EDUCATIONAL TECHNOLOGY AND ICT

Dr. Sarita Anand

Department of Education, Vinaya Bhavana

Visva-Bharati, Santiniketan

Week-06

Lecture-28

Module-28: SMART CLASSROOMS

Hello dear learners, welcome to SWAYAM-NPTEL course on Educational Technology and ICT. I am your course coordinator Dr. Sarita Anand from Department of Education, Vinaya Bhavana, Visva-Bharati, Santiniketan, West Bengal, India. Today we will talk about the module 28 on Smart Classrooms. This is the lecture 28 and before going to the topic we will see the concepts covered. previous lecture we had covered ICT in classroom uses and feasibility different ICT tools for classroom where 15 types of ICT tools were discussed feasibility of ICT in classroom and its challenges of ICT in classroom were discussed

Now, we will talk about the today's topic on smart classrooms. The smart classrooms picture has generated with the help of AI, which is where you can see that a teacher is teaching with the smart board and the students are having their classes. laptops on their desk and these are these is the assumption because I do not have the picture so, I have generated this picture to explain you the concept of smart classrooms.

So, in this 21st century technology has revolutionized every aspect of our lives and the education is no exception smart classroom powered by the technology and we have the immerse transformative forces in education promising to enhance the learning experiences for the students as well as empowering the teachers for innovative tools like I have here using AI for generating the images it is a modern learning environment that Leverages the technology to enhance the teaching and learning experiences. It goes beyond the traditional classroom. The setup of this integrating digital tools and techniques to create a more interactive, engaging and personalized learning environment. So smart classrooms are not very special features. But nowadays, this is becoming the general pictures of the classrooms where the teachers and the students are utilizing the benefits of these smart classrooms. So these smart classrooms

are enhanced with the educational technology. It boosts the teaching and learning by integrating the multimedia like audio, video, animations, images leading to greater student engagement and improved performances. This is particularly beneficial in online learning environments where students focus on focus can be challenging to concentrate. So, online classes, not only online classes, but in traditional classes also smart classrooms are playing an important role for the teaching.

So, unlike traditional classes that rely on the conventional teaching methods, smart classroom utilize technology to create more engaging and effective learning experiences. Through interactive tools, personalized learning and readily available resources like we can utilize the immediate internet facilities in this smart board. We can search instantly. We can drag and drop the images in the screen at the time of teaching, which we cannot do at the time of traditional classes. So, these classrooms are designed to support the self-paced and adaptive learning for the students utilizing modern technology, digital resources to enhance the learning experiences, not only learning experiences but also the teaching experiences.

The primary goal of the smart classroom technology is to create an active learning environment, encourage experimental learning, cater to individual students' need, maintaining the students' attention and teachers to deliver dynamic lessons. I personally believe prefer to take the classes in the smart classrooms, though this is not daily level feasible, but we try to take the classes sometimes in the smart classrooms. So, there are types of smart classes, smart classrooms. The first one is the standard classes.

Smart classrooms where teachers lead are equipped with a computer, interactive whiteboard, projectors, and various other gadgets, which we will discuss-what components, gadgets, or instruments are present in the smart classroom. The second type is intermediate. These intermediate smart classrooms are built upon the standard setup with additions like a digital podium and laptops, blending teacher-led and independent learning. I have some pictures of my department. So, I will show you how it looks the smart board and all.

The third type is student-led. The student-led smart classrooms are fully integrated. They are integrated with personal devices, virtual headsets, tablets, and laptops for each student to promote individual engagement. The picture I had generated was based on this individual student. Student-led type of smart classroom.

Now, before discussing the instruments related to the smart classroom, we will see the evolution of this concept. This concept of a smart classroom has evolved over time, influenced by technological advancements, pedagogical innovations, and the growing need for interactive and student-centered learning. The evolution can be traced through different phases. The first phase is the traditional classroom from pre-1990s. That was the pre-era, meaning the time when we only had the chalk-and-talk era.

The learning there was teacher-centered, with a blackboard and chalk as the primary tools. The knowledge transmission was one-way, with minimal student engagement. The limited use of technology included only overhead projectors and printed books. I hope some of you have seen overhead projectors. Nowadays, we are using LCD projectors.

The second one is multimedia-based teaching from the 1990s. To the early 2000s, that is called the digital transition era. This digital transition period saw the introduction of computers, projectors, CDs, and DVDs for multimedia-based teaching. You have seen CDs and DVDs, but maybe few of you know about normal CDs, compact discs. And the rewritable disks—these were part of storage devices like CDs and rewritable CDs.

As research scholars, we used rewritable CDs. Then came PowerPoint presentations, which replaced chalkboards in some classrooms. Not all teachers started using PowerPoint presentations. But yes, the use of PowerPoint presentations began in that era. And the internet became the source of supplementary learning materials.

The teachers started integrating videos, animations and the graphics into their lessons. Then in the third stage, the interactive and smart board classroom starting from the mid-2000 and 2010, so these were the technology integration period where the interactive whiteboards like smart boards and the Promethean boards become the popular things. Now the classrooms were equipped with the digital content, online assessment and the virtual labs. So, classes in the schools or the colleges started adopting the learning management system like Moodle, Blackboard, your Google Classroom, organized on the canvas, etc.

BYOT: this is the concept we call it Bring Your Own Device. These days, our research scholars, our PG students are having their own gadgets, their own laptops, tablets, smartphones. And this policy allows the students to use their laptops, their tablets, their smartphones in the classroom at the time of teaching. I always go in the class. during the ICT classes and say my students that the ICT lab is not in the lab right now that is roaming here and there with you in your pocket because bring your own device is there and you can access all the facilities in your pocket or if you are taking with you your laptop or the tablet

that will be helpful for your teaching learning process. So blended learning models combine face-to-face teaching with online teaching. The fourth one is AI and IoT enable smart classrooms. This IoT is Internet of Things. So, in 2020s to till present time, we are using the smart and adaptive learning.

And these smart and adaptive learning are promoting the integration of artificial intelligence and machine learning for personalized learning, use of Internet of Things devices like smart attendance systems, Voice attendance these days you are using Siri, Alexa, Bixby or you are using the Google Meet attendance without taking the attendance when you are joining the Google Meet your attendance is completed. So, we are using this kind of smart adaptive. learning techniques, and the cloud-based education with real-time collaboration, like I have already mentioned the Google Classroom and Microsoft Teams, etc. The rise of virtual reality and augmented reality for immersive learning experiences.

This era was, if we can say that the present era is dedicated to AI, AR, and VR. These things are combined with each other and providing the opportunity to prepare to make our classes more interactive and smart classes. So, expansion of gamification, robotics and STEM learning tools in the classes are also today's picture of the class, of the smart class. And the hybrid and flipped classroom gained prominence especially today. Post-COVID period, even in COVID period, these classes help us a lot.

Now, the future of smart classroom beyond 2030. This is my assumption that when we are training our students for AR, for VR, for AI, so after or beyond 2030 our students our classes will be changed so this is my assumption or regarding the future of smart classroom maybe of this is 2025 after five year you will see the picture has been changed the classes has been changed the teaching learning process has been changed with the help of these new technological advancements like Maybe in future, the adaptive learning systems like neurocognitive systems adapted to the individual learning needs will be started. And the students who cannot see, who cannot hear, they can also get benefited by the different devices in the classroom.

The metaverse education, the fully immersive educational experiences in metaverse will come in the classes. I hope because right now we are using AR and VR, VR headsets we are utilizing. We are using the augmented reality with the help of smart boards in our classes for our school students. So maybe scenario will be changed in 5 years or 10 years. Then AI powered tutors. Definitely at present, if we are using artificial intelligence for daily teaching or preparing the presentation, creating the content, even this image which

you are seeing on the screen, this is generated with the help of AI. I have not made it by my own. I have utilized the software. We call it AI. Napkin AI, you can use it also.

So, in next classes where it is required, I will tell you about the use of AI for different uses. So virtual tutor providing personalized learning experiences. Then the fourth one is holographic classroom. Maybe in future interactive 3D lessons using holographic technology will be used in our classes. So, these four aspects are there in my opinion for future smart classroom beyond 2030 but as a learner, you may have your own ideas and you can write in the discussion forum that what may be the future of smart classroom beyond 2030 or 35 or 40. Like government of India is saying, we can see the future of smart classroom also as per our opinion. So, I will be waiting for your responses in discussion forum. What you are thinking about the future smart classrooms? Okay, pen with AI.

This is my own laptop and I kept here the picture to show you that this is can be the part of your smart classroom where you can utilize this kind of laptops for your teaching learning process. You can design, you can scroll, this is the smart laptop with touchscreen and having the pen and having the its own Microsoft AI, this co-pilot is inbuilt here with this laptop. So, the people who are having this kind of laptop, this enhances the working of the teachers and the researchers and the students.

Also, if you are a student and having this kind of smart laptops. Now, the main features of these instruments which we have listed, the interactive whiteboard, we know that these interactive whiteboards have replaced the traditional chalkboards or the whiteboard with the marker we are using. These days also we are using. This is not a whole to fully stop. It allows the teachers to display and interact with the digital content, write notes and even control the computer from the board. So, these interactive whiteboards are giving us facility to do the many things in the classroom at the time of teaching. Like if you are writing on the whiteboard or the blackboard or greenboard, you have to erase when it is fully written. filled the whiteboard or the blackboard. But in the interactive whiteboard you have the option to scroll down and you will go to the next page.

It means in one hour lecture you can use the many pages of this interactive whiteboard, also in the same time you can utilize the links, the videos and the other facilities available in the interactive board using the internet also. The projector, we all know the projector, the uses of the projector but I have kept the features here because you will be

remembering that what are the major components or the instrument the class having which we are calling it smart classroom.

So, it displays, the projector displays the images, the videos, the presentation. On the interactive whiteboard we can project it or on the simple screen we can project it making it easier to the student to see and understand. Normally we project it on the simple screen. The computer and the laptop, these are the essential part of the smart classroom for access and presentation and giving the digital content, managing the classes and different activities and connecting with the internet. The speakers which I have mentioned, shown there so you can go through these contents you already know without internet those smart boards or the smart phones or the tablets or the laptops will not be very much useful so definitely internet is the important feature the educational software and apps the student devices students can collaborate with the other peers or the teachers with their own tablet or the laptops or other devices which they are bringing with them and the assistive technologies.

Now the benefit of the smart classroom, we all know there are the benefits that enhance engagement. Students are very much happy when we go to the smart classes using the smart boards and this make them interactive in the classes. They interact with the teacher.

They try to do by their own the multimedia presentation, the gamified learning experiences. They feel happy. So, their engagement increases. Improved understanding definitely visual aids, video simulations make lessons more engaging for the students. And for us also as a teacher we are feeling ease to explain things with the help of these gadgets used in the smart classes.

So, personalized learning technology enabled personalized learning experience designed and tailored to the individual student need and their learning style will help them to learn effectively. Adaptive learning platforms and apps provide the student status track their progress by the teachers and they can provide the support to their students. Now, collaborative learning smart classroom also encourages the collaboration among the students. And through interactive projects, group discussions and online collaboration tools, this learning increases. The students work together to share and create the content.

Then the access to information, these devices and the availability of internet provides the vast repository of the information enabling the students to explore different topics in a greater depth and conduct research beyond textbooks. In PG classes at the time of dissertation and research, we say that go and access the Internet. See the Google Scholar

and different search engines for the vast repository of the information. Go to NDLI, go to the site. Other websites like dissertation abstract international where you can access the information related with your research.

So, teachers can curate relevant online resources to supplement their classroom teaching learning process. Development of 21st century skills. This is the best benefit because the smart classroom equips the teachers and the students with the essential 21st century skills. If we are not having the smart classroom and we are not acquainted with the digital devices, then definitely in future as a M.Ed. student or any other PG students, they will face difficulty for their lacking of crucial skills for their future coming classes.

So, here are the future of the smart classroom- the smart classroom have definitely the strong potential to transform the education preparing students for success in 21st century skills as technology continues evolve smart classroom will become even more sophisticated incorporating the artificial intelligence virtual reality and personalized learning platforms the feature of education lies in creating dynamic, engaging and personalized learning environments that empower the students to reach their full potential. Now, we will talk about the challenges of smart classroom. The main challenge of the smart classroom is infrastructure and cost.

To implement smart classroom requires significant investment in technology, infrastructure, hardware, software and teacher training. So, the cost can be the barrier for schools or the colleges with limited resources. Every academic administrator is crying for the infrastructure and cost that we are not having the enough money to establish the smart classroom. The next issue is the teacher training. Teachers need adequate training and support to efficiently, effectively integrate technology into their teaching process.

So, if they want to utilize this smart classroom for their teaching practices, definitely they have to be trained enough. Professional development programs are essential to equip the teachers with the skills and knowledge utilized for the smart classroom tools. The next one is digital divide. This is the biggest issue every time I am talking about this that the digital divide referring to the unequal access to technology and internet connectivity. It can create disparities in the educational opportunity. Either it's the teacher or the students. If the teachers are not trained enough, they are having the facility but they will not be able to utilize it. So, efforts must be made to bridge the digital divide and ensure the equitable access to technology for all students. The next challenge is distraction and

misuse. I think this could have been put on the first point because the technology can be distracting.

If not used appropriately, the students are the most affected population by these technological advancements. Teachers need strategies to manage technology use in the classroom and ensure that it enhances rather than hinders learning. Suppose you have a smart classroom in your department, school, or college, and you have left your students in that class to practice something. You have given a topic or task to your students, and when you left the smart classroom, they were watching videos, movies, or playing games. Then, this definitely becomes a misuse of the smart classroom and a distraction from the teaching-learning process.

Now, in conclusion, we can say that smart classrooms represent a paradigm shift in education, offering a wealth of benefits for students and teachers alike. While challenges exist, the potential of smart classrooms to revolutionize learning is undeniable. By embracing technology and addressing the challenges, we can create a future where education is more engaging, personalized, and effective for all students, as it prepares them for the future by emphasizing active learning, resilience, stress tolerance, and flexibility. And these are the references for your further reading. Hope you will go through them.

Keep learning. Thank you.