

Review Article

Enhancing e-Learning: Exploring Design and Evaluation of an Online Quiz System for Effective Knowledge Assessment

Yaspal Singh¹, Vineet Kumar Sharma²

^{1,2}Computer Science & Engineering, Chandigarh University, Chandigarh, Punjab, India.

I N F O

E-mail Id:

technicalpapers01@gmail.com

Orcid Id:

<https://orcid.org/0009-0000-3498-4181>

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A B S T R A C T

The Quick Quiz System is a web programme that allows you to take online exams more efficiently and save time by not having to physically examine the paper. The major goal of speedy Quiz System is to comprehensively assess the applicant using a completely computerized framework that saves time and provides speedy results. Educators deliver papers to students based on their convenience and time, there is no necessity of extra materials such as paper, pens, so on. This may be used in educational institutions as well as the business sectors. Because it is an electronic application, it may be used anywhere and at any time (client location is irrelevant). There is no requirement that the invigilator be present when the candidate takes the test. This Web Application allows you to lead online assessments anywhere around the world. It saves time by allowing several applicants to take the exam at the same time and displaying the results as the test progresses, so there's no need to wait for the results. The server generates it on its own. Admin could create, modify, delete represent instructors. Teachers may create a variety of assessments and settings for their learners. Students may enrol, login, take the exam using their unique id, as well as view the results. Teachers can also evaluate various settings. Students may also view their scores in all their attempts in various tests in various classes. It provides a competitive environment in which students may assess their insight/calibre while also working on their insight/expertise.

Keywords: E-Learning, Quick Quiz System

Introduction

This project is based on web development (FULL STACK), we have used HTML, CSS, Python and SQLite for development. The main aim of this project is to provide a user-friendly platform to students and teachers for conducting online exams in MCQ format. Moreover, this project is designed for the need of an organization to carry out operations in a smooth and effective manner.¹

The meaning of user-friendly here means that no formal knowledge is needed for the user to use it. Basically, the Online Quiz System is designed for Educational Institutes (like schools, colleges, universities, training institutes).

The system handles all the CRUD operations (create, read, update, delete). The type of questions in this system will be only in multiple choice. This system will provide better security and transparency in the examination. Also, this

system will reduce the time of taking examinations of the students manually. Moreover, it can be used anywhere any time as it is a web-based system.²

Advantages of Online Quiz System

Large Number

Taking online quizzes makes it possible to have many participants. It could be up to a number of 1000 participants (and even more).

It doesn't matter at what kind of location they conduct the online quiz as long as they are connected to the Internet.

Environment-Friendly

The traditional pen-and-paper exams have detrimental effects on the environment. The adverse environmental impact of mercilessly cutting down trees for paper is evident. However, using an online exam system will ensure that institutions and organizations can go paper-free and not print exam papers and create a paper record of applicants, etc.

Economical

When considering the human, logistic and administrative costs associated with the traditional exam setting, it's easy to distinguish an online exam system as the most economical system to conduct exams at scale. There is no need for students to assemble in large, spacious classrooms to take the test. The flexibility of time and venue lend considerable popularity among examinees. Online exams don't require renting a class or hiring an assessor for manual invigilation. Thereby, the advantages of an online examination system include eliminating redundant and expensive processes, bolstering the bottom line of an educational institution administering the system.²

Quick Turnaround Time

The enormity of the task is known to everyone involved in designing, managing, evaluating assessments, from students to teachers. One of the essential benefits of an online examination system is that it reduces the time invested in overseeing the entire examination process. The exam platform saves precious time for both students and teachers, which would otherwise be wasted on repetitive tasks. The exam software features the option of adding and importing questions, enabling students to access the exam facilitating batch-wise and examinations.³

Highly Secure

One of the main benefits of an online examination system is the enhanced privacy for students, which validates the usefulness of the entire process. There is no room for conducting malicious activities to rig the system and produce incorrect results, indulge in cheating or other such unlawful practices. In such a secure system, students too embrace the

results without contesting the outcomes, which encourages growth. Such levels of security and privacy foster a more positive mindset toward the educational institution and build a stronger mutual trust among teachers and students, ensuring overall transparency and bias-free results.

Easy-to-use

One of the main advantages of an online examination system is the ease-of-use for the administration and the students. The examiners can easily set up the questionnaire, determine the grading and send invites to students. Meanwhile, students can take exams remotely. Even participants from remote areas can attend the exam. Moreover, there is no scope of question paper leaks as every student gets a randomly selected set of questions as per the arrangement determined by the examiner.

Auto Grading

The benefits of an online examination system include setting up an automated grading system, more convenient than a standard grading method. The proliferation of technology in e-learning and the increasing number of participants mandate a flawless scoring mechanism that eases teachers' burden, saves time, ensures fairness. Automated scoring finds the correct answers by comparing the respondents' reply against the model answer. Interestingly, MCQs are extensively used in online tests because they make automatic scoring by a computer easy.

Project Design

Online Quiz System is a web-based application used to create and evaluate examinations. This system architecture consists of 3 sections: frontend, backend, database server. For the design of the system, we used python, interpreted programming language JavaScript, CSS for the styling of web pages and the SQLite database. The whole system is divided into different modules:

Administrator Module: The administrator module does the function of system management. It includes a test management module, add module, record, result module.

Teacher Module: The teacher module includes test management module, automatic organizing of examination paper, examination-paper management, paper analysis, result and so on.

Student Module: The student module has a login option to attend the exam and after completing and submitting the exam the result is immediately generated.

Add Module: This module is only available for Admin and Teacher. On clicking the ADD button, users will be brought to an interface where they can enter all the necessary details like they can add course/subject and questions.¹⁻⁴

Record Module: On clicking the RECORD button, the user

can view already entered records of the database and be able to edit or delete any record. This module is available for all the users but with limited functionalities. Only Admin will have access to this module.

Result Module: In this module students, teacher and admin will be able to see the result of the student.

Login/ Register Page Module: This module is the most important module as it is the main page of the system and authorized users will need to sign-in through this page to access its content.

Login/Register page is divided into 3 parts for different users:

1. Admin
2. Teacher/ Authority
3. Student

In this module the system will ask the user to enter some information like Username, Password, First Name, Last Name, Mobile, Address and a Profile Picture.

Flow Chart [Figure 1]

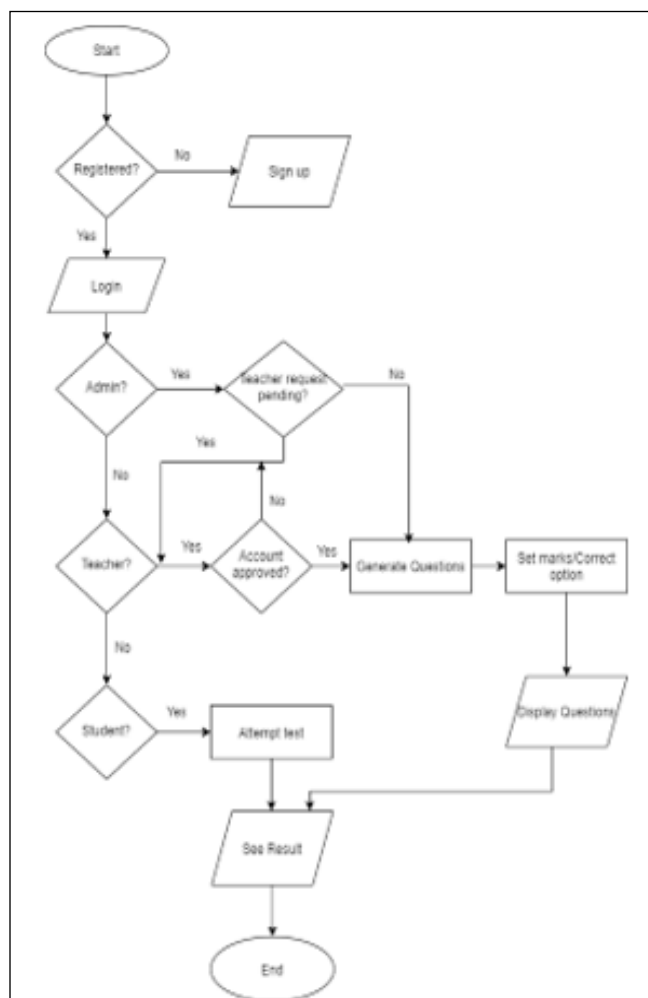


Figure 1



Figure 2

Figure 2, the homepage of our website. The Main Menu allows the user to navigate the website in an easy way. Social media presence is very important for brands nowadays, so we have also provided website's social media links in the footer section for engaging with the online audience.

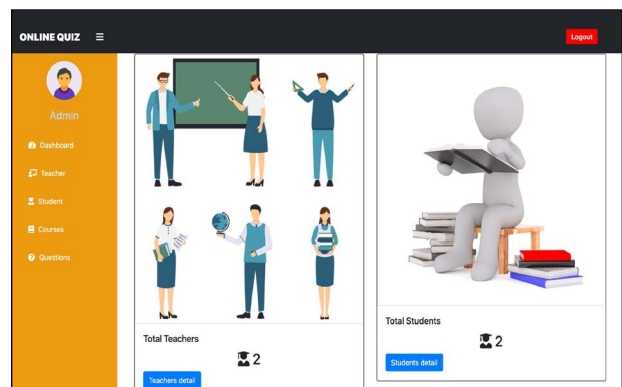


Figure 3

Figure 3, the admin's dashboard. It keeps track of the number of teachers, students, courses, total students. Moreover, the admin can use the side navbar to move between menus.

Through the dashboard, Admin can:

- Approve, View, Update, Delete a teacher
- View, Update, Delete a student
- View, Update, Delete a Course
- View, Add, Update, Delete a Question
- Add Questions with a correct answer
- View the result of each student.

Figure 4, the Teacher's dashboard. It keeps track of the number of students, exams, total students. Moreover, the teacher can use the side navbar to move between menus.

Through the dashboard, Teacher can

- Add, View, Delete Course/ Exams
- Add Questions to Respective Courses with Options, Correct Answers, Marks
- View And Delete Questions

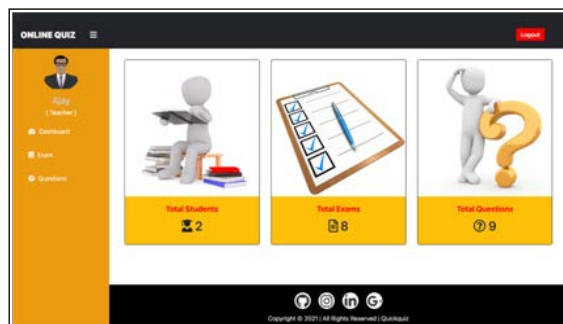


Figure 4

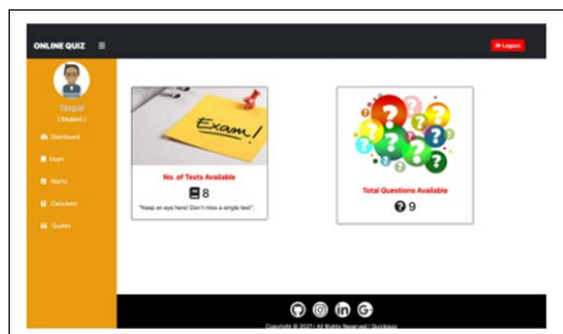


Figure 5

Figure 5 the student's dashboard. It keeps track of the total exams and questions available. Moreover, the Students can use the side navbar to move between menus.

Through the dashboard, Student can:

- Attempt an exam any number of times
- View his/her result just after submitting the test

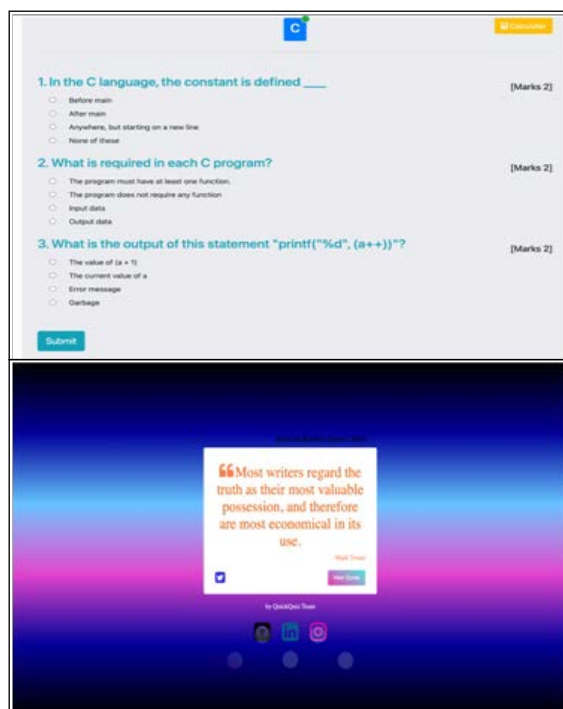


Figure 6

Students will see this page/ interface when they start a particular exam. Figure 6 contains all the questions added by the teacher/ admin, for that course/ exam.

A calculator is also integrated in this page to facilitate the students in doing calculations if required.

All the questions in this page will be MCQ type. There are no restrictions in changing the options. A student can change options at any number of times. After attempting all questions, students can submit them easily via clicking on the "Submit" button. After submitting the test/exam he/she will be redirected to another page where he/she can view their scores in that test.

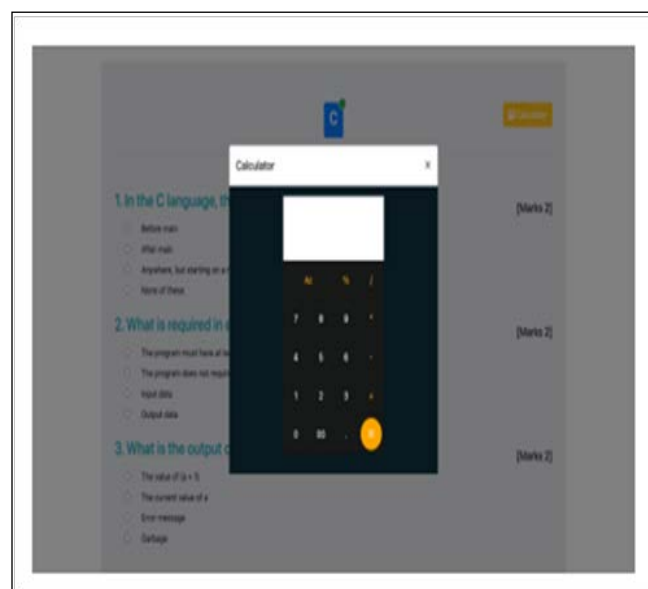


Figure 7

Figure 7, the calculator integrated for the ease of students who may need it for complex calculations.

This is the Quotes page available for students in case they feel demotivated. These quotes will enhance the productivity of students.

Conclusion

The project was developed in such a way that future challenges will be simple. The following conclusions may be drawn from the project's development.

It delivers an intuitive graphical user interface that outperforms the old system. It grants authorized users suitable access based on their permissions. With restricted access, updating information becomes an uncomplicated.

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