Social E-Learning System for Sri Lankan School Students

A dissertation submitted for the Degree of Master of Information Technology

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UCSC

Declaration

The thesis is my original work and has not been submitted previously for a degree at this or any other university/institute.

To the best of my knowledge, it does not contain any material published or written by another person, except as acknowledged in the text.

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Abstract

Conventional education systems fail to provide motivation to study which results in children moving away from activities that are less attractive to them towards those which are more attractive. Taking these into account, the developed system aims at encouraging social interactions to foster learning. The system will facilitate teachers to create their own eLearning materials and publish them to be consumed by a large number of students around the country.

Teachers can either provide this as a community service or they can charge a fee to access the content. This will ensure that this eLearning system will have enough and relevant content for almost every subject that is taught in school curriculum. This system mainly targets A/L, O/L and Grade V students.

The students can do quizzes online and get the corrections at the same time. Individual progress of the students can also be observed with statistics. The system has been tested with the use of several testing methods such as unit test, integration test, system test along with user acceptance test. Also, a questionnaire was provided to get the feedback of the system users. Object-oriented concepts have been used to build the system throughout the entire development process.

The open-source software used for the implementation are PHP framework, Bootstrap library, jQuery JavaScript frameworks, Node module managers, MySQL database management system and Apache web server. It was easier to build a responsive and cross-browser compatible application with the help of above tools.

Acknowledgments

First and foremost, it is with immense gratitude that I acknowledge the support and help of my supervisor Mr. K.P.M.K. Silva for guiding me throughout the entire process of this project. He has been supportive since the day I came up with my first project proposal and helped me to submit the relevant documents on time.

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Finally, I must express my very profound gratitude to my wife and parents for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of writing this thesis. This accomplishment would not have been possible without them, which I will never forget.

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List of Abbreviations

AJAX   -   Asynchronous JavaScript and XML

CPU   -   Central Processing Unit

CSS   -   Cascading Style Sheet

DB   -   Database

DBMS   -   Database Management System

ER   -   Entity Relationship

FTP   -   File Transfer Protocol

GUI   -   Graphical User Interface

HTML   -   Hypertext Markup Language

HTTP   -   Hypertext Transfer Protocol

HTTPS   -   Hypertext Transfer Protocol Secure

JPEG   -   Joint Photographic Experts Group

MIT   -   Master of Information Technology

MVC   -   Model, View, Controller

MySQL   -   My Structured Query Language

NIC   -   National Identity Card

OOP   -   Object Oriented Programming

PHP   -   Hypertext Preprocessor

PNG   -   Portable Network Graphics

RAM   -   Random Access Memory

SLBFE   -   Sri Lanka Bureau of Foreign Employment

SMS   -   Short Message Service

UCSC   -   University of Colombo School of Computing

UML   -   Unified Modeling Language

URL   -   Universal Resource Locator

WWW   -   World Wide Web

XAMPP   -   Cross-Platform (X), Apache (A), MariaDB (M), PHP (P) and Perl (P)

XML   -   Extensible Markup Language

SSL   -   Secure Sockets Layer

Chapter 1: Introduction

1.1 Motivation for The Project

Sri Lankan education system is very competitive. In addition to teaching sessions at school, children are almost compelled to attend tuition classes as well, in order remain ahead of the competition. This has led to frustration among most of the school students. They no longer want to study and would do anything that would keep them away from studies. On contrary to the use of social media amongst the age group 13-18 has risen during the past several years. Parents are concerned about the time spent by their children on social media, but children are more inclined to spend more time on interactive social media.

Social media has two-way communication than on contrary to a conventional lecture. As of today, children show an interest in spending more time on the computer and even their activities revolve mostly around computers. They are more concerned with choosing e-sports over traditional sports (growth of e-sports compared to physical sports that were popular with earlier generations of children). Parents complain that children spend less time on studies and more time on other activities. On the other hand, children are reluctant to move away from advancing technology which may sometimes isolate them from the related age groups.   Eventually, time that could have been otherwise spent on studies is now spent on social media. This has led to disputes between children and their parents.

Conventional education systems fail to provide motivation to study which results in children moving away from activities that are less attractive to them towards those of which are more attractive to them.

Currently, there are e-learning systems in operation in universities. Students who are at universities are adults and less inducement are required for them to manage time for studies compared to children below 18 years who would need continuous support from the family and friends to be on track about education. The eLearning platforms currently available are mostly developed for educating purpose alone and same do not cater to the social

belongingness element. Only the self-motivated individuals can work swiftly on such platforms.

A classic example would be medicine given to children are flavored in such a way that would remind them of a food item they would love to have, as they would reject taking such medicine otherwise. Similarly, it can be observed that if the mode of education can be coupled with student's inherent preference to remain on social media, it would create a win-win situation.

It was understood that the concepts of collaborative learning and social constructivism could be used in devising a solution to the problem encountered. Collaborative learning occurs when two or more persons try to learn together. The integral part of collaborative learning is that one can capitalize on another's resources and skills to achieve learning objectives. Similarly, social constructivism could be identified as a sociological theory which believes that human development is socially situated, and knowledge is created when interacting with people. Taking these into account, it was decided to develop a system that encourages social interactions to foster learning.

1.2 Aims of The Project

The following aims are expected:
- Achieve interactive learning with average learner adaptation time to the system kept below 10 working hours, through real-time access via a web-based approach which is mobile responsive.
- Ability to offer engaging training via different learning approaches with supporting collaborative learning and social constructivism and making availability to for system functioning to function with 5000 simultaneous users without any issues with capacity to expand.
- Ranking and reporting features useful for performance evaluation and, for users to share on their own will.
- Simplified and user-friendly learning process.

- Achieving interactive environment with customer satisfaction rate of 75% or higher
- Anytime, anywhere learning.
- Create an e-learning platform that students will love to spend time around.
- Developing test cases to capture all potential system failures and to achieve zero unknown defects.

1.3 Scope of The Project

- Practical implementation of the system is not attempted among stakeholders within the project scope as this is done for the requirement of a particular client but as a requirement for the completion of MIT programme.
- The target group is limited to school children considering ease of development of the system. Given ease of referring to structured and already documented school education curriculums in Sri Lanka which would be useful when developing the system features, school children for taken as the target group.
- Only a selected number of features available in e-Learning platforms and social platforms would be considered in the project to save on resource allocation (development time/effort/cost).

- The system would be developed using PHP Framework, HTML5, CSS, SASS, JavaScript, and MySQL database to due to compatibility of these technologies in developing a high-quality system, use of these technologies in commonly in similar systems, and the author's personal preferences.
- The system would contain a social e-learning portal for the Sri Lankan A/L, O/L, and Grade V students.
- Students and Teachers are the users of the proposed system.

- The all the end-users are required to register with the system online. The successfully registered user will notify by the email message. Then, the user can log in to the system using an email address as the username and relevant password. The registered users can access bellow modules such as:

- User profile

  All the registered users have a user profile, this section will have facilitated updated their basic information, password, profile picture, and more.

- Online quizzes

  The register users can do quizzes online and get the corrections at the same time. Get a progress report for your result and points.

- Groups

  Users can create groups and register user can join groups like as Facebook group also users can create public and privet groups as well.

- User wall

  This feature also develops like as Facebook wall and users can share photos, videos, and text on their timeline.

- Followers

  Users can follow registered users.

- Registered user can search papers using keywords and categories.

- Registered users can create question and quizzes under categories.

- Progress report

  The system facilitates progress reports to quiz result. Displaying your mark, average mark, maximum mark.

- User Ranking

  Users ranking using their points.

1.4 Dissertation Outline

Chapter 2 – Background

This chapter concentrates on the analysis stages of the project. It describes the requirements of the project in detail. The existing and proposed systems are provided through appropriate structures. Also, it contains a brief review of similar systems and a comparison of alternative design strategies.

Chapter 3 – Methodology

The design of the system, database management, and testing plan have been discussed in this chapter. This chapter concentrates on the design methodology of the project. It contains application design pattern with the relevant diagrams and the data model used. The structure of the system clearly described in this chapter.

Chapter 4 – Evaluation

This chapter includes the evaluation of the system. It discusses the project objective in detail whether they were satisfied or not and the details if unsatisfied. The lessons learned by the project, achievements and failures and the problems beyond of the control.

Chapter 5 – Conclusion

This chapter concludes the work indicating the summary of the results, deficiencies, and suggestions for the benefit of developers of similar projects in the future.

Chapter 2: Background

2.1 Introduction

Proposed system will have some of social platform and eLearning platform features for Sri Lankan student community. The system will facilitate teachers to create their own eLearning materials and publish them to consume by large number of students around the country. Teachers can either provide this as a community service or they can charge a fee to access the content. This will ensure proposed social eLearning system will have sufficient and relevant content for almost every subject is taught in school curriculum.

2.2 Sri Lankan Education Structure

Sri Lanka's school system is comprised of four main parts: primary, junior secondary, senior secondary and collegiate. Most of the schools are maintained by the government, but there are a considerable number of private schools as well. Government schools can be divided into two groups; schools maintained by the central government and the local government schools.

Currently, there are 10,194 government schools and 106 private schools in Sri Lanka [1] see Figure 2.1.

	2013	2014	2015	2016	2017
School Candidates sat for the GCE(O/L)	287,040	277,414	290,929	286,251	312,464
Percentage Qualifying for GCE(A/L)	64.21*	66.55*	67.15*	69.94*	71.03*
All Candidates Sat for the GCE(O/L)	308,054	298,549	314,635	293,218	326,424
Percentage Qualifying for GCE(A/L)	62.42*	64.51*	64.81*	69.68*	70.11*
School Candidates sat for the GCE(A/L)	209,906	207,304	210,340	211,865	206,630
School Candidates Qualifying to Enter University	122,913	126,971	131,137	134,238	136,421
Percentage Qualifying to Enter University	58.56	61.25	62.35	63.36	66.02
All Candidates Applied for the GCE(A/L)	277,395	290,517	302,501	310,613	315,326
All Candidates Sat for the GCE(A/L)	241,629	247,376	255,191	258,193	253,330
All Candidates Qualifying to Enter University	140,993	149,489	155,447	160,520	163,104
Percentage Qualifying to Enter University	58.35	60.43	60.91	62.17	64.38

Figure 2.2: Performance of Candidates - G.C.E.(O/L) and G.C.E.(A/L), 2013-2017

Si Lankan education sector is very competitive. Sri Lankan society still depends heavily of formal education. Due to its competitiveness parents are compelled to push their children to focus on studies at school and tuition classes. Children on the other hand prefer more of experiential and interactive learning through both offline and online activities. Compared to decade back, children now are more tech savvy and would have an inclination to spend more time online than offline. Current infrastructure available is also supports rapid growth of internet usage in Sri Lankan compared to a decade back. Children tend to oppose the pressure they receive from teachers at school and parents at home for structured education as the formal channel the education is conveyed does not seem to impress them. It is a challenge to the responsible parties involved to a strike a balance between the demands of all stakeholders involved including students, teachers and parents.

2.3 Key Benefits of Proposed Solution

Proposed system key benefits are:
- Highly social interactive and user-friendly eLearning system
- Student can do quizzes online and get the corrections at the same time
- Student progress report and ranking
- Teachers can create groups and quizzes online

2.4 Stakeholders

Proposed system stakeholders are:
- Sri Lankan school students (Grade V, GCE O/L, and GCE A/L)
- Private school students
- School teachers
- Private tuition teachers

2.5 Similar Projects

It is observed that already there is a considerable number of social e-learning platforms operational at global level.

Edmodo.com
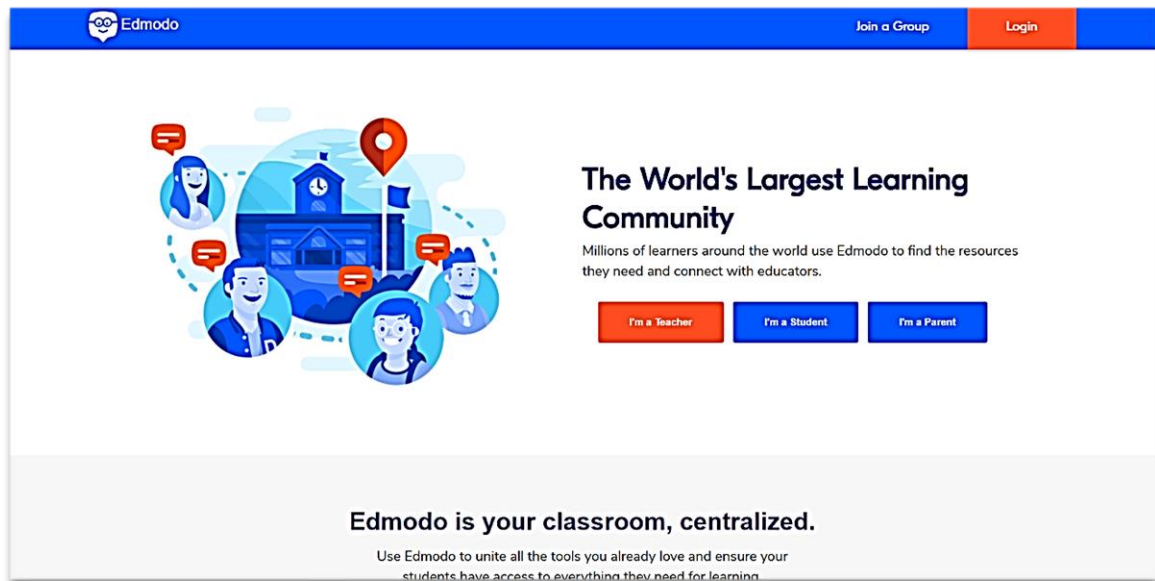
Figure 2.2: Edmodo.com website

The features namely online quizzes, content sharing, user ranking, flowers and messaging were tested across several existing social eLearning platforms and it was found out that only www.edmodo.com offered all listed features. However, www.edmodo.com model does not allow self-signup for students unless a class code is shared by the teacher with a particular student.

Moodle.org

Figure 2.3: Moodle website

Moodle is a free and open-source learning management system written in PHP and distributed under the GNU General Public License. Moodle to be quite user-friendly. This is because of its simple interface and intuitive navigation, which consists of only three distinct columns. It is based on HTML5 and designed to be responsive, so you can access it on any mobile device.

Blackboard.com
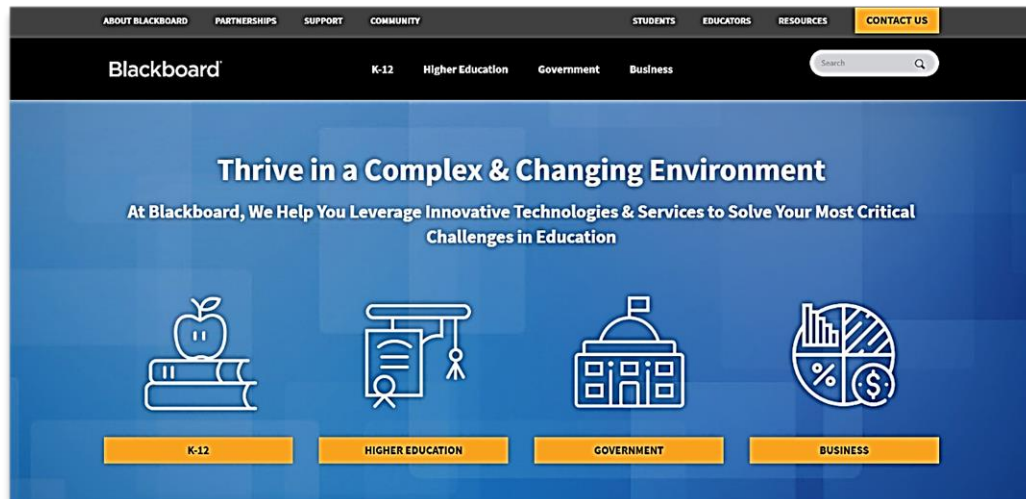
Figure 2.4: Blackboard website

Blackboard Learning Management System offers a variety of distinctive benefits for learners and students. To start with, they gain immediate and streamlined access to all its features, and work navigating an intuitive and reminiscent of social networks, that is even compatible with their devices. Basically, Blackboard can be used on all types of smartphones and tablets.

Guru.lk

Figure 2.5: Guru.lk website

Guru.lk eco-system comprises of various initiatives that provide e-learning based solution. It has more than 500 courses under various categories, spanning from school education to professional education, general skills, entrepreneurial skills, soft skills, IT skills and many more.

Khanacademy.org
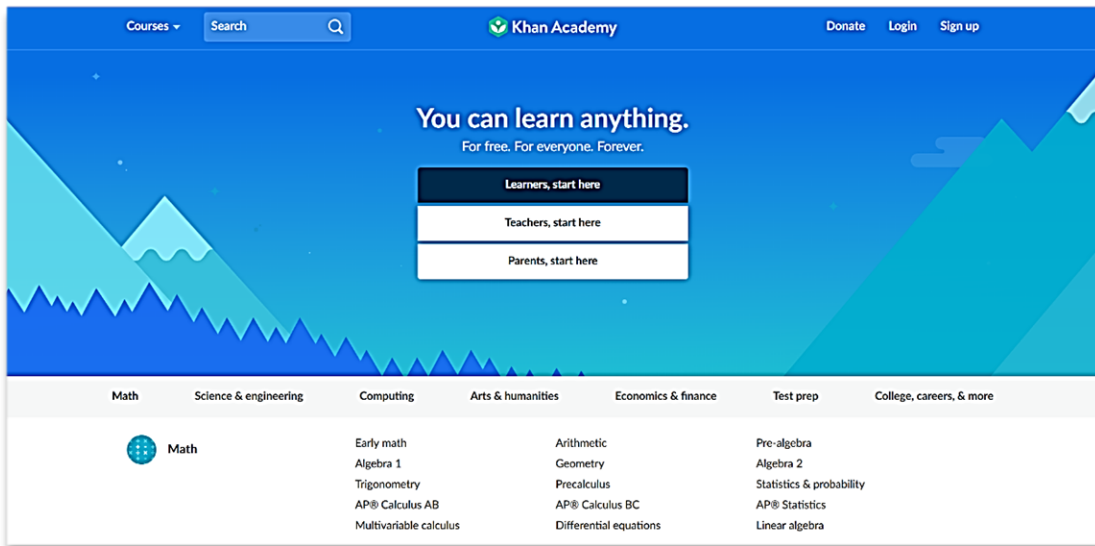
Figure 2.6: Khanacademy.org website

Khan Academy offers practice exercises, instructional videos, and a personalized learning dashboard that empower learners to study at their own pace in and outside of the classroom. We tackle math, science, computer programming, history, art history, economics, and more.

Several such examples are compared (**Table 2.1**) against considering several features.

Systems	Online Quizzes	Video, photo & content sharing	User Ranking	Followers	Progress Tracking
www.edmodo.com	Yes	Yes	Yes	Yes	No
www.moodle.com	Yes	No	No	No	No
www.khanacademy.org	No	Yes	No	No	No
www.guru.lk	Yes	Yes	No	No	No
www.blackboard.ecu.edu	Yes	Yes	No	No	No

Table 2.2: Similar project comparison

Moodle and Blackboard mostly support LMS environments and fail to give the atmosphere of a social learning platform. Those systems include more advanced features which might hinder user-friendliness of the overall experience.

Guru.lk and Khanacademy.org focus on content sharing where social interaction is not encouraged extensively.

According to **Table 2.2**, existing systems do not offer the above mentioned features in their systems. There are no systems which provide all the requested features; therefore, proposed system should be developed to full fill the requirements. The proposed system combined all these features together to satisfy user requirements. Therefore, users can get maximum benefits.

Chapter 3: Methodology

3.1 Methodology for Analysis

Analysis is the most significant part of software development life cycle. It helps developers to get a clear idea about the problem domain and to find out user requirements before start developing the new system.

This chapter explains the ways of requirement gathering, analyzing and management techniques of the system. Also discusses about functional and non-functional requirements of the proposed system, what is the best method to develop the system, what technologies have to be used and what tools are required to develop the system.

3.2 Requirement Gathering

Purpose of every system is to fulfill the needs of the user. Those needs are named as requirements of the system. Requirement gathering is an essential activity in any kind of system development. Requirement gathering can be done by following various techniques such as,

3.2.1 Background Reading (Inspection of Existing Documents)

Evaluating reports and documentation of the present manual system will assist to get a good understanding about the background of the business.

3.2.2 Interviewing

It is necessary to understand the perspective of every stakeholder, in order to properly address and weigh their ideas. This technique can be used to collect information from groups or individuals. Initially, individual stakeholders were interviewed and later conducted group interviews to clarify doubts.

Interviews helped to gain valuable ideas about the usability of the system and the current difficulties with the existing systems.

3.2.3 Observation

Observation is watching users and their normal workflow in order to learn about the system. Observation made at tuition classes and government schools were useful to validate the collected data. However, few problems were identified with this technique as some users did not like being observed and some behaved differently while observing.

3.3 Requirement Analysis

Requirement analysis plays a significant role in a software development process. Analysis can be done by using functional and nonfunctional requirement. Gathered requirements need to be analyzed properly. Avoidance of scope creep, erroneous and ambiguous requirement can create chaos later, therefore, it is very important to have frequent communication with the system users. The requirements can be defined clearly to ensure the design and implementation successful, system requirement should be analyzed and defined clearly. Different kinds of techniques are being used to do the analyzing to find a solution. The gathered requirements were analyzed and checked for ambiguities to be solved in order to avoid issues at a later stage.

3.4 Requirements for The New System

Requirements for the new system was gathered using interviews, observations, and questionnaire. Based on that gathered and analyzed requirement can be divided into functional requirements and nonfunctional requirements.

3.4.1 Functional Requirements

Functional requirements of the System Users are as follows.
- User Profile
  All the registered users have a user profile, this section will have facilitated updated their basic information, password, profile picture, etc...

- Online Quizzes

  The register users can do quizzes online and get the corrections at the same time. Get a progress report for your result and points.

- Groups

  Users can create groups and register user can join groups like as Facebook group also users can create public and privet groups as well.

- User Wall

  This feature also develops like as Facebook wall and users can share photos, videos, and text on their timeline.

- Followers

  Users can follower register users.

- Registered user can search papers using keywords and categories

- Registered users can create question and quizzes under categories

- Progress Report

  The system facilitates progress reports to quiz result. Displaying your mark, average mark, maximum mark.

- User Ranking

  Users ranking using their points

- User Notifications
  Notifications on different actions by other users

3.4.2 Non-Functional Requirements

Non-functional requirement describes how a system should behave:

- **Availability**

  System should be available and up to date. Availability can be measured by reliability if the reliability increases availability also increases. If the system is upgrading or maintaining it should be informed early to the users to minimize the inconvenience.

- **Usability**

  Generally migrating from manual process to computer system are not easy to some users. Therefore, the system should be easy to learn, use, arrange inputs, interpreting outputs, and understandable to every type of people. Especially people from a different background such as non-IT related people should be easy to learn, easy to understand, and should be easy to use the developed system.

- **User Friendliness**

  System should design graphically attractive and very clear. Generally, people prefer graphical beauty than to read the text. System contains images and buttons with very clear easy to understand language and avoid technical jargons. If the system is not user-friendly users hesitate to use the system.

- **Performance**

  Response time is very important part of the system. When a specific task has requested by the user, feedback of that request should appear in very fast. User cannot wait a long time for the system to respond. If the user had to wait a long time to get the responding user will not happy about the system and they will reject to use the system.

- **Security**

  System should be ensuring that the user's personal information is confidential. As well as it should provide secure access to every user, the administrator can control the activities of users. When the user register to the system admin should give privileges and give access to the specific users.

- **Reliability**

  Reliability describes how well the system consistently performs the system functions without failure. Details included in the system should be accurate and available. System users should acknowledge if the system failure or downtime occurs.

3.5 Hardware and Software Requirements

3.5.1 Software Requirements

- **For Server**

  The server with Cloud Linux operating system having Apache server v2.4, PHP v7.1, MySQL v5.6 and which has Mobile Access support for Android, iPhone and Windows Mobile.

- **For Teachers and Students**

  A personal computer with Microsoft Windows 7 or higher version having either Mozilla Firefox, Google Chrome or Internet Explorer 8.0 or higher web browser. Android or iOS mobile phone with Mozilla Firefox or Google Chrome web browser.

3.5.2 Hardware Requirements

For Server:

Disk Space   Minimum requirement is 2 GB space.

Bandwidth   100 GB 1 Gbps dedicated

- **For Teachers and Students**

  A personal computer with any quad-core processor with 8 GB of RAM and 100 GB of available hard disk space having and Internet access.

3.6 Implementation Procedure

The system was developed and tested on a local environment and running Windows 10 and XAMPP local server. The web application to be accessible via the Internet, it has to be installed on a Web Server running Apache, PHP and MySQL.

3.6.1 Server Implementation

Since my development was based on PHP and MySQL technologies both Linux and Windows servers will support. But in contrast, Linux hosting is cheaper than Windows hosting solutions due to the expensive license fee of the Windows operating system. Also, Linux server stability and security are truly superior to that of Windows. Hence it is decided to choose Linux hosting over Windows.

3.6.2 Client Implementation

Since this is a web application, there is no need for a specific installation or deployment method. Students and teachers can access the system via the internet. It is tested on Google Chrome, Mozilla Firefox and Internet Explorer v8 and above web browsers. Mozilla Firefox and Google Chrome web browsers are free to download and use, whereas Microsoft Internet Explorer is readily available with Windows operating system. It is recommended to use Google Chrome on Windows 7 or newer. Since this system was designed and implemented by considering the portability as

well, it runs on Linux environments too. It is tested on Linux Mint v18 with Mozilla Firefox.

Since the client had his own computers with core i3 processors running Windows 7 operating system and other applications, the only application software installed was Google Chrome.

3.7 Development Tools

3.7.1 Sublime Text v3

Sublime Text is a proprietary cross-platform source code editor which supports many programming languages including PHP. Additional functionality can be easily added by community-built plugins [2]. Why I like Sublime Test most is it has a dark background which reduces eyestrain and increase the amount of contrast with the text. Another favorite feature of Sublime Text is the full project search which opens a new tab where I can see my search term as well as the surrounding text. Multi-select editing feature with copy-paste support allows me to place more than one cursor in text, which facilitate simultaneous editing. Also, Sublime Text has a huge following of users with hundreds of questions each month on Stack Overflow, countless blog posts on any feature and recommended packages. Installed and tested the text editors Php-Storm v2017, NetBeans IDE v8.2, and Sublime Text v3 and selected Sublime Text v3 as the text editor because it is a lightweight application with amazing text editing keyboard shortcuts.

3.7.2 CodeIgniter Framework

The leading open source PHP frameworks in the market are CodeIgniter [3] and Laravel. If we just compare the two frameworks side by side, only about the features that they have Laravel will be the winner. But I am more familiar with CodeIgniter because it was taught during "Rapid Application Development" subject. No configurations are required for CodeIgniter, just download copy and paste use. Also,

lot of support is available on the web than Laravel. If I choose Laravel I have to learn it from the beginning, which may consume considerable amount of time. It is not to choose the best framework, but it is rather to choose the best framework that fits me. Since I am a beginner and I have to start fast as possible I have selected CodeIgniter framework.

CodeIgniter is a free, open-source, easy-to-use, object-oriented PHP web application framework, providing a ready-to-use library to use with PHP applications. There is a Database API to make it easier and more convenient to execute SQL queries, such as SELECT, UPDATE, DELETE, INSERT, etc., without having to create a lot of repetitive code. Also, it has a very extensive user guide, which is much better than documentation on other frameworks. CodeIgniter primarily uses the Model, View, Controller (MVC) approach to application design and development. It essentially separates application logic from the application design/view. The application logic is the Controller, whereas the application design/view is the View. The Model is for database interactions.

3.7.3 PHP v7.1

PHP [4] is a platform-independent server-side web programming language that is widely used for web development. There are many languages which are used for web development or web programming, but among all of them, PHP is the most popular web scripting language since it is cheap, secure, fast and reliable.

3.7.4 XAMPP

XAMPP [5] is a free and open source cross-platform web server solution package. XAMPP stands for Cross-Platform (X), Apache (A), MariaDB (M), PHP (P) and Perl (P). It is a simple, lightweight Apache distribution that makes it extremely easy for developers to create a local web server for testing and deployment purposes. The website works the same way as with the web host. Since most actual web server

deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server extremely easy as well.

3.7.5 Navicat

Navicat [6] is a cross-platform graphical database management and development software. It is straightforward and easy to use when compared to phpMyAdmin. It has an Explorer-like graphical user interface and supports multiple database connections for local and remote databases. The features I like most are Import/Export Wizard, Report Builder, and Data Modeling.

3.7.6 jQuery

jQuery [7] is a cross-platform JavaScript library designed to simplify the client-side scripting of HTML. It is a free, open-source, fast, small, feature-rich and widely used. The purpose of jQuery is to make it much easier to use JavaScript on my application. jQuery takes a lot of common tasks that require many lines of JavaScript code to accomplish and wraps them into methods that I can call with a single line of code. In simple terms, jQuery is a lightweight, "write less, do more", JavaScript library.

3.7.7 Bootstrap

Bootstrap [8] is a free and open-source front-end library for designing websites and web applications. It contains HTML and CSS based design templates for typography, forms, buttons, navigation, and other interface components, as well as optional JavaScript extensions. Unlike many web frameworks, it concerns itself with front-end development only. Bootstrap also support creating responsive designs.

3.7.8 HTML5

HTML is a markup language used for structuring and presenting content on the World Wide Web. HTML5 [9] is the fifth and current major version of the HTML standard. HTML5 was developed to solve compatibility problems that affect the current standard, HTML5. One of the biggest differences between HTML5 and previous versions of the standard is that older versions of HTML require proprietary

plugins and APIs. (This is why a Web page that was built and tested in one browser may not load correctly in another browser.) HTML5 provides one common interface to make loading elements easier.

3.7.9 MySQL v5.5

MySQL [10] is the most popular open-source relational database management system (RDBMS) based on Structured Query Language (SQL). SQL is the most popular language for adding, accessing and managing content in a database. MySQL is most noted for its quick processing, proven reliability, ease and flexibility of use. It is an essential part of almost every open source PHP application. Its connectivity, speed, and security make MySQL Server highly suited for accessing databases on the Internet.

3.8 Methods used to enhance code quality

- **Naming Conventions** - When declaring necessary variables, meaningful names have been used for them to aid the readability of coding. Meaningful names help others to understand what has been done in coding.

- **Comments** - Comments increase the readability of coding as they describe what has done in coding. This feature is very useful for future purposes also. Because when authorized person (except the system developed programmer) needs to handle system errors or do more modifications to the system, he has to know the existing coding. Even the programmer may forget coding which he has done after certain time period. Comments are essential in coding and very helpful for code maintenance.

3.9 Methodology for Design & Development

3.9.1 Waterfall Methodology

This is a sequential approach in system design. This method is well structured and has well-identified steps in applying. All those steps have very clear start and ending points. To use this, requirements should be clear and well identified. Requirement specification, system analysis, design, development, testing, and maintenance are the basic steps of waterfall methodology.

3.9.2 Agile Methodology

The incremental development model involves developing the system in an incremental fashion. Specialty of this methodology is, most important part of the system is first delivered and then the other parts of the system will have delivered according to their importance.

For this system implementation, waterfall development methodology has been selected as the requirement was understood comprehensively, prior to start developing of the system.

3.10 Use Case Diagram

A use case diagram is used to describe a set of actions that a system should or can perform in collaboration with one or more external users of the system (actors). Each use case should provide some observable and valuable result to the actors of the system. **Figure 3.1** shows the high-level use case diagram of the proposed system.
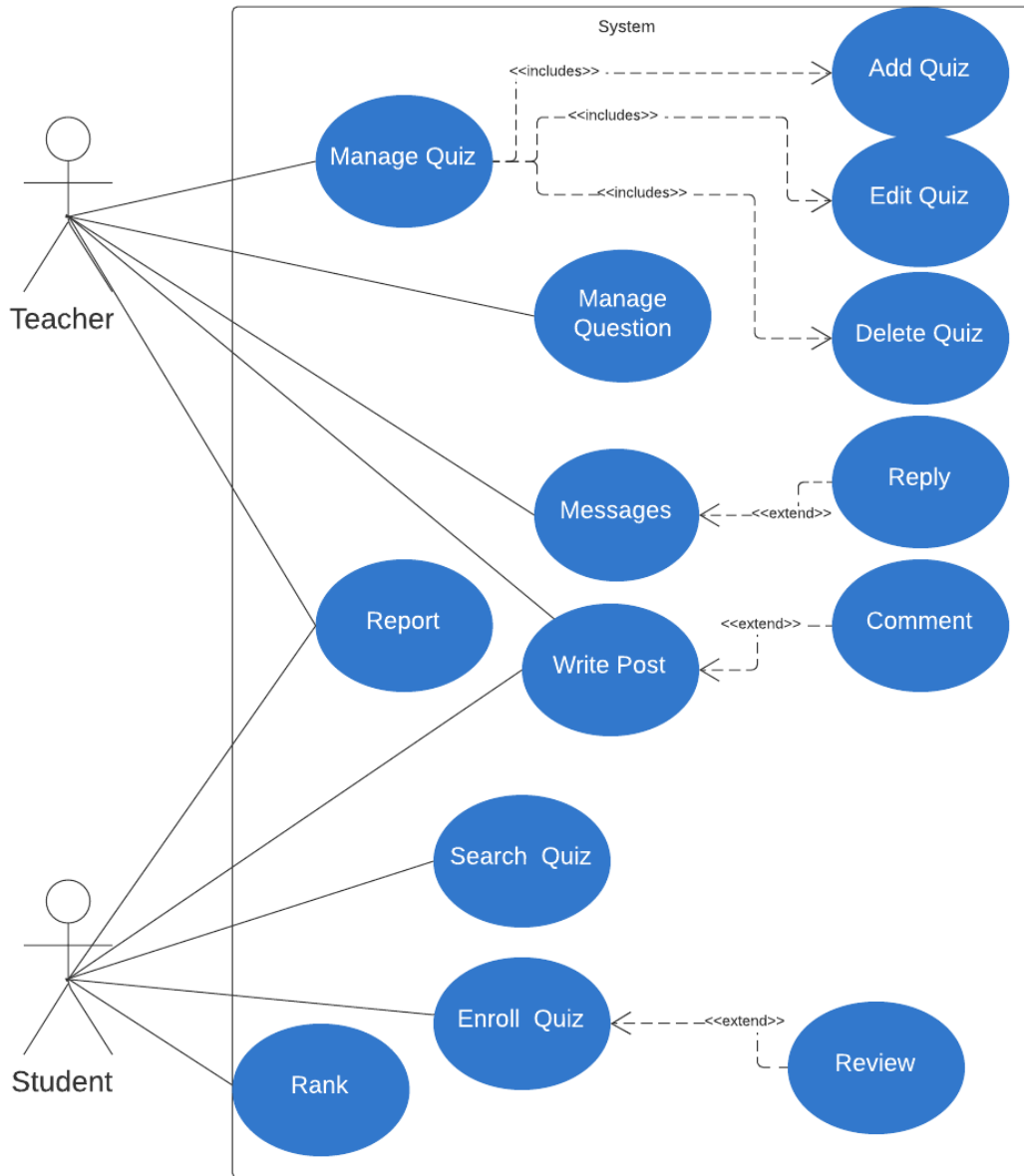

Figure 3.1: High Level Use Case Diagram

3.11 Use Case Narratives

3.11.1 Use Case Narrative for Manage Questions

Use Case ID	01
Use Case Name	Manage Question
Actors	Teacher
Description	Manage Question (Edit/ Add/ Delete)
Preconditions	Teacher has already logged into the system with a valid user account.
Normal Scenario	1. Teacher clicks "Add New Question". 2. Fill in the necessary question details. 3. Saves the question information. 4. Using edit button teacher can update question 5. Using delete button teacher can delete question if not added to the quiz
Alternate Scenario	Show error message when invalid details are provided.
Post Conditions	Question has been successfully published.

Table 3.1: Use case narrative for Manage Question

Above **Figure 3.1** shown use case narrative for manage question.

3.11.2 Use Case Narrative for Manage Quizzes

Use Case ID	02
Use Case Name	Manage Quizzes
Actors	Teacher
Description	Manage Quizzes (Edit/ Add/ Delete)
Preconditions	Teacher can manage quizzes
Normal Scenario	1.Teacher clicks "Add New Quiz". 2. Fill in the necessary quiz details. 3. Saves the quiz information. 4. Using edit button teacher can update quiz Using delete button teacher can delete the quiz, if not enroll any of student for this quiz.
Alternate Scenario	Show error message when invalid details are provided.
Post Conditions	1. Quiz has been successfully added. 2. This quiz will be published, and students can enroll this quiz

Table 3.2: Use case narrative for Manage Quizzes

Above **Figure 3.12** shown use case narrative for manage quizzes.

3.11.3 Use Case Narrative for Write Post

Use Case ID	03
Use Case Name	Published Posts
Actors	Student / Teacher
Description	Student or teacher can publish post on wall or quiz pages
Preconditions	User has logged into the system
Normal Scenario	1. Go to wall or quiz page add new post 2. Write post and upload images. 3. Published post using post button
Alternate Scenario	1. Show error message when empty text area 2. Show error message when trying to upload large images
Post Conditions	3. Post has been successfully added.

Table 3.3: Use case narrative for Write Post

Above **Figure 3.13** shown use case narrative for wall post.

3.11.4 Use Case Narrative for Message

Use Case ID	04
Use Case Name	Message
Actors	Teacher / Student
Description	Students or teachers can message each other's
Preconditions	User has logged into the system
Normal Scenario	1. Click on ''Message'' button 2. Select user followers and send messages
Alternate Scenario	Show error message when an invalid follower.
Post Conditions	1. Message has been sent.

Table 3.4: Use case narrative for Message

Above **Figure 3.14** shown use case narrative for message.

3.11.5 Use Case Narrative for Search Quiz

Use Case ID	05
Use Case Name	Search Quiz
Actors	Student
Description	Student can search quizzes using category and keywords
Preconditions	Login to the system as a student
Normal Scenario	1. Click on "Quizzes" menu link. 2. Then click "Find Quizzes". 3. Filling and select category and keywords 4. Click on search icon
Alternate Scenario	Show error message quiz not found
Post Conditions	1. Filter quizzes will be listed.

Table 3.5: Use case narrative for search quizzes

Above **Figure 3.15** shown use case narrative for search quiz.

3.11.6 Use Case Narrative for Enroll Quiz

Use Case ID	06
Use Case Name	Enroll Quiz
Actors	Student
Description	Student can enroll public quizzes
Preconditions	Login to the system as a student
Normal Scenario	1. Click on quiz image or title 2. Click on "Enroll" Button 3. Click on "Start" button.
Alternate Scenario	Show error message when invalid details are provided.
Post Conditions	1. Enroll has been successfully completed.

Table 3.6: Use case narrative for enroll quiz

Above **Figure 3.16** shown use case narrative for enroll quiz.

3.11.7 Use Case Narrative for Report

Use Case ID	07
Use Case Name	Report
Actors	Student, Teacher
Description	Student or teacher can view report about quiz summary
Preconditions	Login to the system as a student or teacher
Normal Scenario	1. Go to quiz page 2. Click on "My result summary" link 3. Load summary about quiz with graphs
Alternate Scenario	
Post Conditions	

Table 3.7: Use case narrative for report

Above **Figure 3.16** shown use case narrative for student report.

3.12 Sequence Diagrams

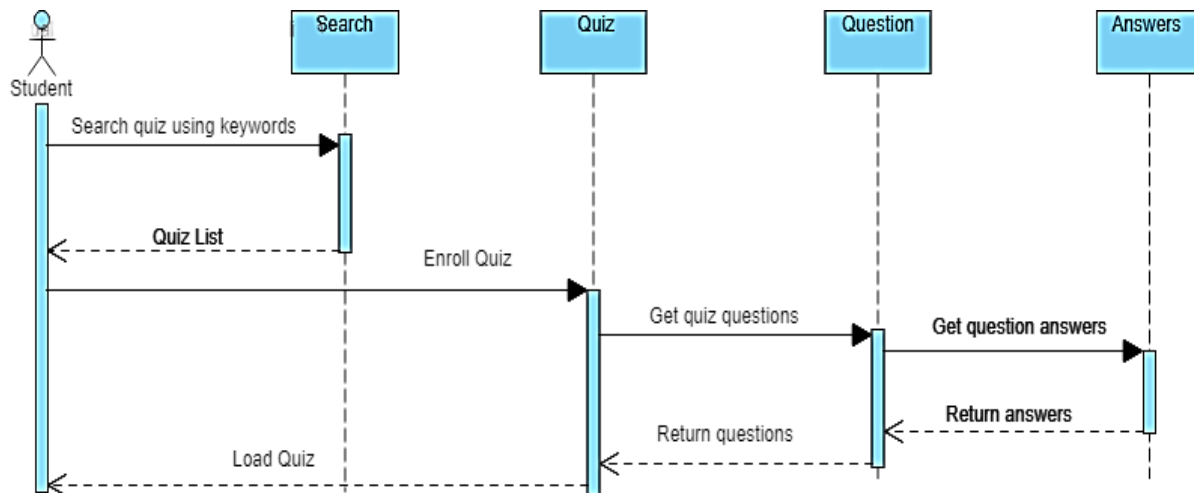### 3.12.1 Sequence Diagram for Online Quiz

Figure 3.1: Sequence diagram for online quiz

Above **Figure 3.1** explains the steps followed by a student during enroll quiz and start quiz process.

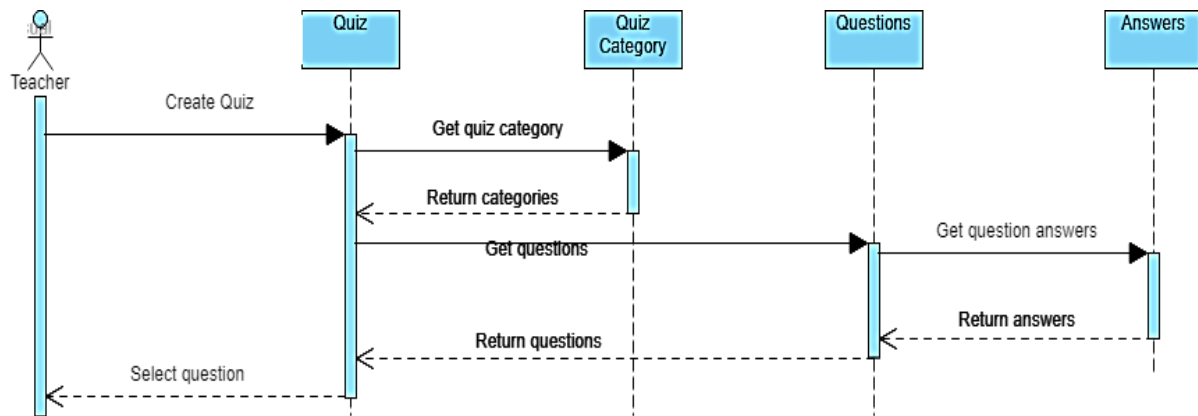## 3.12.2 Sequence Diagram for Create A New Quiz

Figure 3.2: Sequence diagram for create a new quiz

Above **Figure 3.2** explains the steps followed by a teacher during create a new quiz process.

3.13 Class Diagram

Below **Figure 3.3** shown system class diagram is an illustration of the relationships and source code dependencies among classes in the Unified Modeling Language (UML). In this context, a class defines the methods and variables in an object, which is a specific entity in a program or the unit of code representing that entity.
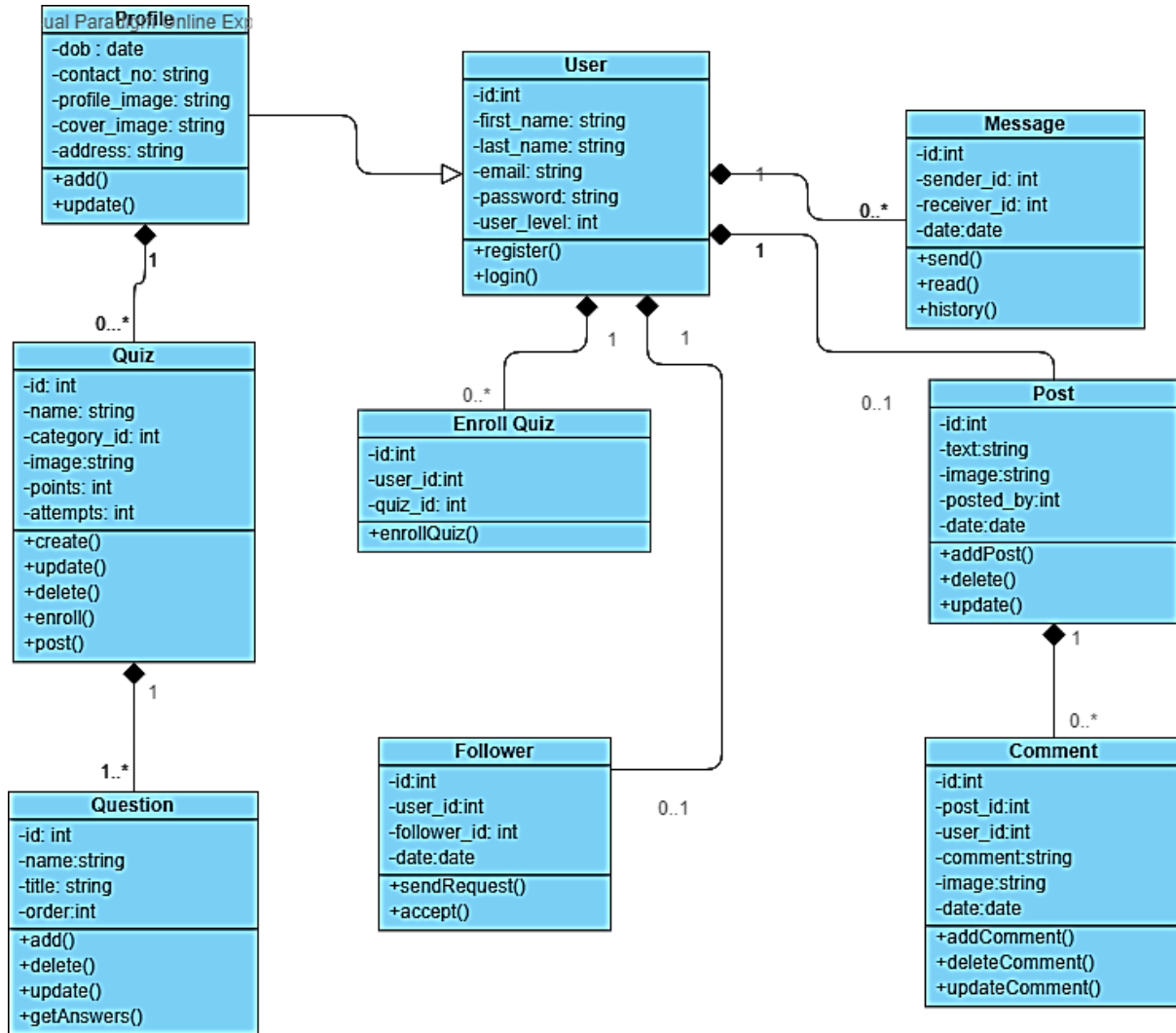

Figure 3.3: Class Diagram

3.14 ER Diagram

ER diagram is a graphical representation of entities and their relationship to each other, typically used in computing regarding the organization of data within database or information systems. Entity is a piece of data, object or concept which described which data should store. Relationship is how data is shared between entities. The ER diagram for the system is shown in **Figure 3.4**.
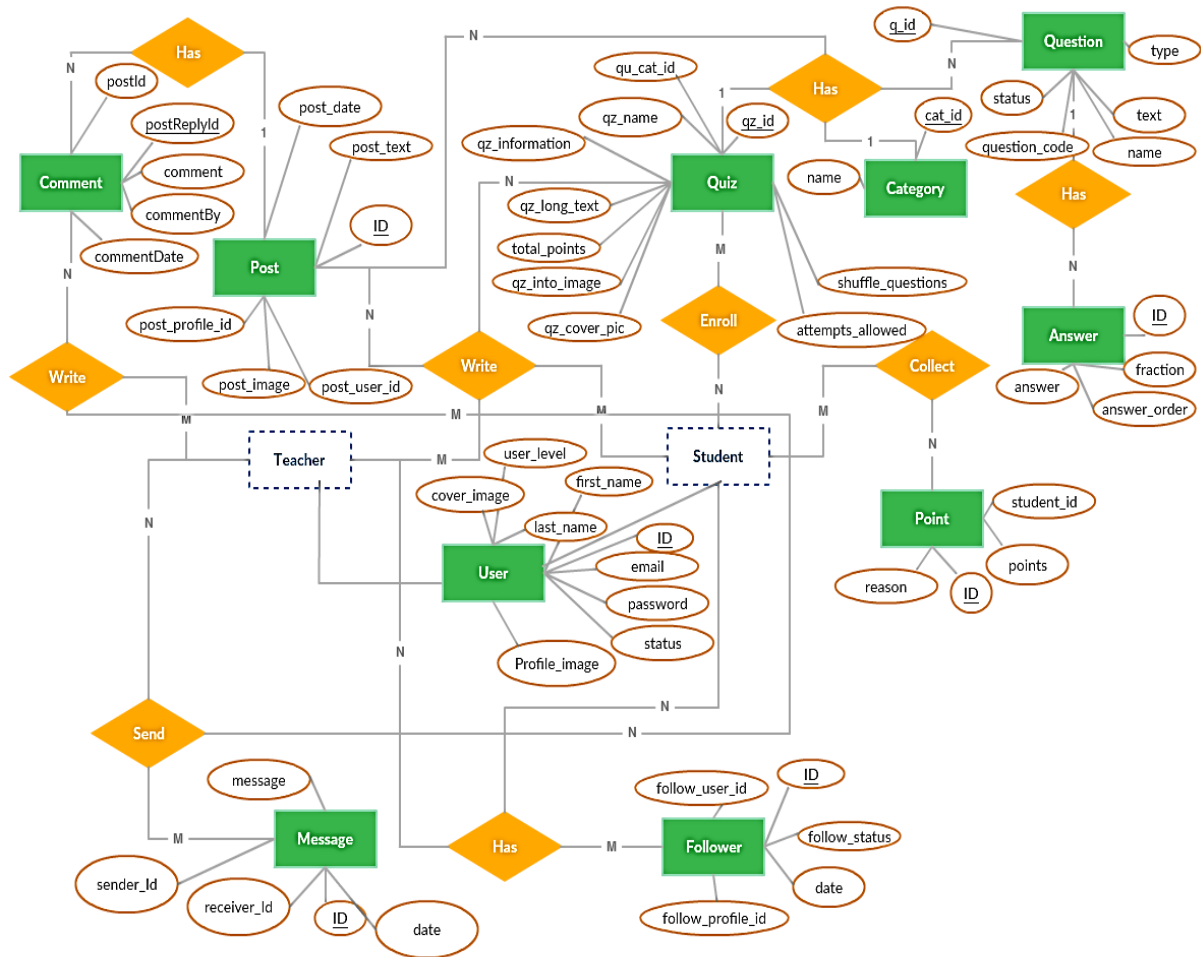

Figure 3.4: ER Diagram for the proposed system

3.15 Database Diagram

Database diagram shown in **Figure 3.5** this diagram show structure of the data tables, attributes and relationship with tables using foreign keys.
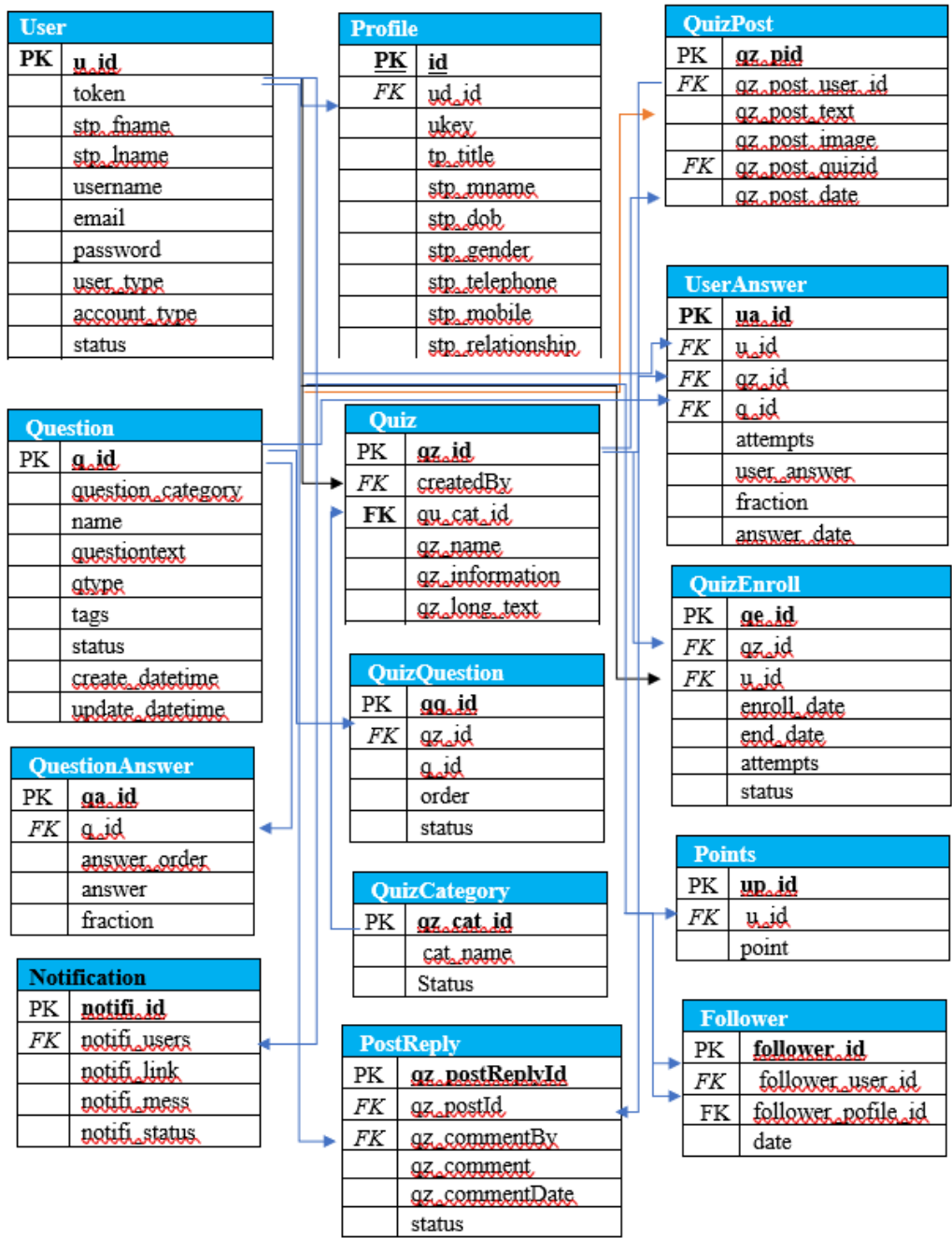

Figure 3.5: Database diagram for the proposed system.
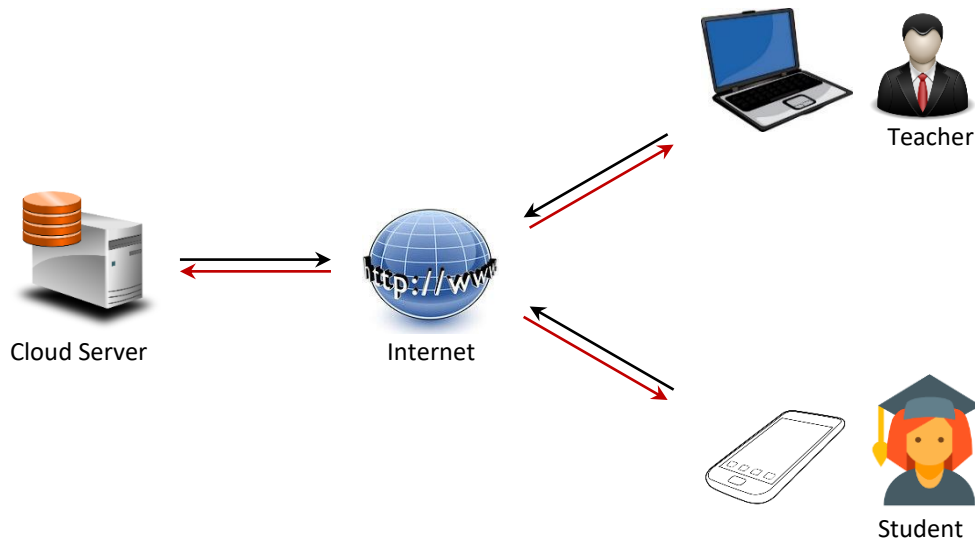
3.16 Physical Design

Figure 3.6: Physical design of the proposed system

Physical design shown in **Figure 3.6** this diagram shows how to connect system and end users via the internet.

3.17 Testing Methodology

Software testing is a process used to identify the correctness, completeness, and quality of developed computer software. It includes a set of activities conducted with the intent of finding errors in software. So that it could be corrected before the product is released to the end users. In simple words, software testing is an activity to check whether the actual results match the expected results and to ensure that the software system is defect free.

There are two approaches to software testing called static and dynamic. Static testing includes reviews, walkthroughs or inspections which is omitted in practice. Dynamic testing includes actually executing programmed code with a given set of test cases. It takes place when the program itself is used. Dynamic testing may begin before the program is 100% complete in order to test particular sections of code and are applied to discrete functions or modules.

3.17.1 Testing Levels

Testing can also be grouped by where they are added in the software development process, or by the level of specificity of the test. The main levels of testing during the development process can be mainly identified as unit testing, integration testing, system testing, and acceptance testing. **Figure 5.2** shows the testing levels in the project life cycle.
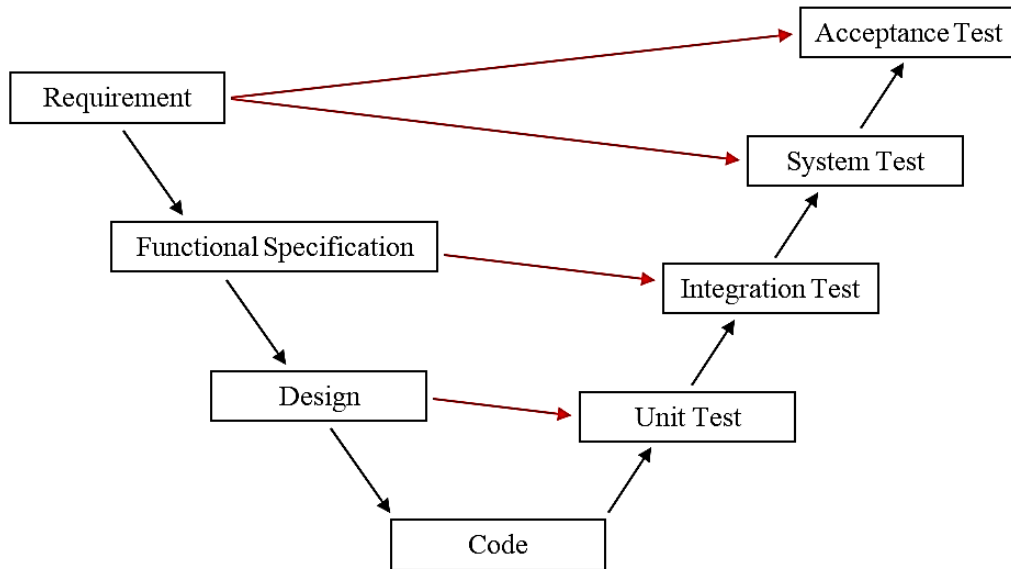

Figure 3.5: Testing Levels in Project Life Cycle

3.17.1.1 Unit Testing

Unit testing [11] is carried out as a part of the coding task. This phase is based on the design of the software for a piece of code. Unit testing should prove robustness, functionally correctness and correct interface of the code.

3.17.1.2 Integration Testing

Integration testing [12] is carried out after the separate software modules have been unit tested. Integration testing is based on the functional specification of the software and it should prove integration and functionally correctness of the software. There are several types of integration testing:

incremental integration testing, top-down integration testing, and bottom-up integration testing.

3.17.1.3 System Testing

System testing is carried out at the completion of the integration testing. The purpose of system testing is to prove that the software meets the agreed user requirements and works in the target environment. System testing covers both functional and non-functional requirements. This will also include recovery, security, stress and performance tests.

3.17.1.4 Acceptance Testing

Acceptance testing is carried out at the customer's site with the customer in attendance. The purpose of the acceptance test is to show to the customer that the software does indeed work. These tests are usually a subset of the system test.

3.17.2 Software Testing Techniques

Testing techniques were used to effectively design efficient test cases. These techniques can be grouped into white-box testing and black-box testing.

3.17.2.1 White box Testing

White box testing tests internal structures of a program, as opposed to the functionality exposed to the end-user. The tester chooses inputs to exercise paths through the code and determine the appropriate outputs.

White box testing was done for this project that based on knowledge of the internal logic of an application's code. Tests are based on coverage of code

statements, branches, paths, conditions. Using this method, test cases were derived according to the program structure.

3.17.2.2 Black box Testing

Black-box testing treats the software as a "black box", examining functionality without any knowledge of internal implementation. The tester is only aware of what the software is supposed to do, not how it does it.

3.17.3 Used Testing Strategies

Following were adopted for better practice of testing process of this system.

- Creating a Test Plan
- Prioritizing Tests
- Test Cases and Design

3.17.3.1 Creating a Test Plan

For this system, a test plan was created explaining the outline and defined approaches taken to perform testing of the project. Test plan was developed to fulfill the following objectives:

- To establish a comprehensive test plan that identifies the nature and extent of tests deemed necessary to achieve the testing objectives for the project, including software and hardware requirements.
- To coordinate an orderly schedule of events, identify equipment and organizational requirements, describe test methodologies and strategies to be used and identify items to be delivered.

3.17.3.2 Prioritizing Tests

Before testing was started, we had to prioritize according to the importance of tests, because of the limited time. When prioritizing tests, we concentrated on the following ranking criteria:

- Test where a failure would be most severe
- Test where failures are most likely
- Ask the user to prioritize the requirements
- What is most critical to the user's business

An advantage we got by prioritizing is when we stopped testing; we have done the best testing in the time available.

3.17.3.3 Test Cases

Test case is a set of actions with expected results based on requirements for the system. It contains of outputs and procedures, follows when doing the testing process. There are two types of test cases as positive test case and negative test case.

- A test case includes these elements:
- The purpose of the test or description of what requirement is being tested.
- Test data - Test data is a specification of the data elements, values or set that define how to satisfy the test intent.
- The setup to test - Version of application, hardware, software, operating system, access level, logical or physical date and any other setup information being tested.
- Actions and expected results.

Following is the sample test case which were used to run unit and integration tests and all off the test cases are like Table 3.8 tests case.

Test Case for Login Form

Below **Table: 3.8** shown test case of the user login validation.

Test Case Name	Validate Login Form
Purpose	Check whether login form work correctly
Tasks	1. submit form without username 2. submit form without password 3. submit form with invalid username 4. submit form with wrong password 5. submit form with correct username & password
Expected Results	1. take cursor again username box 2. display message" password cannot be empty 3. display message 'Invalid Username' 4. display message 'password is incorrect' 5. login successfully
Summary	Received expected results. Displayed error messages properly.
Status	Pass

Table 3.8: Test case for Login Form

Test Case for Register Form

Below **Table: 3.8** shown test case of the user register form validation.

Test Case Name	Validate Register Form
Purpose	Check whether register form work correctly
Tasks	1. submit form without first name 2. submit form without last name 3. submit form without email 4. submit form without password 5. submit form with invalid email 6. submit form with existing email 7. submit form with existing username
Expected Results	1. display message first name can't be empty 2. display message last name can't be empty 3. display message email can't be empty 4. display message password can't be empty 5. display message 'email is invalid 6. display message 'email is already taken 7. display message 'username is already taken 8. register successfully
Summary	Received expected results. Displayed error messages properly.
Status	Pass

Table 3.8: Test case for Register Form

Chapter 04: Evaluation

4.1 Introduction

Few days after system installation, a set of user feedback forms were distributed among a selected set of end users to get their feedback about the system. Returned feedback forms were assessed to obtain the actual feedback of the users.

There were twenty attendees for usability testing. Each individual session lasted for about 30 minutes. Five of the participants were from teacher category and the remaining fifteen participants were from student category.

Software Evaluation Form

Q1	Navigability through the program?				
	□ Poor	□ Fair	□ Satisfactory	□ Good	□ Excellent
Q2	Readability of the characters on the screen?				
	□ Poor	□ Fair	□ Satisfactory	□ Good	□ Excellent
Q3	User friendliness of the user interface designs?				
	□ Poor	□ Fair	□ Satisfactory	□ Good	□ Excellent
Q4	Helpfulness and Understandability of the error messages?				
	□ Poor	□ Fair	□ Satisfactory	□ Good	□ Excellent
Q5	Compatibility of the program with other applications?				
	□ Poor	□ Fair	□ Satisfactory	□ Good	□ Excellent
Q6	Performance of the software?				
	□ Poor	□ Fair	□ Satisfactory	□ Good	□ Excellent
Q7	Please write your suggestions to improve the software.				

4.1.1 User Feedback Analysis

		Poor	Fair	Satisfactor	Good	Excellent
Q1	Navigability of the program	0	2	4	12	2
Q2	Readability of the characters on the screen	0	0	14	4	2
Q3	User friendliness of the user interface designs	0	0	6	12	2
Q4	Helpfulness and Understandability of the error messages	0	2	14	4	0
Q5	Compatibility of the program with other applications	0	2	12	4	2
Q6	Performance of the software	0	0	4	14	2
	Overall feedback of end users	0	6	54	50	10

Table 4.0 Evaluation Result for Navigability of The Program

Above Table 4.0 shown teachers and students feedback overview.

Option	Result	Percentage
Excellent	2	10 %
Good	12	60 %
Satisfactory	4	20 %
Fair	2	10 %
Poor	0	0 %

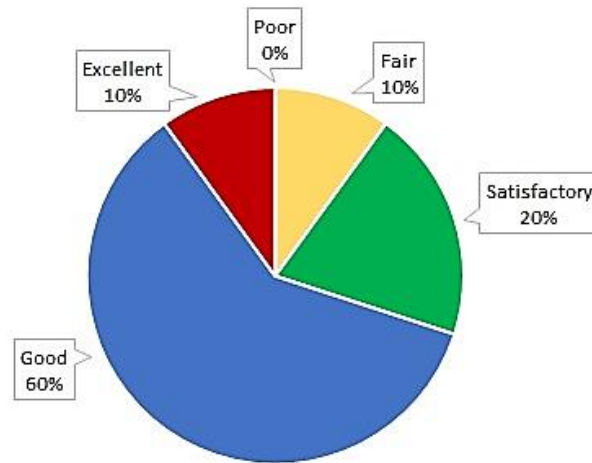**Table 4.1**: Evaluation result for Navigability of the program

Figure 4.1: Graphical representation of Evaluation result for Navigability

According to the **Figure 4.1** graphical representation, 20% of the users say Satisfactory, 60% of users say Good and 10% of the users say it is Excellent. It shows that 80% of the users are satisfied with Navigability of the program.

3.9.2.1   Evaluation Result for Readability of Characters on Screen

Option	Result	Percentage
Excellent	2	10 %
Good	4	20 %
Satisfactory	14	70 %
Fair	0	0 %
Poor	0	0 %

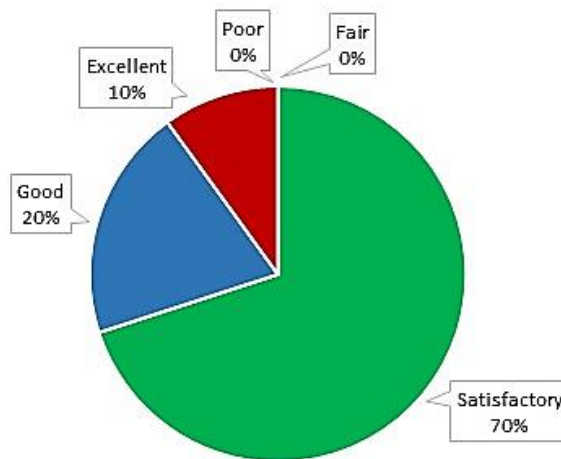**Table 4.2**: Evaluation result for Readability of characters on screen

Figure 4.2 Graphical representation of Evaluation result for Readability of the characters

The **Figure 4.2** graphical representation shows 70% of the users say Satisfactory, 20% of the users say Good and 10% of the users say Excellent. It shows that almost all the users are satisfied with Readability of the characters on the screen.

4.1.1.2 Evaluation Result for User Friendliness of User Interfaces

Option	Result	Percentage
Excellent	2	10 %
Good	12	60 %
Satisfactory	6	30 %
Fair	0	0 %
Poor	0	0 %

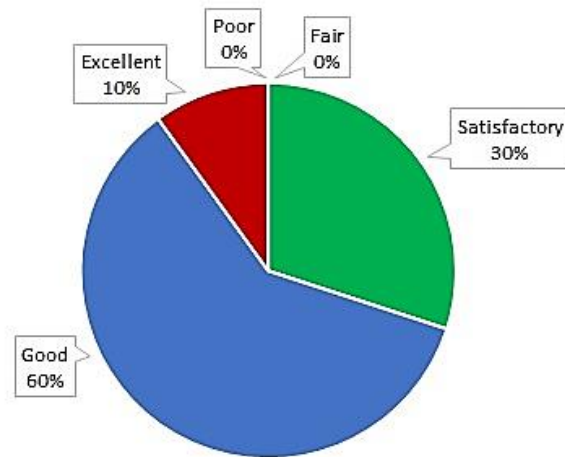**Table 4.3**: Evaluation result for User Friendliness of user interfaces

Figure 4.3: Graphical representation of Evaluation result for User Friendliness

The **Figure 4.3** graph clearly shows that there are no end users who say the Interfaces of the application was not User-Friendly. Almost all the users say User Interfaces are user-friendly.

4.1.1.3 Evaluation Result for Understandability of Error Messages

Option	Result	Percentage
Excellent	0	0 %
Good	4	20 %
Satisfactory	14	70 %
Fair	2	10 %
Poor	0	0 %

Table 4.4: Evaluation result for Understandability of error messages
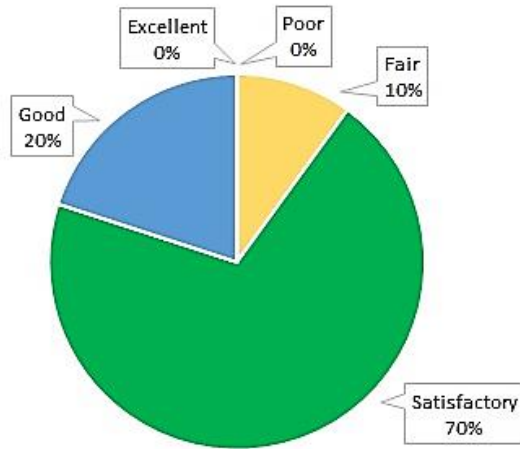
44

Figure 4.4: Graphical representation of Evaluation result for
Understandability of messages

Figure 4.4 graphical representation shows 70% of the users say Satisfactory
and 20% of the users say Good. It shows that almost all the users say error
messages of the application are helpful and understandable.

4.1.1.4 Evaluation Result for Compatibility with Other Applications

Option	Result	Percentage
Excellent	2	10 %
Good	4	20 %
Satisfactory	12	60 %
Fair	2	10 %
Poor	0	0 %

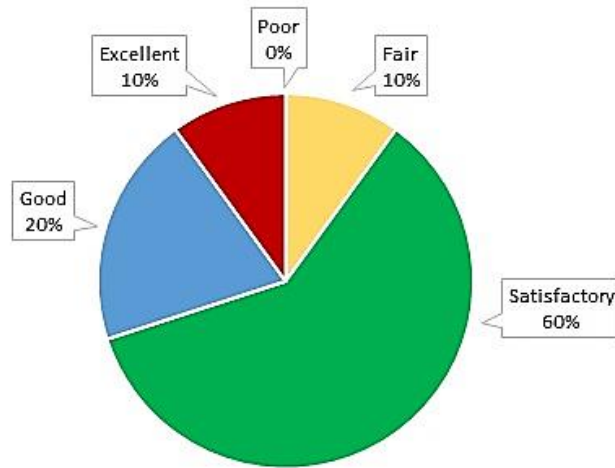**Table 4.6**: Evaluation result for Compatibility with other applications

Figure 4.6: Graphical representation of Evaluation result for Compatibility
with other applications

The **Figure 4.6** graph shows that there are no users who say Poor and only
10% of the end users say Fair. This clearly indicates that majority of the
users are satisfied with compatibility of the software with other applications.

4.1.1.5 Evaluation Result for Performance of The Software

Option	Result	Percentage
Excellent	2	10 %
Good	14	70 %
Satisfactory	4	20 %
Fair	0	0 %
Poor	0	0 %

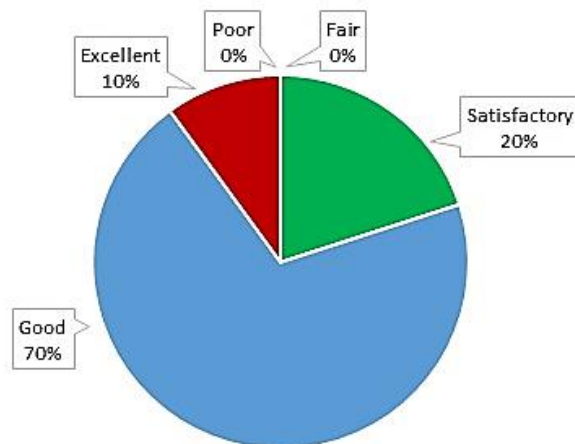**Table 4.7**: Evaluation result for Performance of the software

Figure 4.6: Graphical representation of Evaluation result for Performance

The **Figure 4.7** graph clearly shows that there are no users who say Poor or Fair. That is almost all the users are satisfied with performance of the software.

4.1.1.6 Evaluation Result for Overall Feedback of End Users

Option	Result	Percentage
Excellent	10	8 %
Good	50	42 %
Satisfactory	54	45 %
Fair	6	5 %
Poor	0	0 %

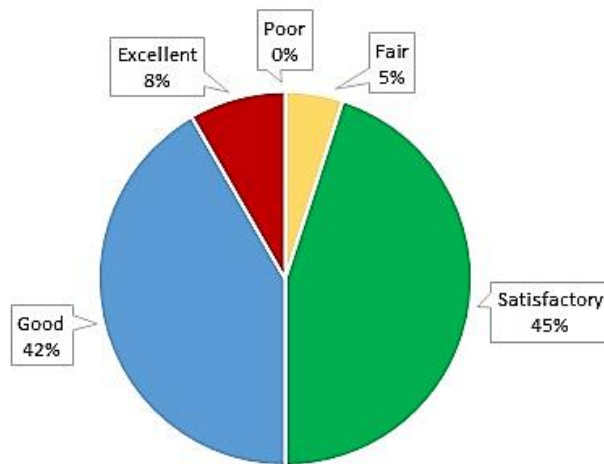**Table 4.8**: Evaluation result for Overall feedback of end user

Figure 4.8: Graphical representation of Evaluation result for Overall feedback of end users.

The **Figure 4.9** graph shows that 45% of the users say Satisfactory, 42% of the users say Good and 8% of the users say Excellent. So, in general, we can say that 95% of the users are satisfied with the system.

4.2 Lessons Learned

This project assisted me to gain a practical experience and apply the knowledge assimilated from the previous courses undertook. Putting the knowledge gained earlier and applying different techniques from past courses was interesting and certain concepts, tools and techniques only made sense after seeing their application in real-world scenario.

The importance of planning and finishing work as early as possible was the most important lesson. Initially defined timeline for developing a software project is supposed to be a guideline, deviations from the guideline occur from time to time. It is important to make changes to the work and the guideline to stay on course for meeting the deadline set for the project. Reviewing project work often is necessary to ensure that effort is translated into meaningful work. Following are some of the lessons learned during the project work.

- Meeting the project objectives should be the highest priority task.
- Communication skills are vital to a project success.
- It is absolutely necessary to plan for contingencies.
- Documenting each finding is a must so that everything is clear and concise.
- A properly planned schedule has to be maintained throughout the project.
- Database handling is much easier with Navicat when compared to traditional phpMyAdmin.

It was extremely challenging at times, but it has been a great and worthwhile learning experience.

Chapter 5 – Conclusion

5.1 Review

User evaluated conclusions on the system:

As per the user evaluation following strength and weaknesses of the system have been identified.

Strengths of The System:

- Easy to access and easy to learn.
- User friendly and user interfaces are very simple.
- Ease of updating the website.
- Ease of publishing details.
- Have several filtering methods.
- Ability to find previous details.

Weakness of The System:

- Data backup and restore functionality is still not available
- Social media plugins should be introduced to the system to get more publicity about for the events.
- Need more reports

Achieved objectives:

Almost all the functions listed under the scope work as per the expectations. Non-functional requirements such as user interface need some alterations and modifications. Not many reports were designed till now, but it is evident that addition of few more reports giving different insights will certainly add value to the overall delivery of the system.

5.2 Future Work

This system has many areas where improvement can be made. Following are the future extensions that could be put into action.

- Improve graphical user interface with advanced JavaScript and AJAX
- Customer review system - Most of the websites, especially online business sites have this function. This is another way of letting the potential customers know about the business.
- Expand the system to include exams other than O/L, A/L and Grade V Exams
- Develop a more generalized, customizable selling software product
- Mobile App for Android and iOS - Mobile App is a common tool use by most businesses today and it attracts more customers.
- Integration of a payment gateway

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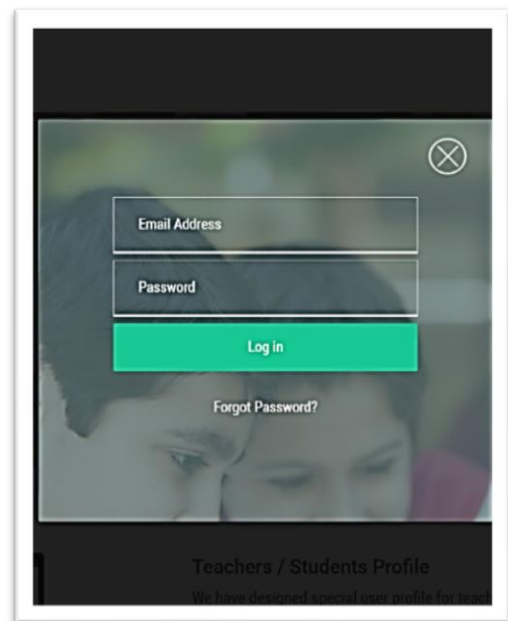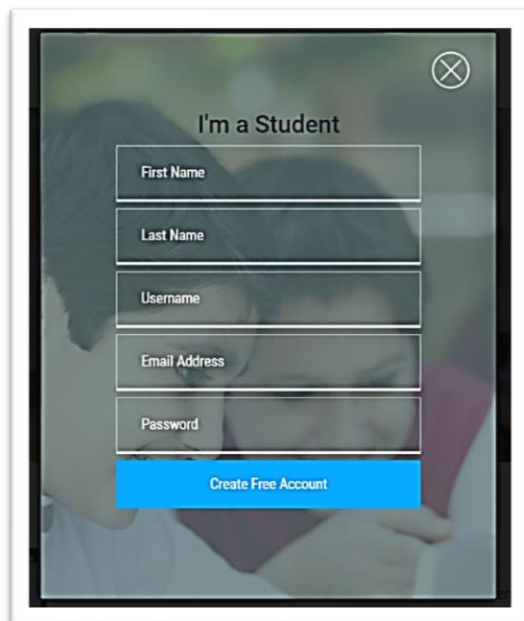
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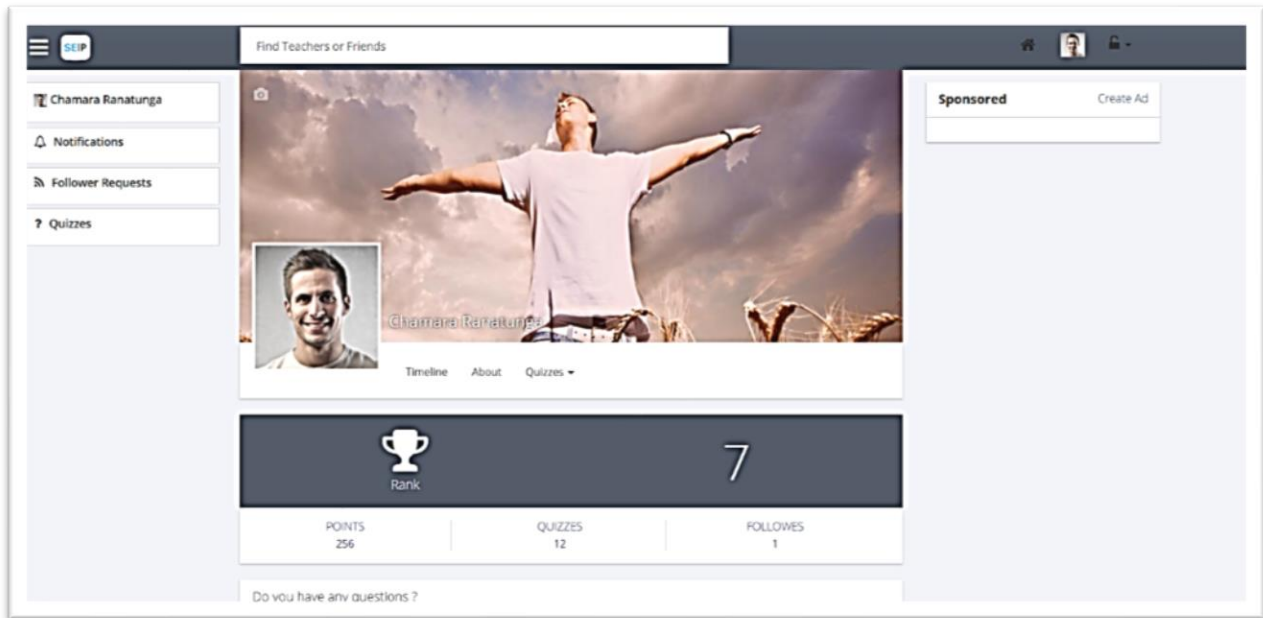
Appendix A – User Manual

Landing Page
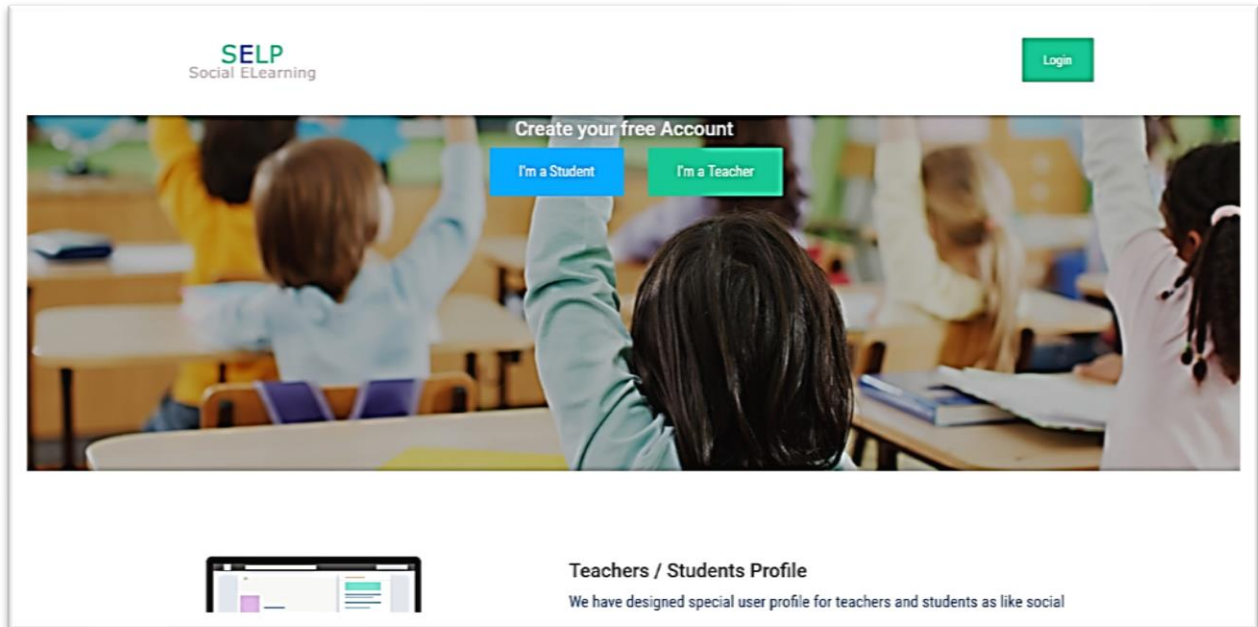
This is the landing page students or teachers can create free account using relvent button if they alrady registed then they can login to the system using login button.
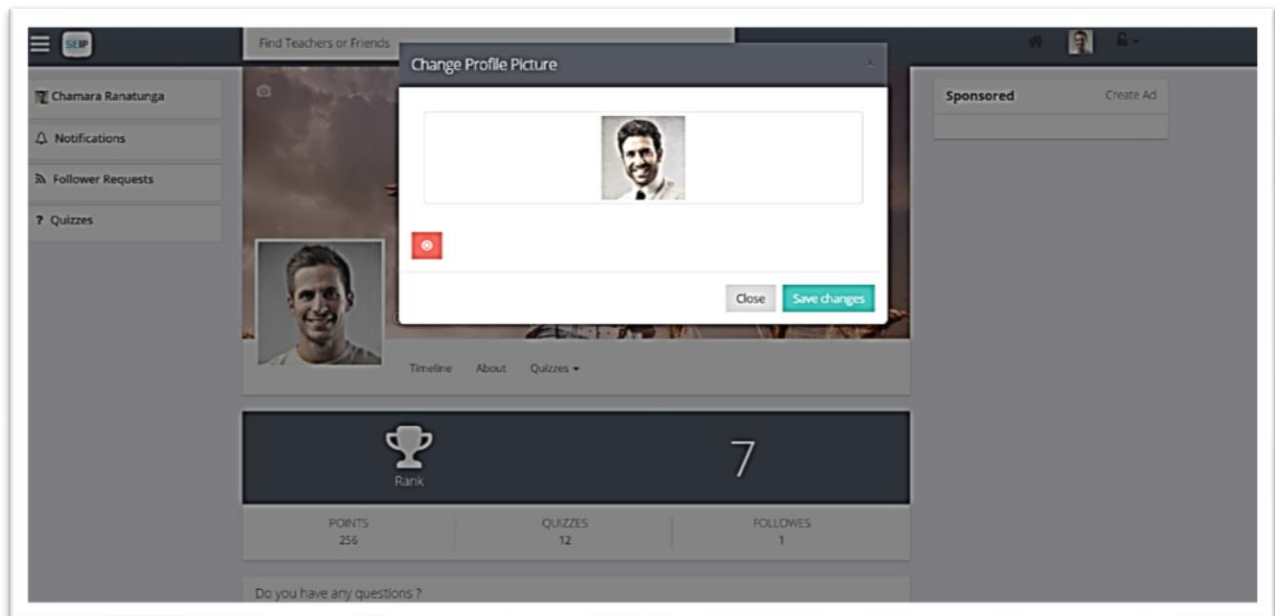
Register and Login Forms

User Wall Page

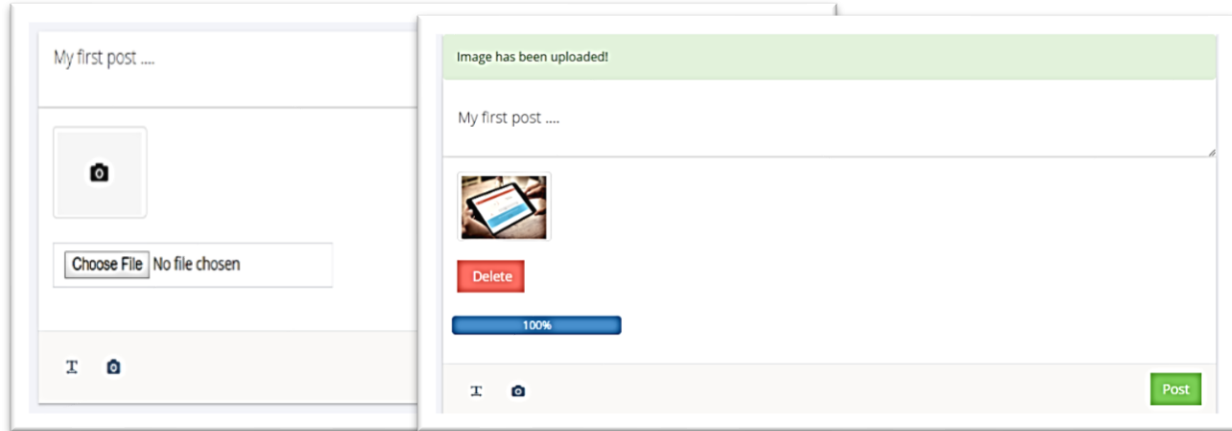After login user will rediract to wall page. This page user can share learning contents and imeages. Also user can change profile image and cover image.

Change Profile Image

Click on the change profile picture button and user can choose new image uisng change popup modal. Also same as user can change cover picture as well.

Summit a New Post

Users can submit posts on the wall using text and images.

User Profile
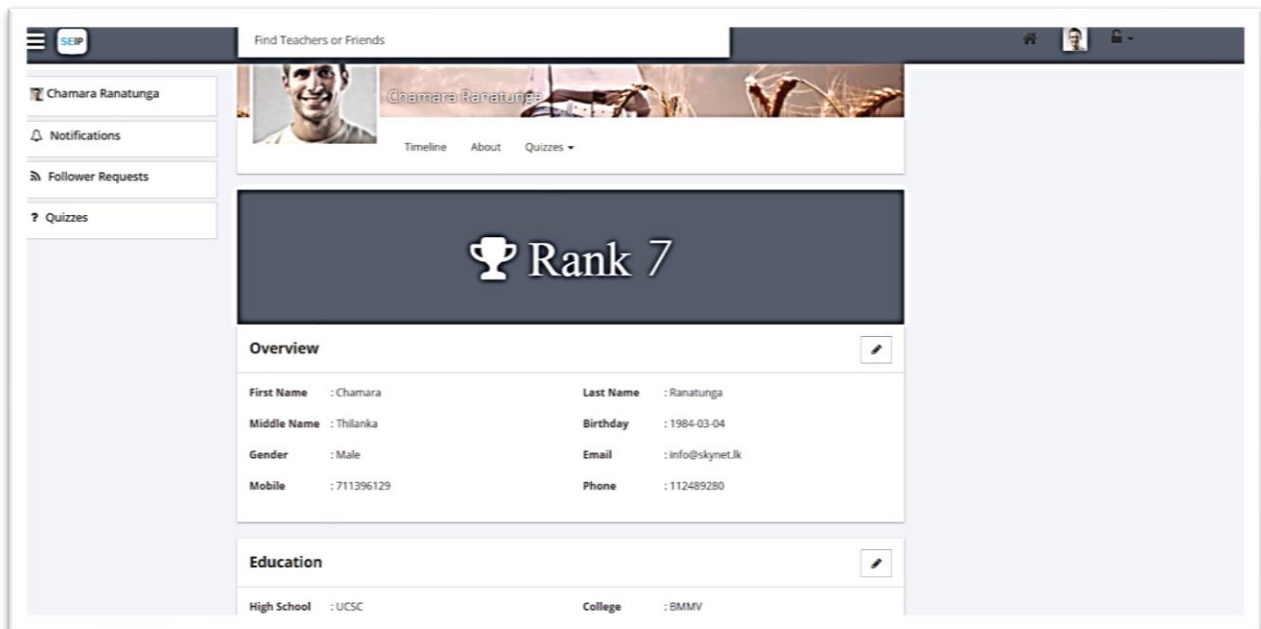
User profile page users can update personal, education and contact details. Also, user can he/she rank as well.

Search Users and Follow
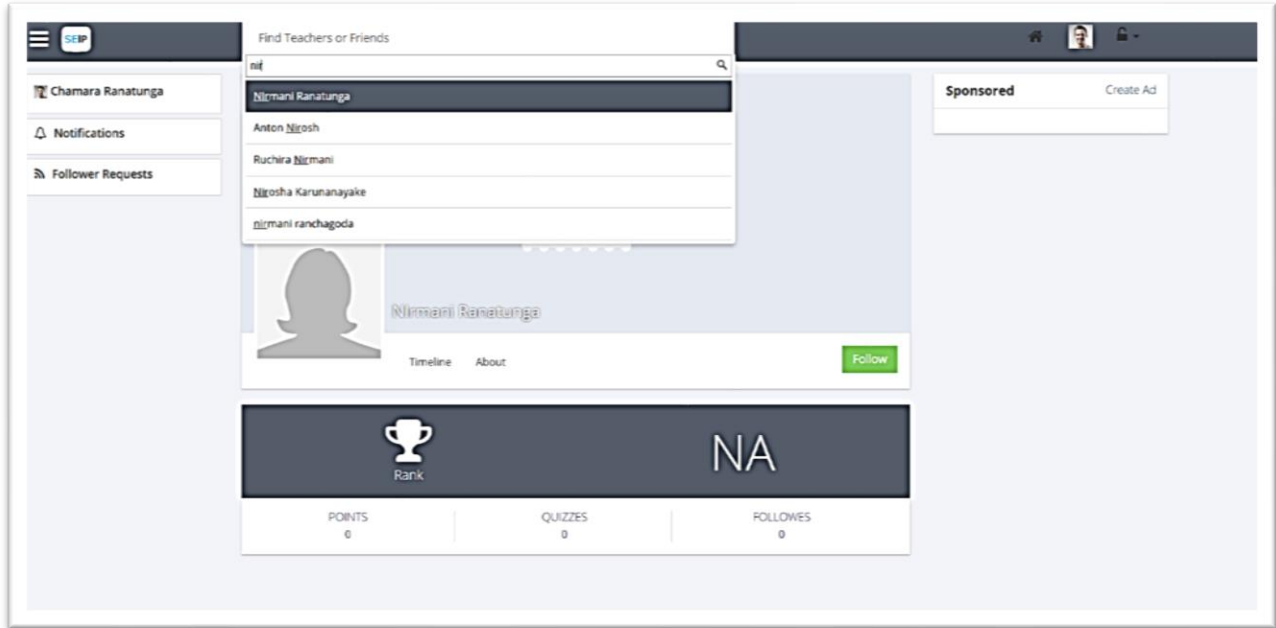
Using search box user can search students and teachers. Then click on the name and go to profile page and follow users using green color follow button.

Find Quiz
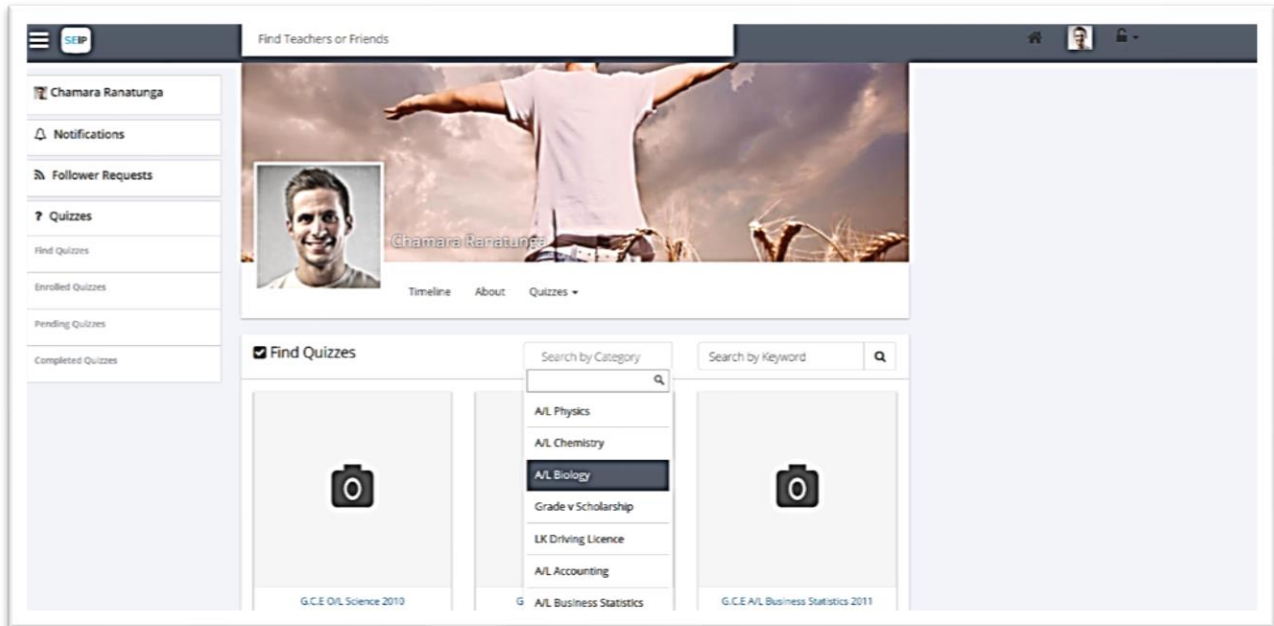
Using left hand side menu click on the quiz menu and go to find quiz page. This page student can search quizzes using category and keyword.

Enroll Quiz and Start Quiz

Go to quiz page and click on enroll button after enrolled user can see start button then click on the start button the system will confirm to start quiz.

Doing Quiz
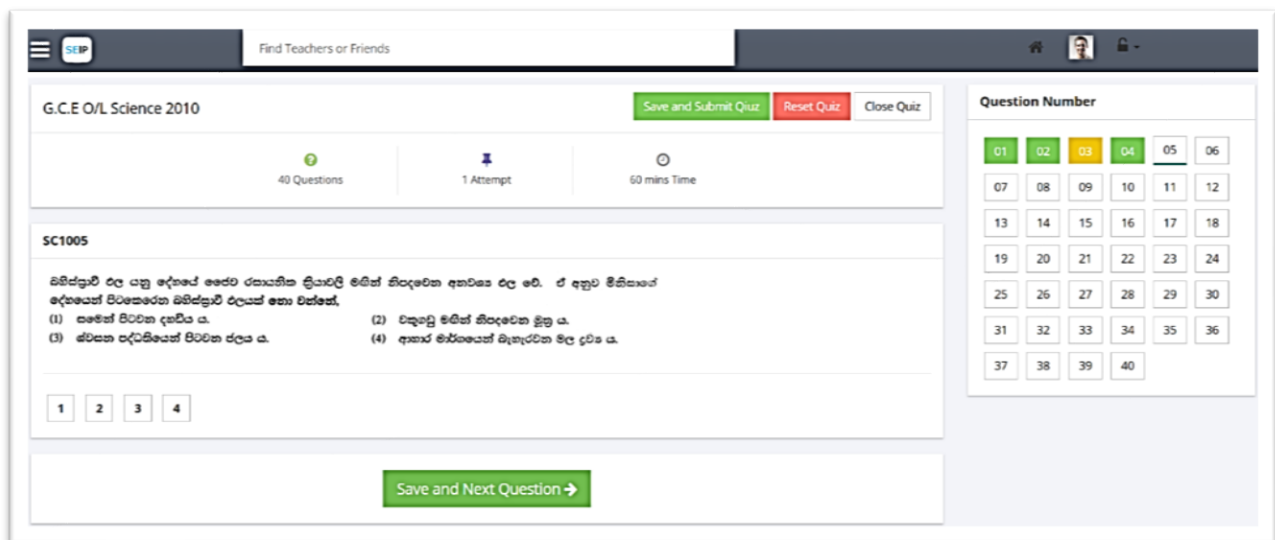
After click on the start quiz will load as above image. Student can choose correct answer. If they want they can skip question as well in the right hand side box green color numbers are completed, yellow color numbers are skipping and white color numbers are to do questions.

Progress Report
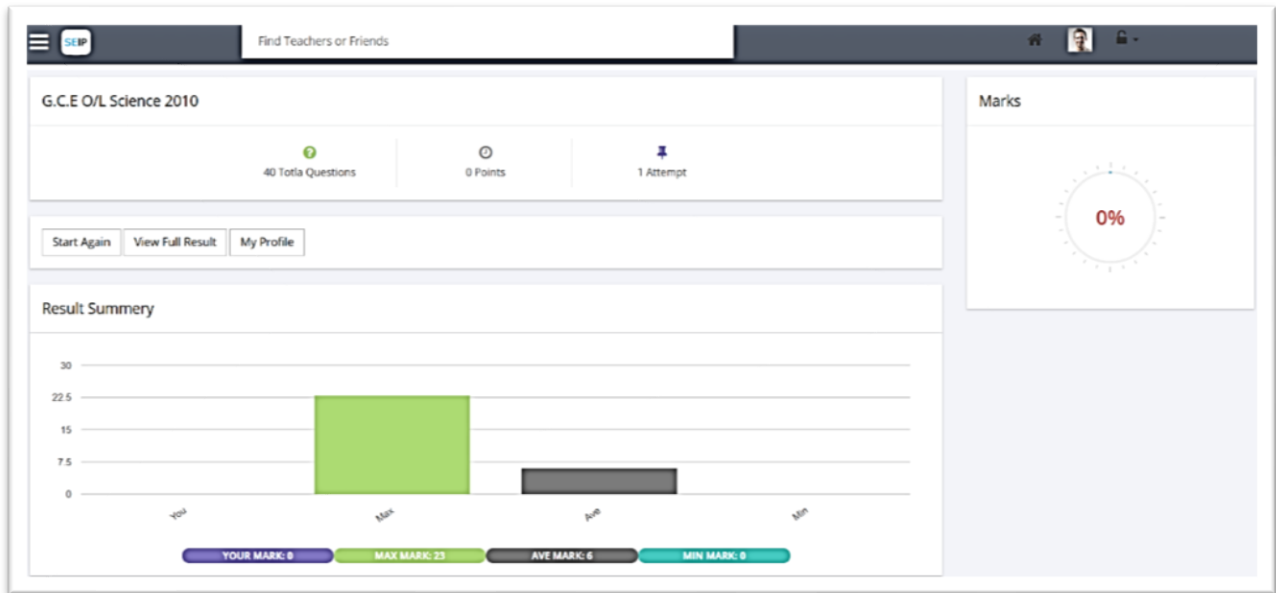
After completed quiz automaticaly rediract to this page. This page will give details reprt about user marks and there students marks as well.

Appendix B- Sample Codes

Quiz Controller

```php
1  <?php
2  defined('BASEPATH') OR exit('No direct script access allowed');
3
4  class Quizzes extends CI_Controller {
5
6      function __construct() {
7
8          parent::__construct();
9          $this->load->model('userProfileModel');
10         $this->load->model('quizzesModel');
11         $this->load->model('userModel');
12     }
13
14     public function enrolled($username){
15
16         if($this->session->userdata('is_logged_in') == TRUE    )
17         {
18
19         $user_id = $this->session->userdata('user_id');
20         $result =  $this->userModel->profile($user_id, $username);
21         $data['userData'] = $result['userData'];
22         $data['profilePic'] = $result['profilePic'];
23         $data['followers'] = $result['followers'];
24         $this->load->view('users/head', $data);
25         $this->load->view('users/header', $data);
26         $this->load->view('users/sideBar');
27         $this->load->view('users/enrolled', $data);
28         $this->load->view('users/footer', $data);
29         $this->load->view('users/changeProfilePictureModal');
30         $this->load->view('users/changeCaverPictureModal');
31         $this->load->view('users/enrolledJs');
32         $this->load->view('users/notificationJs');
33         $this->load->view('users/requestNotifiJs');
34         }
35         else
36         {
37             redirect(base_url().'userAuth/logout');
38         }
39     }
```

Quiz Modal

```php
1  <?php
2  class QuizzesModel extends CI_Model {
3
4    public function quizDataDB($quizId, $user_id)
5    {
6      $this->db->join('nana_quiz_category', 'nana_quiz.qu_cat_id = nana_quiz_category.qz_cat_id');
7      $this->db->join('nana_users', 'nana_quiz.createBy = nana_users.u_id');
8      $this->db->where('nana_quiz.qz_id', $quizId);
9      $query = $this->db->get('nana_quiz');
10
11     if( $query->num_rows() > 0 ){
12       $rew['quizData'] = $query->result();
13     }
14     else{
15       redirect(base_url());
16     }
17
18     $this->db->where('qz_id', $quizId);
19     $this->db->where('u_id', $user_id);
20     $queryCeck = $this->db->get('nana_quiz_enroll');
21
22     if( $queryCeck->num_rows() > 0 ){
23         $rew['enrollCecked'] = 1;
24     }
25     else{
26       $rew['enrollCecked'] = 0;
27     }
28
29     return $rew;
30  }
```

HTML Sample Code

```html
1  <section id="main-content">
2      <section class="wrapper site-min-height">
3          <!-- page start-->
4          <div class="row">
5              <div class="col-md-8">
6                  <section class="panel">
7                      <div class="cover-photo">
8                          <div id="cover-photo">
9                              <?php if( $userData[0]->u_id  == $this->session->userdata('user_id')){ ?>
10                             <div id="caverUpdate" style="display: show;">
11                                 <div id="caverUploadModalView"> <i class="fa fa-camera"> </i><span class="cavertext"> Change Caver Picture</span>
12                                 </div>
13                             <?php } ?>
14                         </div>
15                         <div class="fb-timeline-img" >
16                             <?php  if($userData[0]->cover_pic ==""){ ?>
17                             <img src="<?=base_url() ?>uploads/caver_pic/nana_def_cover.jpg" height="320px" alt="">
18                             <?php } else{?>
19                             <img src="<?=base_url() ?>uploads/caver_pic/<?= $userData[0]->cover_pic; ?>" height="340px" alt="">
20                             <?php } ?>
21                         </div>
22                         <div class="fb-name">
23                             <h2> <a><?= $userData[0]->stp_fname; ?> <?= $userData[0]->stp_lname; ?></a></h2>
24                         </div>
25                     </div>
26                     <div class="panel-body">
27                         <div class="profile-thumb" id="profile-thumb">
28                             <div id="profielPicimage">
29                                 <?php if($userData[0]->stp_profile_pic !=="") { ?>
30                                 <img src="<?= base_url();?>uploads/profile_pic/<?= $userData[0]->stp_profile_pic; ?>" alt="" />
31                                 <?php } else { ?>
32                                 <img src="<?= base_url();?>uploads/profile_pic/empty.png" alt="" />
33                                 <?php } ?>
34                             </div>
```

Database Create Schema

```sql
28  -- Table structure for table `quiz`
29  --
30
31  CREATE TABLE `quiz` (
32    `qz_id` int(10) NOT NULL,
33    `qu_cat_id` int(11) NOT NULL,
34    `qz_name` varchar(100) NOT NULL,
35    `qz_information` text NOT NULL,
36    `qz_long_text` text NOT NULL,
37    `total_points` int(4) NOT NULL,
38    `qz_price` decimal(5,2) NOT NULL,
39    `medium` varchar(25) NOT NULL,
40    `qz_into_image` varchar(255) NOT NULL,
41    `qz_cover_pic` varchar(255) NOT NULL,
42    `attempts_allowed` int(4) NOT NULL,
43    `shuffle_questions` double NOT NULL,
44    `shuffle_questions_aswers` double NOT NULL,
45    `time` int(5) NOT NULL DEFAULT '120',
46    `level` int(11) NOT NULL,
47    `start_quiz` timestamp NOT NULL DEFAULT CURRENT_TIMESTAMP,
48    `end_quiz` datetime NOT NULL,
49    `createBy` int(11) NOT NULL DEFAULT '1',
50    `enroll_key` varchar(25) NOT NULL,
51    `status` tinyint(3) NOT NULL
52  ) ENGINE=InnoDB DEFAULT CHARSET=latin1;
53
```