

**ONLINE SELF-EXAM APPLICATION
WEB-BASED LEARNING EVALUATION SOLUTIONS
DURING A PANDEMIC**

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ABSTRACT

The Covid-19 pandemic that struck the whole world has a considerable impact on all aspects especially the field of education. Some schools that have not used information technology as learning media are required to have high creativity and adequate knowledge of information technology. Testing as an evaluation of students' learning during a pandemic is conducted remotely so that online self-exams web-based are required. The local test system was changed to online. The study aims to evaluate student learning through an online exam application. It uses the Fisher-Yates method to randomize questions so as to minimize students from cheating. The study resulted in an online self-exams application that could save paper use, deliver real-time exam results, and presentation of randomized questions using the Fisher-Yates method. Easy to use application for teachers and students so that exam activities are easy to implement and fun.

INTRODUCTION

The world is currently experiencing a covid-19 pandemic. This Pandemic provides a tremendous impact on all aspects especially the field of education[1]. The world of education when this pandemic makes learners follow distance learning. The role of information technology is indispensable for running distance learning. The online exam system is part of a remote education information system through online technology media or e-learning[2].

Exams are one form of evaluation used to assess the ability of students taught by teachers to students[3]. Online self-exams application is required to evaluate distance

learning to control the quality of education[4]. Referring to the legal basis of BNSP regulation number 0032/P/BNSP/III/2015 about computer-based online exams.

Exam activities that occur before a pandemic involve many people in one room should now be converted into network-based to prevent the spread of viruses. Therefore, the author raised the research of web-based self-exams applications as one of the solutions to the lack of current exam systems. Leveraging information technology and communication development by designing web-based applications so that they can reach students in distance learning. The use of paper will be more efficient and check its value in real-time. Surely the use of this application requires knowledge and training for the operator to be able to use it.

Exam questions are presented using the Fisher-Yates method. This method aims to randomize the sequence of questions for each student so that there is no sequence of the same problem. The proposed method in the year 1938 was used by many previous researchers[5]. Algorithms Fisher-Yates is an algorithm for generating random permutations from a limited set. The Fisher-Yates algorithm is used for file encryption[6]. This method is used in online self-exams applications to minimize student cheating.

METHOD

The research methodology is done to get good results and according to research objectives. The research method step is done as follows:

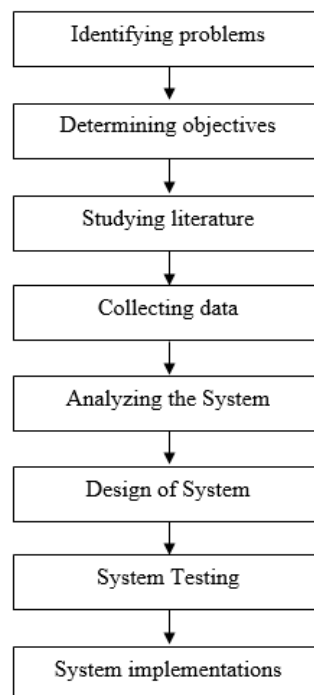


Image 1. The research methodology

Identifying problems

At this stage researchers see, study, review, and describe and explain problems with research objects. Researchers also learned the right methods for addressing web-based exam issues, preventing students from cheating. The Fisher-Yates method is an option to randomize the question that will be presented

Determining objectives

At this stage explain how the researcher determines the objectives and limits the problem so that the research does not expand. The study aims to evaluate students' learning during pandemic using online exam applications.

Study Literature

The literature studied in the selection to be determined which literature to be used in this study. Literature is derived from libraries, journals, and reading materials that support this research.

Collecting data

Collect the necessary data for this research by conducting field research and observation methods. The Data collected will be the design material at the design stage.

Analyzing the System

Learn the current system, the parties involved in the system, and analyze the required device requirements.

Design of System

Designing a Usecase Diagram, designing the user interface, and database design. At this stage, the system will be designed first. The system design phase is a stage of depiction, planning, and manufacturing. The goal is to create a clear and complete design to be used for the creation of the computer program. The result of this stage is to get a system model to be designed.

System Testing

Learn the current system, the parties involved in the system and analyze the required device requirements

System Implementations

Researchers implement web-based self-exams applications that have been conducted in design and testing.

In addition to using the waterfall method researchers also used the Fisher Yates method as a random value generator used to randomize the sequence of questions. The following is the flowchart of the Fisher Yates method.

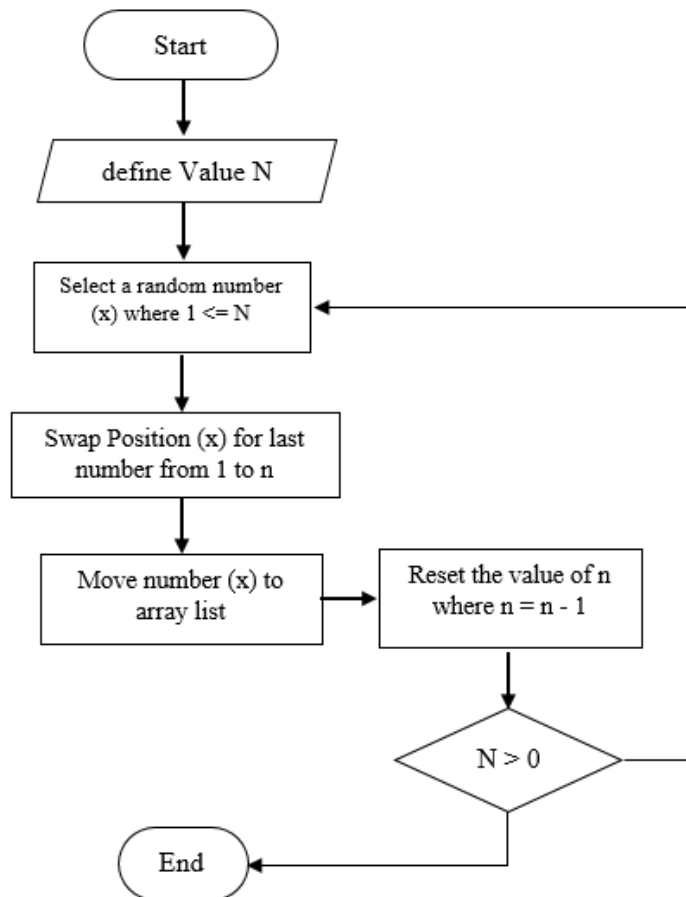


Image 2. Flowchart Fisher Yates-Shuffle

RESULT AND DISCUSSION

The benefits gained using Fisher Yates-Shuffle are that in the iteration process there is no recurrence possibility and this process is faster than the usual randomization method and minimizes memory usage.

Design of Use Case Diagrams

This design is necessary to illustrate the boundaries of the parties involved in using the system.

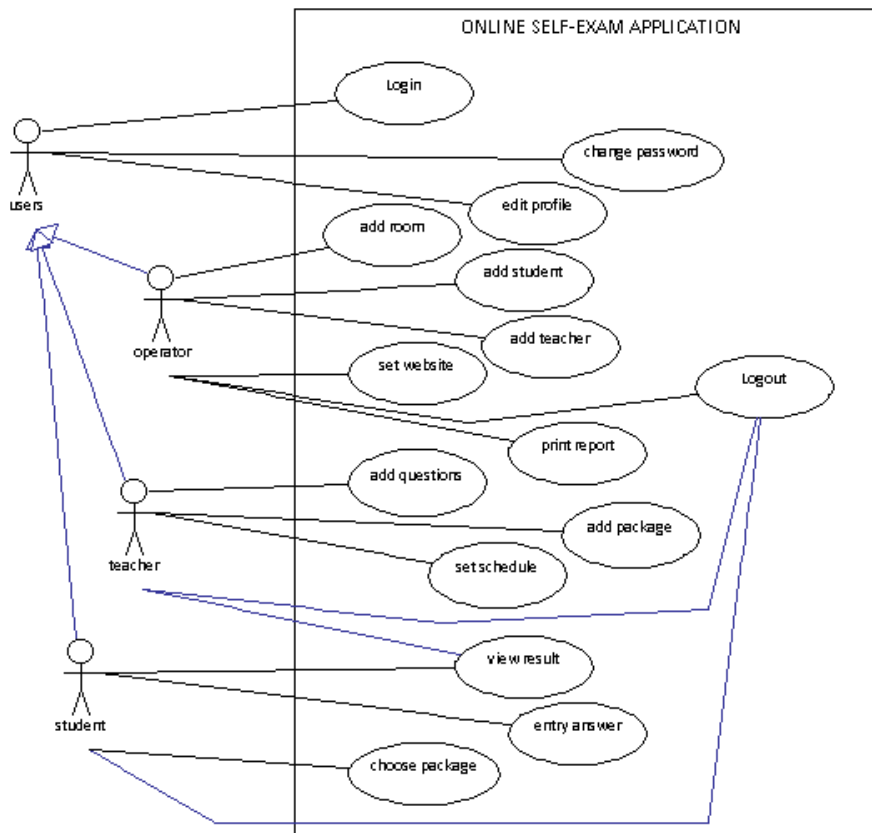


Image 3. Use Case Diagram

Display of the application

The online Self-exams app display is as follows:

Login Page

The login page only consists of one form consisting of three levels of users, namely admin, teacher, and student.

Image 4. Form Login

Teacher Dashboard Page

On this dashboard page consists of several menus, namely: packages, questions, schedule settings, and reports.

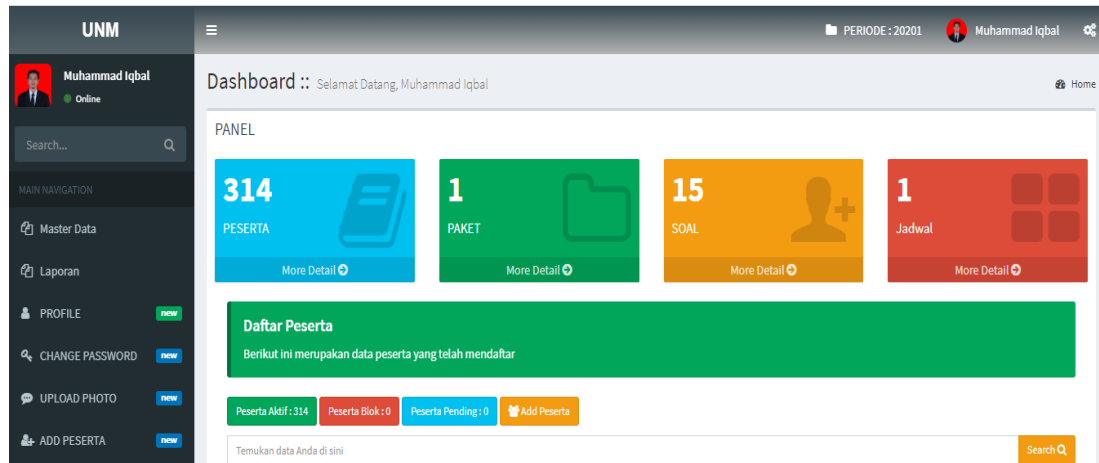


Image 5. Teacher Dashboard Page

Student Exam Pages

On this page, students answer the question just by choosing one of the many options. This page supports a responsive display so that each student can access via a smartphone.

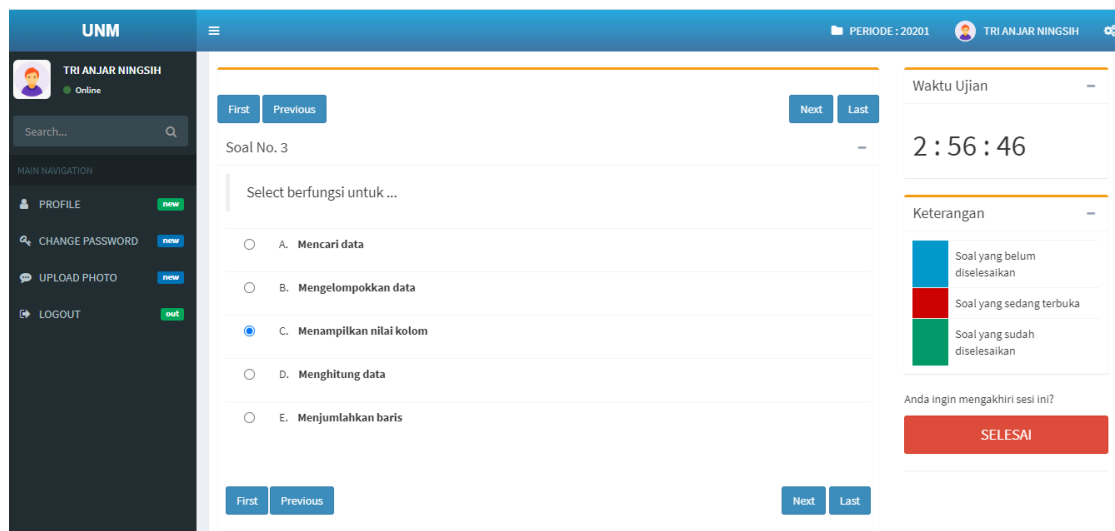


Image 6. Student Exam Pages

System Requirement

The minimum system needs to be fulfilled for online use Self-exam applications consist of:

- Operator (computer laboratory officer),
- Server (PC, Processor 4 Core 1.6 GHz, 8GB RAM DDR 3, 500GB HDD, OS 64 bit)
- Client (PC/laptop/smartphone, Single Core processor, 512MB RAM, OS, browser)
- Internet network with minimum bandwidth of 1 Mbps

Advantages of the App

- Easy Installation (Server)
- Presenting questions Randomly
- Easy to use
- Multiple choice and Essay use
- Simply use the Browser (Client)
- Realtime Exam Results (multiple choice questions)
- Responsive

Disadvantages of applications:

- Not yet support *.mp3 and *.mp4 (Questions in the form of video)
- The value of essay still requires the role of teacher because of the question of using students' opinions.

CONCLUSION

The evaluation of student learning at the time of this pandemic can be done by utilizing information technology one of them using an online self-exams application. The online Self-exam application becomes one of the solutions to evaluate students' learning in distance education. Cost savings, real-time exam results, and app usage easily handle system weaknesses manually by using a lot of paper, spending a lot of costs, and taking a lot of time. Questions randomly using the Fisher-Yates method makes students not get the same sequence of questions to minimize cheating.

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