**DEPARTMENT OF COMPUTER SCIENCE**

**FACULTY OF SCIENCES**

**UNIVERSITY OF LAGOS.**

# ELECTRONIC LEARNING SYSTEM (A CASE STUDY AND APPLICATION IN FACULTY OF SCIENCE, UNIVERSITY OF LAGOS)

**BY**

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**DR. ADEWOLE P.A**

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## CERTIFICATION

This project was submitted to the department of computer science, faculty of science of the University of Lagos, Nigeria and it is certified to the work carried out by me under direct supervision

## DEDICATION

This report is dedicated foremost to God Almighty for his favor, mercy and grace upon my life especially during my four (4) years in University of Lagos.

I would also like to dedicate it to my parents and siblings for their love and support and everyone else that contributed towards my studentship.

## ACKNOWLEDGEMENT

To start with, I would like to thank God Almighty for giving me the grace and strength to see this project through, may His name be forever glorified

Secondly, I would like to recognize my supervisor, Dr Adewole P.A for his efforts and help towards this project. May Almighty God continue to guide you aright.

Also, I am deeply indebted to God Almighty, the giver of all wisdom, knowledge and understanding, without whom I would have achieved nothing at all.

I am also grateful to my friends for their assistant in various ways who have contributed to the success of this project. Thank you all. I am highly grateful.

## ABSTRACT

E-learning systems are gaining attention among academicians and students because of its time and location independence which provide learners a great flexibility of learning. Most of the e-learning systems are deployed using Internet. This project describes various e-learning systems designed and developed by individuals, Institutions or universities to support learning process.

One primary aim of this project is to develop a next-generation online learning platform – Electronic Learning System for the faculty. The platform would allow students to log in to the system, collect their learning materials from lecturers, and discuss with their classmates. The major advantage is that the entire process is real-time and online, which means students can study everywhere examples are at home, hostel etc. Thought the use of advanced web technology, the administrator can add a new module to the system to provide an extra function by uploading materials such as videos, PDF etc. for their students.

## TABLE OF CONTENTS

# CHAPTER ONE

## 1.0 INTRODUCTION

**What is an Electronic Learning System?**

Chapter 1 consists of five sections: Background, Objectives, Methodology, Organization of this report and the Limitations.

This chapter will describe the background to this project, list the objectives, outlines the methodology, examines the limitations and preview the organization of the project.

## 1.1 BACKGROUND

The basic requirement of this project is developing a web-based software which will be running on the Internet and perform some actions. Electronic Learning System is web-based classrooms that enable instructors (lecturers) and learners (students) to have continuous access to course materials, broadcast announcements, submit and receive feedback on assignments, and network among classmates.

This is a new generation online educational platform; which will include much new technology on it. For example, it has an ability to running on most machines with a different design of the operating system.

## 1.2 OBJECTIVE

Providing the information is an effective way and important in University of Lagos. It means that the further studying will be related on an electronic media, such as studying in electronic book once you logon into your account. There is no doubt that, the role of Electronic Learning System will be more and more important especially for students in University of Lagos. Due to this trend, Online Learning System is the platform to help the students getting easier to studying on the Internet. This is the purpose of this project.

To achieve this mission, the system was developed into two parts. The first part is the administrator; another is normal user (for the students). The system would be able to provide two interfaces to allow these two types of user's log in. The administrator should be able to control the whole system, including create/edit or delete the user account, add/drop the function on the system, and so on. So, he/she will control the system by log in to administrator page only. The student is allowed to obtain the information provided by the administrator. For examples, the administrator can upload the notes and the announcement; the student can download it and getting the studying news.

This is the concerned of the system, which is simulator to current used by most university – Student portal. But this system will be user-friendly than that.

## 1.3 PROBLEM STATEMENT

i. Current teaching method more individualistic (a teacher teaching method) and student find boring and less interactive.

ii. A student spends a lot on buying study materials/ handouts.

iii. There is a time limitation for the student to communicate with a teacher

## 1.4 METHODOLOGY

First of all, to implement the Electronic Learning System requires a web-server to deliver the information from the system to the client. The server will be running many server programs, so a stable environment is required.

Electronic Learning System is designed to be able on running different web browsers. This is because the cross-platform designed web-based software is more expected in the market and it is difficult to expect the user to use a specific browser, so using a most general programming language that is supported in most Operating System is one of the considerations. This is the result of this project mainly program by the PHP script.

PHP is the hit web programming language in this few years. The advantage is, the PHP script can be run on most operating system although the architecture of hardware and OS is totally different. That mean the software can be Operating System and hardware independence. Another major advantage is; it is free of charge. The server system only requires to install the PHP run-time support and then do a little bit configuration, their web server will support it. Also, the performance of PHP script is very good, when compared with PERL and ASP, especially running on Unix/Linux system.

Electronic Learning System is a modules base system, so the design of the system should be based on basic modules as possible. There are several advantages of writing the program into modules structures. The programmer can add or remove the function (modules) more easily. The whole system should not require to modifier anything before or after add or delete the modules. The programmer only considers how to programming with modules, but they do not require to understand the deep of Electronic Learning System and the codes are easier to read by another person. So, the design of Electronic Learning System must provide a mechanism that allows a user to communicate end-to-end users.

## 1.5 LIMITATIONS

There are some limitations in the developing of Electronic Learning System.

***Time Limitations & Consuming:***

The difficulties when developing Electronic Learning System, is the “Time Limitations

& Consuming". Design the modules are basic on the structure and the rule of Electronic Learning System. So, decision and design the architecture is very important. It needs to take a relatively long time to construct the kernel part then the modules, it is a time-consuming job and there is difficult to set the finish point of Electronic Learning System. Because Electronic Learning System will grow continuously, it can develop a huge number of modules what student wanted and improve the system to better. But this project is a one-year (final year) task, so it is not possible to be finished within a year. Developing grow continuously is a long running process, and the system will be grown up by time.

***Resource:***

Electronic Learning System is a new concept of system design, so there is very difficult to find any reference or resource from before, all the things are created by creativity and start from the beginning.

## 1.6 ORGANIZATION OF THIS REPORT

This report is mainly divided into five chapters - Chapter 1: What is Electronic Learning System? Chapter 2: Electronic Learning System's Literature Review; Chapter 3: System Analysis; Chapter 4: Electronic Learning System Implementation and Design; Chapter 5: Conclusion and Recommendation. After these six chapters is the Reference and Appendix.

In the chapter 1, I will introduce the basic idea of Electronic Learning System, and the goal of Electronic Learning System.

In the Chapter 2, This chapter also relates two of the most common models that might be applied to the adoption of technological innovation and investigates the stages through which technological innovation can happen.

Chapter 3, I will introduce the design process of the modules, which come with the Electronic Learning System.

Chapter 4, I will explain how to getting start with Electronic Learning System and how it works.

Chapter 5, I will make a conclusion and recommendation of this project (Electronic Learning System).

Finally, is the Appendix. It will contain all the information, which is related to Electronic Learning System. Such as the API of Electronic Learning System, program sources, Windows configuration guide, and the tools used.

# CHAPTER TWO

## LITERATURE REVIEW OF THE E-LEARNING

Firstly, this chapter shall focus on discussing what is meant by e-learning, and how the definition of e-learning has been developed up until the present day. Secondly, it shall discuss opportunities and limitations related to e-learning; e-learning in Higher Education and how we can benefit from it. This chapter also relates two of the most common models that might be applied to the adoption of technological innovation and investigates the stages through which technological innovation can happen. It is argued that the power of societies is highly affected by its stock of knowledge and how effectively they can use this knowledge in order to create new knowledge. It has been indicated that the traditional learning style is delaying the presentation of knowledge in the modern era. Therefore, the internet applications can be included in a successful way into blended learning, e-learning approaches which are employed in this digital era of education. Write that, "Keeping up with new information and knowing how to use it are "mission critical" activities to businesses and individuals alike in a market where competition is no longer characterized by the big beating up the small, but rather by the fast running past the slow". They also defined training and education as: "giving people the information and skills they need to compete effectively in the marketplace". They also emphasize that education and training institutions need to understand this definition of training and education in order to be able to provide ways of qualifying individuals with enough skills to cope with the demands of today's society. In addition, they argue that many traditional learning methods are not suitable for today's fast-growing knowledge driven economies. This thesis shall focus on e-learning development in University of Lagos. There is evidence that University of Lagos is still in the fundamental stages of e-learning adoption, thus, it is important to investigate the factors affecting e-learning development, as suggested through students from various faculties. The aim of this review is to become knowledgeable with the guidelines and paths of where and how to explore e-learning development factors in University of Lagos. This review makes it possible to develop a framework for investigating the factors that could enable a more effective e-learning implementation for the school starting from Faculty of Science.

## 2.1 THE E-LEARNING DEFINITION

E-learning is one of the educational outcomes that has surfaced from the development of ICT. Its general concept is essentially learning which involves the usage of any electronic device, from computers to mobile phones, and which might, or might not, involve the usage of the internet (Web sites+ other applications) or an intranet (Local network system). E-learning could be presented through several resources, for example: computer software and internet websites. Clark & Mayer has defined e-learning as “the delivery method of a learning, training or education program by electronic means, e-learning is involving the usage of a computer or electronic device (e.g. a mobile phone) to provide training, or learning material”. Also, Oblinger and Hawkins suggest that e-learning has transformed from being a completely online course to use technology to deliver selected parts or all of course, independent of a fixed place or time. This means that students can be domestic or can learn at any distance. Nevertheless, there are differences of view regarding the definition of e-learning from other professionals working in this field, such as Dublin & Cross and Oblinger and Hawkins, who demand that there is no definition accepted by all researchers. In the opinion of Oblinger and Hawkins, "everybody knows what you mean when you talk about e-Learning: however, the term e-learning means different things to different people". Also, Heinze and Procter and Zemsky & Massy in 2014 addressed the same point, adding, "Yet, the e-learning is a concept in search of consistent definition". They argued that it is difficult to find a commonly accepted definition of e-learning. In summary, new technologies, including computer networks, interactive-media, digital technologies, and the internet significantly increase the reach of e-learning provision. It enables and allow students to connect and interact with each other, and with their lecturers, at any time, and it has opened up a universal market. Thus, many institutions have been attracted to e-learning systems and the e-learning market has grown continuously. The industry analysts situated the size of the e-learning market at 3 billion USD in the United States alone; the number grew to almost 15 billion USD by 2005, 18 billion USD in 2010, Carayannis described the advantages of using e-learning systems in modern educational institutions. E-Learning, in comparison with traditional learning, significantly reduces the time needed to locate information. It also offers access to online resources, databases, periodicals, journals and other material. If a student has trouble understanding part of the coursework, finding tips on the matter couldn't be easier than having immediate access to supplementary, unlimited and mostly free material online. Those characteristics can potentially maximize the time spent actually learning

rather than looking for information; this is the first benefit from the e-learning. Also, there are numerous benefits such as the cost of training; the speed to use the education packages faster without waiting for a training representative. Also, can provide feedback on training immediately. This suggests that e-learning offers a wide range of opportunities that need exploring and thus the proposition is that e-learning can be defined through three broad domains:

### 2.1.1 E-learning is a distance education method

Most of the authors working in this field have accepted that the conceptual idea of the term e-learning indicates distance education or education delivered online.

### 2.1.2 E-learning is transactions facility on the web

Some writers have highlighted that the facilities offered via the Learning Management Systems (LMS) exemplify a second e-learning big success. The LMS proposal is an extensive set from the options and communication tools to service the lecturers and their students' interactions and implement daily activities that help improve the learning process.

### 2.1.3 E-learning is electronically facilitated learning

This domain relates to the material of e-learning courses itself, rather than the electronic system, whereas it focuses on the material design of the e-books, CD-ROMs and Web sites, to assessment and electronic tests. Even though there are natural differences in all of those tools, they are all mediated electronically. This thesis could give a brief definition for e-learning from the conclusion that most of the definitions imply, which focuses on the means of delivery, but not on the process of learning. Those definitions viewed e-learning in terms of its numerous delivery options, but missed the learning process situation. However, the definition put forward by the Council of the open and distance learning quality did not ignore the learning process situation; whereas the definition was included the word created, in the sentence "effective learning process created..." means that the learning takes place. On the other hand, most the types of services and support tools could be provided in an e-learning system; whereas, the outcome may not be learning. From this argument, e-learning may be named [e-education]; but it might not be defined as e-learning as the process of interaction with electronically mediated education materials; except or unless the learning takes place. Where there is a focus on the learning process rather than the meaning of delivery, this thesis is accepting the definition formed by Mason and Rennie since 2006, which is

as follows: “the e-learning is the effective learning process created by combining digitally delivered content with (learning) support and services”.

## 2.2 THE ADOPTION OF E-LEARNING

The progression of e-learning adoption is not simple operation; there are many positive factors that must be provided before; such as:

- The positive attitudes of the institution.
- The perceived helpfulness in adopting this system.
- The perceived effortlessness and the comfort of using the system.
- The readiness of the team in the institution; of the users and the staffs in terms of technology usage access and cultural evaluation.

Also, the e-learning adoption process may be considered a diffusion of innovation. Whereas, there are numerous other the models, which have been established to clarify and explain this, these models are designed specially to indicate in what way the new technology innovations are accepted and adopted. There is a similar opinion, which concludes that attitudes have a significant and an essential direct influence on meaning and the goals to adopt e-learning, whereas attached to perceived helpfulness, benefits outcomes, ease of usage and the security of the system.

## 2.3 E-LEARNING PERFORMANCE IN HIGHER EDUCATION IN GENERAL

Through starting to recognize e-learning as an additional means to access learning, many tertiary institutions are adopting e-learning to meet the rapid growing demands on higher education. A strong relationship between Khan in 2001 and Salmon in 2011 has been suggested that in the recent years have seen a melodramatic increase in both the uptake of e-learning within higher education and research into its influence for institutions, the practitioners or teachers, and the learners or students. This presented study was designed to determine the effect of the quick spread of e-learning in both face-to-face (F2F) on campus and distance education, which is still integrating with the organizational and educational systems of higher education institutions. Yet, it has not changed the fundamentals of the institutions, since most institutions adopt ICT not in accordance with a general strategy that they should reconvert to e-learning, but rather with a more logical approach towards suitable technology that is introduced to 28 respond to clearly identifiable needs or opportunities. The traditional means of learning and teaching that are paper based are still the most commonly used methods, compared to the web-based and online learning methods.

According to Andersson & Grönlund, developing nations find the traditional means of learning more reliable and maintainable.

## 2.4 THE DEVELOPMENT OF THE E-LEARNING PERFORMANCE

The development of e-learning performance cannot be reviewed without mentioning technological development for the educational tools, due to the fact that both are linked to each other. Generally, technology has rapidly developed in the recent four decades with the invention of Personal Computers (PCs), the invention of the Internet, established Networks and the comprehensive usage of the World Wide Web and ICT. Laurillard said in 2004 regarding the development of technology that there has been a "historical accident driven by curiosity, the market, luck, and politics" not by the needs of learners. She added that "Learning technologies have been developing haphazardly, and a little too rapidly for those of us who wish to turn them to advantage in learning".

# CHAPTER THREE

# SYSTEM ANALYSIS

## 3.0 FEASIBILITY STUDY

Experts in E-Learning design suggest that any organization considering a step into E-Learning undertakes a comprehensive feasibility study to assess possible pathways for eLearning implementation. Such feasibility study will identify viable pathways to increase revenue, student retention, and success of individually designed programs, whether in higher or secondary education or professional development.

A feasibility study combines up-to-date pedagogical research with best practice in implementation of E-Learning tools acknowledging that organizational specifics may call for online, blended, or even classroom/field delivery. A feasibility study is conducted in a team with subject experts combining the specifics of delivery with alternative eLearning delivery methods.

An example of such a feasibility study would analyze suitability of E-Learning tools, their adaptation and customization to organizational needs and the most efficient implementation.

Some educational models can benefit from competency-based learning; however, an analysis of the success factors in competency-based learning is needed to secure institutional transition and adequate student support.

Only a careful feasibility analysis can secure return on investment in learning resources needed for successful implementation of online learning tools. While the choices are abundant, there are associated risks that need to be considered when evaluating feasibility of digital texts, audio and video, digital images, publisher and instructor generated content, simulations, and game-based learning opportunities.

The first step towards successful implementation of online delivery is organization specific insight into the risks that are associated with E-Learning programs and a broad understanding of pedagogic and structural implications in online course delivery.

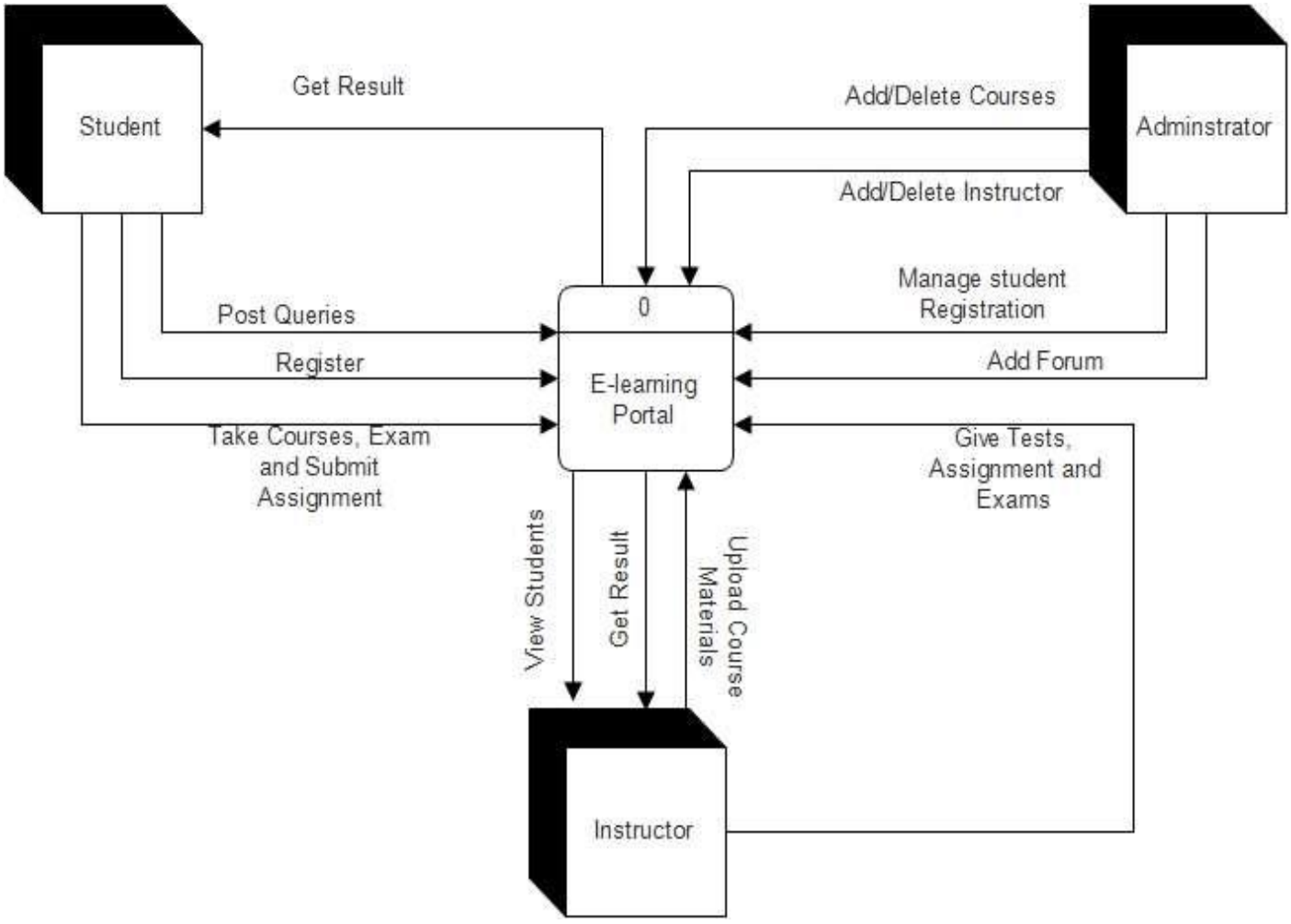
The second step in the feasibility study is to assess the metrics and tools that may contribute to underlying success factors when considering E-Learning solutions.

The third, maybe the most important step, is the implementation plan for the strategy of E-Learning deployment.

A feasibility study concludes its findings with simulation models, cost - benefit analysis and market assessment. This leads to the calculation of the potential return on investment for each of the possible solutions.

## 3.1 THE PROPOSED SYSTEM

### 3.1.1 CONTEXT FLOW DIAGRAM




### 3.1.2 THE OVERALL USE CASE DIAGRAM

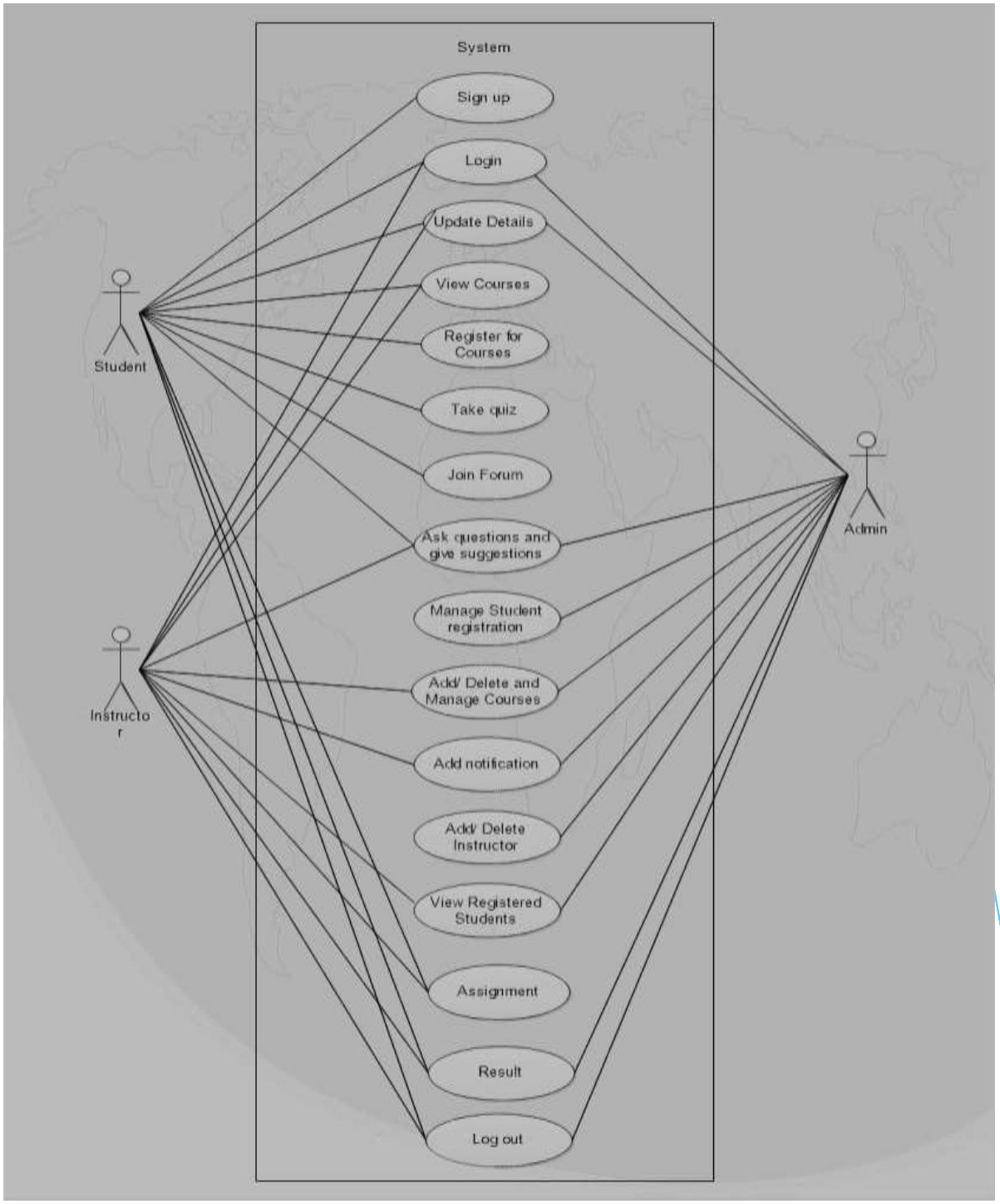
The **Roles** are;

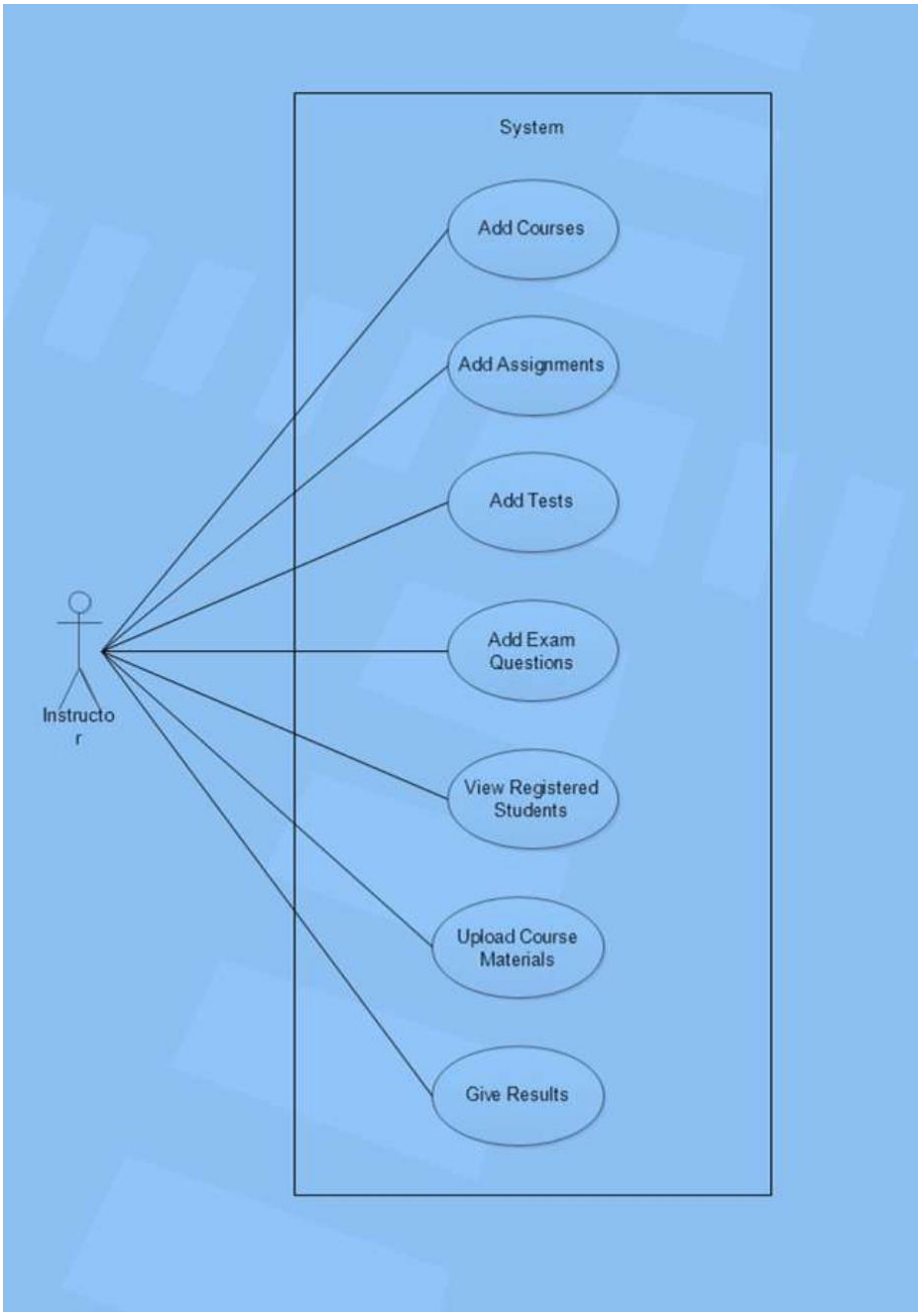
**Administrator**: Manages and coordinates all the activities of the system

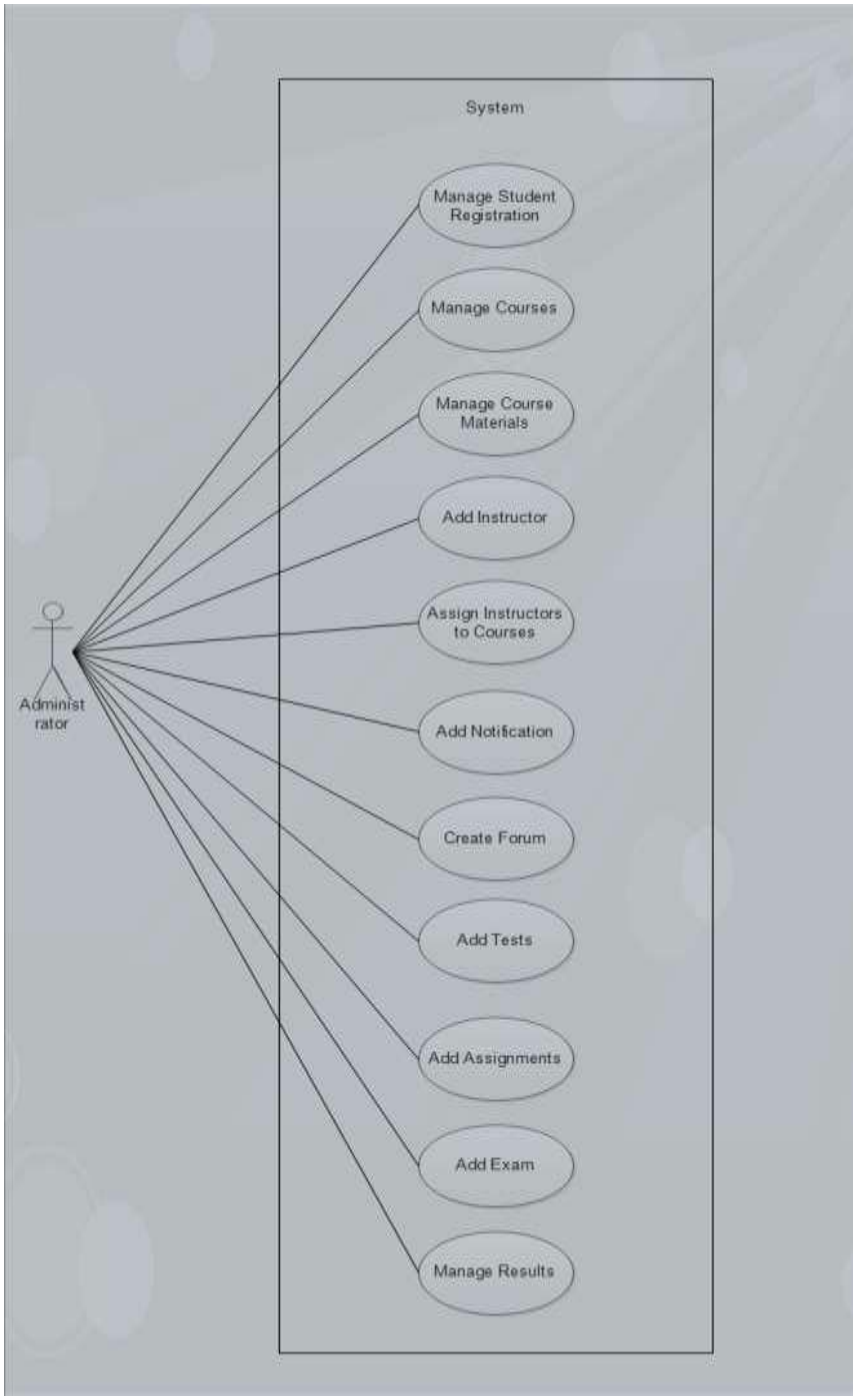
**Student**: Accesses the system for learning

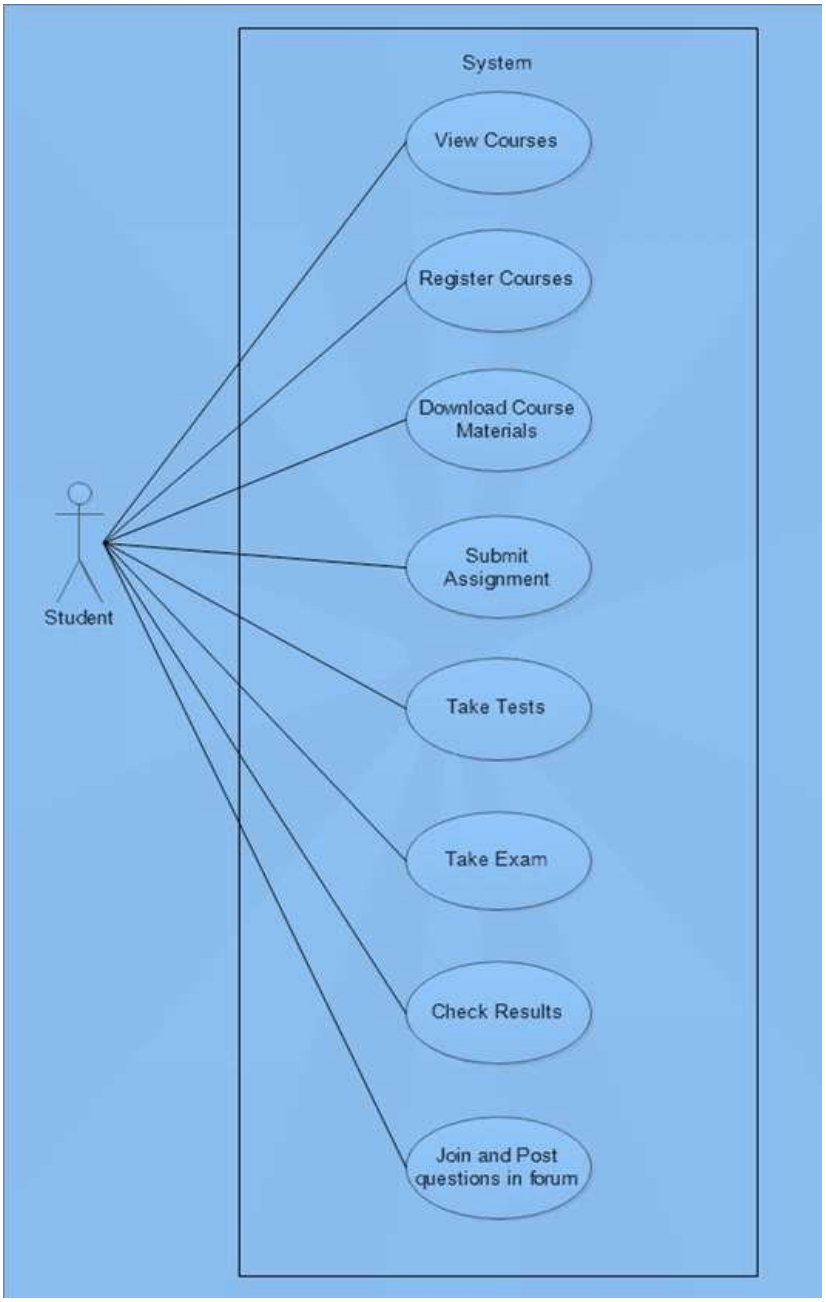
**Instructor**: Provides resources to be used by the student

## INDIVIDUAL USE CASE DIAGRAMS

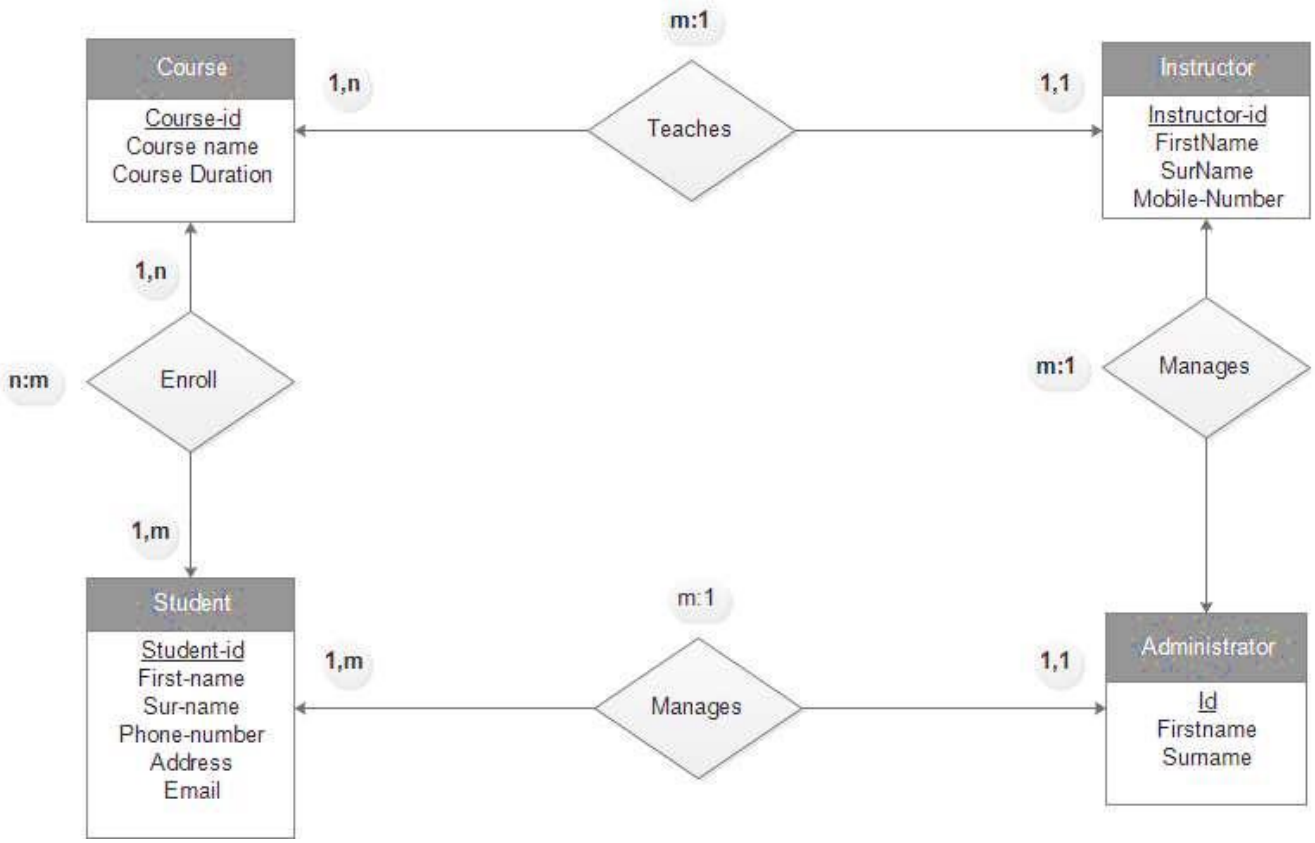



System
Add Courses
Add Assignments
Add Tests
Add Exam Questions
View Registered Students
Upload Course Materials
Give Results
Instructo r


System
Manage Student Registration
Manage Courses
Manage Course Materials
Add Instructor
Assign Instructors to Courses
Add Notification
Create Forum
Add Tests
Add Assignments
Add Exam
Manage Results
Administ rator


System
View Courses
Register Courses
Download Course Materials
Submit Assignment
Take Tests
Take Exam
Check Results
Join and Post questions in forum
Student

### 3.1.3 ENTITY RELATION DIAGRAM



### 3.1.4 DATA DICTIONARY

**STUDENT TABLE**

| FIELDS | DATA TYPE | CHARACTER LENGTH | KEY |
|---|---|---|---|
| STUDENT ID | VARCHAR | 9 | PRIMARY KEY |
| FIRST NAME | VARCHAR | 20 | |
| SURNAME | VARCHAR | 20 | |
| PHONE NUMBER | VARCHAR | 11 | |
| EMAIL | VARCHAR | 50 | |
| USERNAME | VARCHAR | 50 | |
| PASSWORD | VARCHAR | 50 | |
| DEPARTMENT | VARCHAR | 50 | |
| COURSE ID | VARCHAR | 7 | FOREIGN KEY |

**COURSE TABLE**

| FIELDS | DATA TYPE | CHARACTER LENGTH | KEY |
|---|---|---|---|
| COURSE ID | VARCHAR | 8 | PRIMARY KEY |
| COURSE NAME | VARCHAR | 20 | |
| DURATION | VARCHAR | 20 | |
| INSTRUCTION ID | VARCHAR | 8 | FOREIGN KEY |

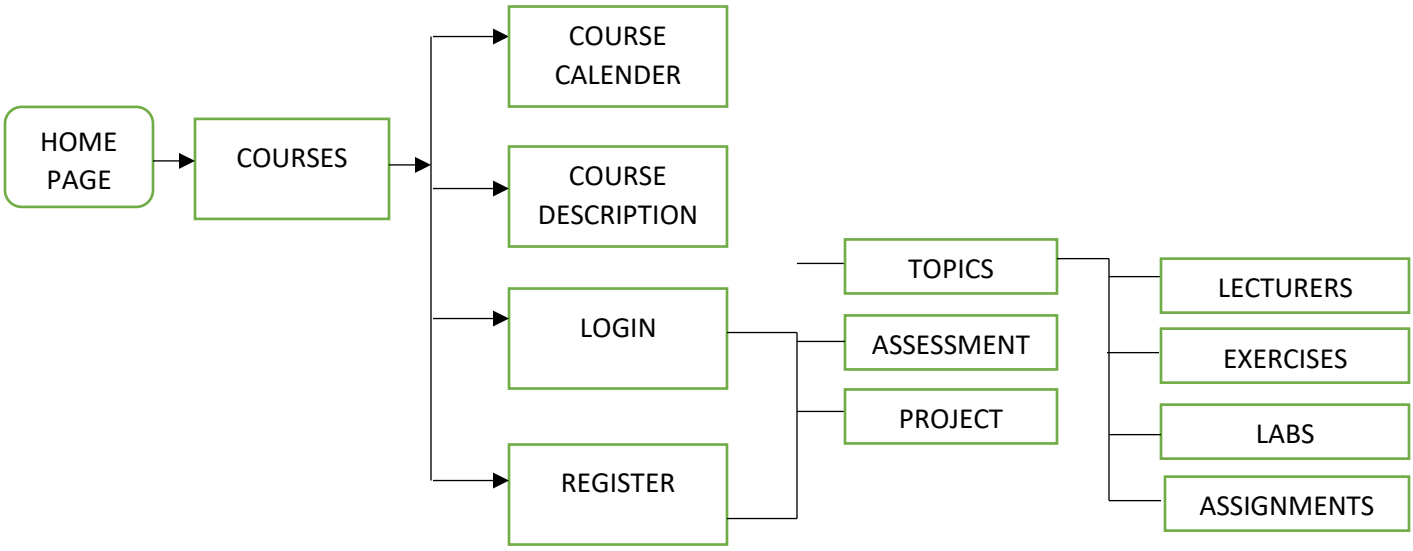
**INSTRUCTOR TABLE**

| FIELDS | DATA TYPE | CHARACTER LENGTH | KEY |
|---|---|---|---|
| INSTRUCTOR ID | VARCHAR | 9 | PRIMARY KEY |
| FIRST NAME | VARCHAR | 20 | |
| SURNAME | VARCHAR | 20 | |
| PHONE NUMBER | VARCHAR | 11 | |
| EMAIL | VARCHAR | 50 | |
| USERNAME | VARCHAR | 50 | |
| PASSWORD | VARCHAR | 50 | |
| STUDENT ID | VARCHAR | 7 | FOREIGN KEY |
| DEPARTMENT | VARCHAR | 50 | |
| COURSE ID | VARCHAR | 7 | FOREIGN KEY |

**ADMINISTRATOR TABLE**

| FIELDS | DATA TYPE | CHARACTER LENGTH | KEY |
|---|---|---|---|
| ADMIN ID | VARCHAR | 9 | PRIMARY KEY |
| FIRST NAME | VARCHAR | 20 | |
| SURNAME | VARCHAR | 20 | |
| COURSE ID | VARCHAR | 11 | |
| INSTRUCTOR ID | VARCHAR | 50 | |
| STUDENT ID | VARCHAR | 50 | |

## 3.2 SAMPLE SITE MAP FOR STUDENT




## 3.3 FUNCTIONAL REQUIREMENT

**SOFTWARE REQUIREMENT**

1. FRONTEND:- PHP Version 5.2.6.
2. BACKEND:- My SQL.
3. BROWSER:- Google Chrome & Mozilla Firefox.

**HARDWARE REQUIREMENT**

1. Intel Core CPU i3.
2. 2GB RAM for windows7/windows8/ windows10
3. 120 GB HDD.

## 3.4 TECHNOLOGY USED IN THE PROJECT E-LEARNING SYSTEM

I have developed this project using the below technologies:

**HTML**: Page layout has been designed in HTML

**CSS**: CSS page has been used for all the designing part

**JavaScript**: All the validations task and animation has been developed by JavaScript

**SQL Server**: SQL Server database has been used as a database for the project.

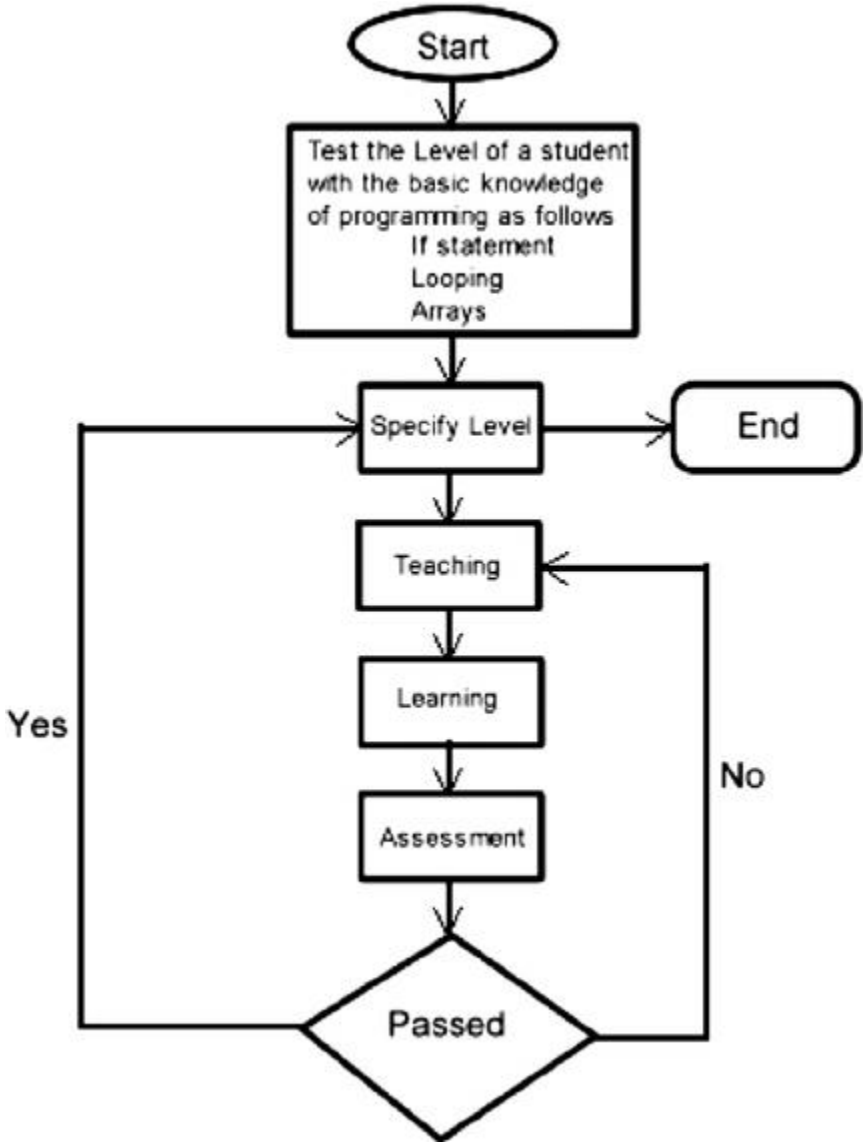
**Bootstrap**: Build responsive, mobile-first projects on the web the component library

**PHP**: Used for calling events and actions.

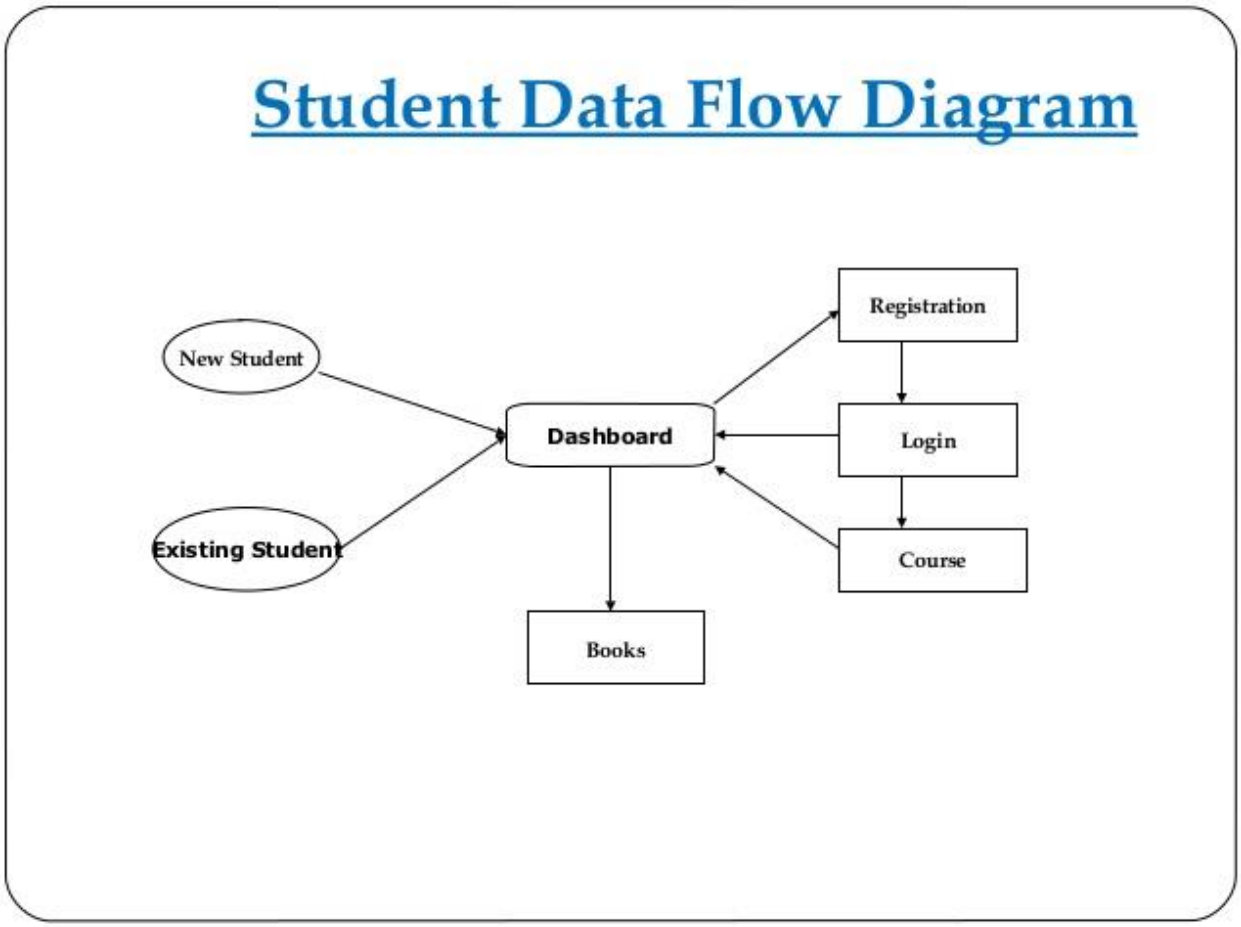
# CHAPTER FOUR

# IMPLEMENTATION AND DESIGN

## 4.0 PROGRAM FLOW CHART

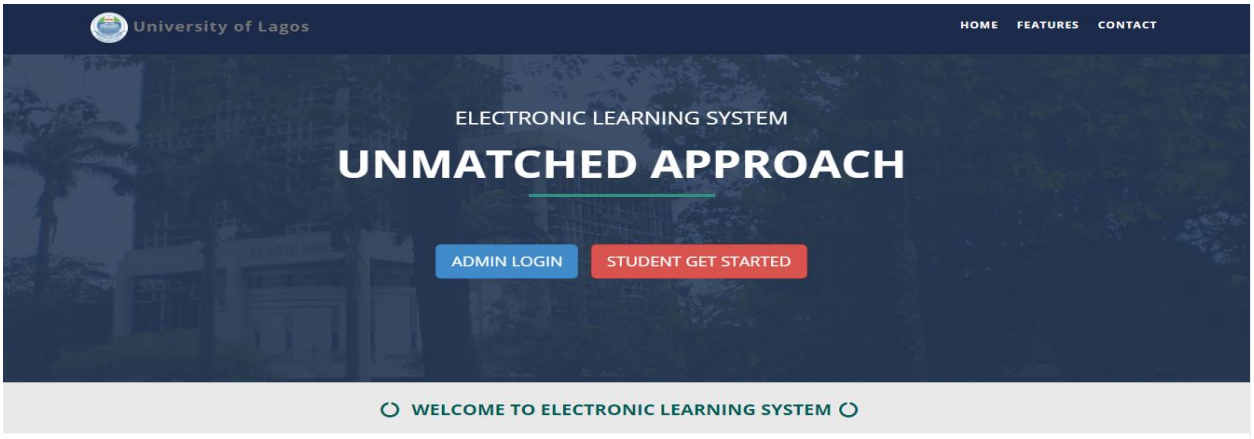


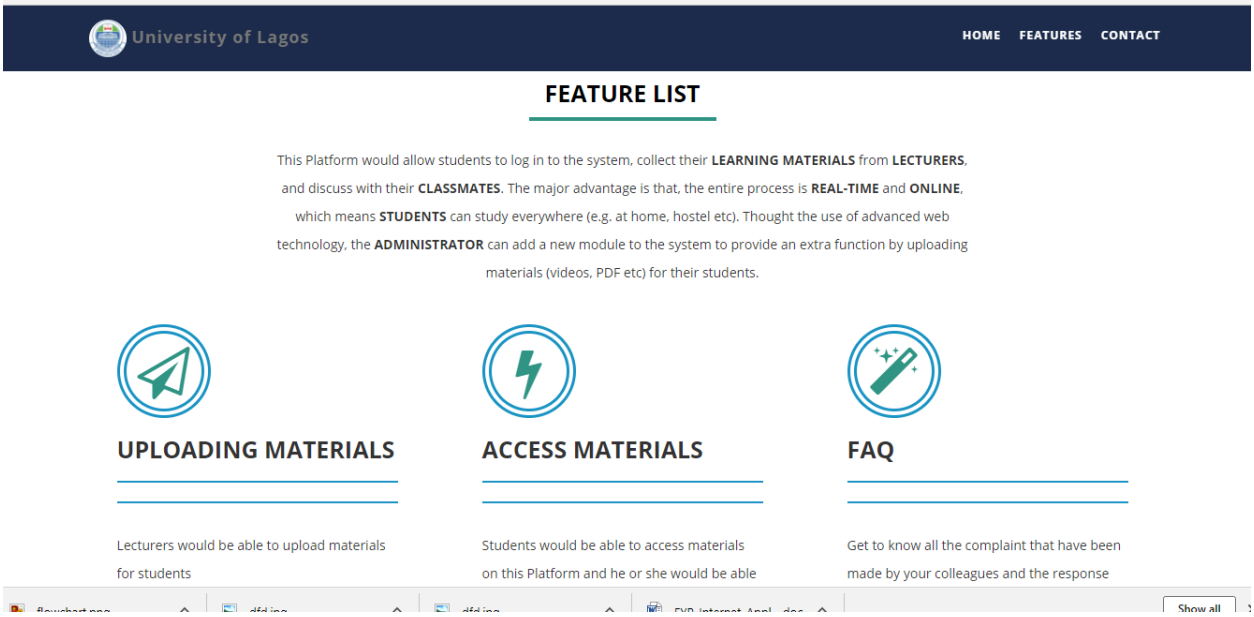
## 4.1 DATA FLOW DIAGRAM



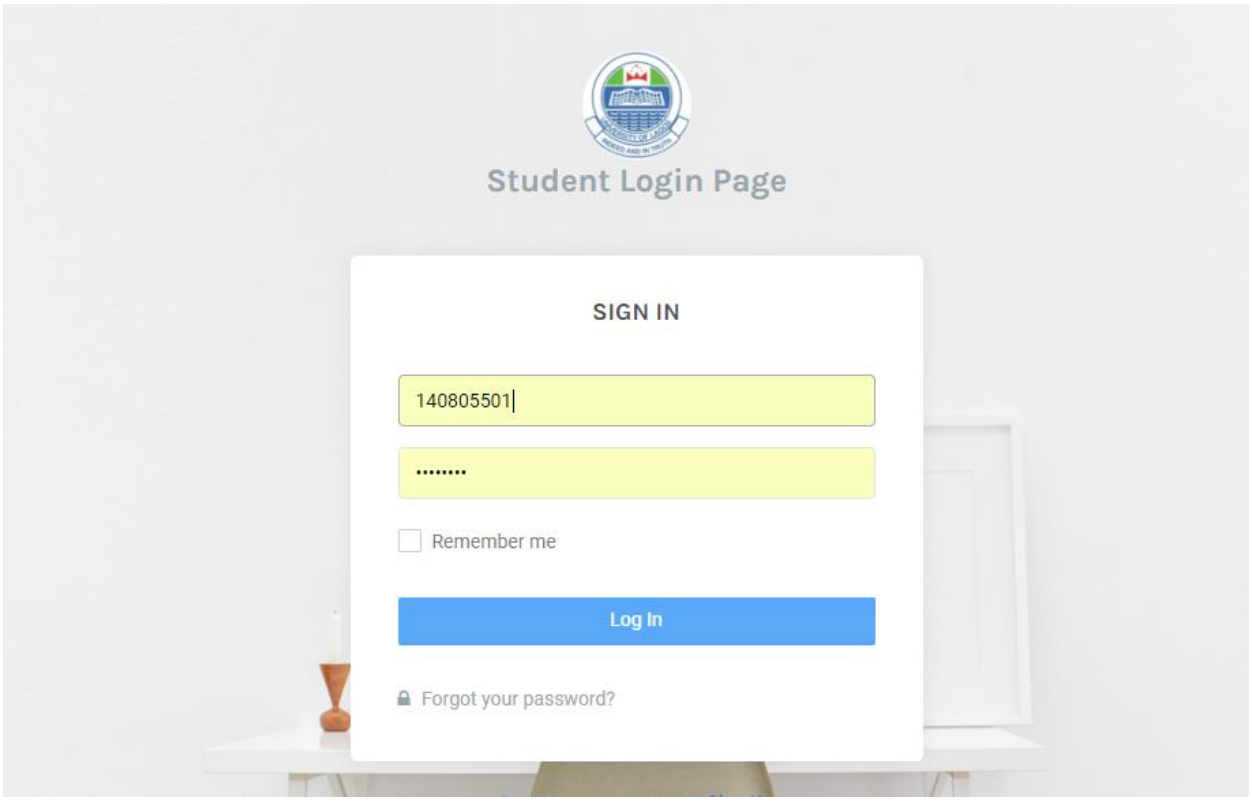

**INPUT/ OUTPUT**

**HOMEPAGE**

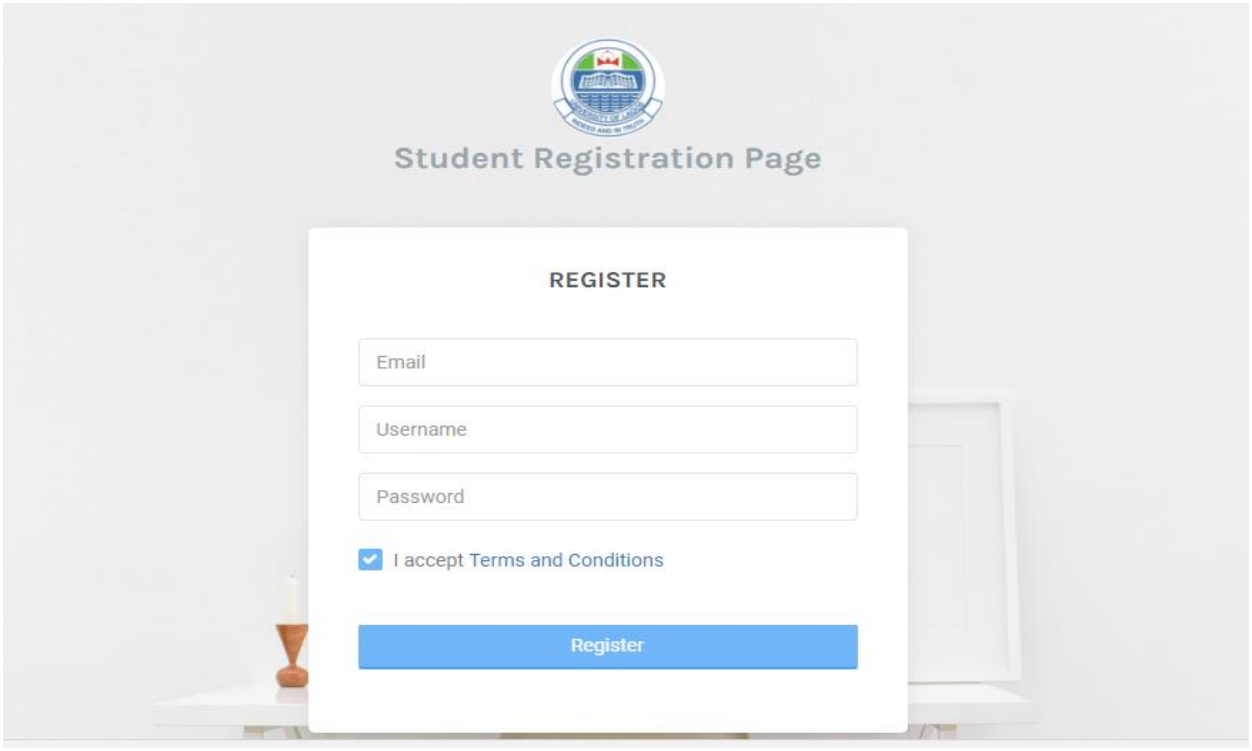




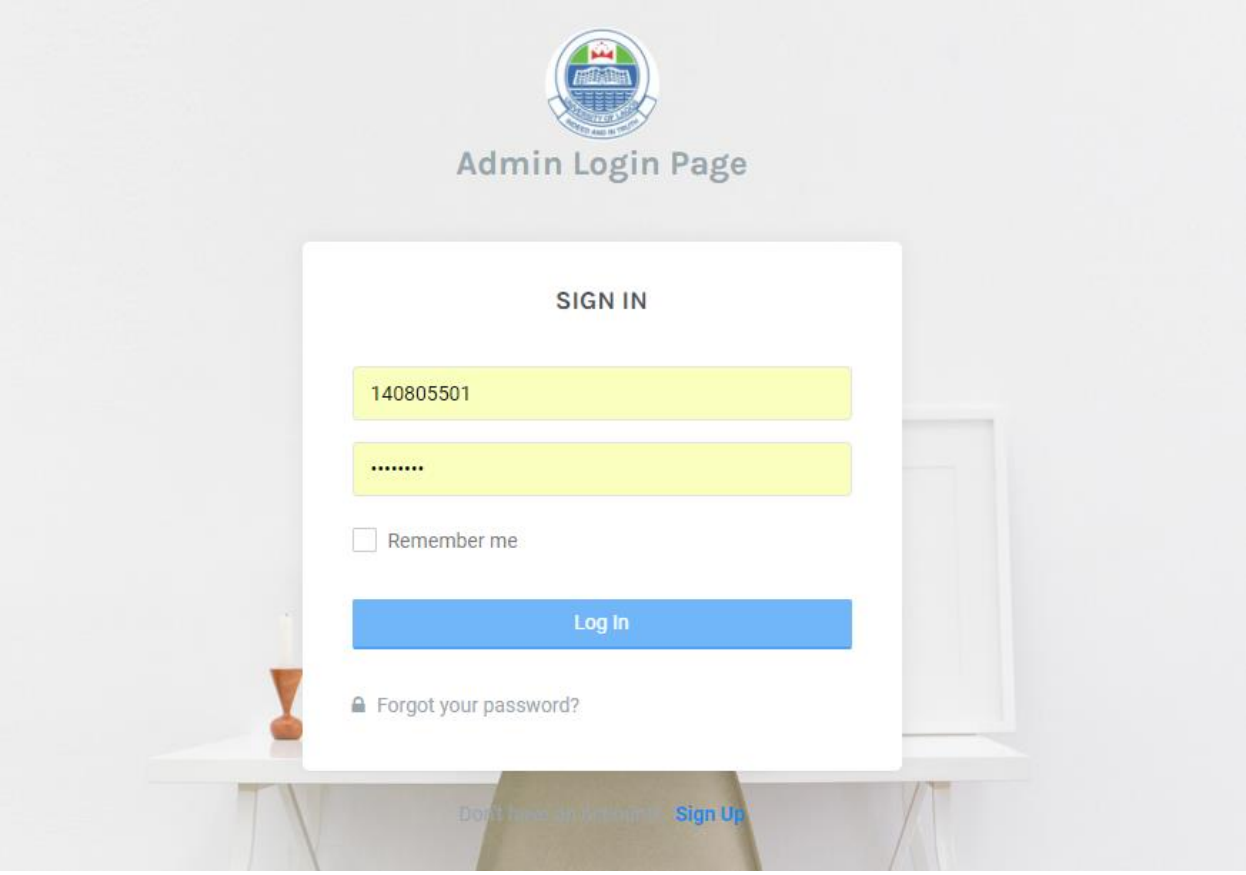

## STUDENT LOGIN PAGE



## STUDENT REGISTRATION PAGE



## ADMIN PAGE

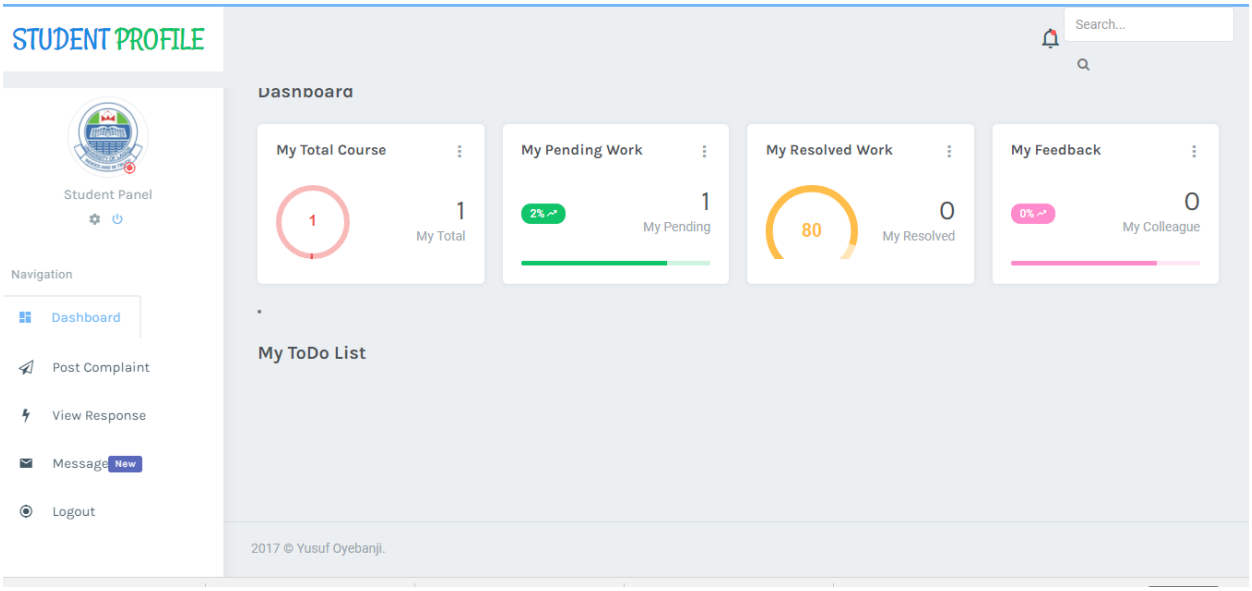



## SHOW DATA (OUTPUT)

ons

| | student_id | matric | fullname | faculty | department | level | phone | password | email | date_created |
|---|---|---|---|---|---|---|---|---|---|---|
| Edit Copy Delete | 1 | 1214545 | adegoke toheeb | Faculty of Engineering | Religious Studies | 200 | 08184613415 | x2u827ccb0eea8a706c4c34a16891f84e7bq8j | atoheeb39@yahoo.com | 24/06/2017 12:58:2 |

## DASHBOARD




| # | Student Name | Matric Number | Posted Date | Status | Assigned To |
|---|---|---|---|---|---|
| 1 | Yusuf Oyebanji | 140805501 | 05/12/2017 | New | Ademola |

# CHAPTER FIVE

## CONCLUSION AND RECOMMENDATION

The summary of the present work along with important conclusions arrived are presented in this chapter. The research is focused on salient for E-learning platforms. The summary of the study includes, the most difficult part is selection of good online platforms for E-learning. This E-learning features has an advanced user management with certain features like self-registration and enrollment options and customizable user profiles using standalone web development components. The E-learning system include flexible course management tools, online help and video training tutorials, learning path features, advanced quiz modules, student/teacher toggle modes are the main features this software. Electronic Learning system application has been computed successfully and was also tested successfully by taking “test cases”. It is user friendly, and has required options, which can be utilized by the user to perform the desired operations. Application software meets the information requirements specified to a great extent. The system has been designed keeping in view the present and future requirements in mind and made very flexible. The goals that are achieved by the software are Instant access, Improved productivity, Optimum utilization of resources, Efficient management of records Simplification of the operations, less processing time and getting required information, User friendly, Portable and flexible for further enhancement

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## APPENDICES

Codes are available on request (disk).