

# Web-Based Quiz Application

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## Article History

Received Nov 28, 2023  
Accepted Dec 9, 2023  
Published Dec, 2023

## Keywords

edmodo, google form,  
learning evaluation, sectional  
quizzes, quizizz, quiz  
limitations



## Abstract

Innovations in technology have an impact on education, particularly evaluation. Edmodo, Google Forms, and Quizizz are examples of web apps that make it easy to assess learning. However, there is no time restriction for answering inquiries via Google Form. Because Kahoot and Quizizz have restricted quiz styles and processing durations, it is impossible to assess students' abilities thoroughly. The answer is to utilize a new quiz type called "sectioned quiz" that breaks the quiz into timed portions. Teachers may acquire a better grasp of each section's student knowledge, identify areas for growth, and build more tailored teaching solutions. This app is a flexible tool for evaluating participant learning and comprehension of classes. It enables subject-specific evaluation, making estimating participant knowledge levels easier. This app makes it easier to respond to queries and adds a feature that allows users to rate their replies. Furthermore, this function evaluates the quality of the quiz questions, assisting in their development to achieve an adequate degree of rigor.



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## 1 INTRODUCTION

At the moment, we are living in a digital era that is being shaped by innovations in technology. The continuous improvement of technology is making life easier for the general public. One of the fastest-growing sectors is information and communication technology. The improvement of technology is closely related to the expansion of internet penetration in Indonesia. Currently, we may easily access a variety of information in just a few minutes of time. It has a positive impact on people's lives, particularly in the field of education [1].

Evaluation is an important part of education that adds to the effectiveness of the teaching and learning process. Teachers, as evaluation implementers, can use assessment data to improve the learning process. As a result, teachers may assess how they are teaching and what the next steps are for pupils to attain learning objectives [2].

In the twentieth century, assessment became a prominent subject in education. There is a wealth of literature on assessment, and many professionals are interested in the subject. Overall, academics believe that evaluation is an essential component of the educational system and cannot be separated since it is the most important factor in obtaining effective learning. Teachers must comprehend the evolution and progression of student learning from the beginning to the end of the teaching and learning process over the course of multiple school years [2].

Simply put, assessment is the act of gathering and analyzing data in order to determine student learning outcomes. Teachers can monitor and analyze students' learning progress and the learning process by conducting learning assessments. They can also offer students continual feedback [3].

According to Purwati [1], information and communication technology may now be used to evaluate learning that takes place in the classroom. Teachers may utilize numerous digital tools and software to carry out evaluations more efficiently and successfully in this manner. Teachers can gather information on students' knowledge and development, for instance, by using digital assessment tools, interactive quizzes, or online learning platforms. This makes it possible for teachers to more swiftly gather precise information and decide on the best course of action for each student's learning requirements.

Website-based apps are one viable alternative for making learning assessments more convenient. As an assessment medium, numerous apps may be utilized. Edmodo, Quizizz, and Google Forms are a few examples. The ability to generate and manage examinations online is offered by these tools. Through the site, teachers may create tests, assignments, and quizzes that students can access. This facilitates the quick collection and analysis of assessment outcome data by educators [3].

An additional option for doing the learning assessment process is a Google Form. A user-friendly framework for producing online assessments is offered by Google Forms. Instructors are able to formulate evaluation questions, get student responses, and effectively analyze assessment outcomes [4]. By imposing a time restriction on answering questions, Google Forms cannot, however, be used to assess learning. Applications for computer-based tests, or CBTs, typically include a timer or another feature that might interfere with focus. As a result, it is anticipated that participant tension will drop and the caliber of their responses will rise.

The goal of this research is to create Quiz App, an online application, based on these issues. This program offers two different quiz formats: a section quiz with a time constraint on several sections inside the quiz, and a conventional quiz with a time limit on the entire assessment. Users may select the kind of quiz that best fits their needs thanks to the diversity of question styles available.

## 2 KAHOOT!

Kahoot!, a popular interactive quiz tool in education, is utilized in both schools and other educational settings. Users of the platform may construct multiple-choice tests that are accessible through the Kahoot app or a web browser. When Kahoot! is used in education, it may be used for formative assessments to gauge students' understanding or for revisiting the students' prior knowledge.

By using an interactive method, Kahoot! makes learning enjoyable and engages students in the process of learning. However, because there is a time restriction on each question, utilizing Kahoot as a learning evaluation runs the danger of forcing pupils to answer quickly. Because of this, pupils who struggle to comprehend the subject matter could only respond haphazardly [3].

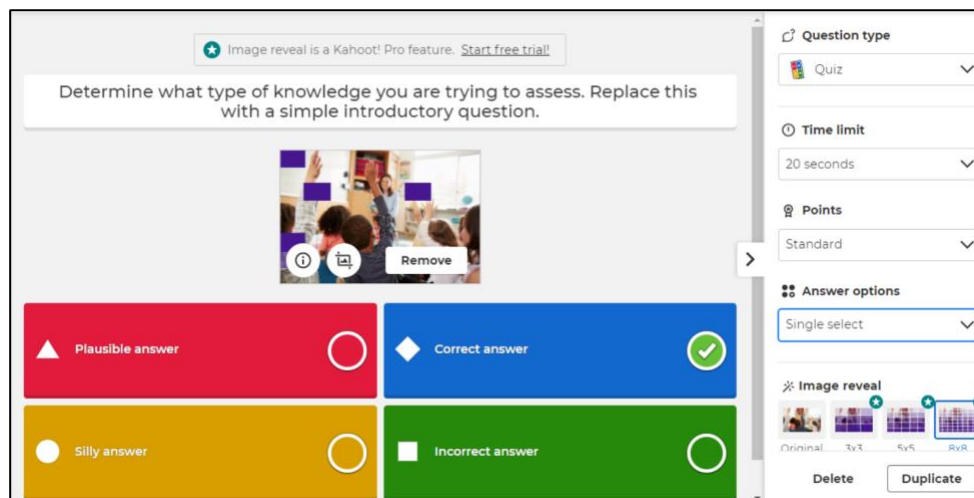


Figure 1. Kahoot!

## 3 EDMODO

Edmodo is an instructional tool that simulates social media in general but is tailored for use in the classroom. Students and teachers may communicate with one another using Edmodo by exchanging concepts, issues, and helpful advice. Assignments may be assigned and graded by teachers using Edmodo. There is a quiz component in the Edmodo program that may be used in Edmodo classes. However, unlike Quizizz and Kahoot! Edmodo quizzes have a structure that is restricted to certain questions.

Figure 2. Edmodo

#### 4 QUIZZZ

Quizizz is a tool that may be utilized in a variety of settings, including classrooms, study groups, examinations, and last-minute assessments. With this tool, educators and students may collaborate online while taking part. Users of Quizizz, including teachers and students, can respond freely to a series of questions in the form of quizzes. In addition, people who are taking the same quiz as them may compete. Quizizz offers an engaging and competitive learning environment that involves users in the process of learning and assesses their comprehension through this teaching and learning approach. Quizizz employs the same instructional strategies as the Kahoot! app.

Quizizz, as a learning assessment tool, suffers from the same flaws as Kahoot! There's a chance that pupils will respond hastily to questions because they feel under pressure to finish each one within the allotted time. Because of this, pupils who struggle to comprehend the subject matter could only respond haphazardly [3].

#### 5 GOOGLE FORMS

Users may use Google Forms to administer tests or surveys to other users and gather their information. Because Google Forms do not contain time constraints, they are less useful as learning assessments because it is harder for those implementing the evaluations to determine if a user can manage their time to finish a job.

In this case, Quizizz and Google Form can be utilized as tools for performing assessments. Teachers may construct online assessments using Google Forms, which students can view. The lack of a time restriction feature for each question, however, is Google Forms' drawback. As a result, assessments that gauge pupils' capacity to make judgments quickly may be less successful.

#### 6 SOCRATIVE

Graduate students in Boston created the cloud-based student response system Socrative in 2010. With Socrative, educators can design short tests that students may complete on their phones, laptops, or desktops in a hurry. Because Socrative lacks a time restriction option for use in assessment, it is comparable to Google Forms.

#### 7 RESULTS

Scenario for creating a quiz: at this step, the test-taker chooses the kind of quiz they want to take, from a standard quiz with a timer to a section quiz with a timer for every segment, all while entering questions and response options. The quiz scheduling scenario is one in which the quiz organizer schedules the quiz so that other users can utilize it. By selecting the previously generated quiz and then setting a time limit for access to the quiz (see Figure 3).

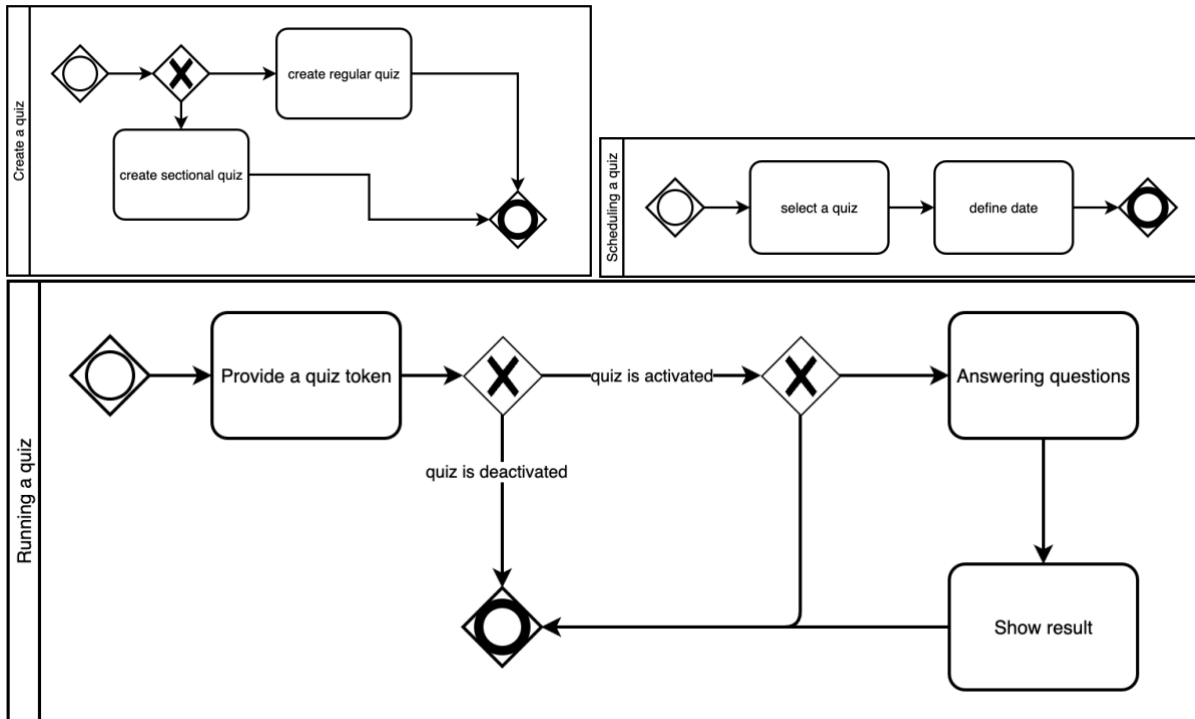


Figure 3. Main process in BPMN; (top-left) process to create a quiz; (top-right) process to scheduling existing quiz; (bottom) process to answering a quiz.

The database design consists of four collections: Users, Quizzes, UserQuizzes, and Participants. User data that has access to the program is stored in user collections. Data from quizzes is stored in the Quizzes Collection. Each User's quiz data is stored in the UserQuizzes collection. Users' information that has completed the quiz is stored in the Participants collection in the interim (see Figure 4).

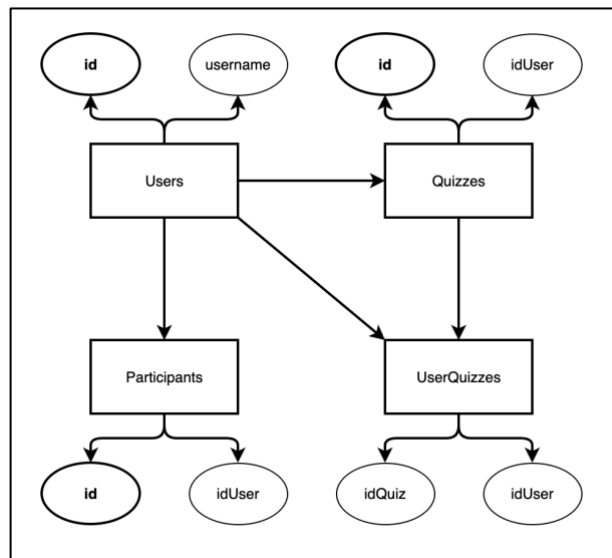


Figure 4. Database design overview

At the implementation stage, when a user signs in to the system successfully, the dashboard display appears first. You may make quizzes, see a list of quizzes, or see the quizzes that other users have been given to do using the menu. The screen for making a standard quiz comes next. Users can add the quiz's name, duration, question list, answer options, and the right response for each question to this display. And lastly, the quiz's questions manager interface. Sections that may be modified based on needs are used to organize the questions (see Figure 5).

When a quiz is launched, the app shows an opening/introduction page with information about the quiz, the quiz schedule, and the quiz duration. This display also shows how many questions and sections of the quiz will be performed. Regular quizzes

and sectional quizzes are not the same thing. Regular quizzes just show the total number of questions, while sectional quizzes describe the number of questions for each area (see Figure 6).

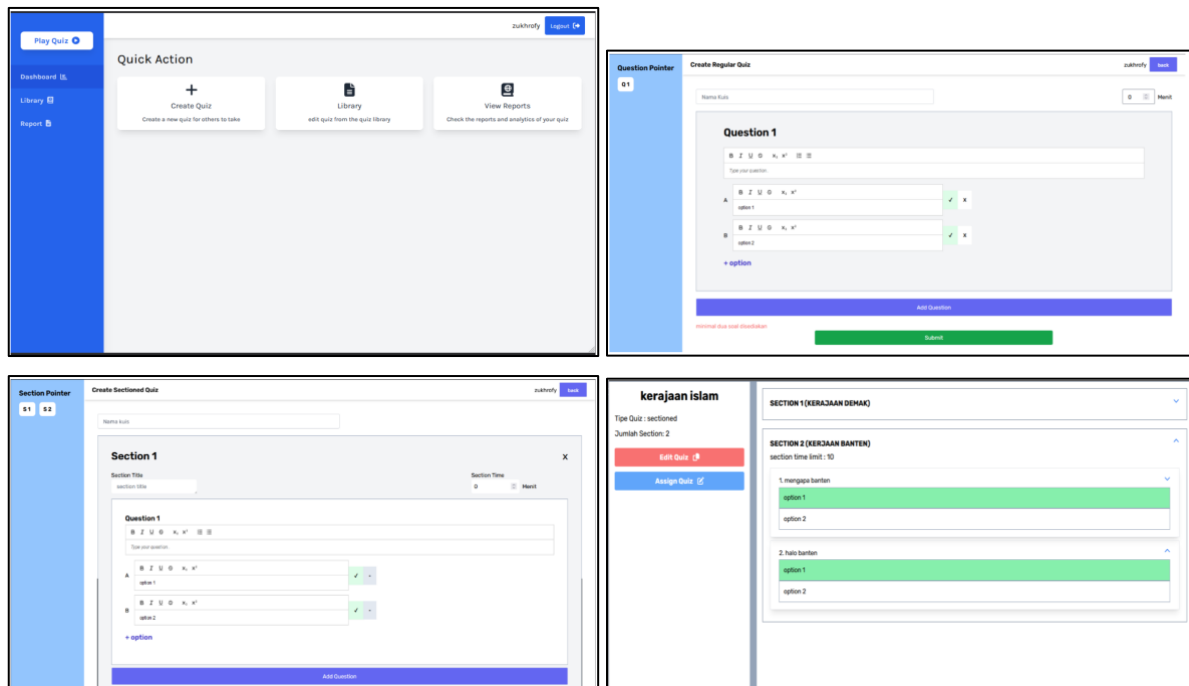


Figure 5. Quiz App; (top-left) system admin dashboard; (top-right) create a quiz; (bottom-left) create a sectional quiz; (bottom-right) managing question in a sectional quiz.

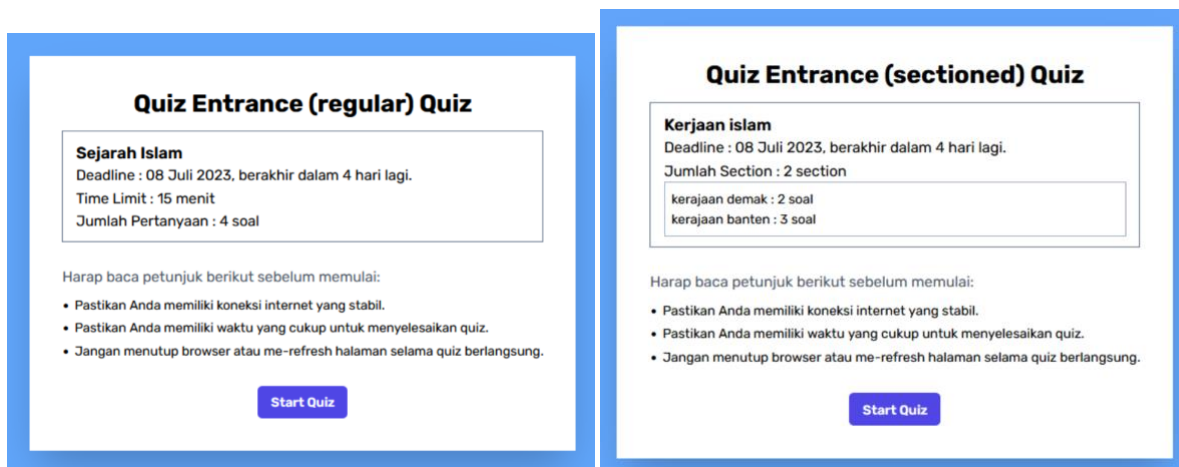


Figure 6. Running a quiz; (left) regular quiz; (right) sectional quiz;

The app shows the results of the user's replies once the quiz has been completed. This interface shows the final score, a list of chosen responses, and an assessment of all answers in comparison to the answer key. Users will find it simpler to assess the answer's outcomes as a result. Sectional quizzes will show the assessment results of quiz responses sorted by question group. This makes it easy to retrieve the quiz results for each group of questions (see Figure 7).

Backend quiz administration users may view a list of quiz participants who took part in the quiz, their scores, the answers they provided, and which items were correctly answered. However, the real answer information is not revealed for incorrect responses (see Figure 8).

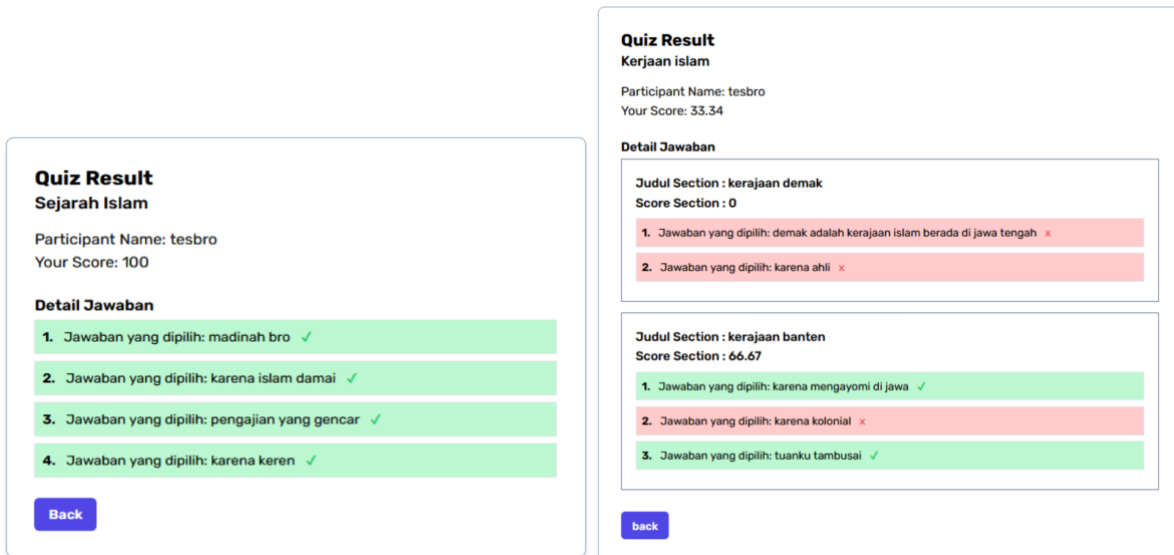


Figure 7. Quiz results

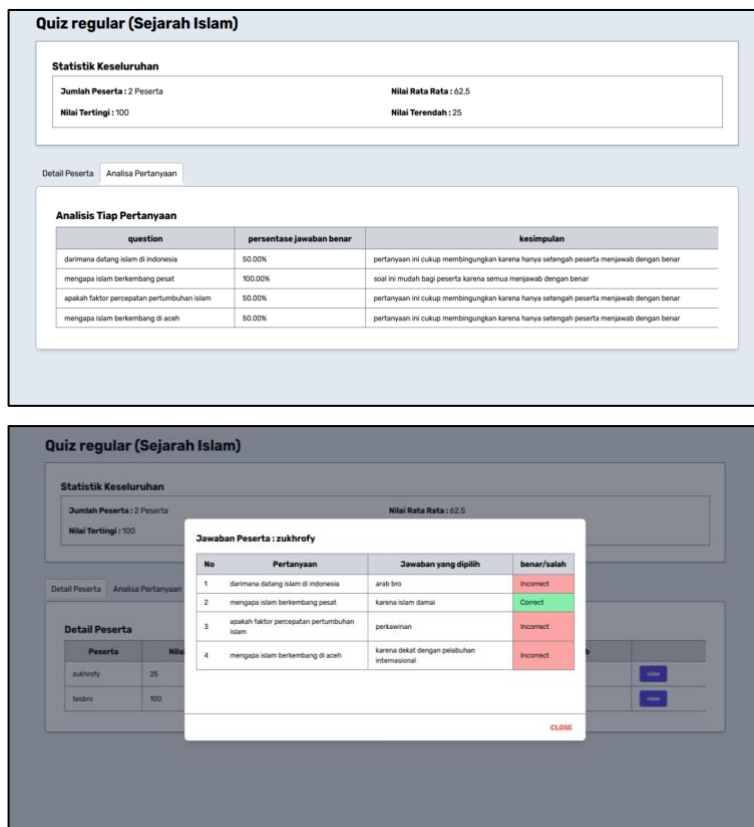


Figure 8. Quiz participants manager

The final app is tested using certain techniques after successful implementation. The goal of this testing is to evaluate whether the application fits the criteria and performs in accordance with the established plans and parameters. The User Acceptance Test (UAT) is one of the testing methodologies employed, and it seeks to determine how well this system can be used. Six respondents who assessed the application were asked a series of questions in order to conduct testing.

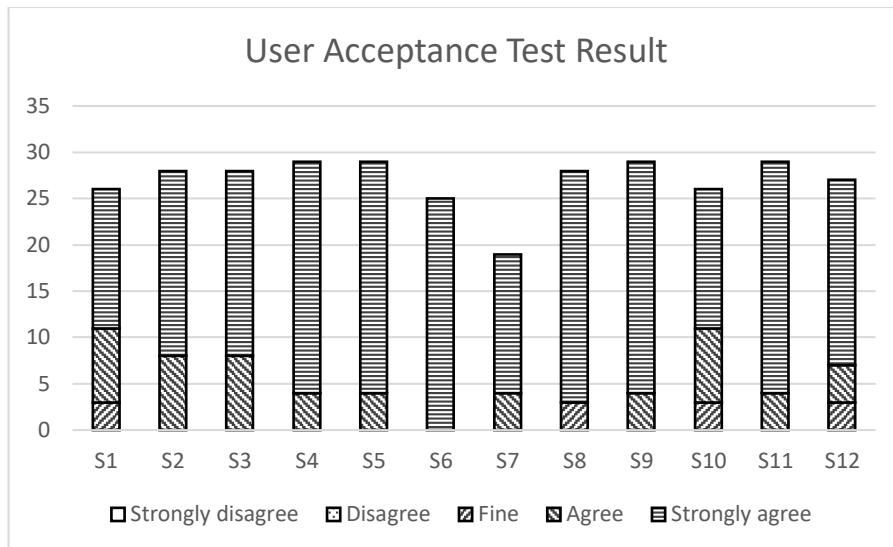


Figure 9. Cost per product: by value (left); by percent (right)

## 8 DISCUSSION

This application may be used to measure participant learning or the level of their understanding of a lesson. The app is able to help in assessing participants based on subject areas, making it easy to estimate their degree of learning. Participants can also find it simpler to respond to the questions by using the application. There is a function in the program that allows users to gauge how well they answered each question. However, this will aid in assessing the quiz's prepared questions in order to improve their level of severity.

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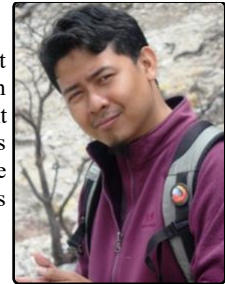


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