

# A Study on the Characteristics of a Virtual Classroom

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**Abstract** – Progress in technology has changed the whole aspects of human lives. The effect of this change is more apparent every day. Education is one of the areas that had significant impact on information technology, such that without information technology is not possible education and learning. Virtual classroom is one of the products of ICT in education. Virtual courses do not require a physical presence in the classroom and Students can take classes in terms of geographical distribution and can exchange the information. Many of the activities that take place in virtual classrooms, It is similar to traditional classroom programs but nature and spatial that is performed these activities, are different. In virtual courses, Students can have access to the content of the education courses at any time day in different formats (text, video, audio). In this paper, we will describe characteristics of a virtual classroom environment and will examined learning methods in the virtual classroom and security and existing challenges.

**Keywords** – E-Learning, Synchronous Learning, Asynchronous Learning, Virtual Whiteboard, Virtual Classroom.

## INTRODUCTION

Nowadays's everything is changing at a tremendous pace and development of information technology has changed a lot of things. It has not been excluded from education, and it must be responsive to the new needs to the proper and acceptable manner. Distance learning is a new solution for institutions that want to move towards information technology to change teaching methods and their environment. Distance learning is a viable solution for individuals, who are unable to attend classes due to limitations of space and time, is a proper solution. Distance learning is one of the e-learning types and is the process of using computer technology to transfer knowledge and educational materials to the learners who are located terms of location or time away from the teacher.

Virtual classroom is one of the products of ICT and communication in education.[8]

Many of the activities that take place in virtual classrooms, are similar to the programs that are performed in traditional classes, but the nature and spatial that performed these activities in it, are different .In virtual class, students can have access to the contents of training courses in various formats (text, video, audio) and with teachers and classmates communicate through communication tools at any time of day or night and every time they want to have access to it. They also frequently use the corresponding files.

## II. A VIRTUAL CLASSROOM SYSTEM

A virtual classroom is a private online space, Which is available via the Internet 24 hours a day, 7 days a week.[3]The virtual classroom is created to communicate between the learner and the lecturer in the Internet. In the virtual classroom, the studying time is fixed, But the learner and the lecturer can access to the virtual classroom from anywhere, that is connected to the Internet. In this class, the instructor teaches using Powerpoint slides and learners and teachers can interact with shared virtual whiteboard.[1] The most important features of virtual classroom are support , assessment and communication with participants. Support in the virtual classroom includes tools such as online calendar, search Engine and online help guides. Assessment consists of standards tools such as online grading books, exam and quizzes. The communication participation tools used in a virtual classroom include email, instant messaging, chat rooms, and discussion boards, and file transfers.[3]

## III. COMPARISON OF TRADITIONAL CLASSROOM AND VIRTUAL CLASSROOM

Differences between traditional classroom and virtual classroom can be tracked in three dimensions:

*3-1 learning time:* learning time is fixed in a traditional classroom and everyone should take advantage of learning at the same time, but in the asynchronous virtual classroom, learning period is determined by the receiver of training.

*3-2 learning place:* In a traditional classroom, a special place considered for everyone. But in the virtual classroom, any where the receiver of the training can access to the educational materials.[3,8]

*3-3 learning process:* In the traditional classroom, a method and learning content are considered for all learners but in the virtual classroom, there is unique training methods and content customized training for any students.[8]

## IV. COMMUNICATION VIRTUAL CLASSROOM TOOLS

The most important communication tools in virtual classroom include:

E-mail, Discussion boards, Chat Room, White board, video and audio conference, Instant-messaging, Tele-Conferencing, Weblog, Wikis, Application sharing capability, Shared Web browser, Polling/Interaction tool, Recording capability for delayed viewing [3,4].

## V. LEARNING METHODS IN VIRTUAL CLASSROOM

Generally, learning system in the virtual classroom is divided in three types:

### 1) *The synchronous learning system*

In this way, learners and teachers communicate with each other directly during the learning process. Synchronous Virtual Classrooms are software applications that bring human interaction into the virtual classroom through facial expressions, vocal intonations, hand gesticulation, and real-time discussion.[7] Tools of synchronic learning are: chat, video and audio conference, teleconferencing. [3,8] The synchronous learning system includes one of the following situations:

- Two-way video conference
- Two-way audio conference
- Visual -audio methods

### 2) *The asynchronous learning system*

In this method, each student can participate in any time and place through the Internet in the classroom, There is no online and immediacy relationship between student and teacher.

In this system, teacher puts courses at different files (text, audio, slides, etc.) and through Internet and Intranet for the learner. E-Mail, discussion groups, Whiteboard, wikis, weblogs and forum are tools of asynchronous learning.

### 3) *Semi-attendance education system*

In this method, Part of the training is offered as attendance and other part as non-attendance, such as sending education package in the form of text and multimedia flash.

## VI. COLLABORATIVE FUNCTION FOR LECTURER AND LEARNER PROCESS

There are functions in a virtual classroom, that is Collaborative for lecturer and learner. The functions are as follows:

### 1) *Login function*

When learner or lecturer wants to enter in the classroom, they have to login with correct username and password. Only logged-in users are allowed to use shared objects or resources.[1]

### 2) *Whiteboard function*

The purpose of using this function is to provide a collaborative environment for learners and lecturers. They can write message in text format and draw line on the shared whiteboard environment in real time. When they want a message or line, they must select tools by dragging and dropping them on the whiteboard. They can also delete objects by pressing delete key on the keyboard. Learners can write or erase any items at any time they want. They are equally authorized in this classroom.[1] main features of this application is: support for voice and video calls (visual and audio communication), instant messaging , drawing of basic shapes (circles, rectanangels, etc) and text on the whiteboard, group or individual chat

and file transfers (upload and download) and support for presence. Each user will have the ability to enable or disable these features based on the availability of the necessary equipment (speakers, microphone, webcam) or bandwidth usage in other to reduce cost.[2] The following figure shows an example of a virtual whiteboard in the classroom.[8]

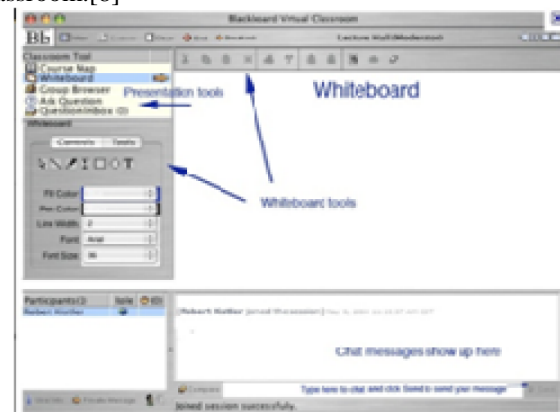


Fig.1. An example of a virtual whiteboard in the classroom

Some characteristics of Whiteboard function :

### 2.1) *Pen and keyboard based*

Two "tools" are at hand for data introduction. The mouse can be used for drawing objects on the whiteboard area or typing text in the chat area or whiteboard area using the keyboard. It would be better if you could connect a "pen" to your computer instead of the mouse. Using this so called pen you'll find it easier to draw objects.[3]

### 2.2) *Multiuser over the Internet*

This application is designed to be used on the Internet. We can find a lot of multiuser applications on the Internet, one example could be the IRC (Internet Relay Chat) where a lot of users from every part of the Earth are connected to a server and they can communicate with each other. The White Board application is based on this multiuser concept. A server is running on a computer connected to the Internet, and users can connect to this server anytime they want and communicate with each other through the whiteboard area or the chat area of the client interface.[3]

### 2.3) *Is scalable*

Scalability is related to the possibility to further extending the capabilities of the whiteboard as an auxiliary tool for a scientific data dynamic frontend.[3]

### 3) *Presentation function*

This function allows creating a presentation in SWF format. This function contains two modes. The first mode is lecturer mode. Lecturer can fully control the presentation. Learners can see the same frame simultaneously. The second mode is learner mode. Learner can navigate the presentation by using next and back buttons in order to view the presentation. They are not allowed controlling the presentation that the lecturer has corresponded. The presentation function requires SWF presentation files.[1]

### 4) *Chat function*

This function supports lecturer and learners for chatting in regular text format. They can send message to other

people in the same classroom. Text can be selected in different styles.

#### 5) *List of learners*

This function displays lecturer and learners name that login the classroom. All usernames appear on the list in the classroom that is used to identify who they are.

#### 6) *Audio/Video presentation function*

This function displays the names of the logged-in users. All usernames appear on the list in the classroom that is used to identify who they are.[1]

### VII. SECURITY OF VIRTUAL CLASSROOM

Security in a virtual classroom include the following items:

- Access authentication options that require all participants to authenticate themselves before gaining access to classes or materials.
- Integration with college or university directories to ensure only legitimate students can access classes.
- Encryption options, to protect sensitive information such as students' or instructors' personal data.
- In-session classroom controls that allow class leaders to change participant permissions, require passwords, lock a class, and eject unwanted attendees.
- Complete control to set up classes as internal only (behind the college or university firewall) or accessible to outside parties through the Internet.[5]

### VIII. CHALLENGE IN VIRTUAL CLASSROOM

Virtual classroom like of other Internet systems are facing to the danger penetration due to transfer information and sharing them. Among the actions that an observer can do:

Changing the content, and out of order service is that to avoid this actions. It can be noted the method of data encryption, identity authentication and the use of dedicated lines. [7]

The other challenge is that in a synchronic class may be present someone else rather than students in the class, to solve this problem, used advantage of the biometric methods.

### IX. CONCLUSION

With advances in technology, we need to change lifestyle. Training is one of the areas that significantly changes with technology development, which refer to excrement. Electronic education. The virtual classroom is one of the ICT products, which is created for better and easier learning by using the electronic system like computer, Internet, etc. virtual class is like physical class just the nature and the environment is different in that the activity is performed. Therefore, the space that is performed a virtual classroom in it, has characteristics which we investigated in this paper. We also describe the teaching methods that exist in the virtual classroom and we enumerated the challenges that are facing this kind of class.

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