

Virtual Classroom: Need of the Era

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ABSTRACT-- Virtual classroom overcomes the challenges and difficulties which present in a traditional classroom. Every student's motive is to concentrate on their studies in the classroom, and this research gives importance and motivation through an e-learning platform that is highly suitable for learning the subjects. The Virtual Classroom is the best well-experienced online teaching strategy. To increase the style of learning new tools and strategies introduced in online classroom environments such as animations and graphics are implemented. The purpose of this article is to offer the concepts on the e-learning platform used to maintain and improve the education and learning system at the universities. In this article, we discuss the various technologies that are being used in the e-learning system. This paper also uses Machine Learning and AI Techniques and virtual classroom explores Machine learning and AI techniques. To create virtual classrooms, distance education relies on the writing and technical support. With the aid of art, map, and live video sessions and many innovations, it is very easy for students to understand the subject matter. The teacher can quickly solve the problems and address them in the smart learning classroom. The implication is that students will more easily gain logical reasoning skills and knowledge in a virtual classroom. Essentially, the Virtual Classroom is better than the traditional classroom.

Keywords-- Machine Learning, Artificial Intelligence, Virtual Classroom, Virtual Classroom Technologies, Smart Classroom, E-Learning Platform, Online Learning Strategy.

I. INTRODUCTION

A virtual classroom can be described as a teacher-student interaction that is exactly like a real classroom. The word 'interaction' here means face-to-face contact, which is just like in physical classroom communication. The Virtual classroom offers a lot of things like online teacher interaction, learning by different techniques like virtual reality, easily viewing video lectures of different teachers, searching any related topic at any time and asking questions from anywhere. There is no time limit for research in the virtual classroom, if a student has a membership (Classroom Login ID and password) then he/she can log in from anywhere like home, office, cyber café, etc. Users who study from online classes do not need to waste their time by going to the learning institutes, which are sometimes far from the homes of the students. The Virtual classroom brings all of the study material to their house but if the user has an internet connection on their smart gadgets. The task of the teacher in a virtual classroom is to direct the students through different learning styles and solve in-class problems. There's no need to think about the skipped lessons or study material in a virtual classroom if users skip the lecture or

lesson for some reason or leave the class, then the session that the students miss will be registered in the classroom database. The virtual classroom consists of live chat, which can be audio and video, video conferencing, live presentation, instant subject reporting and reviews, a whiteboard for teachers and users, and

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smart assignments. With the aid of ML and AI, the virtual learning system can upgrade from previous experience, helping to store huge amounts of data, and extracting data holding multiple times or similar data from the system. This will help in storing and preserving the data. The future of higher education is directly proportional to the evolution of new technologies and the computing power of the new smart machines.

II. Literature Review

'Virtual classrooms' that are enabled by network technology in which learners and teachers interact through the online interface [1, 2]. Development in technology has made the development in virtual classrooms much easier, particularly within social disciplines [3]. Different tools and techniques used in virtual classrooms which is based on video conferencing system [4], multimedia environment [5], based on whiteboard and text chat [6]. There are many learning and teaching tools available for students, such as e-mail, YouTube and wikis, while some others use the Learning Management System (LMS) [8]. As new environments started to include more features [7]. Apart from the sound and video faults, the main objective is implementation and the usability of the environment [9-13]. The use of interactive classes was not just about distance learners, but also about blended instruction, or even as a complement to on-campus courses [14]. Live contact with distance learners and instructors can be used in a virtual classroom to better support student engagement, inspiring and motivating people [15] and help students to better form a learning community and avoid alienation, which is inversely related to the classroom community [16]. Group assignments in virtual classrooms improve the skill, design, learning ability, motivation and capacity of the students [17]. Machine learning examines researching and designing algorithms that can learn from and predict results. [18]. There's an artificial device that is avatar-based training modules that have been developed by the University of Southern California to send the military to foreign posts for military training. [19].

2.1. Benefits of Virtual Classroom

2.1.1. Time saving

There is a time limit in a traditional system, sometimes a student's questions aren't answered due to lack of timing, but in the virtual classroom, any learner or student from anywhere asks every query or question 24/7. There's no need to sit in the classroom and listen to lectures, just log in to the classroom servers and pick the module and choose subjects and teachers. It helps every learner to understand the topics with the aid of classroom resources.

2.1.2. Easily Understand the Concepts and Increase Learning Ability.

Virtual classrooms develop student skills by providing many functions, and learning becomes very easy. Students or users can access their account in the classroom and learn from anywhere, e.g. during an office break or school recess, or from anywhere, but most importantly classroom ID and connection are required. Experienced teachers manage the sessions in an online learning classroom and the students communicate easily with teachers and the teacher knows the smart methods and many ways to connect with the students.

2.1.3. Feedbacks and Rating System.

Feedback Form is provided to the students in school or college classrooms at the end of the semester. Feedback is like completing formalities in schools or colleges, and there is no value for feedback in schools or

colleges, but in a virtual classroom, feedback plays an important role as students receive hand-to-hand feedback after each session, and universities will see the feedback report on a daily basis. As a result, it will improve the skills and learning style of both students and teachers. In a virtual classroom system, the rating system is also implemented. After each session, a teacher rating is held in which AI technology is used. At the end of the month, the teacher's rating is observed and the best teacher will be easily available on the basis of their rating.

III. 3. Virtual Classroom Technologies

3.1. Games and Virtual Reality (VR)

Some parents complain that their kids are wasting their time with sports, but this demonstrates that children are interested in games and that challenges can be easily understood and measures and stages overcome. Kids can easily solve a game of hard difficulty, or they can easily understand and solve a difficult game of mystery/puzzle. This improves a student's ability for problem-solving. For military schools, several countries use simulations for students. Players are valuable for children in the classroom and veterans to easily grasp the military orders. Students can easily learn from videos based on the content of the topic, with the support of VR. BYJU'S, for example, is an online learning site for students. Users may apply a charge in connection with their courses in this sense, and become a classroom student. Byju's users benefit from immersive lectures and videos (video-recorded lessons and puzzle games) and instructors also know how to guide students through different learning styles and strategies.

3.2. Synchronous Learning

Synchronous learning is a real-time method for engagement between teachers and students. There is an online video messaging service and a live class session. Students interact and take part in a live training session in an online classroom and teachers often immediately answer the student's request. Digital communication is a must inside synchronous learning. The interaction of online teachers is very effective and helpful for students and motivated the students to study.

3.3. Functions of Audio and Video Tools in Virtual Classroom

The role of audio and video resources is extremely significant in the interactive classroom. There are available audio resources such as call calls, voice messages and multimedia devices such as video conferencing, online show, etc. Professors make a video slideshow and submit it in a remote classroom to students to build a messaging system for any concerns or performance issues. Students can also create and exchange their ppt in the school, and make an intelligent task (picture assignment, 3D graph, and diagrams) and apply it to the instructor during the online session.

3.4. Sessions Recording

If for some reason some student leaves their class then teachers do not provide the missed session in some cases and students just copy the missing work from other students. Many students are facing this problem. To overcome this problem, each session will be registered in the digital classroom after the session is finished and students can see or learn from the missed session.

3.5. White Board

The Whiteboard is the principal feature of teacher-student interaction. In the whiteboard, as in the physical classroom, we can draw, write and erase anything on the class board. It is the best tool in a virtual classroom since students can complete assignments with the aid of a whiteboard. It can also be used to draw graphs and diagrams in the virtual classroom and can be personalized. Teachers use diagrams in lectures and if there are no maps available in the whiteboard, teachers draw the diagram themselves.

3.6. Participation of Students

Students in the virtual classroom are not allowed to speak at the same time during the classes, in order to avoid messy situations. All teachers and students are linked to the audio and video conference, the professors track the engagement and involvement of the student and the discipline of the classroom. In the course of the lectures, when the instructor clarifies the student's doubt or question, then it shows ticks in the query parts. Students can set their status to raise hands suggesting the student has a question to answer. To avoid ambiguity and to remain concentrated and to clarify the doubts, only one student can ask questions at a time and the teachers have the control to answer the question or otherwise, the teacher disables the "raise hand" status and takes the questions after the session.

IV. Machine Learning and Artificial Intelligence used in Virtual Classroom.

Machine learning is the field of computer science which is based on artificial intelligence. A machine learning system learns from the previous work by itself or gaining knowledge from the previous work. Artificial intelligence made-up of two words: "artificial" and "intelligence." The artificial sense is a replication that is true to the original, and intelligence is the consistency that allows you to comprehend concepts and ideas easily. Artificial intelligence is not a machine, a tool or computing. It is used in structures or devices. The system does insightful research using Artificial Intelligence, which executes the task in a wise way. The job human beings can do, AI does it effortlessly in the computer field. Marks and grading system is easily done by machine learning in the smart learning platform. Optical recognition is used in the grading system in a smart learning environment AI technology complements grading with smart assessments that teachers can use for two purposes: adjusting classroom work to maximize efficiency and recommending individual tutoring. Machine learning and AI fields are currently working on algorithms and constructs of technology that could easily review and rate written tasks, such as essays. Teachers can also use cloud storage as it holds important universities documents and student marks in the cloud. It requires the security and preservation of all data if there are any defects in the university learning system. Cloud provides free storage of up to 5 GB of data for new members to be enrolled. The field in which the computer works intelligently is artificial intelligence, or we could also say that the idea of artificial intelligence derives from the human model. In virtual schools, there are many students, who belong to various cultures and do not learn English. Text files will be interpreted manually and subtitles of video files will appear in the language that the user is familiar with. All these can be achieved through artificial intelligence and natural language processing, just as the translation of words or phrases in many languages is mostly carried out by the Google translator.

V. Pros and Cons of Virtual Classrooms

5.1. Pros

Recently there are various models available in the virtual classroom. For Example Moodle, Vedamo, etc. The virtual classroom covers the drawback of physical classroom methods and virtual classroom provides quality education to the students.

There are many options in a virtual classroom. Firstly, students can choose their instructor on their own and the interactive classroom has no partiality. Second, students can learn from different notes, materials and so on.

The main advantage of using online learning platforms is that users become accustomed to giving presentations, attending live video conferences, participating in any event in which participants come from anywhere. As a consequence, confidence and abilities will increase and the standard and personality of learners also develop.

5.2. Cons

The primary goal of the virtual classroom is a face-to-face student and teacher online interaction. Sometimes it creates problems in video and audio sessions due to lack of network and power, as high bandwidth connectivity is required to access the virtual classroom.

The classroom has no rules and regulations and there is no rigor. Rules mean that there is no fixed time for attending or leaving the class. Users come online at any time and go offline. Even side-by-side users can do anything that includes viewing videos, using social media, gaming, text, etc. Users get less social and the list of friends gets fewer because there is no such thing as a traditional classroom meeting.

VI. Challenges

6.1. Data Storage

Data storage is one of the most important issues in which a vast amount of data is stored and online sessions are also documented and processed. A huge data warehouse is used to store all types of study materials, including audio, video, text, graphics, and images. Lectures and presentations of seminars are to be registered for future purposes.

6.2. High bandwidth and Connectivity Issues

Network access and high bandwidth are also required for the seamless use of virtual classrooms. Network access is needed for online classrooms and the high bandwidth network is also necessary. If there is a poor network, then it could be a problem while attending online lectures and interrupting other functions. Internet access is required for the virtual classroom. Sometimes the internet doesn't work properly or because of some reason, the internet has stopped working so all classroom activities can be lost.

VII. Conclusions

Designing a virtual classroom in a good and reputable university network guide for the efficient use of teaching resources, providing all details and full access, real-time and experienced features of the computer network, and improving the teaching model of the physical classroom and improving student subjective learning,

and for teachers, it improves teaching efficiency. Students can learn and discuss in the digital classroom while creating a virtual classroom and stay in touch during holidays and complete the assignments together, not only including students and teachers, outsiders (teachers, students, and scholars) can also participate from all over the world in any activity or conference. A virtual classroom is also very useful for those who go to study abroad and spend lots of time and money on studying, but virtual classroom eliminates this aspect and we can easily study at a lower price from a virtual classroom. It provides quality education and gives the exact study process. Machine learning also makes use of a virtual classroom to improve digital classroom strategies and skills. Machine learning and Artificial Intelligence will be used to upgrade the virtual classroom model and to solve some of the drawbacks that exist in the virtual classroom.

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