CHAPTER 1

INTRODUCTION

Technology is changing the way teacher teaches and learner learns. Difficulty in obtaining higher education increases for a number of reasons. It could be their possible limit of capabilities with an educational environment or disabilities that limit their access to educational institutions. There are also a number of people that live a great distance from the educational institutions. The need to commute becomes an encumbrance to achieving higher education. Also, the job markets are so competitive that employees find that they must obtain higher education for further employment success. With synchronous schedules in present educational institutions, individuals are required to resign from their current employment to further their education. Typically, individuals are not willing to surrender their income due to the need to support a family or their current lifestyle. Some form of educational reform must take place to address the problems.

Distance education or Distance learning programs are the solution to the above problems. The greatest appeal of distance learning is that one can study without having to leave home or a job to obtain higher education. These programs made it possible for students to complete their education without having to sacrifice their career and family time.

The report is organized as follows:

This chapter (chapter 1) gives the technologies used to deliver distance education, it describes the problem statement and the main objective of this project.

Chapter 2 gives background information on distance educations, its problems, advantages, disadvantages and tips for successful distance learning.

Chapter 3 describes the design and implementation aspects of this proposed and new system.

Chapter 4 describes the evaluation of this new system.

Chapter 5 describes the challenges faced to build this system.

Chapter 6 concludes the paper with conclusions and suggestions for future work.

1.1 Technologies Used in Delivery

The types of available technologies used in distance education are divided into two groups: **synchronous** and **asynchronous**.

Synchronous means that the teacher and the student interact with each other in "real time." For example, with two-way videoconferences, students interact with "live" video of an instructor. Less complex technologies, such as telephone conversations, are also synchronous.

Asynchronous delivery does not take place simultaneously. In this case, the teacher may deliver the instruction via video, computer, or other means, and the students respond at a later time. For example, instruction may be delivered via the Web or videotapes, and the feedback could be sent via e-mail, messages.

The various technologies used in distance learning can be roughly divided into **four** categories: print, audio (voice), computer (data), and video (see Figure 1). (print, audio, computer, video)

Print	Voice/Audio
Textbooks	Telephone
Study guides	Voicemail
Workbooks	Audioconferences
Fax	Audiotape
	Radio
Computer	Video
E-mail	Videotape
Web-based courses	Satellite delivery
Videoconferences	Microwave
CD-ROM	Broadcast video
Collaboration software	Desktop Video

Figure 1. Distance learning technologies.

Print: The original form of distance learning was correspondence courses, in which print materials were mailed to students and returned to the teachers through the postal system. Even though there are numerous new options for distance learning, print remains a significant component of most courses. Print materials may serve as the primary source of instruction, or they may be supplemental. As a primary source, distant students might use a textbook and read various units on a specific timetable. Other technologies, such as e-mail, could then be used to ask questions or send assignments back to the teacher.

Audio: Audio or voice technologies offer cost-effective ways to enhance distance learning courses. The audio component of a distance learning course can be as simple as a telephone with voicemail, or it can be as complex as an audio conference with microphones, telephone bridges, and speakers.

Voicemail: Voicemail is becoming extremely common. There is a great deal that voicemail can offer to distance learning initiatives

Audiotapes: Audiotapes (cassettes) are inexpensive, easily duplicated, and very versatile. They can be used to deliver lectures, panel discussions, or instructions for the distant learner. Audio is especially useful in courses that require the nuances of inflection, such as foreign languages, or those that are designed for non-readers.

Audio conference: Telephones are one of the simplest, most accessible technologies used for distance learning. Telephone conversations can be used to mentor individual students or to reach numerous students simultaneously via a conference call (audio conference). If more than one person is at each location, audio conferences can be set up using speakerphones and telephone bridges .

Computer: With the increased popularity of the Internet, computer technologies are receiving more and more attention as a means of delivering distance learning. The primary computer technologies used for distance education include e-mail, online collaborations, and Web-based education.

Email: Sending e-mail messages is a common and inexpensive way for students to communicate with instructors. In some cases, an entire distance learning course may be structured using e-mail as the only method of communication. In other cases, e-mail may be used to supplement audio or video technologies.

Online Collaboration: Internet Chat and Conferencing: Online chat refers to a two-way, interactive exchange on the Internet. In chat mode, two or more people at remote computers connect to the same chat "room" and type messages. Online chat allows students and teachers to communicate in "real-time." Shared whiteboards are another form of collaboration of the Internet. If two or more people are connected to the Internet at the same time, they can communicate through graphic images on a shared whiteboard. The student and teacher are both able to input data and make revisions.

Web-based Education: The World Wide Web has opened a whole new arena for distance learning courses and the access to remote resources. The Web can be used to enhance education through remote access to resources or experts or it can be used to deliver educational programs. As an enhancement to education, teachers can locate relevant Web sites for students to explore or have students conduct searches for information related to a specific topic.

Video: The ability to see and hear an instructor offers opportunities for behaviour modelling, demonstrations, and instruction of abstract concepts. Video techniques for distance learning are often characterized by the transmission media (videotapes, satellites, television cables, computers, and microwave).

Videotapes: Videotapes offer a popular, easy-to-use format for instructional materials. Almost all students have access to a videotape player in the homes, and they are also common at school. Videotapes can be used for demonstrations or documentaries. In addition, it is quite easy to videotape a lecture for a student who is unable to attend class.

Satellite Videoconferencing: Full-motion video teleconferencing (referred to as videoconferencing) offers the “next best thing to being there”. Satellite transmission is one of the oldest, most established techniques for videoconferencing. In most cases, satellite delivery offers one-way video and two-way audio. Satellite videoconferencing is very expensive.

Microwave Television Conferencing: Satellites are a popular method for enabling video communications over long distances. Microwave transmissions provide a cost-effective method for videoconferencing in more localized areas. Most microwave systems are designed to transmit video signals to areas that are not more than 20 miles apart.

Cable and Broadcast Television: Cable and public broadcast television have been used to distribute instruction for years. In addition to the educational networks, such as CNN, the Learning Channel, almost all public cable television systems allow schools to transmit television courses.

Digital (Desktop) Video conferencing: Desktop videoconferencing uses a computer along with a camera and microphone at one site to transmit video and audio to a computer at another site or sites. The remote sites also transmit video and audio, resulting in two-way video and two-way audio communications.

Internet Video conferencing: It is also possible to conduct videoconferences over the Internet. Two popular software programs that allow videoconferences are CU See-Me from Cornell University.

1.2 Problem Statement

Distance Education can be as effective as traditional education when the methods and technologies are used appropriately. With the introduction of new technologies for learners and teachers, most universities have introduced distance learning/distance education. Inspired by the modern technology aimed to construct a basic framework within the computer science department where, the student can take courses online. The activity described in this report is to develop a web-based system that would meet the needs of online course delivery approach.

1.3 Objectives and design goals

With the introduction of new media and technology for learners and teachers, universities have introduced distance learning/distance education. With the above technologies in mind the objective of this project is to develop a system using this internet as one of the delivery mediums. The objective of this report/project is to design and implement a web-based system that allows interaction between instructors and students.

This involves developing an intuitive user interface for both instructor and student. Instructors and students are the external entities to the system who can log into the system and use the functionality provided by the system. The instructors and the students enter the system through a login tool component.

The objective of this system is to develop non-expensive interactive tools like **message board tool**, **discussion group tool** and **chat tool** to provide interaction between the student and the instructor. The additional objective of this project is to design a system with reusable components, feasibility and provision for system expansion without compromising system performance.

CHAPTER 2

BACKGROUND

2.1 History

Distance education dates back to at least as early as 1728, when "an advertisement in the Boston Gazette... 'Caleb Phillips, Teacher of the new method of Short Hand" was seeking students for lessons to be sent weekly. Modern distance education has been practiced at least since Isaac Pitman taught shorthand in Great Britain via correspondence in the 1840s [3]. The development of the postal service in the 19th century leads to the growth of commercial correspondence colleges with nation-wide reach. In the twentieth century, radio, television, and the Internet have all been used to further distance education. Computers and the Internet have made distance learning distribution easier and faster. In 2006 the Sloan Consortium reported that more than 96 per cent of the largest colleges and universities in the United States offered online courses and that almost 3.2 million U.S. students were taking at least one online course during the fall 2005 term.

2.2 Characteristics

To learn more about distance learning programs, a look at the distance learning students, teachers, and technology will be used to understand characteristics involved with successful distance learning experience. Distance education is different from courses taught in a more traditional manner. Distance education has several identifying characteristics that set it apart from traditional classrooms. Keegan described the following characteristics, which were cited by Spooner, et al. (1999, p.132):

1) Separation of the teacher and the student (i.e., separation vs. face to face, in the same room lecturing). The influence of an educational organization (e.g., department or college) in the planning, preparation, or delivery of material (vs. a stand-alone professor responsible for content generation and delivery of course information). This component is not typically found in most on-campus courses.

2) Use of technical media. Historically, this has been mostly print. But as technology advances, electronic media (computers, television studio delivery, and computer software presentation packages) contribute to a list of technical options.

3) Provision for two way communication, which could be via a prearranged telephone conference with a single student or group of students at a prescribed time.

4) The possibility of an occasional seminar, which could be via a prearranged telephone conference with a single student or group of students at a prescribed time. The possibility of an occasional seminar, which could allow students working independently, perhaps viewing pre-recorded video tapes, receiving paper assignments via the regular mail or watching the lecture via the regular cable or satellite television in their own homes, to assemble as a group in the presence of the instructor of record for the class.

Before enrolling for online education, the learner should make sure its right for them. Earning a degree online is a rewarding experience, but distance learning is not right for everyone. Successful and happy distance learners have few **common characteristics**:

Successful distance learners do just as well, if not better, without people looking over their shoulders. While some people need teachers to keep them motivated and on-task, distance learners are able to motivate them.

Successful distance learners never or at least rarely procrastinate. You'll rarely find them putting off assignments or waiting until the last moment to write their papers. These students enjoy the freedom of working at their own pace and appreciate the ability to complete their work in as much time as it takes them, instead of waiting for an entire class.

Successful distance learners have good reading comprehension skills. While most people learn by listening to lectures and taking notes, the majority of distance learners are expected to master material through reading alone.

Successful distance learners can resist constant distractions. Successful students know how to filter out the constant disturbances that threaten their progress.

Successful distance learners feel alright about missing the social elements of traditional schools.

2.3 Issues and Concerns

Distance Education is becoming an increasingly important method of delivery of many educational contexts. These online programs have many benefits, but when compared to the traditional classroom based courses these online programs suffer from extremely low student completion rates. Few of these issues and concerns are:

Lack of access to the resources: Distance learners have expressed concern of accessibility to the university's resources. This could be for many reasons. The system does not give this provision, or insufficient bandwidth from home to access the university resources.

Interaction with instructor: The survey concerns instructor interaction. It addresses the importance given to the student and instructor interaction, which affects how well students learn. The implied definition of interaction is direct physical interaction, like that observed in a traditional classroom.

Lack of interaction with other students: The student interaction is very important. Distance education is a collegial, non-competitive learning environment where it is not about who has the best grade, but it's about to succeed.

Confusion involved with classroom chats: Virtual classroom chats may load and perform slowly. It causes confusion as several windows are opened simultaneously. Classroom chats should be organized and implemented in a better way.

Without **self-motivation** the success with distance learning course would not be good.

In systems that use computers as the technology in delivering education, **network access** is a key component and a major obstacle to improved utilisation.

Not all employers prefer employee's that earn degree through online courses.

Instructors worry about putting their course materials online because once there, the knowledge and course design skill in that material is out of their possession. This puts the administration in a position to hire less skilled, and cheaper, workers to deliver the technologically pre-packaged course (Noble, 1998 cited in Dibiase, 2000).

2.4 Advantages

There are numerous advantages of distance learning which ought to be considered when electing an online distance learning course.

Distance learning does not require **commuting.** This saves money and times that student otherwise spend on travel back and forth to school. The learner can schedule learning around other aspects of their personal and professional life.

The learner can complete most of the classes at their **convenience**. Most of the classes are asynchronous, which means leaner does not have to attend a lecture at a particular time and place. Review of the assignments and doing homework can be done during off-hours or from home. Live anywhere, study from anywhere while pursuing the education of choice. Learners don't have to live in the same city or the same country to attend the learning institution of choice. Learner can study wherever they have access to a computer and Internet connection.

Gain extra **knowledge**. Learner can transfer the computer and Internet skills that they will gain in the process of your distance learning experience to other facets of life.

Self-paced learning. For slow and quick learners. This reduces stress and increases satisfaction.

Accessibility. Online classes address physical accessibility issues that some people with limited mobility encounter when taking traditional classes. Learner can use their comfortable furniture while enjoying free movement and a chance to further education.

2.5 Disadvantages

While thinking about the advantages and disadvantages of distance learning, pros and cons, one may wonder if there are any distance learning disadvantages. But there are!

Costly and complex technology. Despite the many opportunities of distance education, there are inevitable accompanying costs. Live video communication for example, requires careful planning of the equipment and facilities. For online learning, learner must own a computer (possibly with access to the Internet) or have access to one. Thus required technology is not always available. Some learners may also be afraid of technology.

Advance planning. Both the instructors and students involved in distance learning may need to make sacrifices at times to get things done in time.

Hidden costs. If learner works for the military for example, and they are on the ship, how do they get the required materials? They may need to be mailed in advance incurring extra shipping and handling costs.

Distance learning does not offer **immediate feedback**. In a traditional classroom setting, a student's performance can be immediately assessed through questions and informal testing. With distance learning, a student has to wait for feedback until the instructor has reviewed their work and responded to it.

Distance learning **does not always offer** all the necessary courses online. Students pursuing a specific certificate or degree program may not have all the necessary courses available through distance learning so it is not suited for all subjects. While student can study a history lesson completely online but cannot perform nursing clinical online. Thus physical classroom attendance will be mandatory to complete the course.

Distance learning may not be **acknowledged** by all employers. Although most employers do acknowledge distance learning, certain employers do not. Students who want to work for a specific employer upon graduation should be sure of that employer's perspective about online education.

Social isolation. Most often learner will be studying alone. Distance learners may feel isolated or miss that social physical interaction that comes with attending a traditional classroom. However this impersonality has been lessening with advances and use of communication technologies such as bulletin boards, threaded discussions, chats, email and conferencing.

2.6 Tips for Successful Distance Learning

Before enrolling in a course, make sure to have access to the tools necessary to complete assignments.

Schedule: Everyday schedule sometime for study. Schedule this study time when mentally fresh and devout at least minimum of one hour.

Where to study: Choose an environment that is appropriate to study. Choose a place that is free from distractions like library, work place before or after work.

To be successful at distance learning one really needs to be a good student. It is a different way of learning but doesn't change the principles of learning. One has to pay attention in class or online. Learners have to study the material between classes. Learner have to complete all homework's and assignments on time. And have to ask questions or get extra help if stuck or bewildered.

Paying **attention** online in a distance learning program is essential to your success. Normally there will be one online class per subject a week and during that period of time the instructor will try and guide through the basic theory of a subject and give few examples to help understand and

comprehend it. Sometimes these online classes are archived for a period of time so that the students can go back and take that class again if they didn't get it the first time.

Students should develop the **discipline** to get their assignments completed and submitted on time.

After grading and reviewing the should take time to not just check their marks, but carefully **review** any comments that the instructor may provide. This is one of the ways where your instructor can give you feedback to improve your distance learning program.

Finally, don't hesitate to ask for **help** if stuck. Most distance learning programs have an e-mail response system to deal with questions and concerns. Many offer online tutoring if needed.

2.7 Other Distance Learning Systems

This section gives an overview of other distance learning systems that have been developed and are in use.

2.7.1 UCCS Distance Learning (MBA)

The existing MBA online course has several collaborative tools to allow you to communicate with instructors and your peers, and to help you contribute to and view information about the course.

Grade book: You can use the Grade book to view any assignments or other course work your instructor has set up to be gradable and viewable.

Email: The Email tool is a convenient and effective way for you, your instructor and other students to communicate with each other, without leaving the course.

Chat: Like a regular online chat room.

Search: With the Search tool, you can search your course calendar, course announcements and other parts of your online course for specific assignments or topics.

Doc Sharing: The Document Sharing tool lets you upload and download documents, images, spread sheets and HTML pages.

Journal: The Journal is a place where you can make notes and record your thoughts. It's also a place where your instructor can make specific assignments.

Webliography: The Webliography course tool lets you work with your instructor and with other students to create an annotated bibliography of Worldwide Web sites that are relevant to your course.

Both you and your instructor can submit sites to the Webliography.

CHAPTER 3

DESIGN AND IMPLEMENTATION OF THIS DISTANCE LEARNING SYSTEM

A distance learning system is a web-based system by which distance education can be carried out over the Internet or Intranet. This chapter describes the setup of the system. The following topics are discussed in detail in this chapter:

1. Software and framework used.

2. System architecture.

3. Different modules/tools developed in this system.

3.1 Software

The software design of this system focuses on the Java-based, client/server type software model. The system is implemented using XAMPP and PHP technologies. It includes windows 7 as the operating system, MySQL as the backend.

3.1.1 MYSQL: The database is designed and implemented using MySQL v4.1. MySQL is free and scalable.

3.1.2 PHP: PHP is a general-purpose scripting language that is especially suited to server-side web development, in which case **PHP** generally runs on a web server. Any **PHP**code in a requested file is executed by the **PHP** runtime, usually to create dynamic web page content or dynamic images **used** on websites or elsewhere.

3.1.3 JAVASCRIPT: JavaScript is a dynamic computer programming **language**. It is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted programming **language** with object-oriented capabilities.

3.1.4 BOOTSTRAP: Bootstrap is a free front-end framework for faster and easier web development. Bootstrap includes HTML and CSS based design templates for typography, forms, buttons, tables, navigation, modals, image carousels and many other, as well as optional JavaScript plugins. Bootstrap also gives you the ability to easily create responsive designs.

3.1.5 JSP Templates – Composite Design Patterns: Use composite views that are composed

of multiple sub-views. Each component of the JSP template may be included dynamically into the whole. The layout of the page may be managed independently of the content.

The Framework provides sets of JSP Tag (using JSP's Custom Tag extension libraries) to allow the creation of JSP templates. The JSP Tag will interpret the input and call the framework in order to achieve a particular goal.

In addition, the JSP will be using a set of standardized tags, as mentioned, for server-side processing in order to accelerate development, e.g. forms processing, use of resource bundles, search/results display, field validations, etc.

3.2 Process Overview of the current system

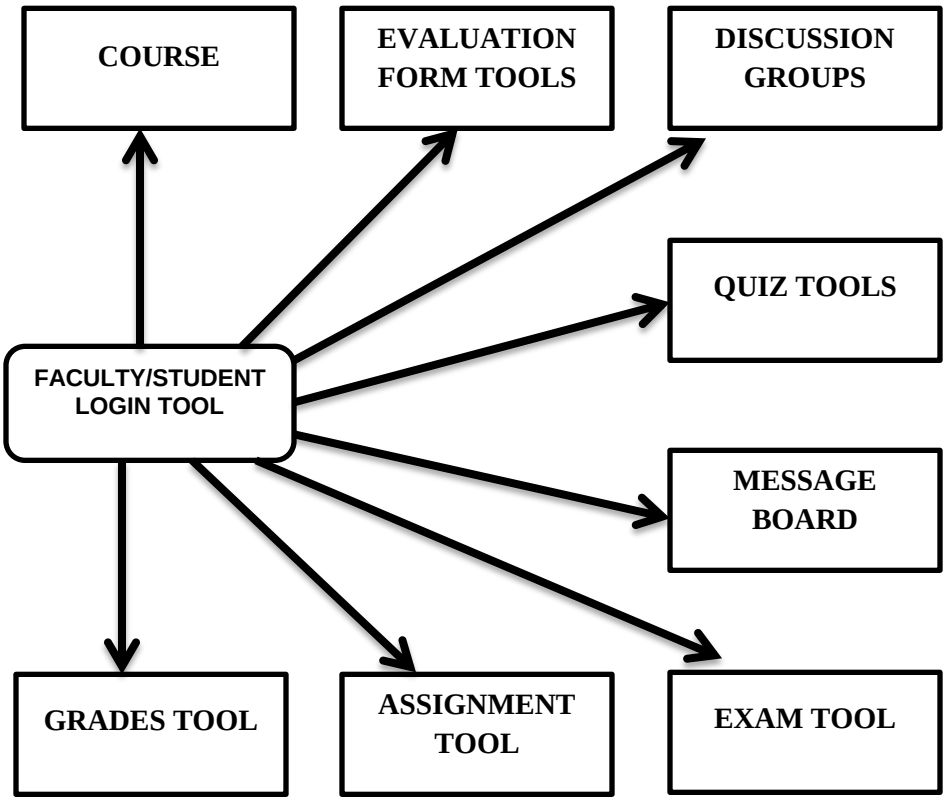

Figure 2. Process overview of the current system.

Login Tool: This tool will validate user credentials. If valid, it allows user to enter into the system else gives a login fail message.

Course Tool: This tool allows user with admin role to create/edit/view/delete course details. Only user with admin privilege has access to this tool.

User Tool: This tool allows user with admin role to create/edit/view/delete user details. Only user with admin privilege has access to this tool.

Scheduled Course Tool: User with instructor and student role can view all scheduled course details.

Registered Course Tool: User with instructor and student role can view his/her registered courses. When the user logs into the system only his/her registered courses can be viewed through this tool.

Course Material Tool: Through this tool instructors can create material to his/her courses. Only instructors can create/edit course material details. Both the instructor and student have permission to view the course material. Through the search page users can search for any particular course and view details.

Users can upload any document to the dedicated server. Users can also download any document to their local machine. Users also have print option to print their course material.

Message Board Tool: Through this tool the instructor can publish messages to the students. Only instructors can create/edit messages. Both the instructors and students can view the messages.

In the search page, users can search for any messages and view the details.

Discussion Group Tool: Through this tool instructor and students can participate in any discussion. Instructors and Students can create new discussion. Using search page users can search for any discussion and respond to it or view all the responses given to any particular topic.

Assignment Tool: Through this tool instructors can create new assignments. Instructors can add short answer questions, essay questions, multiple choices, true or false or blanks. Only instructors can create/edit assignment details. Students can answer the questions. Both the instructor and student have permission to view the assignment. Through the search page users can search for any particular assignment and view details. Users can upload any document to the dedicated server. Users can also download any document to their local machine. Users also have print option to print their assignments.

Exam Tool: Through this tool instructors can create new exams. Instructors can add short

answer questions, essay questions, multiple choices, true or false or blanks. Only instructors can create/edit exam question details. Students can answer to the questions. Both the instructor and student have permission to view the exam details. Through the search page users can search for any particular exam and view details. Page automatically closes when the time expires. Users cannot edit any exams with postdate.

Users can upload any document to the dedicated server. Users can also download any document to their local machine. Users also have print option to print their exams.

Quiz Tool: Through this tool instructors can create new quiz questions. Only instructors can create/edit quiz details. Students can answer to the questions. Both the instructor and student have permission to view the quiz. Through the search page users can search for any particular quiz and view details. Users can upload any document to the dedicated server. Users can also download any document to their local machine. Users also have print option to print their quiz.

Evaluation Tool: Through this tool instructors can create course evaluation questions. Only instructors can create/edit evaluation questions. Students can answer the questions. Both the instructor and student have permission to view the evaluation questions. Through the search page users can search for any particular evaluation paper and view details. Users can upload any document to the dedicated server.

Users can also download any document to their local machine. Users also have print option to print the details.

Grade Tool: instructors can add grades to the students. Only instructors can create/edit grade details. Students can only view his/her grades. Through the search page instructor or student for search for any particular course and see his/her grades. Students can view only his/her grades.

Home: This page gives a short description about the system. It is a welcome page.

Help: It gives the system requirement information and also contacts information.

Logout: User can logout of the system by clicking this tab. If user has to access any tool he/she has to re-enter into the system.

3.3 Database Implementation

The following tables represent changes in the application database that are intended to meet the requirements of the Distance Learning System. Each field with a special use will be identified by type of use. Possible types are:

UK – Unique Key for table

FK – Foreign Key joining the information to another table

The following rules will apply to all tables and columns created, unless otherwise stated for a specific column;

1. All columns will be created to require values in the column. Some columns will be populated with NULL values.
2. All numeric columns will be filled with 0 or 0.0
3. All alphanumeric columns with the exception of indicators will be filled with spaces.
4. All indicator columns will have a default value of 'Y' (Yes).
5. All alphanumeric columns will be defined as character columns (char) rather than variable character columns (varchar).

3.3.1 Overview of Database tables

The following table presents the database tables that will be affected by this distance learning system.

Table Name	Current Status	Description
courses	New	This table contains all the course details.
discussion_group	New	This table maintains list of discussions.
discussion_group_detail	New	This table contains discussion details.
employee	New	The table contain employee details.
evaluation	New	This table maintains list of evaluations
evaluation_question	New	This table contains list of evaluation questions
evaluation_student	New	This table contains student answers to the questions
evaluation_sub_question	New	This table contains sub questions.
exam	New	This table contains list of exams
exam_question	New	This table contains exam questions
exam_result	New	This table contains exam results.
exam_student	New	This table contains student solution to the questions.
exam_sub_question	New	This table contains sub questions
grade	New	The table contains student grades.
login	New	This table contains the list user's loginid and password
message_board	New	This table contains messages details
quiz	New	This table contains quiz's
quiz_question	New	This table contains all the quiz questions
quiz_result	New	This table contains results to the quiz.
quiz_stud_ans	New	This table contains student answer to the quiz's
quiz_sub_question	New	This table contains sub questions
role	New	This table lists the system roles
scheduled_courses	New	This table contains all the scheduled course details
stud_registered_courses	New	This table contains all the student registered course information
xreference	New	This table contains commonly used columns

Table 1. The database tables that will be affected by this distance learning system.

CHAPTER 4

EVALUATION OF THE SYSTEM

In this chapter Evaluation of the system is described. Ten people assisted in taking the Evaluation test.

Their comments are summarized. Evaluation of the system determines the degree to which program objectives are met through the procedures used by the program. Evaluation ensures the goal of our system and the results we get are in alignment. Evaluation determines whether or not the outcomes or results predicted by the program occurred. Evaluation should always be based on the objectives of a program or course. Without the specification of objectives, there are no criteria on which to base an evaluation. There are two forms of evaluation, i.e.

Formative evaluation is conducted formally and informally throughout a course/program to provide feedback to the stakeholders that need the data. This can be accomplished through scored tests and quizzes, self-tests that are not scored, and one-minute evaluations given at the end of a class. The latter asks one pertinent question such as "What was the most important thing that you learned in class today?"

Summative evaluation takes place at the end of a course or program. These data are used to re-design a course or program. This type of evaluation includes attitudes towards the course/program as well as learning outcomes. In addition, summative evaluation would also include administration of the program/course. Sample summative evaluation questions could include open ended constructed response questions such as:

1. Identify the strengths and weaknesses of the course/program.
2. Would you recommend this course/program to your colleagues or other students?
3. What would you do differently?
4. What would you add or eliminate?
5. How relevant and useful was the content?
6. What are some of the benefits that you gained during the course/program?

Summative evaluation is used in the following actual evaluation of the system.

4.1 Evaluation Plan of this system

The evaluation plan determines to what extent the object of this project is reached. It helps to determine what new tools need to be added to the system, what needs to be changed or eliminated? Qualitative and quantitative methods are used to assess this system. This system is evaluated by evaluators by means of an inquiry. Summative evaluation form is used to evaluate this system.

A group of ten people both with and without computer background joined the evaluation. Prior to starting the evaluation of the system a demonstration of each and every tool was given. Each person was setup with two different id's (instructor and student). Persons logging in as a student, registered to a few courses, went through the course material, worked on assignments, and took exams and quizzes using tools of the present system. Persons logging as instructor created course material, exams, assignments, and quizzes online. The instructor and student also verified the upload and download option given in this system. Through grade tool evaluators as instructors evaluated the assignments, exams and evaluators as students viewed there grades. The communication between the instructor and student is done through the message board tool and students inter communicated through the discussion board tool.

Finally an inquiry was made with the ten evaluators about the operation and design of the system. Out of these ten evaluators eight were familiar with web browsing, surfing the internet and two others did not have much experience. During evaluation of the system the evaluators without browsing knowledge was given guidance as they were new to the Internet technology. A set of evaluation questionnaires were prepared based on the functionality, efficiency, navigation and presentation of the system. Each evaluator was given a questionnaire with 25 survey questions for their feedback.

4.2 Results of the evaluation.

In particular, most of the evaluators agreed that this system is effective, user friendly and helpful for their learning and self-paced studies, considering this as a basic framework and new tools are to be added to complete the system. Additional tools are especially needed for instructors to create the course material with the ability to add figures etc. Favourable and unfavourable comments were given on the system. The feedback will be discussed in detail below.

4.2.1 Favourable comments on this system

1. In order to access this application/system, user does not need to install/download any separate

software; all that they need is a browser with internet access.

2. The system is user friendly. Navigation through the system is very easy. The labels/titles of the pages, the naming conventions of the buttons/menus/sub-menus are quite understandable and self-explanatory.

3. The security of the system is very well implemented. Only the registered users can enter into the system. Only the user with admin role can create new user profiles into the system. Evaluators tested the system with different roles; access to the data is given depending on the user role. Students cannot edit exam/assignment questions; users can edit his/her registered courses, grades, answers etc.

4. Evaluators tried to break into the system using different URLs, (to the pages directly) instead through the login page, but the application redirected to the login page. Evaluators are very much pleased with this feature.

5. The search facility in each tool is very well designed. The user can search the required information in each tool. User can search the details of the course in the course tool and details of the exams in exam tool. Each tool has separate search functionality. All the tabs are self-explanatory.

6. Instructors/students have the option to upload and download their work. Instructors can either create the course material, exam papers, assignment papers or quizzes using the tool or they can upload them to the server directly. Students also have the provision to upload and download their work.

7. The system is bug free. Validations of the user entered data are done at every step and messages are displayed appropriately, e.g., if the date entered is not in a valid format, a popup message is displayed saying that "the date entered is invalid format".

8. Messages given by the instructor are appropriately displayed in the message board tool and threaded discussions are displayed based on the subject in the discussion tool. These tools assist the interaction between the instructor and student and also between students to student.

9. The system is flexible to add new tools.

10. The performance of the system is very good. The pages with vast data are populated very fast.

4.2.2 Unfavourable comments on this system

1. Inexperience users (user with no back ground on web browsing) need more training. This is the disadvantage of the distance education itself. The basic assumption is that the user is familiar

with the technology.

2. This system is not complete. It can only be considered as the basic framework/foundation or the initial start-up. The present system cannot be considered as the complete distance learning tool.

3. The user cannot register through the system. This system starts once the user registered in the program. It would be good to have a registration tool in the administration tab giving user information on the degree, fees information, required forms etc.

4. This system does not have WYSIWYG editor. While preparing the course material/exams/assignments the instructor cannot include figures, fancy texts/styles. Throughout the tool user can only use plain text. While taking the exams online the students cannot include figures. The instructors/students can only upload/down the required documents/papers.

5. Evaluation per course level is given, but not for the complete system. We do not have a tool to evaluate the complete system.

6. The system does not support FAQ page. For simple questions or clarifications user need not contact support person.

7. The interaction between instructor, student or student, student can only be done with discussion group tool, it is good to have a chat tool were they can chat online.

CHAPTER 5

CONCLUSION AND SUGGESTIONS FOR FUTURE WORK

In this Chapter I will describe some of the challenges I faced. It may be helpful for anyone reading my report before starting on their own. It also points out the effort that went into this work. The change in mode of study from the structured units and teaching methods of conventional Open University distance courses to the more open framework of a project-based course makes demands on students, i.e., a heightened level of self-confidence, motivation, and ability to organize their own work plans.

Comparing distance education to traditional face-to-face instruction indicates that teaching and studying at a distance can be as effective as traditional instruction, This is true when the method and technologies used are appropriate to the instructional tasks, there is student-to-student interaction, and when there is timely teacher-to- student feedback (see Moore & Thompson, 1990; Verduin & Clark, 1991).

The present study outlined the design and development of **a new and inexpensive distance learning system**. The design was inspired by modern technology aimed to construct a basic framework. It was started with the computer science department where the student can take courses online.

This **new** system is a basic framework. New tools and enhancements to the existing system can be made.

The objective was to design the system using a framework that was simple while using **free** software. In order for the framework to be **simple,** I used struts MVC model 2, where the presentation, business ~~&~~ and database layers are different. Any developer can undertake this project and can work on separate layers.

This study met with many challenges. The main challenges were to allow the software to be free, user friendly and to fit on modest computer facilities.

The system is **user friendly** with titles and navigation details on each screen.

The screens are well designed with **consistent layout**. A user who has been given training in one screen can use all the screens easily. The system was evaluated by ten randomly chosen

individuals.

Introduction of the admin role removes **instructors overload**. Instructor can only concentrate on his/her course related work.

5.1 Suggested Future Work to Improve this System

Following are suggestions to initially improve this **new** distance learning system:

WYSIWYG: This system is not What You See Is What You Get. Instructors while creating any course material or assignments or exams cannot include any figures. Also students cannot draw any figures. Users cannot use any kind of format, style. The future work on this project is to include an editor where the users can draw figures and use different styles.

Chat tool: In this system the interaction between student and instructor is through discussion boards. A discussion board is to discuss about certain issues. The construction of the chat tool through which instructor and student can chat will be an added flavour to this system.

Email tool: Instructor and Student can send emails through an external email tool. An additional email tool to this system allows users not to go out of the system to exchange emails.

Automated Test results: Allow the system to automatically evaluate test results. System cannot automatically evaluate results for all the questions but can only evaluate for multiple choice and True/False questions.

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APPENDIEX

SNAPSHOTS

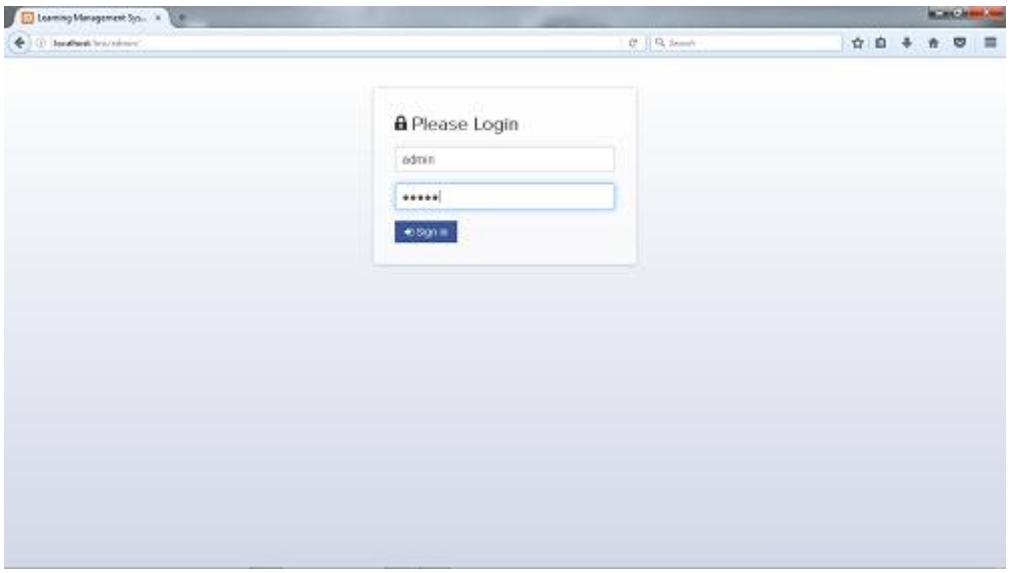

Figure 3: Admin login page

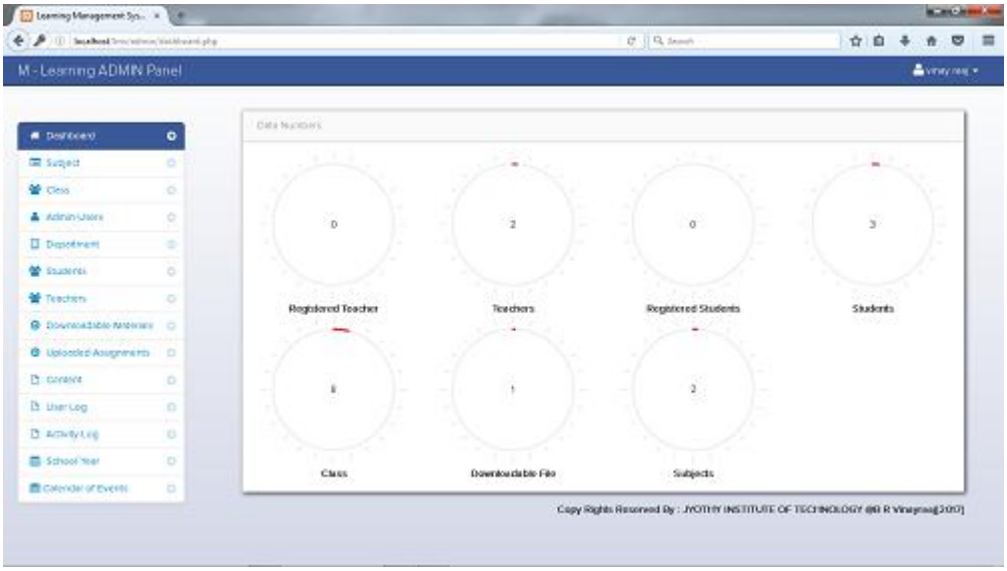

Figure 4: Admin dashboard

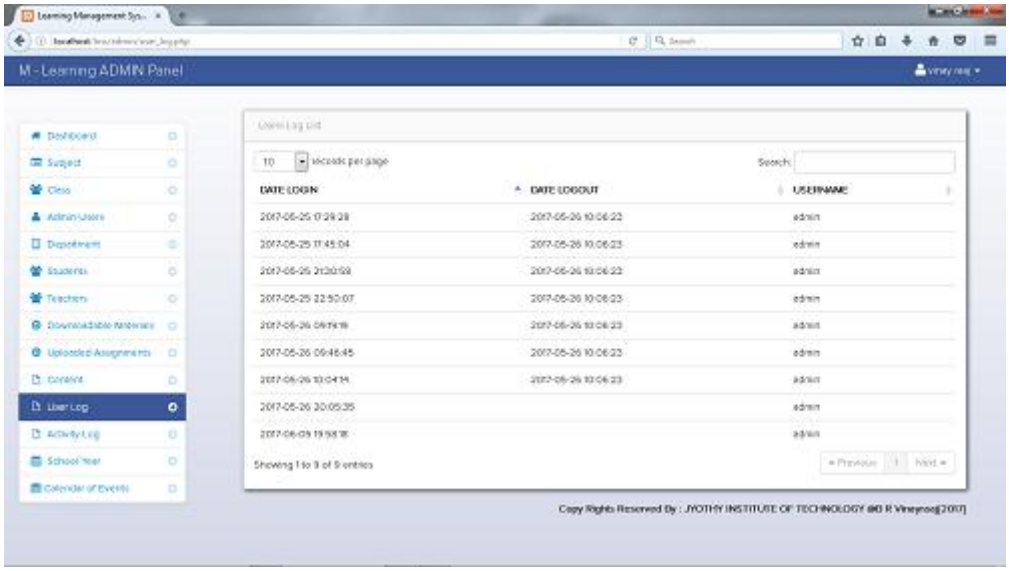

Figure 5: Admin activity page

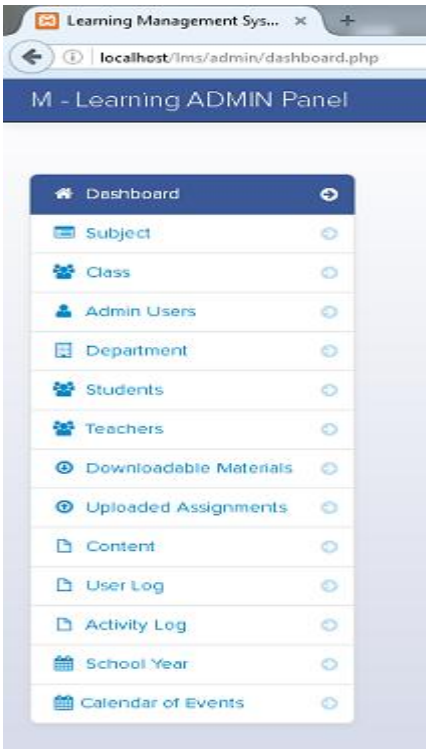

Figure 6: Admin menu list

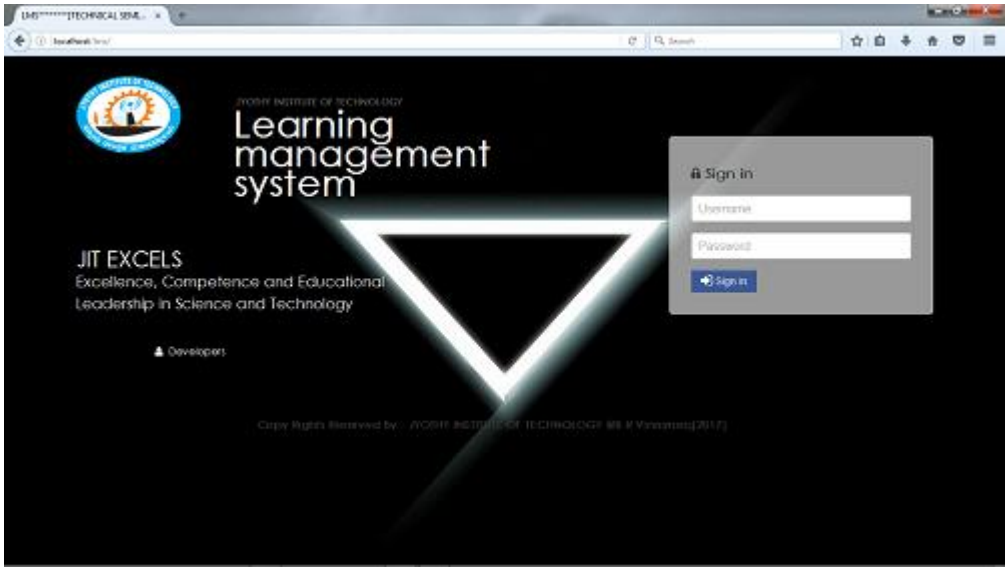

Figure 7: General login page

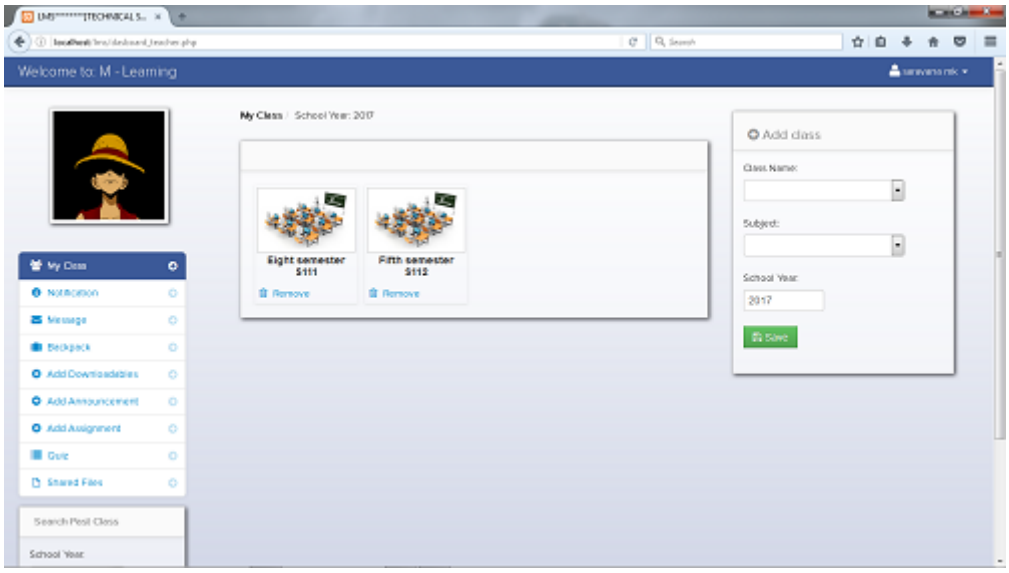

Figure 8: Faculty dashboard

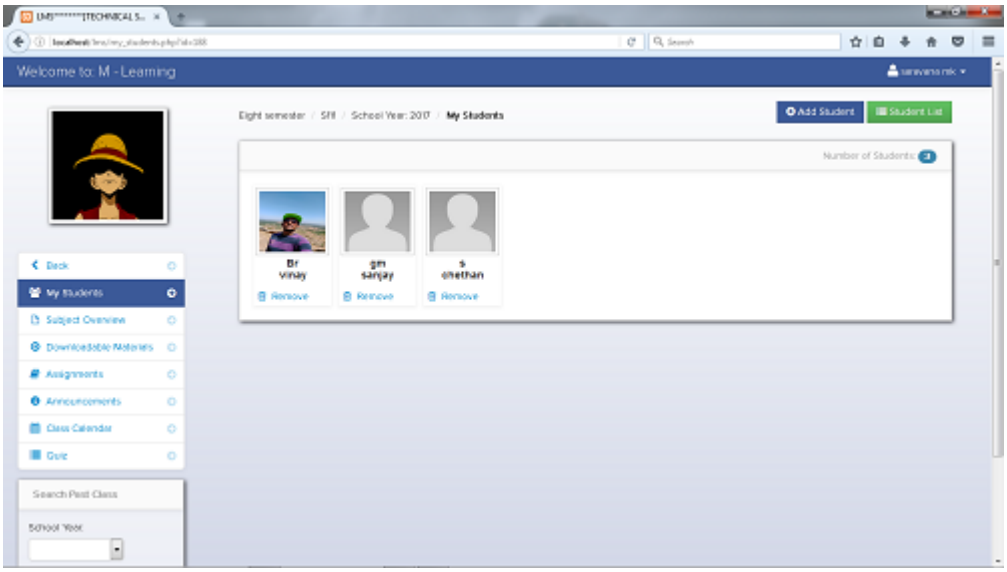

Figure 9: Faculty activity log

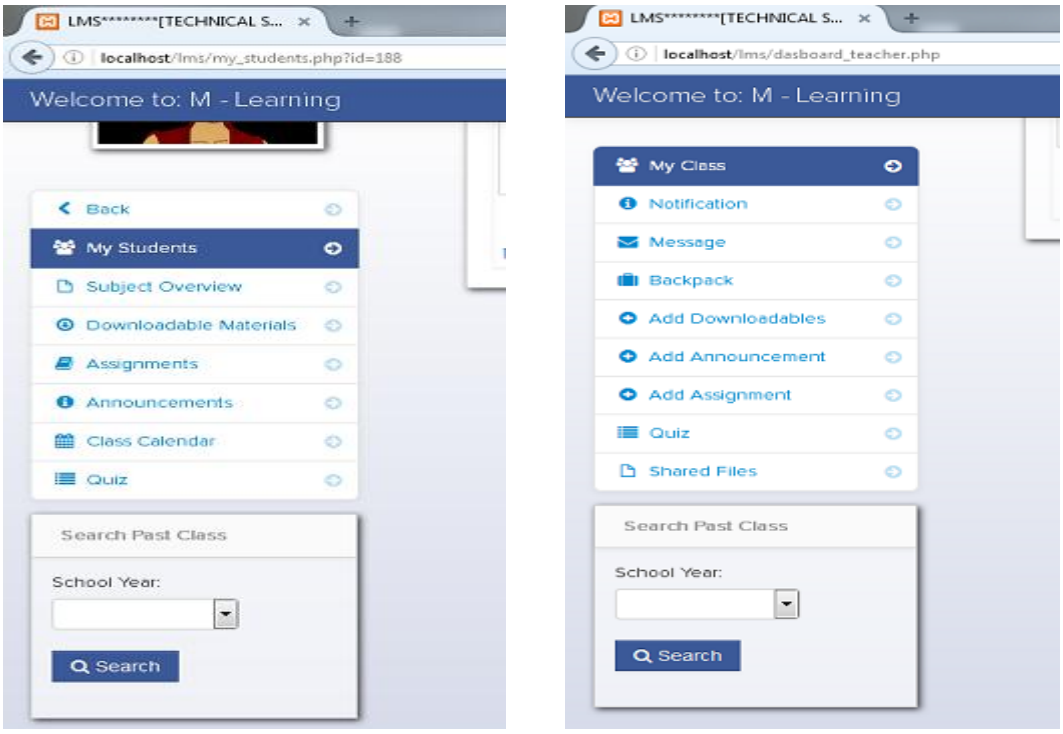

Figure 10: Faculty menu list

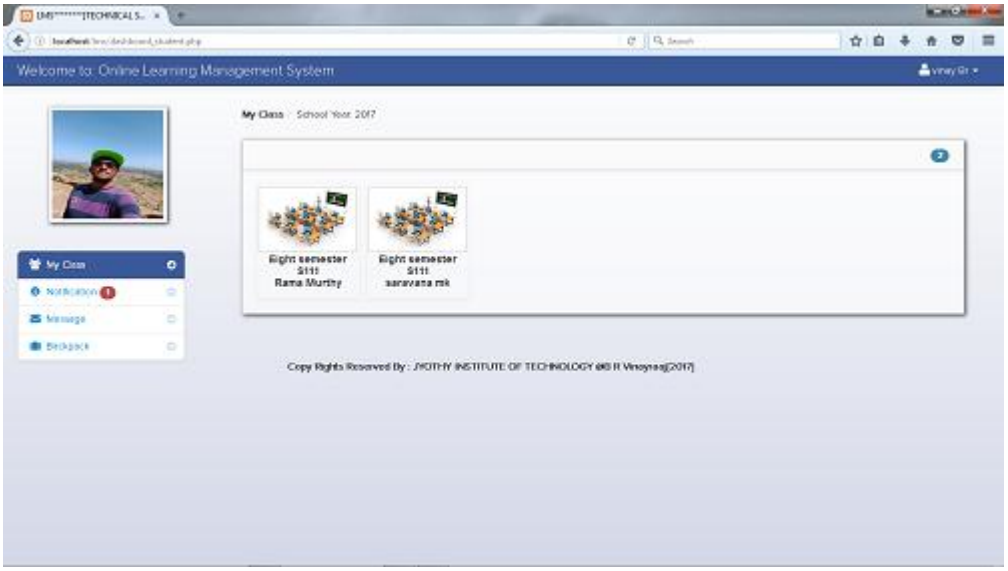

Figure 11: Student dashboard

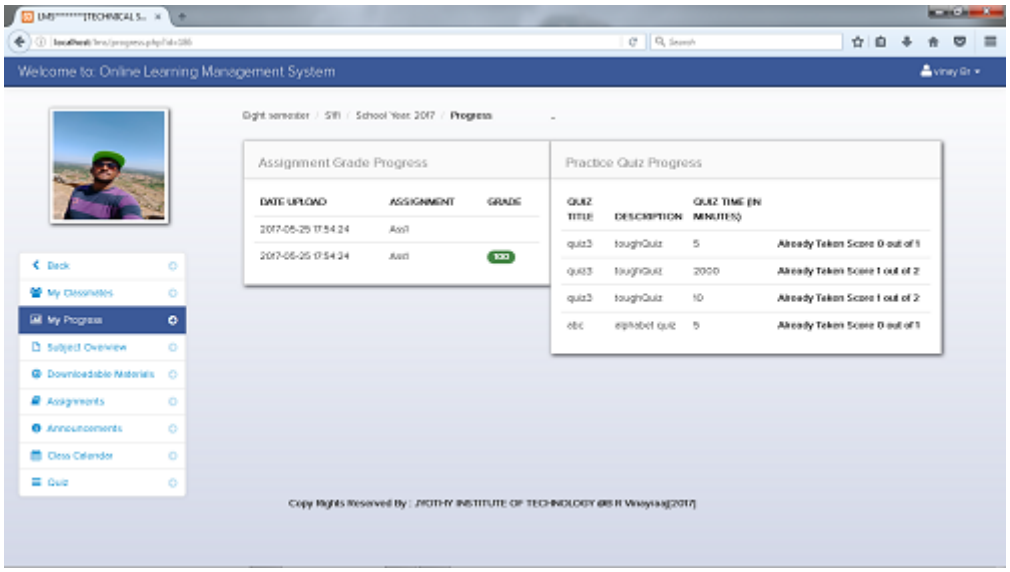

Figure 12: Student activity log

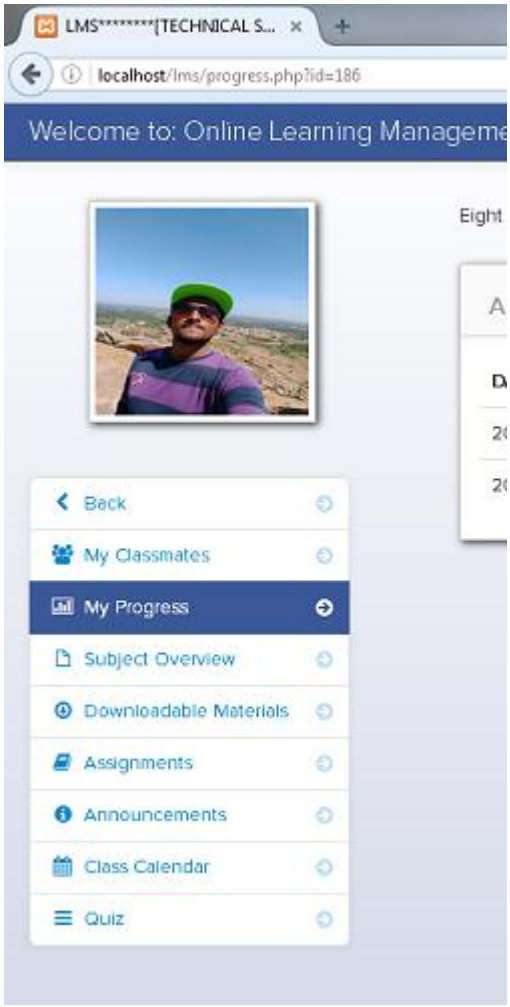

Figure 13: Student menu list