



The Journal of Multidisciplinary Research (TJMDR)

Content Available at www.saap.org.in

ISSN: 2583-0317



Importance of Smart Classroom: A Study

Yamini Jyothsna Kambala¹, M. Ramakrishna²¹Assistant Professor, Department of Political Science, Adikavi Nannaya University, Rajamahendravaram² Assistant Professor, Department of Computer Science, Adikavi Nannaya University, Rajamahendravaram*Received: 22 Feb 2021 Revised: 11 Mar 2022 Accepted: 30 Mar 2022*

Abstract

The classroom is an important location where learning activities are carried out. It is the most important component in education system since it promotes knowledge transfer from a teacher to a group of pupils. In this digital era, Smart classroom is a digital effort that is fast transforming the way teachers teach and students learn via the use of technology. During covid time smart classrooms played a key role in online teaching.

Learning is a process of cognitive thinking. The old method of teaching was geared towards one kind of learning. Visual or solo learners struggled to comprehend concepts. However, we now have a way to meet all specific needs to cater to the needs of the student.

In addition to these services, educational institutions are creating their own applications and software to help organize and make the process of learning easier. With the rapid advancement of digitalization, the shift to online classes at the period of covid19 was easy. Virtual communities facilitate better interaction between people. Information also tends to last longer when using visual aids. Smart classrooms enable students to not be in the classroom physically. They are also able to access prior classes via their mobile devices taking notes on the go redundant.

The main objectives of the study are: to determine the effect of smart classrooms, to explain the benefits and drawbacks of smart classroom, to explain the impact of introducing smart classrooms and what factors are deficient for the better implementation of smart classrooms. This paper examined the concept and importance of "Smart Classroom". The sources of secondary data are government publications, websites, books, articles in journals etc. The study elaborated and analysed the system of smart classroom. The study has strongly observed that smart classroom learning environment is better to teach the students than traditional class.

Keywords: Smart Classroom, Traditional Classroom Teaching, Learning Environment Education, Health issues.

This article is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

Copyright © 2022 Author(s) retain the copyright of this article.



*Corresponding Author

Yamini Jyothsna Kambala

Produced and Published by

South Asian Academic Publications

Introduction

Smart Classes utilize digital technology to aid in education. The many audio as well as visual tools help in teaching and make it more enjoyable. The possibilities are infinite. The software is specifically designed and optimized for the specific needs of a particular class, as opposed to generic solutions. Digital infrastructure improves teacher-to-student and peer-to-peer

communication since data streams are separate and organized. A good example will be the feature of raising hands in video conferencing applications currently.

Smart classes can also teach students about the advantages of making use of it. In the end, they'll be able to come up with more innovative concepts at night. One of the most essential aspects of class in the past was lectures. This is no longer the case. Interactive learning has been proven to assist students more effectively. Computers and projectors are used to share information. Interactive touch screens assist students to be fully immersed.

During the pandemic period (Covid 19), we have seen a noticeable increase in educational standards, advancements, and innovations in the field of education. Schools and other educational institutions have adopted modern teaching methods through virtual whiteboards, projectors, and other audio/visual components. All these elements of a smart class make learning fun and interesting for the students and enable teachers to teach effectively.

The smart classroom technology is a big asset for the education system. It boosts the confidence of the faculty along with the students and encourages them to think beyond their imagination. In many institutions the smart class technology is using from long before; as we know, students of today are the futures of tomorrow, and it is only right that we invest in a better tomorrow.

Since centuries our classrooms are following traditional type of teaching methods and using chalk pieces, black boards, dusters etc., but in the modern times classrooms are no longer desks and chalkboards. In this century, classrooms are outfitted with multiple pieces of technology to improve teaching, learning, and other aspects of the classroom. These smart classrooms make for a near-perfect environment for students to engage with technology and learn from it. Smart classroom design is essential when setting up a classroom. There are plenty of advantages from Smart classroom.

Objectives of the study

The main objectives of the study are:

- To examine the concept of "Smart Classroom".
- To determine the effect of smart classrooms,
- To explain the benefits and drawbacks of smart classroom,
- To explain the importance of introducing smart classrooms and
- To suggest the factors which are deficient for the better implementation of smart classrooms.

Methodology

This paper examined the concept and importance of "Smart Classroom". The sources of secondary data are government publications, websites, books, articles in journals etc. The study elaborated and analysed the system of smart classroom by using descriptive analysis method and observation method. The study has strongly observed that smart classroom learning environment is better to teach the students than traditional class.

Concept of the Smart Class room

Learning is a process of cognitive thinking. The old method of teaching was geared towards one kind of learning. Visual or solo learners struggled to comprehend concepts. However, we now have a way to meet all specific needs to cater to the needs of the student.

In addition to these services, educational institutions are creating their own applications and software to help organize and make the process of learning easier. With the rapid advancement of digitalization, the shift to online classes at the period of covid19 was easy. Virtual communities facilitate better interaction between people. Information also tends to last longer when using visual aids. Smart classrooms enable students to not be in the classroom physically. They are also able to access prior classes via their mobile devices taking notes on the go redundant. When we hear the word 'classroom', the first things we think about are teachers, black boards, chalk, and duster. But today, technology has surpassed our imagination of the classroom.

Definition of Smart Classroom

There are many definitions of a smart classroom floating around the internet, adding them all together and putting them into a simple explanation. A smart classroom is a space for learning that is enhanced by educational technology, and the smart classroom design is used to improve the teaching and learning experience.

There are still pencils, paper, and textbooks in classrooms today. But there is also a range of educational technologies designed to help educators enhance the learning experience for students. Information technology has so many benefits for the classroom.

Smart classrooms are the classrooms enhanced with technological equipment for the purpose of better learning and teaching. Based on the equipment available smart classrooms can be categorized as follows:

- Basic Smart Classes: The classrooms with basic smart technology include gadgets like laptops or computers, projector, DVD or VCD player and a viewing screen etc.
- Intermediate Smart Classes: The intermediate smart classrooms are one step ahead of the basic technology smart classrooms. They include gadgets like a smart podium with the control panel in addition to a laptop, projector, screen and DVD or VCD player etc.

- Advanced Smart Classes: The advanced smart classrooms have all the gadgets of a basic or intermediate smart classroom but their features are very advanced, that is, they use the newest technology.

Importance of Smart Classrooms

Smart classrooms allow teachers to change and adapt their teaching styles to help meet the needs of the students sitting in their classrooms. Technology can help students with a variety of learning needs and is important for helping kids with learning challenges. With a smart classroom design, teachers use various technologies and smart classroom management to help all students learn.

Types of Smart Classes

The learning solutions are evolving and are smarter than the word. There are a variety of ways to go about making your school smarter. The budget as well as the digital proficiency of students, and the school's digital literacy all affect it. Innovations have allowed the price of equipment's to drop by a substantial amount in the recent years. There are various kinds of Smart Classes.

1. The Basic Setup

Smart and clever

They are the most popular types of screens used in schools. They use projectors, a computer, and a display. The system is preloaded with courses that rely on auditory and visual learning. Videos and animations are the most popular mediums used to impart information. Lessons can be easily modified to reflect changes in the curriculum.

2. Personal Devices

Alongside the basic configuration, students are able to have laptops and tablets. Tablets have been replaced by the traditional digital slate since the price of creating them devices is extremely low. Students can record notes, get materials, as well as complete their assignments and test on this same gadget. This can also help save paper which is good for the environment.

3. Virtual Reality

With the help of the VR headset, learners are able to experience a completely new world, or play in a Sandbox. In a sandbox students are able to conduct experiments, particularly physical ones, to study concepts and stimulate the brain.

The content of the VR could also be controlled by the instructor so that everybody experiences the same experience. From the DNA molecule all the way to the French revolution, it is possible to show in detail.

Augmented Reality can be utilized to recreate objects that exist in real life. real world. It can be used to create holograms or AR glasses. Technology is currently in the cradle and rapidly moving forward.

3. Student Tracking Management

All aspects associated with the institution are recorded in this site. From attendance tracking and school buses tracking stored in the cloud. This provides more transparency in data. The performance of students is also assessed in real time.

4. Interactive Boards

The dusty chalkboards of the past have been replaced by Smart boards. Teachers can now show images and videos, etc. on the brand new blackboard. Students can interact with it via their personal tablets. New tools let you communicate ideas more effectively.

5. Student Devices

This is helpful in the event that you are studying from a distance. Services such as Google Jam board can enable multiple participants to work together on the same whiteboard using separate devices. PDF, e-books and other study materials can be uploaded directly to the device, removing the requirement for books.

6. Apps

Hardware isn't the only option required for intelligent classes. The development of the app must be designed to meet the requirements that your students. Kahoot is one example. It's extremely simple, minimalist layout that kids will appreciate.

7. Communication Devices

It is recommended to use high-quality microphones (preferably wireless) or speakers as well as other devices to communicate with all students more effectively.

8. IoT (Internet of Things)

Many textbooks today have QR codes and links for its online counterparts in order to provide more information to students. Progress and attendance can be monitored.

Components of the Smart Classroom

There are many different technologies available to teachers, students, and schools. When figuring out a smart classroom design plan, it's essential to determine what type of technologies will be helpful for students. Here is a smart classroom equipment list and key technologies that someone may find in different smart classroom designs. Some of the smart classroom components below:

- Interactive Whiteboard
- Tablets, laptops, or Chrome books
- Charging carts/cabinets
- Learning APPS

- Document Cameras
- Student response system
- Smart Tables
- Lecture recording equipment
- Distance learning capability
- Online learning systems
- Digital podium
- Collaborative furniture
- VR headsets

Although these technologies may not be present in a smart classroom simultaneously, they are components that can make a smart classroom design successful.

Smart Classroom Designs

When planning to implement a smart classroom model, many ask, “what is the ideal classroom design?” This question is often tricky to answer because the smart classroom design depends on the needs of the students. There are 3 common types of smart classroom designs used around the country.

❖ Standard Smart Classroom

This is the initial first step when creating a smart classroom. Standard smart classrooms are teacher-led. They normally include computers, interactive whiteboards, and a projector. Teachers are often at the front of the classroom giving instruction, and the technologies within the classroom give students the opportunities to interact with the content, teacher, and each other.

❖ Intermediate Smart Classroom

The intermediate smart classroom is the next step in smart classroom design from the standard smart classroom. Intermediate smart classrooms feature all the edtech from the standard smart classroom and equipment like a digital podium, laptops, and VR headsets. In these smart classrooms, students have 1-to-1 devices, and technologies are shared between students. These classes allow for a combo of teacher-led and independent learning.

❖ Advanced Smart Classroom

The integrated smart classroom is the last step. These classrooms are student-led and include 1-to-1 devices; every student can access educational technologies whenever possible. In these student-led classrooms, students control and lead the learning and explore and investigate topics independently. These spaces include all the edtech needed, like VR headsets, tablets, and laptops. It also has the required software so students can create their own content, like CoSpaces,

Think Link, and more. This type of smart classroom is most like a flipped classroom.

Every classroom is different, which means every smart classroom will be different. There are no set rules on what tools should be included, and the way teachers use the equipment to deliver their instruction is important. The benefits of Smart Classrooms or advantages of smart classrooms for students are listed below.

Smart Classroom Management System

After setting up a smart classroom, creating and making sure there is a management system in place is important to keep it effective for teachers and students. Some important parts when setting up a smart classroom management system are:

- ❖ Technology rules
- ❖ Consequences
- ❖ Review technology procedures (how to properly carry, use, and store equipment).
- ❖ Group work expectations
- ❖ General classroom rules

When students understand the rules, consequences, and procedures, a classroom is run easily, and learning is at the forefront of the classroom.

Smart classrooms are becoming more and more common across the country. Teachers are bringing in different types of technology daily, and students are becoming more in tune with the available technology. VR headsets, smart boards, Chrome books, and flexible seating will help students collaborate inside the classroom and prepare for the workplace.

Advantages of smart classroom

There are many advantages of the smart classroom. Some of them are as follows:

- Access to Online Resources: In a smart classroom, the teacher can use the resources available on the internet for the better understanding of the students. For every subject, there are numerous resources available on the internet which can be accessed by the teachers as well as the students at any time in a smart classroom. Internet plays a major role in the learning process. Today's students are curious to know about everything. They want to gain extra knowledge about the ongoing topic in the class. This is a limitation of books. The books print only the syllabus. For those who want to learn beyond the syllabus, the internet is a very useful tool. Even for the

syllabus, the resources available on the internet are very helpful.

- **Digital Medium for Notes:** In a regular classroom, the teacher writes on the board and the students note it down in their notebooks. In this methodology of teaching, the student's mind gets diverted in two directions, one is listening to the teacher and understanding and the other is writing or making notes for future reference. In this way, the students do not understand the topic properly or get confused or even sometimes, they do not listen to anything and just make notes. This is a very dull approach in the teaching process. But this is not the case in a smart classroom. In a smart classroom, there is a digital approach for notes. The teacher, instead of writing on the board, teachers using PowerPoint presentation, word documents, images, videos, and audios. These resources are given to the students in pen drives, CDs, or they are emailed to them. In this way, the students do not have to write for making notes. Notes are provided to them and they can devote their full concentration to the lecture.
- **Advantageous for the Absentees:** If a student who studies in a regular classroom is absent for one day, it becomes difficult for him to gather all the notes of the classes he missed. Also, it becomes difficult for the teacher to explain the previous topics to the students who were absent. The students then take a shortcut method and get the notes photocopied from other students. In this way, the students do not understand anything from the classes he missed. In a smart classroom, the lectures are recorded. Whenever a student is absent he can anytime see the recorded lecture. These recorded lectures are also uploaded on the internet which can be accessed by the students anytime by a login id and password. The notes are also in digital form, so they can be easily provided to the student.
- **Ease of Understanding:** There are many topics in the curriculum which are very difficult to understand. They cannot be just taught by using a chalk and a black blackboard. They require an interactive teaching approach. With smart classes, the teacher can use multimedia

to teach that topic to the students. The students learn more from what they see rather than from what they listen. So the students understand easily and effectively all the difficult topics in a smart classroom.

- **Makes Learning Enjoyable:** If we go and look in a regular classroom, the students are feeling very sleepy. Some of the students are not even listening to the teacher. They are busy talking with their friends. In short, the class becomes very boring for them. But it is not so in a smart classroom. The use of smart technology in the class makes the classroom a fun room. The class becomes interesting and enjoyable for the students. No student feels sleepy. It makes learning a fun process. The students who do not like to go to schools also start enjoying the school.
- **Improves the Academic Performance:** It is often seen that the students studying in a smart class get a better result than the students studying in a regular class. This is so because the understanding ability in the students studying in a smart classroom is way more than other students. The use of technology in the classroom for teaching increases the understanding of the students. The topic becomes clearer and the base of the subject becomes stronger. Obviously, the students with a better hold of the subject and with strong basic knowledge of the subject will score more in exams.
- **Communication:** The technology used in a smart classroom makes video conferencing possible in the classroom itself. In this way, the students can communicate with the person who is an expert on the subject. In various schools and colleges with the facility of smart classrooms, guest lectures are organized weekly in which the students can communicate with the experts such as professors of IITs and IIMs or the people engaged in research work. This provides the students with extra information about their subjects which beyond the scope of the textbooks. The students get to know about the ongoing issues related to their subjects. They get acquainted with the upcoming technology and theories. This proves very beneficial for them in the near future.

- **Health Friendly:** There are some teachers who are very sensitive towards the use of chalk or markers. Some of them experience skin allergies when they write with chalk and some are allergic to the chalk dust. Some teachers are not comfortable with the smell of the ink used in the markers. For these teachers smart classrooms are advantageous. There is no or very less use of markers or chalk in a smart classroom. The teaching is done by using digital or e-resources. So, there is no chance of allergy.
- **Enhanced Learning Experience:** A digital smart classroom provides enhanced teaching and learning experience so the teachers can make lessons come alive through smart classes by providing audio-visual exposure to the students. In the smart class room there is many options to illustrate the information using photos, graphs, maps, flowcharts, and animated videos. This makes learning more exciting and easy to understand. Learning through visuals helps the students to learn and memorize the topic for a prolonged period of time.
- **Interactive Learning Experience:** In smart class rooms generally teachers use a Moodle Management System, which eases the process of learning.
 - It helps the teachers engage students with media and explain each part of the lesson with some special effects and graphic presentations.
 - It facilitates easy communication with students via messaging, forums, and mobile notifications.
 - It helps to create a quick FAQ session between teachers and students where students can clear their doubts.
 - Teachers can monitor the students' progress and motivate them with digital rewards.
- **Easy Access to Online Resources:** We all know that smart classes are synchronized with computers and the internet, enabling easy access to online resources. Teachers can explain any topic on a practical basis, and students can download and watch already recorded videos to clear their doubts. To make this process easier and enhance the teaching-learning experience, people use Google for Education.
 - Google Meet to help the teachers conduct classes and easily converse via videos.
 - Google Classroom is used to watch the recorded videos, distribute assignments, and provide feedback in the grading tool.
 - CBSE guide platform is used by students for video lessons, online tests, chapter-wise textbook solutions, sample papers, and test papers.
- **It is a time saving technology:** Students are habitual in writing notes in the class, which tends to divert their attention from learning. But with the help of the smart class, notes and presentations can be shared directly with the students. Various tools can also help teachers distribute assignments, provide feedback, and involve in discussions. Lesson planning takes up a lot of teacher time. Creating resources, printing worksheets, and planning lessons can take hours out of a teacher's day. Plus, many times, the work is brought home after hours. Pre-made resources and learning opportunities are available quickly in a smart classroom, and teachers will be able to build, plan, and deliver lessons easier.
- **Eco Friendly:** Smart classrooms utilize smart gadgets for learning and teaching, which partially eliminates the use of paper, pen, ink, pencils, etc. The lectures are delivered digitally i.e., PPTs etc., and everything is available online; hence there is no need for writing and printing information. Undoubtedly, this is one of the major benefits of smart classes to keep nature healthy and green.
- **Increased Productivity:** Smart classes help in developing interest among students and avoid boredom. The use of smart technology in the class attracts students' attention by displaying animated media, such as videos, pictures, and audio which creates better learning outcomes. It not only enhances the aesthetics of teaching but also helps students visualize concepts in their minds, making learning easier.
- **Highly Effective:** According to Psychologists, visual learning using smart technology

elements like images, graphs, flow charts, videos, etc., are considered highly effective and help students grasp the concepts quickly. Smart classrooms also reduce distractions, and therefore, students can concentrate more and retain more information.

- **Motivate Students:** A smart classroom uses smart class equipment like a digital board, projectors, computers, LED, etc., for imparting quality education. The audio/visuals displayed through the equipment are intriguing for students and helps build interest in them. It also works in sharpening the creative imagination of students. For instance, in a smart class, when a student sees a seed turn into a plant, he gets an idea of how to draw a plant with all its details.
- **Flexible Learning:** In a smart classroom, teachers can enhance learning and teaching opportunities. Technological tools can help with learning speed and learning styles for students. Instead of just using textbooks, teachers have the ability to use interactive whiteboards, VR, or learning software. Teachers can also help students who may need curriculum variations easily. They can convert big paragraphs and text into graphs, flowcharts, or animated videos. Using smart classroom technologies, teachers deliver flexible learning experiences and can ensure students learn in the most effective way working within their specific learning needs.
- **Accessible Education:** Smart classrooms are internet-connected, and these systems store abundant information and is accessible throughout the school day and learning process. Teachers can access this information and many educational sources for teaching purposes. It also makes learning accessible for all students. It provides new opportunities, tailoring the lesson to students' individual needs and styles. It evens the playing field for all students.
- **Engagement:** Almost anything is more exciting and engaging than a textbook to students. Smart classroom equipment like augmented and virtual reality can help grab students' attention, get them excited about learning, help

spark their imaginations and improve learning engagement in the classroom.

- **Interactive Lessons** Smart classrooms encourage interaction between students, teachers, and technology. Students are active in their learning when using interactive technology in the classroom. It also helps develop teamwork, critical thinking skills, and problem-solving.

Benefits of Smart Classes

Anytime Access to the Expansive World of Online Information. The internet is an incredible source of information for students. It is a repository of massive amounts of information that cover every topic an intelligent class can make the most of the internet-based resources for teaching and learning.

The best choice for students that want to go that extra mile to learn knowledge that is far ahead of the curriculum they are studying online resources can increase the interest and imagination of students.

Teachers can obtain online educational information from a variety of content that is published online and display the information culled as an engaging presentation.

So, education can be more than the printed text. The internet can bring the element of excitement in learning, as students can rely on the extensive information available online.

Digital Tools Help Students Understand the Topic Better

There is no need for traditional black-board instruction. Nowadays, we have intelligent classes that permit the teachers to impart knowledge using PowerPoint presentations, Word documents audio classes, as well as video screens, as well as through images.

A photograph is worth the words! This is in line with the famous principle, it is with clever classes that students are capable of comprehending the data delivered through these educational tools.

Since the teacher isn't using the chalkboard to write on the students are able to more effectively concentrate on the lesson as they absorb information from audiovisual (AV) information using digital devices such as pen drives, CDs and PDF documents which will be sent to students.

This way of teaching and learning eliminates the need to make notes during lectures that are taking place. Because notes will be made available to students via these ways and they will be able to concentrate better during the lecture.

A Top Bet for Absentees

Do not worry about it if you're forced to miss your class for the duration of a day. Students in smart classes are able to take advantage of lectures at any time because they are all captured on digital media. One can download the recorded lectures, which are accessible online by typing into your username and password, and then access the material that was presented in your absence. In this way, the digital notes will be there to help in the event that student absent in school without putting into any effort to acquire the identical.

Interactive Environment Favours Better Learning

Digital tools for instruction creates an environment that is interactive for learning. It's all in a smart classroom where more transparency is created between teachers and students.

Because learning is tied to maps, photographs images, pictures as well as animated videos As a student, you can establish an enduring connection with your professor. You'll feel energized to express your thoughts in a relaxed manner in class, and express them in drawings and writing.

"Go Green" with Smart Classes

Smart classes are the perfect answer to environmental risks caused by the traditional method of education. It will create a "Go Green" zone when you be able to learn about your favourite subjects without using pen and paper.

It is not necessary to depend on printouts or photocopiers, which can result in the creation of carbon footprint. So, a well-planned class can be an effective and efficient method to help create greener and more sustainable environment.

An excellent option for students with different Indicators

It requires a variety of students to create an entire class. While some students can grasp the concepts with ease but others have to be re-explained many explanations. In this scenario smart classes are suitable learning alternatives. Because you learn using various media types. These advanced technologies provide an intriguing platform for students and teachers. There are many possibilities for the visual effects that are produced by a clever class. These effects provide an exciting perspective on education. Therefore smart classes are regarded as the perfect learning environment for students to absorb the various aspects of a subject in just one session or by accessing the specific information to get a better understanding.

Ease of Maintenance

Smart classes use electronic tools that are easy to operate and maintain. Utilizing digital pen, along with other electronic gadgets has extremely low cost of maintenance. It's a single expense that you have to do in comparison to markers and chalk, which had their presence felt in traditional classrooms. Once-in-a-while access to all of these devices is all you need to allow your class to provide a quality education to those who seek to learn.

Extracting the Best Out of Technology

With the advent of the digital age that we all are a part of. Smart classes are accompanied by an "technology-aided classroom learning" tagline. It is because of technology that you can gain knowledge about fascinating and exciting things. There are a variety of digital tools to help you in the search for a quality education.

A Fillip to Academic Performance

Graduations are a gauge to measure the level of performance of students. Through smart classes that students can expect to be able to impress their teachers, and even their parents with outstanding grades. Through innovative methods of learning, you'll be able to comprehend the subject taught using digital tools. If the basic concepts to a particular subject matter are grasped, you can rely on this knowledge to move forward in the direction of understanding difficult parts of the topic. These in totality will not only assist you to learn the subject, but also be manifested as the highest grades in your education.

The Fun Element to Learning

It's not an exaggeration to state that lots happens in a class with a high-quality instructor. The class that is smart is noticeable with a plethora of engaged students who are glued to various electronic gadgets to pursue an integrated education.

The class will be buzzing with inquisitive conversations and interaction between groups of students. Inquisitive chatter is what can make learning fun for students. Freeing you from the boring traditional classroom setting. A smart classroom is apparent in increased student-teacher interaction as a result of the latest technology. There is never any dull moment in a well-organized class. You'll be excited to join your class to study diverse subjects; in a fun and fun method.

After we have outlined the advantages of smart classes, let's now shift our attention to the negatives associated with smart class. These are just a few of the benefits of smart classrooms. When bringing a smart classroom design to life, consider the needs of your students, the

level of engagement with the technology, and the flexibility.

Disadvantages of smart classroom system

With so many advantages of the smart classrooms, there are a few disadvantages also which makes the use of smart technology quite limited. They are:

- ❖ Creating presentations, videos and programs are difficult.
- ❖ Devices such as computers, digital boards, etc.
- ❖ Highly dependent on electricity.
- ❖ Requires proper network connectivity such as LAN, WAN, Internet, etc.
- ❖ Expensive and complex to implement (High maintenance costs): The technology used in the smart classrooms is very expensive. All the schools cannot afford it. Even the schools which can afford it get over the budget after buying it. Some schools often take loans to buy the smart technology. Consequently, the fees of the schools are increased to meet the cost of the equipment. The admission fees of the schools with smart classrooms also hike. All parents cannot afford such an expensive education for their children. Every child cannot get access to the smart classrooms.

School administrators have to put a hole in their pockets in order to keep their schools up to date with most recent teaching technologies. Every day every two days, a new version of software is released and it's not just difficult to keep up, but also to fund these resources. Schools that follow the path of the smart classroom will require an employee-paying technologist, who could take away the resources of the school. It's not just about cost, it's a test to identify a contemporary technology-driven professional who can bring needed modifications to classrooms and is adept at integrating new teaching technologies and methods.

Budgetary issues can also be a concern when schools are required to fund training for their faculty because all kinds of teachers have difficulty adjusting to the usage of modern teaching tools. A class that is smart thrives because of highly skilled teachers. If teachers aren't educated on the most recent technology for teaching, a smart class could result in the slowing of learning among students.

- ❖ Need Skilled Faculty only: All teachers cannot use smart technology for teaching. The teachers

have to be trained before they can they can start teaching in a smart classroom. The teachers are trained to use the technology in an effective manner. They are also trained to handle faults in the gadgets. This training also costs much. If the teachers are not properly trained the technology would become a disturbing factor rather than becoming helpful.

- ❖ Maintenance: Like all electronic gadgets, the gadgets used in smart classrooms require proper maintenance. The rooms in which these gadgets are installed should be free from dust particles and should not face direct sunlight otherwise the gadgets will become faulty. Also, these equipment release a lot of heat in the surrounding so the rooms should be air-conditioned. Technical staff has to be appointed for the maintenance of devices. This further adds to the cost. The devices also need to be updated regularly which is a very time-consuming process.
- ❖ Technical Faults: All the electronic devices are prone to faults. If the equipment does not work one day, the day is considered as a waste. They require a lot of time to come back to their proper functioning state. No teaching can be done on that day. In this case, the teacher should always be ready for an alternative methodology for teaching that is, using the blackboard. But this would be a very dull experience for the teachers as well as the students who are regularly participating in smart classrooms. The workload of the teachers is also increased as they have to prepare the topic as per two different methodologies of teaching.
- ❖ The Perils of Technology-Based Learning: When technology is utilized in learning, the results are exciting and progressive. However, the continuous use of electronic devices can affect the capacity to solve problems of students. There are times where you feel confused and helpless when your device malfunctions. Parents of students are a generation behind the technologically-educative student community. If this happens when they are the primary guardians of their children would not provide any kind of assistance in the classroom. Children of these

parents are at a loss in relying on parents to finish their school assignments or do their homework.

- ❖ **Human Values Take a Beating:** In a smart classroom electronic devices serve as tools for teaching. Students who are connected to learning with smart devices may lose contact and their teacher. This change in the way we learn brings the importance of a great teacher. Students will be addicted to laptops and computers; considering teachers as mere objects within their classes.
- ❖ **A Monotonous Learning Process:** In spite of the fact that an intelligent class can make learning enjoyable, you'll be so dependent upon technology, your creativity abilities will be hampered. The use of technology in a class can bring boredom when your creative and smarts are put on the back burner. Learning may seem like to be a process that is mechanical when you are constantly trying to use gadgets that function according to a predetermined method.
- ❖ **Technical Hiccups:** A failure of an electronic device is enough to result in the loss of a lot of teaching hours. Because they are all delicate devices, it requires time and money to return them functioning. With this situation teachers are forced to go back to the traditional method of teaching using a blackboard. It's plenty of discontent from students who are not willing to accept the new system.

These technical issues can affect the atmosphere in the classroom, putting pressure on teachers. In this kind of scenario, teachers must not just be prepared for the subject for the day but must switch between the two teaching methods.

Conclusion

Smart classrooms increase the interest of the students in studies. Students tend to learn more. With so many advantages and a few disadvantages, smart classes can still be considered good for the students. Due to some disadvantages, we cannot ignore the advantages of smart classrooms. All the disadvantages have a solution except for the disadvantage of the cost involved. But in the coming few decades, the rise in technology would definitely decrease the cost of these devices to some extent. Moreover, the new inventions in the fields of computer science and technology would definitely make teaching and learning even much better. The

government schools should also employ smart technology in their classes so that all the students can have access to smart classrooms.

Suggestions for a Smart Classroom Design

A smart classroom allows for so many learning opportunities, and using these 6 tips for a smart classroom design can help ensure the classroom will meet the needs of all students who walk in.

Teaching boards are not just for display

Gone are the days of just chalkboards and whiteboards. Smart classrooms call for smart teaching boards, and these boards should not just be on display to students. Students should be using them to enhance their learning and are not just bystanders as teachers click around. Consider mobile smart boards for classrooms as well. Allowing for multiple students or groups to be working on smart boards in the room at the same time.

The furniture is not glued to the floor

Students need to move, and the classroom furniture should not have roots where it has been placed. There should be multiple options for students, and the options should be flexible. Flexible options allow students to move into groups, get up and walk easily around the room, and learn in a space best fit for them.

Correct Seating Choices

Chairs and places to sit need to be comfortable for students. Many companies create classroom chairs that can be sat on forwards or turned around and sat on backward. There are standing desks with high-top seating etc. Make the classroom inviting for all students.

No more isolation

A smart classroom is interactive, and while single-seat desks may give students fewer distractions, a classroom is there to help students learn how to interact with one another, to problem-solve, and work as a team.

Encourage Collaboration

Smart classrooms allow students to become more open-minded to their peer's ideas, perspectives, and solutions. Using different technology and furniture inside the classroom will allow students to collaborate with others.

Keep Things Convenient

Using equipment like charging carts, supply carts, and other convenient furniture options makes a smart classroom easy to use and convenient for students and teachers.

While setting up a smart classroom, these tips will help create a learning environment where students will collaborate, learn, and interact with technology in a way that is easy to use and educational.

References

1. [Prakash Chandra Jena](#), Effect of Smart Classroom Learning Environment on Academic Achievement of Rural High Achievers and Low Achievers in Science, [International Letters of Social and Humanistic Sciences](#), September 2013, DOI:[10.18052/www.scipress.com/ILSHS.3.1](https://doi.org/10.18052/www.scipress.com/ILSHS.3.1)
2. Sidhu N. S., Computer Applications in Education for the M.Ed. (Educational Technology) Course, M.Ed. Dissertation, Punjab University Chandigarh 2002.
3. G.MuraliManohari and T.Shenbagavadivu, A study on Scope of smart class rooms in the government schools functioning in and around Coimbatore, IJMH - International Journal of Management and Humanities, Volume: 05 Issue: 04 2018, www.researchscript.com ISSN: 2349-7289,
4. Mahajan, Sanjay L. (1994). 'Effectiveness of Computer Assisted Instruction for teaching singular and plural at Grade II'. *BharatiyaShikshaSodhPatrika*, Vol. 13(1), pp. 29-32.
5. Joshi, Anuradha and Mahapatra, B.C. (1995). 'Effectiveness of computer software in terms of higher mental ability in Science'. *Indian Journal of Psychometry and Education*, Vol. 26(2), pp. 105-108
6. <https://www.embibe.com/exams/smart-classes-importance-in-imparting-education/>
7. <https://government.economictimes.indiatimes.com/news/digital-india/andhra-to-launch-10000-smart-classes-for-e-learning-in-government-schools/78146193>