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Virtual Classroom System

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Abstract - *The importance of online virtual classrooms in the ongoing pandemic has increased since it has made teaching & learning accessible at the comfort of our homes. In addition to this, a lot of the training time is reduced with respect to travel, course materials and accommodation. In this virtual classroom system, we enable students to attend the video lectures where they can ask queries to their instructors at any point of time during the lecture. The process of teaching and learning can be made more fun and interactive by conducting live polls during the lecture. In addition to video conferencing, the interaction between the students and instructors can take place using the discussion forum, where students and instructors can have discussions regarding certain topics. An additional plus point to this virtual classroom system is that students can view the recorded lectures and notes provided by the instructors at any point of time, and as many times as they want. In order to get a better understanding of the lectures conducted by the instructors, our system enables them to post assignments and multiple-choice quizzes. Our goal is to offer a system that has a wide range of facilities which will maintain all students, instructor and course records in a much more efficient way with much less hassle.*

***Key Words*: Virtual classroom, live polls, discussion forum, interactive, course records.**

1. INTRODUCTION

Education through the Internet is the latest concept which has been implemented by everyone all over the world. Computer-based technology has also brought with it many new challenges for the teacher who seeks to determine what it has to offer and how that should be delivered to students [1]. This Virtual Classroom System is designed in such a way that the students can communicate with the faculty members when they have logged on to the system, along with this the students can get access to the notes and previous lecture recordings by issuing a request to their respective faculty. Each student will be given a unique Login Id and password, which will help them to log on to the system. The Virtual Classroom System can be accessed by the students at any given time of the day. It not only engages the students into a rich learning experience but also is a real-time collaboration between a faculty and a student. The faculty members can upload notes, video recordings and many such important documents by logging on to the faculty module. The student's and the faculty members can make their session more interactive by discussing certain important topics in the Discussion Forum. Every student can check their performance after completing a particular quiz or an assignment. In this system we not only try to offer a range of facilities that will help maintain all students, faculty course records but also try to make learning more fun and accessible to all the students.

2. LITERATURE SURVEY

A. Design and Implementation of an Online Course Management System[1]

The Design and Implementation of an Online Course Management System which is published by Emmanuel N. Ekwonwune and Dominic C. Edebatu respectively, In this paper they have addressed the issue of learning abilities which may vary among individuals. In spite of this, schools teach them in one single classroom. Due to which managing learning abilities can be difficult. In order to overcome this problem, the online Course Management System integrates all the learning techniques in which they have followed the waterfall model approach. The expectations from this system were to ensure that student evaluation questions are not out of context which covers the three domains of learning and to manage learners courses effectively, to integrate a feature which will enable learners to schedule reminders for their assignments or evaluations, to develop a feature which will be used to make sure that all the levels of learning are covered in a course and to ensure that learners answer questions based on their learning abilities for evaluations.

B. Development of a Class Model for Improving Creative Collaboration Based on the Online Learning System (Moodle) in Korea[2]

The Development of a Class Model for Improving Creative Collaboration Based on the Online Learning System (Moodle) in Korea which was published by Eunjoo Kim, Hyungsik Park and JungUn Jang. In this system, a Moodle-based online learning system was developed and a category model was derived to reinforce learners creative collaboration capabilities. The conclusions drawn from these findings were as follows: First, the development of the Moodle online learning system focused on the functions of forms, real-time conversation, reciprocal evaluation, Wiki, and blogs to market creative collaboration among college students. Secondly, the category model for promoting creative collaboration supported a Moodle-based online learning system consisted of self-reflection, learner-driven learning,

cooperative learning, practical tasks, and therefore the role of the professor. Third, after verifying the effect of application of the Moodle-based class model for university students, a positive effect was found with reference to the creative collaboration of university students. In addition, the appliance of the Moodle-based online class model for school students had a positive effect on improving the discussion activities, active options, active questions, and imagination, in addition to creative collaboration.

C. The Design and Application of Flip Classroom Teaching Based on Computer Technology[3]

The Design and Application of Flip Classroom Teaching Based on Computer Technology published by Jia Li, Xiaoxia Zhang and Zijun Hu, this paper aims to develop a new flipped classroom teaching model which is supported by Moodle, this teaching model arranges learning tasks according to the different characteristics and needs of learners. The model mainly consists of three modules. In the pre-class guidance module, teachers record the category within the sort of video and post it to the micro-class community section of the Moodle platform, alongside a task list for pre-class preparation. Before class, students will receive the courseware and therefore the learning schedule in order that they will choose the acceptable time to preview the course content. The in-class activity module is employed for the method of learning and communication within the class. After previewing the content of a lesson, students summarize the problems found and then exchange and communicate with group members or teachers in different ways to find the solutions by themselves. In the after-class knowledge supplement module, the scholars rethink about the issues and deepen their understanding after class, then summarize the knowledge points. They are also allowed to share their learning experience on the blogs on the Moodle platform to assist one another digest knowledge.

D. Design and Implementation of a Virtual Classroom System[4]

The Design and Implementation of a Virtual Classroom System published by Nicholas A. Omoregbe, Ambrose A. Azeta, Uyiosaifo Bello-Osagie, Michael C. Agarana. In this paper, a virtual learning system has been developed, the new system is expected to serve as a remedy to the problems and weaknesses observed in the old system in which it combines open learning techniques based on new technologies with conventional classroom teaching. The system consists of two main modules: Lecturer module and Student module. In the lecturer module, the lecturers can create and view Lecturer modules, create and view questions and solutions, contribute to discussion forums and check the student's performance along with the course coverage and view discussion forum messages. In the student user module, the student can cover lecture modules, answer questions & view solutions. They can check their performance and contribute to forums, along with these students can view the discussion forum messages.

3. PROPOSED WORK

This Virtual Classroom System provides a better interface for faculty and students so that they can communicate with each other, share documents and videos when the system is logged on. Students can retrieve the text files from the database by issuing the request. Both the users have their own login id and password, which help them to get connected with the server. The System is available anytime without any restriction that means, learners have the freedom to absorb content and engage with peers, at a time and location that they will learn best. It engages students in a rich learning experience. It provides a way of collaborative learning for the scholars. Another big advantage of the virtual classroom is the ability to record the category because it happens, including presenters' audio and video inputs. Each session is captured during a video and therefore the recordings are often viewed online or downloaded and distributed to the scholars. These recordings become a great learning tool for the students if they have missed any lecture.

3.1 Existing System Architecture

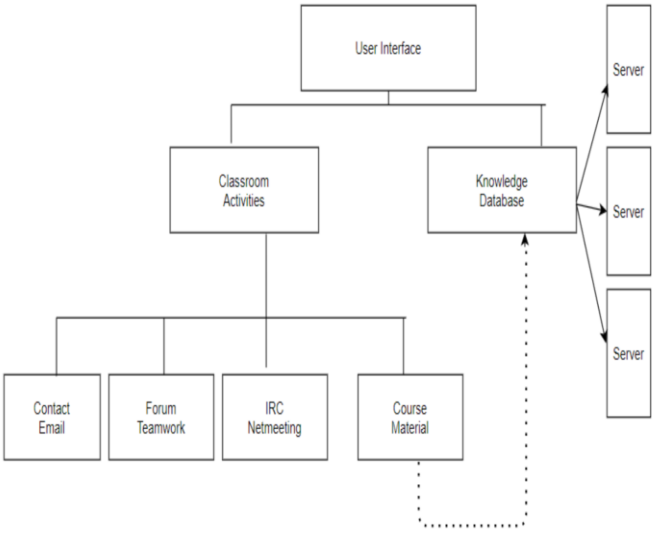

Fig. 1 – Existing system architecture

The Virtual classroom system is divided into two parts namely, the classroom activities and the knowledge database, all the teaching and learning activities take place on the classroom activities part, the components that are used are.

- **Contact email:** It is the part of the classroom activity module where every user needs to create an email account and register it on the website before login.

- **Forum Teamwork:** This Forum provides a platform for the users to post their queries or discuss their problems with each other.
- **IRC net meeting:** IRC net meeting is a platform for conducting meetings or video conferences and instant messaging as well.
- **Course material:** Courseware material is educational material intended as kits for teachers or trainers or as tutorials for students, usually packaged for use with a computer.

3.2 Proposed System Architecture

The proposed system architecture is given in Figure 2. Each module is described in this Section.

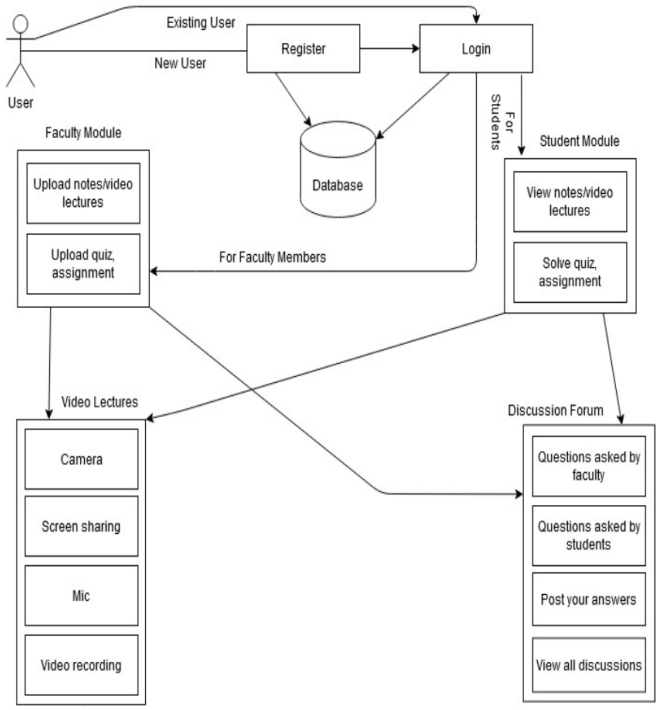

Fig. 2 – Proposed system architecture

A. Control Module

- **Web application:** The Application provides an interface between the user and the database and it acts as a communication medium between the users of the system.
- **Database:** The database is used to store the user activities and all the users that are allowed to access the system and also stores the authorized user's credentials such as login id, password.
- **Registration page:** Every user must register all the necessary information like a name, username, password, user type to login on the system.
- **Login page:** This page provides the login option according to the role of the user that is either Faculty or student.

B. Faculty Module

- **Upload notes/video lectures:** Faculty can upload the recorded lectures and notes here so that students can refer to it.
- **Upload quiz/assignment:** Faculty can upload the quiz or assignments at any point of time to test the student's attention and understanding from the lectures.

C. Student Module

- **View notes/video lectures:** Students can refer to the notes for study and video lectures uploaded by faculty if they have missed any lecture.
- **Solve quiz/assignment:** Students can solve a quiz or upload a solved assignment which was given by faculty.

D. Video Lectures Module

- **Camera:** The camera is used to capture the faculty who are taking lectures through video conferencing and students who are attending the lectures. There is an option to turn on or turn off the camera.
- **Mic:** The mic acts as a medium to send the audio of lectures from a faculty to a student and vice versa through the system.
- **Screen Sharing:** Screen sharing option is used to share the content on the screen like notes or slideshows with other users logged on the system.
- **Video Recording:** Using this option, users can start the recording of the class including presenter's audio and video inputs. Each session is captured during a video and therefore the recordings are often viewed online or downloaded and distributed to the scholars.

E. Discussion Forum Module

- **Questions asked by Faculty:** Faculty can post questions related to a particular topic taught in the lecture.
- **Questions asked by Students:** Students can ask questions or doubts about any concept that was not cleared in the lecture.
- **Post your Answers:** Both the users can post the answers to the questions asked in the discussion forum.
- **View all discussions:** Students and faculty can view all the points discussed at that particular time period.

3.3. Activity Diagram

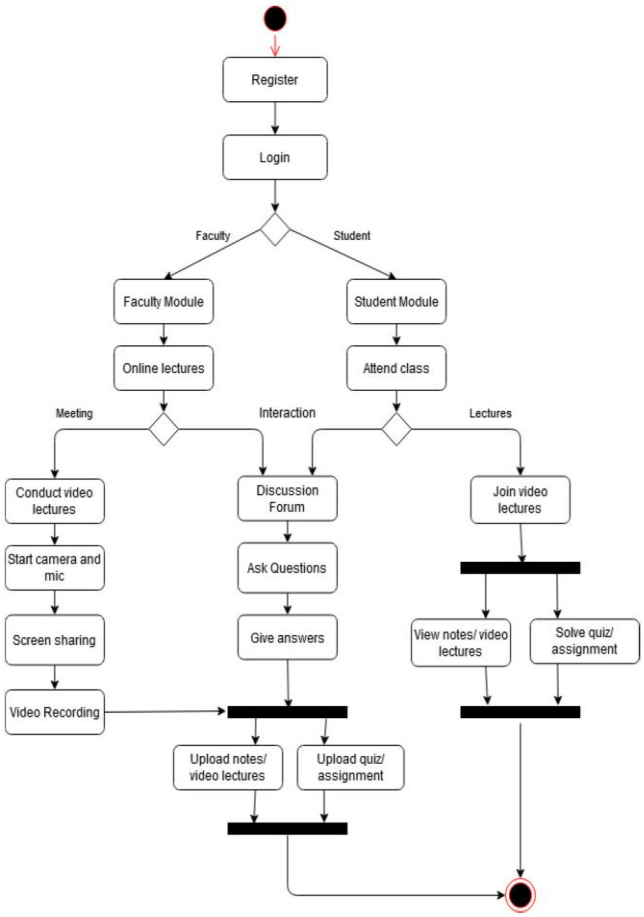

Fig. 3 – Activity Diagram

4. REQUIREMENT ANALYSIS

The implementation detail is given in this section.

4.1 Software

The software in the proposed system consists of a database which is MySQL. The development of the application requires JavaScript and PHP. The operating system used is Windows 7 or higher.

4.2 Hardware

The hardware requirements for the proposed system are Intel Core processor and 4GB RAM.

5. CONCLUSION

In this paper the study of different techniques is presented. The different techniques to work with the different modules such as the student module, faculty module in the virtual classroom system are explained along with an example. The major goals of virtual learning such as enhancing the quality of learning and teaching, meeting the learning style or needs of students, improving the efficiency and effectiveness and improving user-accessibility and time flexibility to engage learners in the learning process are also met.

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