

Smart Classroom and Students' Achievement during the Covid-19: Prospects and Challenges Post Covid Situations

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Abstract: In the present context, the trend of education varying for a good number of determining factors like integrated technologies, new academic approaches, flexible learning space and most importantly the recent corona pandemic situation where the concept of smart classroom can create a gateway for the learners to face the challenges. Smart classroom is defined as a physical classroom space that was effective for showing teaching content, easy for class management, convenient for accessing learning resources, easy for instructional interaction, and combined with contextual awareness. Huang et al. (2012). Smart classroom helps the learner to visualize the course material, create education more attractive, fascinating, comprehensible, turn out to be more interactive, get easy access to online recourses, follow green concept, use time saving technology, increase productivity and many more. There is no unmixed blessing in this world, so smart classroom also brings some challenges with it like lack of technological skill, insufficient IT support, fascination for traditional methods, lack of proper infrastructure, difficulties for the implementation of new teaching plan, inadequate training and so on. This paper is a secondary data-based content analysis. This study aims at to reveal the advantages, disadvantages, and the procedure of Smart classroom in the Covid-19 and Post Covid Situations.

Introduction

The way of our living and working has speedily changed with the introduction of Technology. Gradually the Education sector also started depending on technology. Classroom is a space for teaching and learning. A general classroom normally possesses a blackboard, a lectern, tables, and chairs. But for the last few decades the educational institutions are frequently using electronic products, such as microphone, projector, video camera, and computer into classrooms to make the classroom more engaging and efficient. It has tools to present digital content in the form of an interactive whiteboard and projectors. It is an effective way of interaction with the teacher and the other students. It can provide automated assessment/feedback. A smart classroom can record and store lectures. Moreover, it has a sensor that enabled smart physical environment that controls the temperature, humidity, air quality, and acoustics. Smart Classrooms can help in teaching-learning in a multifarious way like create interactive learning experience, encourage collaboration, support "Go Green" concept, upgrade integration, possess time-saving classroom technology solutions, have smart interactive modules like videos, presentations, etc., a touch of fun element to learning, 24/7 accessible to online resources, a fillip to academics, keep pace of growth and what not. There is no unmixed blessing in this world, smart classroom also brings some challenges with it like Creating presentations even videos and programs are difficult, expensive, and complex to implement, high

maintenance costs, devices are must such as computers, digital boards and many more, highly dependent on electricity, requires proper network connectivity such as LAN, WAN, Internet, etc.

Methodology

The current study consults secondary sources of data based on content analysis. In order to analyze the prospects and challenges of Smart Classroom during the covid and post covid situation the researchers consulted contemporary treatises, books, pamphlets, magazines, research articles, research reports and so on. This piece of research mostly adopts qualitative approach. Both exclusion and inclusion criteria were followed to adjust with the overall objective of the study.

Objectives of the Study

- (a) To review the background of the smart classroom.
- (b) To assess the process of the conducting class through Smart Classroom.
- (c) To investigate the effectiveness of smart classroom
- (d) To identify the strengths and weaknesses of Smart Classroom.

Literature Review

The modern classroom started at the end of the sixteenth century when classroom teaching was invented, with instructors lecturing from raised platforms and pupils sitting at fixed many rows deep (Song et al. 2014). Rows of seats, instructor front and center, student eyes trained on the teacher, this classroom model worked well for centuries. However, traditional approaches were ineffective for today's needs (Finch 2018). Now most classrooms in China remained the same layout as when they were invented (Yang et al. 2013).

Technologies in classroom shifted with time. Since chalkboard was introduced into classroom in 1890, technologies such as film strips, overhead projector, desktop computer, interactive white board, smart phones, and tablets were gradually used in classroom. With the use of these technologies, teaching in classroom has changed from "blackboard & chalk" mode to the "computer & projection" mode. Although technologies use in classroom had enhanced teaching to some extent, many predicaments still existed in today's classroom.

First, multimedia console was fixed in front of the classroom, which limited the flexibility of teaching. In classroom, teachers were always busy with operating computers, with few gesture interactions or eye interactions with students (Yang and Lin 2009).

Second, the unified and fixed classroom layout enhanced the didactic pedagogy but hindered teacher's adoption of student-centered pedagogy. Research showed that classroom with the specially designed layout such as "X-shaped" or "round" shape could meet the need of student-centered pedagogies (JISC 2009).

Third, the misuse of slides in multimedia classroom hindered student's knowledge processing. Slides used by teachers in classroom were normally filled with texts, with no figures, tables, or multimedia materials. It was easily for students to distract their attention from slides where the learning contents were listed (Huang et al. 2012).

Last, big gaps existed in teacher's technological pedagogy knowledge and the needs for using emerging technologies in classroom. For example, interactive white boards (IBW) were equipped to lots of classrooms; however, most of them were used just like a projector screen (Huang et al. 2012). To some extent, the plight of the technology-rich classroom had a close relationship with the design and equipment of the classroom environment. Acknowledging the challenges of technological use in classroom, scholars argued the need of shifting attention from technology and software and learning activities design in smart classroom (Simsek 2005; Aguilar et al. 2015).

The phrase smart classroom had been used since 1995 in San Diego State University when they built the first smart classroom with the aim to enhance learning in big classroom by integrating technologies, like clickers, symposium, multichannel audio system, etc. (Frazee et al. 2006). In the following years until 2012, researchers investigated various technologies, like multimedia communicational supporting platform (Shi et al.2003), Ambient intelligence (Augusto 2009), Internet of things (Temkar et al. 2016), etc. to make either physical classroom or virtual classroom smart. In this period, not much research could be found on smart classroom, and smart classroom was not well defined.

The existed research of smart classroom was mainly investigated from technological point, however, few studies focused on the pedagogical aspect. (Huang et al. (2012) defined smart classroom as a physical classroom space that was effective for showing teaching content, easy for class management, convenient for accessing learning resources, easy for instructional interaction, and combined with contextual awareness. Although the definition started to integrate the pedagogical issues into consideration, few follow-ups research were found on the design and evaluation smart classrooms from both pedagogical and technological issues.

Since 2012, smart classroom implementation “is mainly based on active use of mobile technology, learner mobile devices and automatic communications” (Uskov et al. 2015). Now in a smart classroom, mobile devices are owned by students so that all students can contribute and become active agents (Jahnke et al. 2017). More and more research on smart classroom/ smart learning environments emerged since 2012.

However, pedagogical changed such as innovation in the teaching role, or the new role students take, the role of the contents, who decided on the learning process, resources, etc., was usually overlooked (Bautista and Borges 2013).

In April 2018, China Ministry of Education issued the “The action plan of ICT in Education 2.0”, which emphasized the importance for building smart learning environments to promote smart education (China Ministry of Education 2018). Lots of provinces also announced their local action plans to build smart classrooms for smart learning, like Zhejiang Province and Fujian Province. However, few studies revealed the pedagogical issues of smart classroom, especially from the large-scale survey perspective.

Basic Requirements of a Technology-Rich Classroom

A smart classroom is a technology-rich classroom to support classroom activities, including lecturing, group discussion, presentation, and tele-education, with technology devices. The requirements to build a basic technology-rich classroom are listed as follows:

- (a) A general-purpose personal computer with popular operating system and software applications installed and Internet connectivity.
- (b) The computer is connected to at least two displays. One for controlling the computer, the other is a large screen for all audience.
- (c) The computer controlling display should have the multi-touch function for teachers to put marks with fingers on the displayed contents during a lecture.
- (d) Microphone for lecturing or presentation.
- (e) An audio speaker which takes both the computer’s audio and microphone as a sound
- (f) input source.

Advantages of smart classrooms

SMART Education is Self-directed, motivated, Adaptive, Resource-enriched, Technology embedded.

Access to online study materials.

Smart classes combined with the Internet opens the door to the vast world of online study materials. It can leverage the maximum potential of online materials for learning and teaching. This way, the education would not be restricted to your textbook.

Another important aspect of Internet-based education is that it helps synchronization of all the study materials to every gadget. This helps in reducing taking notes. Students just need to download their study materials to their gadgets. It can save time and effort.

Internet-based education also helps to connect students and teachers 24/7 making it easy for students to ask their doubts and clarify it regardless of the time.

Paperless Classrooms

As discussed before, Smart classrooms utilize smart gadgets for learning and teaching. The use of smart devices in education partially or fully eliminates the textbooks/notebooks. The negligible use of paper makes education Eco-friendly leading to a solution for environmental hazards possessed by traditional education.

Make learning easy

Smart classrooms utilize visuals for teaching. Sometimes students can even interact with the visuals using advanced technologies like Virtual reality. Visual-based learning process found way effective than the traditional learning method. In this way, students can learn easily. Smart classrooms also make to reduce distractions and keep students engaged in the learning process.

Flexibility in teaching and learning

The smart board can present a wide variety of multimedia contents. Some students prefer video-based learning, and some prefer photos, graphs, maps, etc. A projector connected with the computer can present all these contents giving students the flexibility they want for learning effectively.

Benefit for absentees

Digital study materials can be downloaded and watched at any time or place. This benefits the absentees; even if they miss their classes, they can download it and study themselves at their convenient time.

Disadvantages of smart classrooms

Cost of infrastructure

The cost of infrastructure is a concern for smart classrooms. It needs several smart gadgets like computers, tablets, projectors, software, etc. The software and hardware requirements also change frequently when the technology develops. So, the schools may need to upgrade it. To keep track of the changes and advancement of this software, schools may need to hire a technology person which is an additional cost that schools must expend.

Technical Faults

Electronic gadgets are prone to technical faults. When these devices fail, it may need hours or days to repair it. This will waste a working day. Teachers may go back to the old blackboard method, but this is boring for both teachers and students once they get used to smart education.

Diversions

Study using a Smartphone with an internet connection is prone to distractions. Students can browse other websites, social networking apps, other things, if the gadgets are not closely monitored by

parents or teachers. Filtered browsing is an option to prevent this. However, it is difficult if the gadget is personally owned by the child.

Lack of skilled teachers

Not every teacher is technologically skilled. Some teachers even can't use a personal computer. It is hard to train such teachers to effectively teach with smart gadgets. The training also incurs some costs, if they are not properly trained the technology become a disturbing factor than becoming helpful.

Conclusion

Being smart is not enough for a modern university. In fact, universities should better become smarter by "smarter university" we mean a place where knowledge is shared between employees, teachers, students, and all stakeholders in a seamless way. To meet the challenges of upcoming centuries and to face the unwanted situations arises by some pandemic situation like Covid-19 a smart classroom will be a better choice. Accordingly, if we can overcome some insignificant draw backs of Smart Classroom we can effortlessly cope with in the pandemic and post pandemic situations of the present world.

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