# Virtual Classroom and E Learning: A Review

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## ABSTRACT

Virtual classroom and E learning is becoming popular and effective teaching and learning method for contemporary days. It is very much essential for pandemic situation or natural disaster when face to face class become impossible. Teaching is an art and it depends on the techniques adopted in the classroom and the skills of the teacher. Globalization has brought about a lot of technological changes around the world and it has been reflected in teaching method too. The concept of virtual classroom is one of the recent trends in education and teachers are adapting to it, in order to overcome the barriers of teaching and learning. A virtual classroom is a set of teaching- learning tool which intends to improve learning experience of students with the help of various technological devices. However the present study has conducted to explore virtual class room, to assess terminology related to virtual class room and to find out the challenges of virtual class room. The study was documentary analysis type. Information and data were collected from secondary sources. These were collected from books, research reports, journals, different annual reports, different government and non government websites and different websites. A literature review was conducted by using the internet search, google databases with the virtual classroom. A hand search was also undertaken to relevant journals identified by the electronic search and additional articles identified from the reference list of the key articles. A number of articles have been found on virtual class room. From the study it was evident that virtual classroom and E learning plays significant roles in different situations. All stakeholders of education should have well concepts and well practical knowledge about virtual classroom and E learning, Information and Communication Technology (ICT) related knowledge, knowledge related computer and smart phone. Government should provide economic and technical supports to all stakeholders of education and should provide required training for teachers and students.

**Key words:** *Virtual class room, E learning, Education, Training, Teacher, Student, Computer, Smartphone, Internet, Distance learning.*

## INTRODUCTION

Education is a bi polar process, where the two important components are the teacher and the taught. The art of teaching plays an important role in the educational set up and this depends on the skills employed and the techniques adopted by the teacher in and outside the classroom. Burton (S.S. Chauhan, 2005) has defined as the process of stimulation, guidance, direction and encouragement provided to the learners, by Burton (S. S. Chauhan, 2005). To Mark K. Smith, teaching is a process which helps to attend to the needs, experiences and feelings of people/ learner, with the intention to help them learn something. It is a process of sharing of knowledge and experience, formal and informal; it may or may not be structured but it should be organized in order to be effective. A brief exploration of the history of Indian education shows that, the method of teaching in ancient India was based on 'shravan', 'manana' and 'nidhidhyasana' and it was the prerogative of the Brahmins to be the teachers. Gradually during the Buddhist Period, the need for teacher education was felt and the concept of training of teachers came into existence. Although it was not so prominent in India during the Muslim Period, it was after the advent of the Europeans in India, Teacher Training Institutions were established. The art and science of teaching has undergone rapid changes with vast changes in the field of technology. The basic criteria of good teaching are its focus on the content or subject matter, proper methodology and the art of delivery. Good teachings also aim at fostering/ nurturing the creativity and curiosity of the learners and help them to keep into their mind, so that they can ask questions.

Good teaching also involves deeper introspection on the part of the teachers. Some of the common characteristics of good teaching, according to UNESCO (2004) and Scheerens (2004) are – relevance of the subject matter or content, time allotted to teaching the same, active participation of the learners, monitoring their level of understanding and application, regular feedback from them and finally, an environment of respect between the teacher and the taught. To Margaret Rouse (whatis.techtarget.com/definition/virtual-classroom) a virtual classroom is an online learning environment which may be web-based and accessed through a portal or software-base and require a downloadable executable file. To Justin Ferriman, (Dec 12, 2013) it allows participant to communicate with one another and view their presentations. The main characteristics of virtual classroom are-unlimited learning, easily accessible, affordable, flexible as per the need and time of the learner, practical and proven. Virtual classroom is important at this stage as it delivers messages fast, save time, money, paper; it brings back direct learning in an e-learning course as there is provision for recording and re-watching. It encourages social learning, helps to share personal experiences like classroom teaching and acts as clinic; it maximizes the industry network and brings the workplace into the classroom. A virtual classroom not only delivers course materials to the learners, but also provides a live, contextual and interactive environment for them. In addition, teachers can control the learning and teaching process as they do in the traditional classroom (Yang & Liu, 2007). Advances in technology have been used to propagate distance education as a system of choice especially for adult learners. Virtual classrooms provide one example. A virtual classroom is an online learning environment that contains all course materials (http://www.elearnportal.com/resources/getting-started/how-do-virtual-classrooms -work).

## OBJECTIVES OF THE STUDY
The objectives of the study are as follows:
1. To explore virtual class room and E learning.
2. To assess terminology related to virtual class room and E learning.
3. To find out the challenges of virtual class room and E learning.

## METHODOLOGY OF THE STUDY
The study was documentary analysis type. Information and data were collected from secondary sources. Information and data were collected from books, research reports, journals, different annual reports, different government and non government websites and different websites. A literature review was conducted by using the internet search, google databases with the virtual classroom. A hand search was also undertaken to relevant journals identified by the electronic search and additional articles identified from the reference list of the key articles. A number of articles have been found on virtual class room.

## DEFINITION OF VIRTUAL CLASSROOM
A virtual classroom is a digital learning environment that allows teachers and students to connect in online in real time. Virtual classrooms utilize video conferencing, online whiteboards and screen sharing to allow educators to hold live lectures, virtual office hours, and discussions with students in an interactive setting. Virtual classrooms are meant to replicate the experience of physical classrooms, with the added benefits of file sharing, instant feedback and interaction etc. in distance learning situations.

A virtual classroom refers to an online system that allows students and teachers to communicate and collaborate. Virtual classrooms are typically cloud-based learning solutions that are part of larger learning management systems (LMS). They are highly customizable and are accessible to users on a variety of devices, like smart phones, tablets and laptops.

A virtual classroom is an online teaching and learning environment where teachers and students can present course materials, engage and interact with other members of the virtual class, and work in groups together. The key distinction of a virtual classroom is that it takes place in a live, synchronous setting. Online coursework can involve the viewing of pre-recorded, asynchronous material, but virtual classroom settings involve live interaction between instructors and participants.

## EXAMPLES OF VIRTUAL CLASSROOM

There are a few different types of programs that are delivered via virtual classrooms, the most common of which we'll explain below:

### 1. MOOCs

MOOCs, or Massive Open Online Courses, are virtual classes that are available for anyone to enroll and participate in. MOOC providers offer different types of courses. Some are accredited and some are not, some are offered through universities and some are not, some are free and some require tuition, and some are offered with live virtual classroom work and some are not. Examples of MOOCs include courses offered through Coursera and edX.

### 2. Bootcamps

Bootcamps are another example of courses that can take place using virtual classrooms. Bootcamps for web development, graphic design, and data analytics (among many others) are offered in virtual or in-person settings and provide students with concentrated education and training in an industry they're trying to break into or advance in. Examples of bootcamp providers include Thinkful, General Assembly, and Galvanize.

### 3. Online Degree Programs

Online degree programs are offered by colleges and universities to deliver their degree programs in a virtual environment. Using online program management companies or their own internal resources, schools can recruit online students for their degree programs that are delivered into a webcam instead of a lecture hall. Many different schools offer online degree programs -- here's a comprehensive list of accredited programs.

## VIRTUAL LEARNING ENVIRONMENT

A virtual learning environment (VLE) in educational technology is a web-based platform for the digital aspects of courses of study, usually within educational institutions. They present resources, activities, and interactions within a course structure and provide for the different stages of assessment. VLEs also usually report on participation; and have some level of integration with other institutional systems. For teachers and instructors who edit them, VLEs may be used as authoring and design environments. VLEs have been adopted by almost all higher education institutions in the English-speaking world.

### 1. Components of Virtual learning environment

The following are the main components required for the best virtual learning environment or online education curriculum to take place.

**VLE learning platforms commonly allow:**
1) Content management – creation, storage, access to and use of learning resources
2) Curriculum mapping and planning – lesson planning, assessment and personalization of the learning experience
3) Learner engagement and administration – managed access to learner information and resources and tracking of progress and achievement
4) Communication and collaboration – emails, notices, chat, wikis, blogs
5) Real time communication – live video conferencing or audio conferencing

**A VLE may include some or all of the following elements:**
**The course syllabus**
1) Administrative information about the course: prerequisites, credits, registration, payments, physical sessions, and contact information for the instructor.
2) A notice board for current information about the ongoing course
3) The basic content of some or all of the course; the complete course for distance learning applications, or some part of it, when used as a portion of a conventional course. This normally includes material such as copies of lecture in the form of text, audio, or video presentations, and the supporting visual presentations
4) Additional resources, either integrated or as links to outside resources. This typically consists of supplementary reading or innovative equivalents for it.
5) Self-assessment quizzes or analogous devices, normally scored automatically

6) Formal assessment functions, such as examinations, essay submission, or presentation of projects. This now frequently includes components to support peer assessment

7) Support for communications, including e-mail, threaded discussions, chat rooms, Twitter and other media, sometimes with the instructor or an assistant acting as moderator. Additional elements include wikis, blogs, RSS and 3D virtual learning spaces.

8) Links to outside sources – pathways to all other online learning spaces are linked via the VLE (Virtual Learning Environment).

9) Management of access rights for instructors, their assistants, course support staff, and students

10) Documentation and statistics as required for institutional administration and quality control

11) Authoring tools for creating the necessary documents by the instructor, and, usually, submissions by the students

12) Provision for the necessary hyperlinks to create a unified presentation to the students.

13) Interactive online whiteboard for live virtual classes

A VLE is normally not designed for a specific course or subject, but is capable of supporting multiple courses over the full range of the academic program, giving a consistent interface within the institution and to some degree with other institutions using the system. The virtual learning environment supports the worldwide exchange of information between a user and the learning institute he or she is currently enrolled in through digital mediums like e-mail, chat rooms, web 2.0 sites or a forum.

## 2. Student accessibility features in Virtual learning

One of the processes to enhance the learning experience was the virtual resource room, which is student-centered, works in a self-paced format, and which encourages students to take responsibility for their own learning. In virtual mode, the materials are available in the form of computer-aided learning programs, lecture notes, special self-assessment modules. Another mechanism for the student to student interactions in a form of simple discussion forum is by using a novel link cyber tutor. This allows the students with an email account to connect with course content and the staff with their doubts and related questions. The students are able to contact the staff without a face to face visit which saves the on-campus time. The staff remains anonymous which allows for the several staff to act as a cyber tutor during the course. The student does not remain anonymous, although their email address is cryptic enough to mask their identity. Students can discuss the exams, lab reports, posters, lectures, and technical help with downloading materials. The evaluation of the use of a Virtual resource room is done by surveys, focus groups, and online feedback forms. The students have 24 hours of access to the learning material in a day which suits their lifestyles.

## SIMILAR TERMS FOR VIRTUAL LEARNING ENVIRONMENT

Computerized learning systems have been referred to as electronic educational technology, e-learning, learning platform or learning management system. The major difference is that VLE and LMS are applications, whereas the Learning Platform shares characteristics with an Operating System where different educational web-based applications can be run on the platform. The terms virtual learning environment (VLE) and learning platform are generically used to describe a range of integrated web-based applications that provide teachers, learners, parents and others involved in education with information, tools, and resources to support and enhance educational delivery and management. These terms are broadly synonymous with 'managed learning environments' (MLEs) and 'managed virtual learning environments' (MVLEs).The applications that form part of these online services can include web pages, email, message boards, and discussion forums, text and video conferencing, shared diaries, online social areas, as well as assessment, management, and tracking tools.

The term learning platform refers to a range of tools and services often described using terms such as educational extranet, VLE, LMS, ILMS and LCMS providing learning and content management. The term learning platform also includes the personal learning environment (PLE) or personal online learning space (POLS), including tools and systems that allow the development and management of portfolios. The specific functionality associated with any implementation of a learning platform will vary depending upon the needs of the users and can be achieved by bringing together a range of features from different software solutions either commercially available, open source, self-built or available as free to use web services. These tools are delivered together via a cohesive user environment with a single entry point, through integration achieved by technical standards.

Other related concepts include content management system (CMS) which properly refers to the organization of the educational or other content, not the overall environment; learning content management system (LCMS), which is more often used for corporate training systems than for systems in education institutions; managed learning environment (MLE), which normally refers to the overall infrastructure in an institution of which the VLE is a component, learning support system (LSS); online learning center (OLC); or learning platform (LP), education via computer-mediated communication (CMC); or online education. The term "virtual learning environment" is more commonly used in Europe and Asia, while the synonymous term "learning management system" is the more common usage in North America. The term LMS can also mean a "library management system" (which is now more commonly referred to as integrated library system, or ILS).

## JUSTIFICATION OF VIRTUAL LEARNING ENVIRONMENT
**Middle School and High School use VLEs in order to:**
1) Increase academic performance in order to meet standards to graduate.
2) Address the diverse learning needs of all students with the digital curriculum.
3) Personalize learning to better meet the needs of all students including underachieving and accelerated learners.
4) Equip administrators, teachers, and students with real-time progress and performance to make informed decisions to track success.*

Institutions of higher and further education use VLEs in order to:
1) Economize on the time of teaching staff, and the cost of instruction.
2) Facilitate the presentation of online learning by instructors without web authoring experience.
3) Provide instruction in a flexible manner to students with varying time and location constraints.
4) Provide instruction in a manner familiar to the current web-oriented generation of students.
5) Facilitate the networking of instruction between different campuses or even colleges.
6) Provide for the reuse of common material among different courses.
7) Provide automatic integration of the results of student learning into campus information systems.
8) Provide the ability to deliver various courses to a large number of students.

Online learners performed modestly better, on average than those learning the same material through traditional face-to-face instruction.

## CONTROVERSY OF VIRTUAL LEARNING ENVIRONMENT
VLEs are supposed to support many 21st century skills, including:
1) Cultural and global awareness: Students have access to a wide network of people and information.
2) Self-direction: Students are able to work at their own pace.
3) Information and communication technology literacy: Students use technology to obtain and present information.
4) Problem solving skills: Students are required to demonstrate their knowledge and skills in order to be assessed, and they often participate in group thinking and discussion.
5) Time management: Students are required to meet deadlines.

Both supporters and critics of virtual learning environments recognize the importance of the development of such skills, including creativity, communication, and knowledge application; however, the controversy lies in whether or not virtual learning environments are practical for both teachers and students.

Critics of VLE worry about the disconnection that can occur between the teacher and students, as well as between students to student. A Virtual Learning Environment does not provide students with face-to-face interaction and therefore, can deprive students of opportunities for better communication and deeper understanding. Educators also have concerns pertaining to a student's computer literacy skills and access to quality technology. Both can create a challenge for students to succeed in a Virtual Learning Environment. A study among Indian students has suggested that a negative experience with virtual learning environments can leave "the learner with a passive, un-engaging experience, leading to incomplete learning and low performance". The VLE leads to a reported higher computer self-efficacy, while participants report being less satisfied with the learning process that is achieved in the Virtual Learning Environment.

## STANDARDS OF VIRTUAL LEARNING ENVIRONMENT

Most VLEs support the Shareable Content Object Reference Model (SCORM) as a standard, but there are no commonly used standards that define how the learner's performance within a course can be transferred from one VLE to another. There are also standards for sharing content such as those defined by the IMS Global Consortium. Local bodies such as in the school's sector in the UK the DCSF via Becta have additionally defined a learning platform "conformance framework" to encourage interoperability. Virtual learning environments are not limited only to students and learners in university-level studies. There are many virtual learning environments for students in grades K-12. These systems are also particularly suited for the needs of independent educational programs, charter schools, and home-based education. As virtual teaching and learning become more deeply integrated into curricula, it is important to assess the quality and rigor of virtual programs. The Virtual Learning Program Standards provide a framework for identifying key areas for effective teaching and learning in Virtual Learning Programs throughout the Northeast and the nation.

## ASSESSMENTS OF VIRTUAL LEARNING ENVIRONMENT

Educators need benchmark tools to assess a virtual learning environment as a viable means of education. Walker developed a survey instrument known as the Distance Education Learning Environment Survey (DELES), which is accessible to students anywhere. DELES examine instructor support, student interaction, and collaboration, personal relevance, authentic learning, active learning, and student autonomy. Harnish and Reeves provide a systematic criteria approach based on training, implementation, system usage, communication, and support.

## BENEFITS OF VIRTUAL CLASSROOM

### 1. Virtual classrooms enable distance learning for students.

Virtual classrooms are undoubtedly much easier for students to learn new subjects and skills. Online learning makes it possible for working professionals, people with busy home lives, or people with fewer financial resources to learn new skills and grow their knowledge.

### 2. Virtual classrooms make it easier for instructors to share and monetize training.

Similarly, MOOCs, online learning platforms, bootcamps, and online degree programs make it possible for institutions and educators to share and monetize their training and teaching without having to travel to different locations to do so.

### 3. Virtual classrooms help established universities grow brand presence.

For colleges and universities that are trying to grow their brand presence and attract more students, offering online courses delivered through virtual classrooms can be a smart way to reach more students who aren't in their geographic area.

## VIRTUAL SCHOOL

**Virtual School or** e-school) teaches students entirely or primarily online or through the Internet. It has been defined as "education that uses one or more technologies to deliver instruction to students who are separated from the instructor and to support regular and substantive interaction among the students. Online education exists all around the world and is used for all levels of education (K-12 High School/secondary school, college, or graduate school). This type of learning enables the individuals to earn transferable credits, take recognized examinations, or advance to the next level of education over the Internet. Virtual education is most commonly used at the high school or college level. Students, who are of the age 30 or older, tend to study online programs at higher rates. This group represents 41% of the online education population, while 35.5% of students ages 24–29 and 24.5% of students' ages 15–23 participate in virtual education. Virtual education is becoming increasingly used worldwide. There are currently more than 4,700 colleges and universities that provide online courses to their students. In 2015, more than 6 million students were taking at least one course online, this number grew by 3.9% from the previous year. 29.7% of all higher education students are taking at least one distance course. The total number of students studying on a campus exclusively dropped by 931,317 people between the years 2012 and 2015. Experts say that because the number of students studying at the college level is growing, there will also be an increase in the number of students enrolled in distance learning. Instructional models vary, ranging from distance learning types which provide study materials for independent self-paced study, to live, interactive classes where students

communicate with a teacher in a class group lesson. Class sizes range widely from a small group of 6 pupils or students to hundreds in a virtual school.

The courses that are independent and self-paced are called asynchronous courses. Typically for this type of learning, the students are given the assignments and information and are expected to complete the assignments by the due date. This is done on their own time. There is no scheduled time when the class meets. Usually, the only interactions that take place are through discussion boards, blogs, and wikis. On the other hand, synchronous online courses happen in real-time. The instructor and students all interact online at the same time. This is done either through text, video, or audio chat. Therefore these lessons are socially constructed. In addition to the scheduled class time, there are usually additional assignments to complete. A key to keeping Kindergartners engaged in distance learning can be challenging. Individualizing lessons and giving mini breaks can help students stay engaged during short synchronous sessions. As an educator you have to find creative ways to keep children attention on the screen especially since they're in the comfort of their home with all their toys and all the other luxury's within the house they desire. It is hard to keep their attention in the classroom so virtual learning now becomes extremely harder.

Secondary school age students have to be extremely disciplined and focused in order to be successful in virtual learning. Just like being at an actual school, these pre-teens and teenagers have to make sure they are presentable/looking good before logging onto their classes and have to greet all of their friends and turn off their cellphones before the lesson begins because that will be a big distraction for them just as it would in the classroom. Some of the same problems that exist at school have the potential of existing at home with virtual school. Hybrid, sometimes also called blended, courses are when students learn and interact both in-person and online. These classes meet in-person during the semester in addition to computer-based communication.

## VIRTUAL SCHOOL TECHNOLOGY
Virtual classrooms are made possible through the use of educational technology with the help of the internet. The internet itself can be credited on what enabled modern distance learning to be developed. The internet can allow the virtual student to have access to resources such as virtual test taking functions, systems that aide coursework to include electronic reading materials, podcasts to allow the student to have easy access to the lectures and chat rooms. During the COVID-19 pandemic, the United States began to encourage social distancing in the education system. One use of technology that was found to be resourceful in the collaboration of students and teachers in virtual learning was the use of video conferencing. The utilization of web videoconferencing allows a student to communicate virtually with their teacher or any other mentor through the use of the apps Zoom and Cisco WebEx. Zoom is a web video conferencing app that is free of download on a mobile device, laptop, or desktop. Through the use of zoom, one on one or group meetings can occur between the students and teachers virtually. This app allows the teacher to share their screen to show exactly what they are teaching and even gives the option to screen record their lectures to make it accessible to the student for future use as a resource. Cisco Webex offers a lot of the same features as Zoom such as multiple users being on at once, video connection, and screen-sharing. To engage virtual students even further, a process known as gamification can be used to teach a student learning material in a form of a game to bring more enjoyment in a student's learning experience. Second life, an online virtual world, is a type of gamification system that is used for online educational purposes. Second life can be used as a substitute for face to face learning. It has qualities that resembles an in person curriculum such as class discussions, participation in lectures, and completing assignments. Gamification can also serve as an aide to increase a student's intrinsic motivation. The use of rewarding points while a student is using a gamification system can enhance internal motivation and motivate the student to accomplish learning goals from the game's objective. During the COVID-19 pandemic, many schools turned to virtual learning.

## COSTS AND ACCESSIBILITY OF VIRTUAL SCHOOL
Where online methods are integrated with State provision, costs follow state school standards. Otherwise, fees must be met by the student or parents. Many US school districts are now creating their own online services to avoid paying external providers. Such students can graduate from their home district without ever leaving home. In most of these cases, students are given computers, books, and even Internet service to complete coursework from home. With the resources of the Internet as a library, and the ease of making online study materials, there is usually a comparatively small requirement for textbooks. Most courses will

provide electronic materials free of cost, or these will be included in the course fee. Text books are most often required for an exam syllabus course.

## ADVANTAGES AND DISADVANTAGES OF ONLINE EDUCATION

Potential advantages:

- Personal circumstances or health disruptions, specifically contagious viruses such as COVID-19 and the Common cold, or injuries will not halt learning since the physical demands are much less.
- Digital transcripts of lessons can additionally help absent students with learning missed curriculum.
- Online learning is ideal for students and families who need flexible arrangements. However, synchronous learning does impose limits due to time zones.
- The integration of Internet resources provides a huge library of content, and students quickly become proficient with online research, resources, and tools.
- Greater flexibility enables independent students such as self-learners or gifted students to explore learning beyond the standard curriculum, pursue individual skills and ambitions, or develop at their own preferred pace using online resources. Part-time students with jobs or family commitments may benefit from the flexibility of online schedules.
- Online schools can be equalizers, as age, appearance, and background are far less obvious, and therefore this can minimize harassment, prejudice, or discrimination. Instead, groups are categorized by personal ability.
- Students may benefit from exposure to others in different cultures of the world, which can enrich their understanding of history, geography, religions and politics, and develops social skills.
- Online education may collaboratively engage in or discuss universal or real-world issues, which are necessary skills for a successful career.
- Increased accessibility to remote education for poor or rural areas where commuting to schools or lack of resources are concerns.
- Increased opportunities may allow a student to take more courses they are interested in that are not offered near them.
- Cost-effective for schools or districts since it allows teachers to instruct more students than in a face-to-face classroom setting.
- Online courses may be less expensive for students than traditional classes since less resources may be required. Additionally, many learning resources online are free, easy to access, self-paced, and beginner-friendly.

## Potential disadvantages:

- Remote learning can reduce engagement, interaction, and lead to a lack of socialization, which can potentially decrease a student's social competence or skills such as their ability to cooperate with others.
- A home or online environment may potentially be more distracting or disrupting than a physical school environment.
- Organizing an online school may be more expensive and more complicated to organize or lead.
- Those without access to technology or devices would not have access to virtual education.
- Many virtual schools are relatively new and inexperienced, and therefore may be unfit for educating students properly.
- Technology or the Internet can be more unpredictable since it may be vulnerable to power outages, Internet outages, hacks, exploits, online trolling, glitches, or errors that can potentially be more difficult to fix or deal with when online.
- Potential employers may be skeptical of the credibility of online degrees and virtual programs.
- Cheating online may be easier or more tempting since online resources may be more accessible and restrictions or consequences may be more lenient. The increased anonymity online may further encourage or allow the continuance of misbehavior such as trolling.
- Online schools may be too lenient or disengaging, thus may potentially encourage or harbor potentially damaging and undisciplined behavior that could threaten a student's future or career.
- Not using the physical tools might diminish a student's ability or competence.
- Online can be potentially limiting since physical activities or hands on activities, specifically for courses like Physical education and Chemistry, may be more difficult to engage in or occur less frequent.

## DISTANCE EDUCATION

Distance education, also known as distance learning, is the education of students who may not always be physically present at a school. Traditionally, this usually involved correspondence courses wherein the student corresponded with the school via mail. Today, it usually involves online education. Distance learning programme can be completely distance learning, or a combination of distance learning and traditional classroom instruction (called hybrid or blended). Massive open online courses (MOOCs), offering large-scale interactive participation and open access through the World Wide Web or other network technologies, are recent educational modes in distance education. A number of other terms (distributed learning, e-learning, m-learning, online learning, virtual classroom etc.) are used roughly synonymously with distance education.

## COVID-19 PANDEMIC

The COVID-19 pandemic resulted in the closure of the vast majority of schools worldwide. Many schools moved to online remote learning through platforms including—but not limited to—Zoom, Cisco Webex, Google Classroom, Google Meet, Microsoft Teams, D2L, and Edgenuity. Concerns arose over the impact of this transition on students without access to an internet-enabled device or a stable internet connection. Distanced education during the COVID-19 pandemic has interrupted synchronous learning for many students and teachers; where educators were no longer able to teach in real time and could only switch to asynchronous instruction, this significantly and negatively affected their coping with the transition, and posed various legal issues, especially in terms of copyright. A recent study about the benefits and drawbacks of online learning found that students have had a harder time producing their own work. The study suggests teachers should cut back on the amount of information taught and incorporate more activities during the lesson, in order for students to create their own work.

## TECHNOLOGIES OF DISTANCE LEARNING

Internet technology has enabled many forms of distance learning through open educational resources and facilities such as e-learning and MOOCs. Although the expansion of the Internet blurs the boundaries, distance education technologies are divided into two modes of delivery: synchronous learning and asynchronous learning. In synchronous learning, all participants are "present" at the same time in a virtual classroom, as in traditional classroom teaching. It requires a timetable. Web conferencing, video conferencing, educational television, instructional television are examples of synchronous technology, as are direct-broadcast satellite (DBS), internet radio, live streaming, telephone, and web-based VoIP. Web conferencing software helps to facilitate class meetings, and usually contains additional interaction tools such as text chat, polls, hand raising, emoticons etc. These tools also support asynchronous participation by students who can listen to recordings of synchronous sessions. Immersive environments (notably Second Life) have also been used to enhance participant presence in distance education courses. Another form of synchronous learning using the classroom is the use of robot proxies including those that allow sick students to attend classes.

Some universities have been starting to use robot proxies to enable more engaging synchronous hybrid classes where both remote and in-person students can be present and interact using telerobotics devices such as the Kubi Telepresence robot stand that looks around and the Double Robot that roams around. With these telepresence robots, the remote students have a seat at the table or desk instead of being on a screen on the wall. In asynchronous learning, participants access course materials flexibly on their own schedules. Students are not required to be together at the same time. Mail correspondence, which is the oldest form of distance education, is an asynchronous delivery technology, as are message board forums, e-mail, video and audio recordings, print materials, voicemail, and fax.

The two methods can be combined. Many courses offered by both open universities and an increasing number of campus-based institutions use periodic sessions of residential or day teaching to supplement the sessions delivered at a distance. This type of mixed distance and campus-based education has recently come to be called "blended learning" or less often "hybrid learning". Many open universities use a blend of technologies and a blend of learning modalities (face-to-face, distance, and hybrid) all under the rubric of "distance learning".

Distance learning can also use interactive radio instruction (IRI), interactive audio instruction (IAI), online virtual worlds, digital games, webinars, and webcasts, all of which are referred to as e-Learning.

## INTERNET FOR DISTANCE LEARNING

The widespread use of computers and the internet have made distance learning easier and faster, and today virtual schools and virtual universities deliver full curricula online. The capacity of Internet to support voice, video, text and immersion teaching methods made earlier distinct forms of telephone, videoconferencing, radio, television, and text based education somewhat redundant. However, many of the techniques developed and lessons learned with earlier media are used in Internet delivery. The first totally online courses for graduate and undergraduate credit were offered starting in the fall of 1985 by Connected Education through The New School in New York City, with students earning the MA in Media Studies completely online via computer conferencing, with no in-person requirements. This was followed in 1986 by the University of Toronto through the Graduate School of Education (then called OISE: the Ontario Institute for Studies in Education), offering a course in "Women and Computers in Education", dealing with gender issues and educational computing. The first new and fully online university was founded in 1994 as the Open University of Catalonia, headquartered in Barcelona, Spain. In 1999 Jones International University was launched as the first fully online university accredited by a regional accrediting association in the US.

Between 2000 and 2008, enrollment in distance education courses increased rapidly in almost every country in both developed and developing countries. Many private, public, non-profit and for-profit institutions worldwide now offer distance education courses from the most basic instruction through to the highest levels of degree and doctoral programmes. New York University, International University Canada, for example, offers online degrees in engineering and management-related fields through NYU Tandon Online.

Levels of accreditation vary: widely respected universities such as Stanford University and Harvard now deliver online courses but other online schools receive little outside oversight, and some are actually fraudulent, i.e., diploma mills. In the US, the Distance Education Accrediting Commission (DEAC) specializes in the accreditation of distance education institutions. In the United States in 2011, it was found that a third of all the students enrolled in postsecondary education had taken an accredited online course in a postsecondary institution. Growth continued. In 2013 the majority of public and private colleges offered full academic programmes online. Programmes included training in the mental health, occupational therapy, family therapy, art therapy, physical therapy, and rehabilitation counseling fields. By 2008, online learning programmes were available in the United States in 44 states at the K-12 level. Internet forums, online discussion group and online learning community can contribute to a distance education experience. Research shows that socialization plays an important role in some forms of distance education. E Courses are available from websites such as Khan Academy and Master Class on many topics.

## PACED AND SELF-PACED MODELS FOR DISTANCE EDUCATION

Most distance education uses a paced format similar to traditional campus-based models in which learners commence and complete a course at the same time. Some institutions offer self-paced programmes that allow for continuous enrollment, and the length of time to complete the course is set by the learner's time, skill, and commitment levels. Self-paced courses are almost always offered asynchronously. Each delivery method offers advantages and disadvantages for students, teachers, and institutions. Kaplan and Haenlein classify distance education into four groups according to "Time dependency" and "Number of participants":

1) MOOCs (Massive Open Online Courses): Open-access online course (i.e., without specific participation restrictions) that allows for unlimited (massive) participation;
2) SPOCs (Small Private Online Courses): Online course that only offers a limited number of places and therefore requires some form of formal enrollment;
3) SMOCs (Synchronous Massive Online Courses): Open-access online course that allows for unlimited participation but requires students to be "present" at the same time (synchronously);
4) SSOCs (Synchronous Private Online Courses): Online course that only offers a limited number of places and requires students to be "present" at the same time (synchronously).

Paced models are a familiar mode since they are used almost exclusively in campus-based schools. Institutes that offer both distance and campus programmes usually use paced models so that teacher workload, student semester planning, tuition deadlines, exam schedules, and other administrative details can be synchronized with campus delivery. Student familiarity and the pressure of deadlines encourage students to readily adapt

to and usually succeed in paced models. However, student freedom is sacrificed as a common pace is often too fast for some students and too slow for others. In additional life events, professional or family responsibilities can interfere with a student's capability to complete tasks to an external schedule. Finally, paced models allow students to readily form communities of inquiry and to engage in collaborative work. Self-paced courses maximize student freedom, as not only can students commence studies on any date, but they can complete a course in as little time as a few weeks or up to a year or longer. Students often enroll in self-paced study when they are under pressure to complete programmes, have not been able to complete a scheduled course, need additional courses, or have pressure which precludes regular study for any length of time. The self-paced nature of the programming, though, is an unfamiliar model for many students and can lead to excessive procrastination, resulting in course incompletion. Assessment of learning can also be challenging as exams can be written on any day, making it possible for students to share examination questions with resulting loss of academic integrity. Finally, it is extremely challenging to organize collaborative work activities, though some schools are developing cooperative models based upon networked and connectivist pedagogies for use in self-paced programmes.

## BENEFITS OF DISTANCE LEARNING

Distance learning can expand access to education and training for both general populace and businesses since its flexible scheduling structure lessens the effects of the many time-constraints imposed by personal responsibilities and commitments. Devolving some activities off-site alleviates institutional capacity constraints arising from the traditional demand on institutional buildings and infrastructure. Furthermore, there is the potential for increased access to more experts in the field and to other students from diverse geographical, social, cultural, economic, and experiential backgrounds. As the population at large becomes more involved in lifelong learning beyond the normal schooling age, institutions can benefit financially, and adult learning business courses may be particularly lucrative. Distance education programmes can act as a catalyst for institutional innovation and are at least as effective as face-to-face learning programmes, especially if the instructor is knowledgeable and skilled. Distance education can also provide a broader method of communication within the realm of education. With the many tools and programmes that technological advancements have to offer, communication appears to increase in distance education amongst students and their professors, as well as students and their classmates.

The distance educational increase in communication, particularly communication amongst students and their classmates is an improvement that has been made to provide distance education students with as many of the opportunities as possible as they would receive in in-person education. The improvement being made in distance education is growing in tandem with the constant technological advancements. Present-day online communication allows students to associate with accredited schools and programmes throughout the world that are out of reach for in-person learning. By having the opportunity to be involved in global institutions via distance education, a diverse array of thought is presented to students through communication with their classmates. This is beneficial because students have the opportunity to "combine new opinions with their own, and develop a solid foundation for learning". It has been shown through research that "as learners become aware of the variations in interpretation and construction of meaning among a range of people [they] construct an individual meaning, which can help students, become knowledgeable of a wide array of viewpoints in education.

To increase the likelihood that students will build effective ties with one another during the course, instructors should use similar assignments for students across different locations to overcome the influence of co-location on relationship building. The high cost of education affects students in higher education, to which distance education may be an alternative in order to provide some relief. Distance education has been a more cost-effective form of learning, and can sometimes save students a significant amount of money as opposed to traditional education. Distance education may be able to help to save students a considerable amount financially by removing the cost of transportation. In addition, distance education may be able to save students from the economic burden of high-priced course textbooks. Many textbooks are now available as electronic textbooks, known as e-textbooks, which can offer digital textbooks for a reduced price in comparison to traditional textbooks. Also, the increasing improvements in technology have resulted in many school libraries having a partnership with digital publishers that offer course materials for free, which can help students significantly with educational costs. Within the class, students are able to learn in ways that traditional classrooms would not be able to provide. It is able to promote good learning experiences and

therefore, allow students to obtain higher satisfaction with their online learning. For example, students can review their lessons more than once according to their needs.

Students can then manipulate the coursework to fit their learning by focusing more on their weaker topics while breezing through concepts that they already have or can easily grasp. When course design and the learning environment are at their optimal conditions, distance education can lead students to higher satisfaction with their learning experiences. Studies have shown that high satisfaction correlates to increased learning. For those in a healthcare or mental health distance learning programme, online-based interactions have the potential to foster deeper reflections and discussions of client issues as well as a quicker response to client issues, since supervision happens on a regular basis and is not limited to a weekly supervision meeting. This also may contribute to the students feeling a greater sense of support, since they have ongoing and regular access to their instructors and other students. Distance learning may enable students who are unable to attend a traditional school setting, due to disability or illness such as decreased mobility and immune system suppression, to get a good education. Children who are sick or are unable to attend classes are able to attend them in "person" through the use of robot proxies. This helps the students have experiences of the classroom and social interaction that they are unable to receive at home or the hospital, while still keeping them in a safe learning environment.

Over the last few years more students are entering safely back into the classroom thanks to the help of robots. An article from the New York Times, "A Swiveling Proxy Will Even Wear a Tutu", explains the positive impact of virtual learning in the classroom, and another that explains how even a simple, stationary telepresence robot can help. Distance education may provide equal access regardless of socioeconomic status or income, area of residence, gender, race, age, or cost per student. Applying universal design strategies to distance learning courses as they are being developed (rather than instituting accommodations for specific students on an as-needed basis) can increase the accessibility of such courses to students with a range of abilities, disabilities, learning styles, and native languages. Distance education graduates, who would never have been associated with the school under a traditional system, may donate money to the school. Distance learning may also offer a final opportunity for adolescents that are no longer permitted in the general education population due to behavior disorders. Instead of these students having no other academic opportunities, they may continue their education from their homes and earn their diplomas, offering them another chance to be an integral part of society.

Distance learning offers individuals a unique opportunity to benefit from the expertise and resources of the best universities currently available. Moreover, the online environment facilitates pedagogical innovation such as new programme structures and formats. Students have the ability to collaborate, share, question, infer, and suggest new methods and techniques for continuous improvement of the content. The ability to complete a course at a pace that is appropriate for each individual is the most effective manner to learn given the personal demands on time and schedule. Self-paced distance learning on a mobile device, such as a smart phone, provides maximum flexibility and capability. Distance learning can also reduce the phenomenon of rural exodus by enabling students from remote regions to remain in their hometowns while pursuing higher education. Eliminating the distance barrier to higher education can also increase the number of alternatives open to students, and foster greater competition between institutions of higher learning regardless of geography.

## EDUCATIONAL TECHNOLOGY FOR DISTANCE EDUCATION

The modern use of electronic educational technology (also called e-learning) facilitates distance learning and independent learning by the extensive use of information and communications technology (ICT), replacing traditional content delivery by postal correspondence. Instruction can be synchronous and asynchronous online communication in an interactive learning environment or virtual communities, in lieu of a physical classroom. "The focus is shifted to the education transaction in the form of a virtual community of learners sustainable across time."One of the most significant issues encountered in the mainstream correspondence model of distance education is the transactional distance, which results from the lack of appropriate communication between learner and teacher. This gap has been observed to become wider if there is no communication between the learner and teacher and has direct implications over the learning process and future endeavors in distance education. Distance education providers began to introduce various strategies, techniques, and procedures to increase the amount of interaction between learners and teachers. These measures e.g. more frequent face-to-face tutorials, increased use of information

and communication technologies including teleconferencing and the Internet, were designed to close the gap in transactional distance.

## CREDENTIALS OF DISTANCE LEARNING

Online credentials for learning are digital credentials that are offered in place of traditional paper credentials for a skill or educational achievement. Directly linked to the accelerated development of internet communication technologies, the development of digital badges, electronic passports and massive open online courses (MOOCs) have a very direct bearing on our understanding of learning, recognition and levels as they pose a direct challenge to the status quo. It is useful to distinguish between three forms of online credentials: Test-based credentials, online badges, and online certificates.

## CHALLENGES FOR TEACHING IN VIRTUAL CLASSROOM

The challenges in a virtual learning may be internal or subjective and external or objective from the perspective of the teacher and the taught. Being teachers, perhaps it is better to probe into the internal challenges first, so that we can introspect into it in order to create better teaching learning situation for all. Some of the challenges or obstacles within are:

1. Lack of interest within teachers to learn and adapt to new learning situations – it has been observed that there is a lack of motivation and interest among some teachers to learn new things, as they often feel that ICT based learning is only for students of science stream. Even if it is learnt, teachers should use the techniques regularly, otherwise may be difficulty in retaining the knowledge.
2. Unwillingness to learn and apply ICT in classroom – even if the techniques are learnt, there is inhibition in applying in the classroom. Teachers do not feel comfortable in presenting it in front of students or audience.
3. Age old belief into the effectiveness of chalk and talk method of teaching – teachers unwilling to adapt to this technology often cite the effectiveness of the age old method of teaching.
4. Time consuming with respect to preparation of lecture materials – teachers often feel that preparing for virtual classroom, especially in the initial stages, is wastage of time.
5. Grasp over language often acts as a barrier as virtual classrooms. A teacher may be academically sound but may not be communicative with the students. Communication skills of the teacher play an important role in this respect as it is essential to sustain the interest of the students in the virtual classroom, so that they are also motivated to interact with the teacher and among themselves.
6. Difficulty in preparing the study material with respect to the medium of instruction (for example, preparing virtual learning materials in vernaculars) after act as a barrier.
7. Fear of students looking into inappropriate sites (Tipton et al, 1998).
8. Inability to motivate the students to use virtual learning mode, to prepare study materials.
9. Due to absence of face-to-face contact, the bond between teacher and taught is not formed.

Some challenge or obstacles found among the students are –
1. Lack of awareness among the students regarding the importance and benefits of virtual learning.
2. Lack of interest and motivation among the students to learn.
3. Lack of interest and motivation among the students to use it for learning purpose, although they use latest technological gadgets.
4. Financial condition of the students is an important challenge.
5. Sustenance of the interest to attend virtual classes.
6. Inadequate practice on their part also results in forgetting the techniques.
7. Language problem is a challenge. Inability of students to understand and use English is still a challenge for the students of our country.

The external challenges are –
1. Lack of interest of authority in preparing or providing the appropriate infrastructure.
2. Lack of awareness of the benefits of virtual learning.
3. Lack of coordination between the educational institutions and the community.
4. Does not provide hands on experience as required in some subjects or courses.

In order to overcome the challenges, it is essential to have an idea of the advantages or benefits of virtual learning. They are –

1. Virtual learning has no boundary.
2. Virtual learning saves paper as study materials are provided online.
3. It saves time and money. Virtual learning can take place anywhere provided there is an internet connection or resources available.
4. Saves the time of going through handwriting of the teacher and the taught.
5. Can save space and effort as the books need not be physically stored and maintained.
6. It helps to categorize study materials easily.
7. It is easily accessible by the teachers and the taught (Jason, 2001).
8. Increases intellectual and social partnership, group cohesion and mutual support (Husu, 2000).

## OPPORTUNITIES FOR TEACHING IN VIRTUAL CLASSROOM

The strategies that may be adapted in order to overcome the above challenges and create new opportunity to teach and learn are:

The challenges in a virtual learning may be internal or subjective and external or objective from the perspective of the teacher and the taught. Being teachers, perhaps it is better to probe into the internal challenges first, so that we can introspect into it in order to create better teaching learning situation for all. Some of the challenges or obstacles within are –

1. Lack of interest within teachers to learn and adapt to new learning situations – it has been observed that there is a lack of motivation and interest among some teachers to learn new things, as they often feel that ICT based learning is only for students of science stream. Even if it is learnt, teachers should use the techniques regularly, otherwise there may be difficulty in retaining the knowledge.
2. Unwillingness to learn and apply ICT in classroom – even if the techniques are learnt, there is inhibition in applying in the classroom. Teachers do not feel comfortable in presenting it in front of students or audience.
3. Age old belief into the effectiveness of chalk and talk method of teaching – teachers unwilling to adapt to this technology often cite the effectiveness of the age old method of teaching.
4. Time consuming with respect to preparation of lecture materials – teachers often feel that preparing for virtual classroom, especially in the initial stages, is wastage of time.
5. Grasp over language often acts as a barrier as virtual classrooms. A teacher may be academically sound but may not be communicative with the students. Communication skills of the teacher play an important role in this respect as it is essential to sustain the interest of the students in the virtual classroom, so that they are also motivated to interact with the teacher and among themselves.
6. Difficulty in preparing the study material with respect to the medium of instruction (for example, preparing virtual learning materials in Bengali) is an important factor.
7. Fear of students looking into in appropriate sites (Tipton et al, 1998).
8. Inability to motivate the students to use virtual learning mode.
9. Due to absence of face-to-face contact, the bond between teacher and taught is not formed.

## CONCLUSION

From the study it was evident that virtual classroom and E learning plays significant roles in different situations. All stakeholders of education should have well concepts, well practical knowledge about virtual classroom and E learning, ICT related knowledge, knowledge related computer and smartphone. Government should provide economic and technical supports to all stakeholders of education. Government should provide required training for teachers and students. Correct application of electronic gadgets in teaching and learning environment can make a difference in the educational status ultimately to the prosperity of the virtual classroom. Giving attention to the pedagogical and instructional aspects is a basic remark as one of the most important aspects of the virtual classroom. The study found that there are so many obstacles for teaching in virtual classroom. And there are many advantages for teaching in virtual classroom. If we continue to assess, improve, and therefore accumulate knowledge of teaching and learning effectiveness in an online environment, we hope that both teacher and student will achieve a greater understanding and enjoy the learning. Therefore all will get benefit from the new mode of instruction and teaching through virtual class room and E learning.

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