

EFFECTIVE TEACHING AND LEARNING ENVIRONMENT: CLASS ROOM MANAGEMENT SYSTEM

K.C Chandrasiri¹, R.P.S Kattthriarachchi¹, A Wanniarachchi¹

¹ Faculty of Computing, General Sir John Kotelawala Defense University, Ratmalana, Sri Lanka.

#chandrasiri.kalindu@gmail.com

Abstract— Evolution of the technologies has made the information technology and the computers essential part of life of the human beings. So in modern world the Uses of information technology have expanded from ordinary simple calculation using a computer to the advance concepts as artificial intelligence. Among these various aspects the information technology bind to the human lives, Education is one main sector that get the assistance of the information technology for various academic purposes from the aspect of the teachers, lecturers and also the students. So in modern class rooms, use of information technology and computers for academic related matters has become a common thing. Without doubt, it has become necessary to prepare new generation to be equipped with these ICT skills, But the challenge of today's modern classroom is deliver lesson content, and simultaneously monitoring all student PCs and work collaboratively while ensuring the complete student attention and focus is maintained at all time. So delivering lectures to the students in a computerized or information technology enabled environment has both positive and negative consequences. In order to mitigate theses negative consequences as failing to keep students attention on the lectures while delivering lecture in a computerized environment, developing a monitoring system for computerized environment is a precise solution. Therefore, the intension of the research was to develop an application called "class room management system (CRMS)" which assists for effective teaching and learning environment and for preventing discipline problems and misbehaviors. As the name implies it selves, CRMS is an network based software application totally provide the Management facilities for delivering lectures with other management facilities such as Screen Capturing ,Chat System ,Performance Monitoring, File Sharing ,Remote login , Attendance Marking, Screen Sharing and generating reports. The lecture and the students are the main users of this system and have been provided the privileges for the users according to their user role. Moreover, this CRMS application runs within a local Area Network connection (LAN) connecting all the components of the computerized environment assisting the lectures to deliver lectures in a pleasant academic environment with easier lesson delivering facilities within a classroom.

Key words: CRMS, Computerized, ICT.

I. INTRODUCTION

Advances in Information and Communication Technologies have been influencing almost all parts of our lives. Without doubt, it has become a necessary to prepare new generation to be equipped with these ICT skills in order to move with the globalized world without been isolating. Education is a one of the sectors among the most popular fields that ICT has drastically influenced. So integrating of IT to the Education sector has made the teaching and learning process easier. As a result of this, In the modern class rooms computers has become a common equipment used by the both lectures as well as the students. In perspective of the students this is more helpful for students to improve their studies and skills much more effective manner. In teacher's perspective using the computer assist to deliver lectures more easy and efficient manner. As a lot methods and resources are available to deliver lesson contents as images, videos and audios etc.

A. Issue with ICT enabled Learning environment

As above mentioned information reveal, "Yes" it is true that ICT helps to improve the productivity of the Education, but one of the negative consequence of this is maintain the students attention focus on the lectures while teaching in IT enabled environment has become a difficult task because computer enabled environment expose to the global with internet of everything. Because of this the productivity of the education can be low as students are failing to focus on their lesson contents as well as the teachers can be dissatisfy in delivering lectures as students are not actively participating to the lectures

These negative effects can be mitigating through implementing a proper mechanism for monitoring the computerized leaning environment of the students. So then lecturers can monitor whether students are focusing of the lectures without doing unnecessary things using the computers in the lectures. Therefore class Room Management System is the best solution for this.

B. Research Question

The research question around which this research is based is presented below:

How can CRMS (Class Room Management System) facilitate and assist with basically monitoring computerized learning environment within a class room in

order to maintain the student's attention on their lectures and make easier the process of deliver lesson contents in the perspective of the Lectures.

II LITERATURE BEHIND ANALYSIS

With the evolution of the Technology, computer has become much required equipment for the class room. But the challenge of today's modern classroom is deliver lesson content, and simultaneously monitoring all student PCs and work collaboratively while ensuring the complete student attention and focus is maintained at all times . Without doubt, it has become necessary to prepare new generation to be equipped with these ICT skills (Dursun & Çuhadar, 2009). In fact, Information Technology lecturers, and the computer teachers, working at primary and secondary schools have pivotal roles to fulfill this mission (Kabakçı & Odabaşı, 2007). However, this is not an easy task; especially the prevalence of new technologies in schools has resulted in new classroom management and discipline problems. Students' wrong usage and damage of technological tools in classrooms (Irving, 2003), ineffective time management while using technology, using cell phone in classrooms, video and sound records which might influence the private life are some of the examples emerging as a result of the entrance of new technologies into the schools. In this sense, a successful classroom management and organization is fundamental for designing an effective teaching and learning environment and for preventing discipline problems and misbehaviors (Brophy, 1983; Emmer, Evertson, & Worsham, 2000; Evertson, Emmer, Sanford, & Clements, 1983). Also, communicating with parents is essential for eliminating these problems (Yıldırım & Dönmez, 2008). The existing literature revealed frequent misbehaviors observed in Turkish classrooms.

A. Similar Systems in Global Context

As it was described in the above paragraphs, in order to mitigate the negative consequences occurred within a computerized leaning environment, various researches have been conducted on this and as a result of that different types of software application have been developed. Further will be described some of the information about similar systems

a) Net Support School systems

Net Support School is a class-leading classroom software strategic, providing teachers with the aptitude to teach and visually/audibly monitor, as well as interrelate with their students, separately, as a pre-definite group or to the whole class. Rising to the experiment and requirements of today's modern classroom, Net Support School provides the ability to deliver lesson content, simultaneously monitor all student PCs and work collaboratively, ensuring that complete student consideration and focus is sustained at all times. Net

support school developed for different platforms like widows, ios and android. Some of the Basic facilities provides by this system are monitoring facilities as Monitor the whole class in a single view, Scan through sets of student PCs in pre-defined multiples. Overlay extra information including: Active Application or Active Website, Zoom for enhanced high definition Student thumbnails. Management Facilities as Power On or off and manage all classroom computers from the Teacher PC, Carry out a Remote "Log off" on all PCs, Send a Remote "Log in" to all Student PCs at the commencement of class, Blank Student screens to gain consideration, Lock the Student's mouse and keyboard when teaching, Automatically re-connect to Students' PCs on Reboot. And also the security facilities as Apply a unique "security key" to make your copy of Net Support mismatched with other copies of the software, Limit connectivity across the enterprise to only systems resounding a corresponding software license, Secure Tutor profiles each permitting customized levels of functionality as required, Use Active Directory profiles to bound which users are capable to run the Net Support Tutor or Tech software, Use Active Directory profiles to force accepted configurations for both Tutor and Client software installations.

b) LAN school V7.8

Since 1986, LanSchool has been the leading provider of classroom management and watching software. LanSchool's award-winning technology is identified worldwide for being dependable, simple and easy-to-use. In 2011, Stoneware developed LanSchool Technologies, LLC. Founded in 2000, Stoneware is a privately held corporation headquartered in Indianapolis, Indiana. Stoneware created the first web-based IT delivery platform. Stoneware's Unified Cloud Platform permits IT to arrange for users access their files, applications and services residing on local devices or in private and public clouds with a single password. Stoneware is a subordinate of Lenovo, the world's leading PC company.

This product is also multi-platform sustenance system which can run on Macs, PCs (including Windows 8.1), Chrome books, Linux, Thin Clients, Android and iOS*

Some of the feature provides by the LAN school are as follows,

Reduce Student Distractions -Teachers can decrease student interruptions by Blanking Screens, Restraining Applications and Limiting Web Browsing on student computers. This helps direct student consideration from their computer to the teacher and hold onto students on task.

Monitor Students- Perfect for monitoring student action within a classroom setting, the Thumbnail feature agrees you to view all screens as well as see the current application and website that the students are running. Teachers can send messages to all or separate students.

Assess Student Understanding-Students can be rapidly polled throughout a lecture with true/false or multiple select questions.

Remote Control Student- The Remote Control Student feature in LanSchool 7.7 allows teachers to be movable in the classroom while still taking access to remotely use the mouse and keyboard on a selected student's computer.

c) AB tutor 7.2

AB Tutor is a one more class room management system, tutoring, monitoring and teaching tool that lets you train Students in a networked classroom or lab, solely, effectively. Teachers, trainers and administrators can use the software to easily control, manage, monitor and upkeep their students. AB Tutor is Cross platform Windows, Mac and Linux tutor applications Windows and Mac client applications. Some of the facilities provided by this system are

Broadcast and share- AB Tutor software can Transmission tutor screen to students. Display static, locked, screen to students. Illustration a student's screen to others .Record tutor screen and audio for lesson playback

Monitor- Instantaneous watch by multiple tutors. Network effectual sizeable thumbnail views, with variable refresh times. Real-time remote screen watch Create dissimilar thumbnail tab view for each group. Monitor running applications and files. Recognize what site/file the student is working on. Monitor and log student activity (applications, printing, websites and keystrokes). Take time and name-stamped snapshots of student activity. Record and play back student screen activity. Violation notification. Notify tutor when particular keywords are typed. Inevitably take snapshots of violations. Option to launch remote screen recording upon violation. View all violations, screenshots, user details and context. Inform teacher if student visits quantified sites

Remote Control- Take over remote mouse and keyboard. Share control of applications with student. Launch and close down applications remotely. Automatically launch websites or open files distantly. Set policy to instantly prevent application from running. Lock remote screen, keyboard and mouse, with option to blank screen. Create modified lock screen messages (for lesson plans) .Classroom Management. Power up distant machines. Far-off logon. Remote logoff and shutdown. Agenda remote shutdown

Internet Control-Block ports to avoid any Internet action. Bound web browsing to quantified sites. Black-list detailed sites. Filter by keyword/wildcard.

Application control- Bound applications that can be propelled. Specify applications that cannot be run. Close down incongruous applications

Communication- One-to-one and one-to-many text chat. One-to-one and one-to-many audio chat. Broadcast text messages

Polling and examination- Create + allocate one-question polls to remote computers. Outcomes of poll collected in real-time. Create and dispense more multifaceted exams to remote computers.

File management and distribution- Dispense files to student machines. Gather files from students. Remote file management. As a conclusion, when it is considered the features of all of these system it can be seen followings

A common feature provide by the net support school systems, LAN School v7.8 and AB tutor 7.2 is the facility of monitoring the students while they are in the lectures in monitoring it enable view all student screens in a classroom and see in an immediate which computers have live audio action. And another feature is enabling managing the processes like power on off, blank the screens while in the lectures to get student s attractions. Moreover Remote control the student while facilitating Take over remote mouse and keyboard. Share control of applications with student. Launch and close down applications remotely is another similar kind of feature. What it depicts by these common features are those are the common requirements that is required in the class room management related processes.

III METHODOLOGY

The research was conducted within inductive paradigm. The intention was to develop a Class Room Management system which assists to maintain a precise learning and teaching environment to success the education process. The research was done focus on a class room environment as in the initial stage. Above paragraphs of the research will describe the development of the Class Room Management System.

a) Language & Tools Selection

Overall system architecture is based on the three layers namely presentation layer, data link layer and application layer. The programming language for CRMS is C# ASP.Net because its network base system which require fast and reliability.

b) Database Selection

The database which is a most important aspect of the overall system. The database implement on the server should capable of providing efficiencies operations. In order to fulfill the need of database operations CRMS use Microsoft SQL Server Management Studio to the development. It provides all need features for database scripting and store the data.

c) Determine Technical Requirements

Requirements that are used by developers listed in the below.

- The application package would be developed as it is compatible to for any computer which runs on

Windows platform such as Windows XP, Windows7 and Windows8.1.

- The database requirements are implemented by using Microsoft SQL 2012.
- Developed using C# and Asp.net
- Use network protocols.
- .NET Framework.
- Internet information service (IIS)
- API Library Files
- DevExpress Interface Designing tools.

d) Designing the Software Application

Following figure demonstrate the technical designing of the software application.

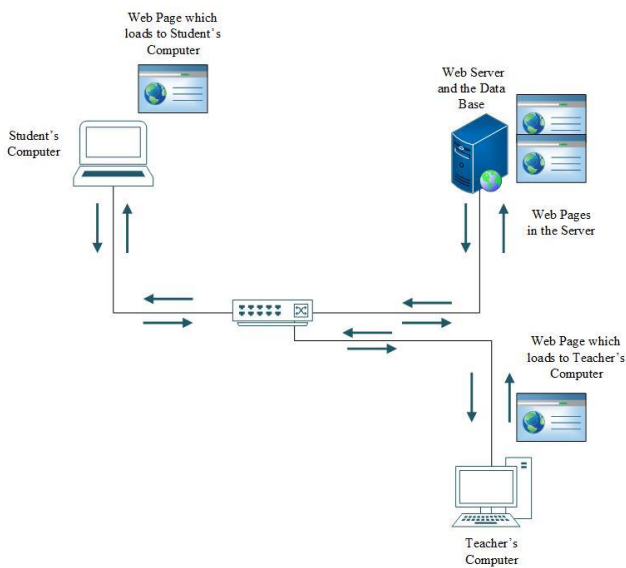


Figure 1. Technical Design

Source: Author

According to the systems above all the users must connected through the network. Server contains the database which holds details about the users. Form the students computer it will send the captured screen Memory usage, CPU usage, Ip address etc... To the server. If the teacher needs to monitor particular student he can retrieve the details from the server. It will reduce the network traffic need only less bandwidth to transfer data through the network. When it is considered overall architecture it will be as follows.

Architectural design is the first illustration of the overall structure of the main components of the Class room management system. The total structure is based on how it would suit the software architecture of the Network based application and, the components will be divided into two separate modules to manage the operations of all components. Overall system will be split in to three layers names as application layer, data layer and

presentation layer. Overall system architecture of the proposed system is given below.

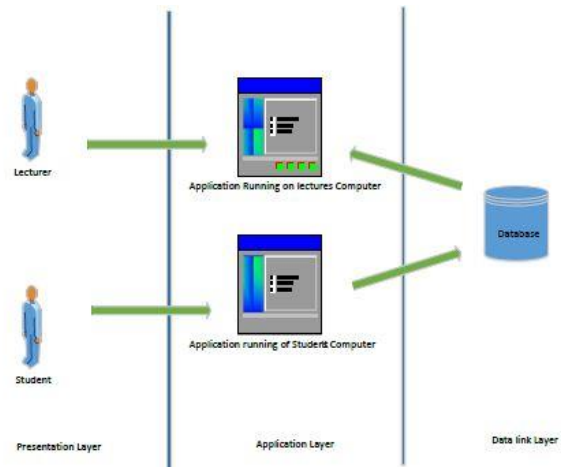


Figure 2. Overall Architecture

Source: Author

Application Layer

Class room Management system executed at this layer in order to achieve the expected objectives of the system and can be named as the heart of the overall system. This layer will interact with data layer and presentation layer where the interfaces are running and data layer where the information is stored. Data gathered by user inputs or by other processes will be manipulated according to the predefined operational instructions at this layer.

Presentation Layer

This layer is responsible of handling interactions with users by controlling interfaces to present requested information and receive the inputs provided by the user. Information gathered by this layer will be provided to the application layer in order to manipulate according to the given instructions. The proposed system will be developed with having two main interfaces as Admin Panel and Students Panel.

Data Layer

This layer handles the data storage operations of the Class room Management system where the database management application is running. A database will be used to store details about the Attendance information's about the student's. Information gathered from user inputs through interfaces or by other processes of the application layer will be stored in respective database after manipulating information at the application layer. Following Diagram demonstrate the Software architecture of the application.

The software architecture was based on modularized approach where the software is split into parts. Each component is assigned to perform one or more task of the

overall system in order to accomplish the ultimate goals expected.

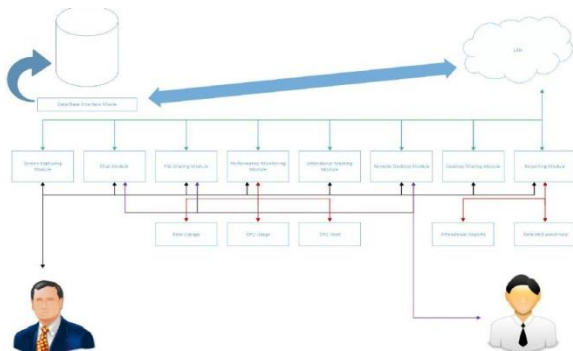


Figure 3. Software Architecture

Source: Author

The development and the maintenance of the system will be ease when the system is developed using the C# and Asp.net. The data are gathered at the Sever and some important data will be stored at database. The LAN (Local Area Network) is then connected to the database information module and the system is linked to the database information module and to the LAN.

Users -

In CRMS contain two types of users. Teacher and the student. Only the Teacher can create user accounts both users need to have user accounts to login to the system. Teacher can monitor the behaviors of students what they are doing during the lecture time and wane them if they are doing unrelated things.

Input -

Users need to have an account to login to the system which they can enter their own username and password. As inputs it takes CPU, Memory, CPU heat and the Ip addresses of the users.

Output -

In the perspective of the Class Room management system the output will be the monitors of the student's computers. And in the management perspective it will provides reports about the pen drives that attach to the computers within a certain time period. Also each and every students Monitors are displayed in the Teacher s monitor. The Applications and the process on student's computers also can be shown in the lectures monitor. And also after successfully marking the attendance through face recognition reports will be generated daily, weekly, monthly etc. basis.

Process -

CRMS contain several processes. One process is Teacher can log into the students computer remotely by giving the IP address username and the pass word of the student's computer. Also Teacher can monitor or view the RAM Usage, CPU Usage, CPU Heat and the IP address in a particular student's computer if the student log into the system.

File Transfer module users can share files between the student's and the Teacher's computer also Teacher's cam share files with students if requires. Pen drive detection module can detect usb storage device is added to the student's computer, then the Teacher's computer will get a message from that particular student username and the number of pen drives that connected . Using these chat module students can chat with only the Teacher. But the Teacher can create group chat sessions. In attendants module Teacher can get the attendants reports through the system. It is done by using the student's computer the through faces are detection. In desktop view modules student's captured desktop screens can be view from the Teacher's computer. In desktop share module students can view Teacher's captured desktop screens. Moreover CRMS consist with the following main facilities,

- Screen Capturing
- Chat Module
- Performance Monitoring
- File Sharing
- Remote login
- Attendance Marking
- Screen Sharing
- Reports

Screen capturing can capture and share their screen with the students in their computer screens. So that will help to perform explaining and demonstrating the relevant lessons easily.

Chat module can chat with students using their computers. So that will help to conducting class perfectly since no student needs to interrupt to the class during lesson by asking questions

Performance monitoring can monitor any particular student performance while test or lesson. So that will help lecturer to identify student capability and understanding particular lesson.

In file sharing Teacher and Students can share lesson related Materials with the students into their computers. So that will help to teach lessons easily.

Remote Login.

Allow teachers to take Remote Login Sessions to Students Computer if there's necessary requirement.

Attendance Marking

Allow students to mark attendance while during lesson through Face Recognition. So that will help Teachers to maintain student attendance reports for particular lesson or test.

Screen Sharing

In this module Teacher can share their screen with the students in their computer screens. So that will help to perform explaining and demonstrating the relevant lessons easily.

Reports.

In this module Teacher can retrieve reports about attendance. So that will help Teacher to perform their operations easily.

IV. CONCLUSION

Information and Communication technology has become an essential component of the education. Influence of the Information and communication technology has made both teaching and learning process more easier and productive by innovating numerous ways to gain knowledge as well as feed the brains with knowledge .As a result of that So computerized class rooms, education environments have become a necessary part of the education. Although there are benefits of using computerized environments for education. One of the difficulty is maintaining the students focus on the lessons while lecture delivering the lesson contents because in computerized environment the students can roam and do unnecessary things while in the lecture. So the intension of the research was to develop an application called "class room management system (CRMS)" which assists for effective teaching and learning environment and for preventing discipline problems and misbehaviors. More over In order to make the CRMS more user effective, as feature enhancements, system will be facilitated with pen drive detection, chat system, screen sharing, screen capturing, remote login, face recognition attendance and File sharing and also system will be integrated with windows active directory. Through that it will be able to integrate more functionality to the CRMS as security options, pen drive detection controlling mechanisms to increase the security and reliability of the application and also increase the number of users and the facility to monitor more number of students at the same time through enabling more screens to be displayed at same time. Moreover system Application will be optimized to provide services in efficient manner.

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