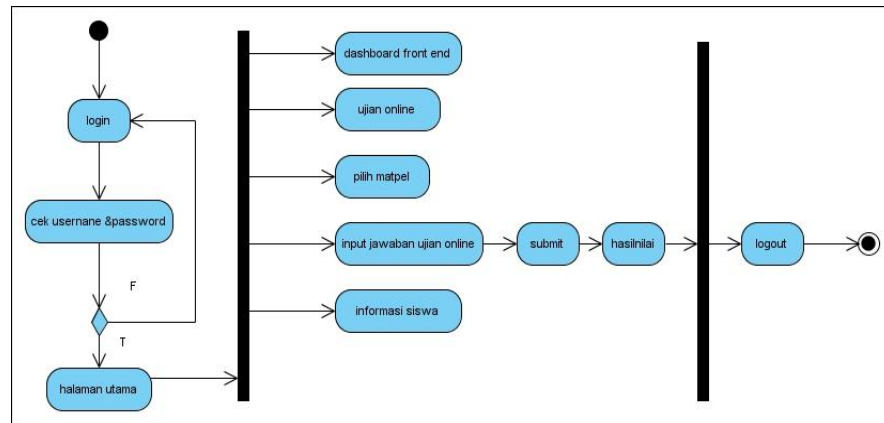
Gambar 4.*Activity diagramof student*

Based on the Figure 4 activity diagram above, it can be explained as below:
-1 (one) Initial Node, as the object begins.
-12 (twelve) actions, state of the system that reflects the execution of an action on this running system.
-1 (one) decision node, which reflects as an execution option.
-2 (two) Fork nodes.
-1 (one) Final State, as the object is terminated.

Activity Diagram of teacher

Gambar 5.*Activity diagram of teacher*

Based on the Figure 5 activity diagram above, it can be outlined as below:
-1 (one) Initial Node, as the object begins.
-25 (twenty five) actions, state of the system that reflects the execution of an action on this running system.
-1 (one) decision node, which reflects as an execution option.

70

-2 (two) Fork nodes.
-1 (one) Final State, as the object is terminated.

Sequence Diagram of Online examination system

Gambar6.*Sequence Diagram*of Online examination system

Based on the picture 6 sequence diagram above, it can be explained as below:
-3 (two) actors, who do the activities; students, teachers,.
-18 (Twelve) life line, object entities interacting with each other.
-13 (Thirteen) Mesage, specification of inter-object communication that make the activity information occur.

Diagram Class
        The diagram class can assist in visualizing the structure of the classes of a system and is the most widely used diagram type. The diagram Class also describes the group of objects with the same attributes and relations. The following is an online test system diagram class. (see figure 7)

Gambar 7.*Class Diagram*of online examination system

71

The Interface design of Online Examination System

This Interface design of Online Examination System consists of adisplay of login menu, a display of menu for selecting the exam questions, a display of studentexam questions, a display of student grades, a display ofmaking exam questions, and a display of changing student grades.

Display System for login page

This display login page (see Figure 8) asks for input username and password from the user who will operate this system. This Login will receive several user categories such as students, teachers, principles and system administration in accordance with the authority of each user.
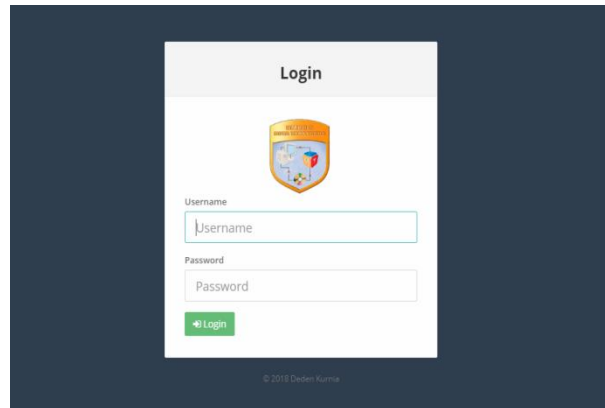
Figure8.Display forlogin page

Display to select the student exam

Each user, especially teacher who successfully login can choose the questions that are tested to the students. This view provides several facilities: Do the question, download the task and see the test scores of examination was conducted by students (see Figure 9).
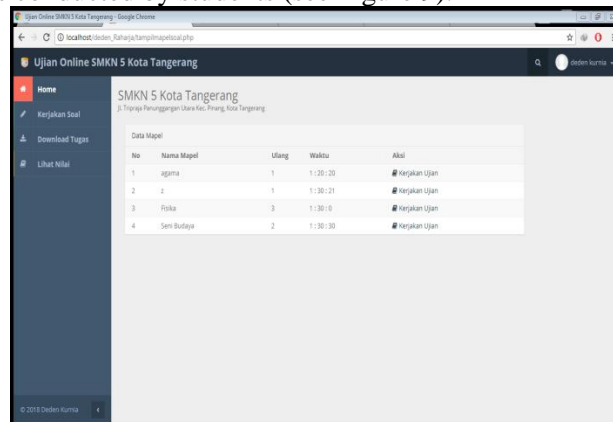
Figure9.Design of Display to select the student exam

Display of student exam question

For examinees students on-line who are logged in and succeed will be shown as display in figure 10 below.
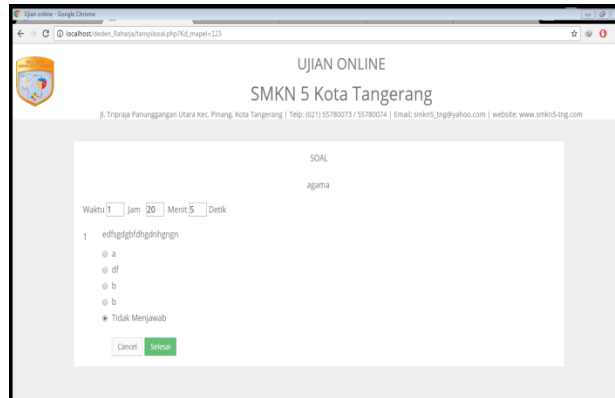
Gambar10.Design of student exam display

Display to see student Score

Teacher user who has successfully logged in can see the results of the students grades and the number of times they have taken the on-line exams as shown in Figure 11 below.

Gambar11.Design of display to see student score

Display to make the exam question

To create a variety questions, a user can add new questions to the facility as shown in Figure 12 below.

Gambar12.Design of Display to make the exam question

4. CONCLUSION

Based on the results of the identification of problems and discussion above, this research can be concluded as follows: In the current test process is still very simple by recording manually and the data is stored using the bookkeeping or archive, this makes the data or information will be lost or damaged. In the process of analysis system byElisitation method is obtained 22 functional needs and 4 non-functional needs.

5. SUGGESTION

In the design system used Unified Modeling Language (UML) and implementation using the programming language (PHP), then for the writing of the program listings using Dreamweaver with MYSQL as the database. With this online test system, the quality of students learning will be improved, reducing school administration costs and preventing question leakage and scheduling the exam can be more flexible.

REFERENCES

[1]   Renny Oktapiani. 2016. Kajian penerimaan Sistem Ujian Online Mengunakan Technologi Acceptance Model (TAM) dan Theory Of Plan Behavior (TPB) di SMK Pasim Plus Sukabumi, Sukabumi: Jurnal SNIPTEK AMIK BSI.

[2]   Erick Andika dan Djajasukma. 2017., Herry Heryanto, Analisis Manfaat Penerapan Sistem Informasi Ujian Online: Studi Kasus SMK Pasim Plus "jurnal JTERA - Jurnal Teknologi Rekayasa, Vol. 2, No. 1, Juni 2017, Hal. 47-54. 1

[3]   M. Ramad dan Julianti dan Petrus Silalahi. 2015. Perancangan Ujian Online Berbasis Web Study Kasus Pada STMIK Buna Sarana Global. JURNAL SISFOTEK GLOBAL.

[4]   Ade Mubarok dan Mochammad Chandra Kurniawan. 2015. Aplikasi Ujian Online pada SMK Ma'arif Bandung Berbasis Web.Vol. II No. 1 April 2015.Bandung: Jurnal Informatika.

[5]   Ni Kadek Sukertidan Ni Wayan Cahya Ayu Pratami(…..). Aplikasi Sistem Ujian Online pada SMP NEGERI 2 NUSA PENIDA.Vol. 17 No. 4, hlm 1-6. Jurnal Ilmiah DASI.

[6]   Yohanes Setiawan. 2016. Prototipe Sistem Ujian Online dan Penilaian Jawaban Peserta Secara Real-Time.Vol 3. No 1. Maret 2016.Jurnal Teknologi Informatika dan Komputer Atma Luhur.

[7]   Dheru Alam Perkasa, Eki Saputra, Mona Fronita.2015. Sistem Ujian Online Essay dengan Penilaian Menggunakan Metode Latent Sematic Analysis (LSA).

[8]   Rogers Pakpahan.2016. Computer-Based National Exam Model: Its Benefits And Barriers. Jurnal Pendidikan dan Kebudayaan, Vol. 1, Nomor 1, April

[9]   Ferro Bayu Saputro, Maman Somantri, Agung Nugroho. 2017. Pengembangan Sistem Kuliah Online Universitas Diponegoro Untuk Antar Muka Mahasiswa Pada Perangkat Bergerak Berbasis Android.Vol 19 No 1,Januari 2017. Semarang: Jurnal TRANSMISI.

[10]   Rizka Ella Setyani dan Sukmawati Nur Endah. 2014. Sistem Penjadwalan Ujian Doktor pada Pascasarjana Universitas Diponegoro. Semarang: Jurnal JurusanI lmuKomputer/ Informatika.

[11]   Undang-Undang Republik Indonesia No. 20 Tahun 2003 tentang Sistem Pendidikan Nasional.