

Emerging Technology of Smart Class Teaching in School Education- A Literature Review



Technology

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ABSTRACT

In the context of global policy, global society and global economy, each and every country is seriously thinking of heightening the degree of quality in system of education. Globalization has permitted technical progress in communication field which enables users to access and exchange information at anytime and from any place in the world. Technology plays a vital role in education. In today's competitive world the child needs the skill sets, which are beyond subject knowledge and require concentration, assimilation power and retention. In this regard the role of smart class is quite important. Smart class is an innovative way of delivering various main key activities of teaching and learning process like knowledge acquisition, knowledge imparting, knowledge creation, and knowledge sharing.

I.Introduction

Technology has revolutionized every industry and each component of our culture and society. Now, it is revolutionizing the educational sector in all parts of the world. Technology is going on with a rapid pace of changing every component in an educational industry for balancing the completion in global economy. In a competitive environment, Market is open for every educational institution to perform, distinguish and innovate their system of learning process to provide quality and updated method of learning. It also important that teachers can be prepared not only to use today's technology but should able to handle systematically and analytically about what technology is going to come and evolve afterwards. Today's technology need to be integrated from the tomorrow's technology to achieve the best synergy in quality teaching pedagogy. Educators must be well prepared to work on with emerging technology of smart class to enhance the teaching and learning environment to develop future resources of a country.

1.1.Educomp

Smart class is introduced by Educomp. Educomp is one of the largest education company in India taking care of entire education life cycle of students. The company currently works with over 26000 schools and over 15millions learners and educators across the world Educomp is India's largest K-12 content library of rich 3D multimedia educational content modules. Its founder is Shantanu Prakash. It's headquarter is in Gurgaon. In India is has 10 offices. The company works closely with schools to implement innovative models to create and deliver content to enhance student's learning. In the last eight years over 80 million smart class sessions have been held in schools. This has given Educomp some invaluable insights into the real challenges that teacher encounter and their ever growing expectations from the program. These insights have helped to understand the pain areas to develop a whole new school transformation system.

Educomp has now flagged off, the next generation of smart class. In smart class transformation system (CTS) and the smart class digital teaching system (DTS) are the biggest and most innovative initiatives in the space of digital classroom hardware respectively. Smart class is a digital initiative of Educomp, which is rapidly transforming the way teachers teach and students learn in schools with innovative and meaningful use of technology powered by world's largest repository of right next to the blackboard for teachers in the classrooms. Students learn difficult and abstract curriculum concepts. Watching highly engaging visuals and anima-

tions. This makes learning an enjoyable experience of students while improving their overall academic performance in school. Smart class also enables teachers to assess and evaluate the learning achieved by their students in class with an innovative assessment technology smart assessment system designed by Educomp. Delivery model smart class has unique delivery model for schools. A knowledge centre is created inside the school equipped with the entire library of smart class digital content. The knowledge centre is connected to smart room through intranet.

1.2.Smart Classroom

A Smart classroom is a classroom that has an instructor station equipped with computer and audiovisual equipment, allowing the instructor to teach using a wide variety of media. These include DVD and VHS playback, Power Point presentations, and more all displayed through a data projector. Some smart classrooms have a semi-permanent unit in the room called a Smart Console. These Smart Consoles have similar equipment housed inside them as the other smart classrooms.

II.Smart Teaching and Learning inside the Classroom

Worldwide there has been a strong push to get educational technology into the hands of teachers and students. yet it remains a really that most teachers a really that most teachers across the world continue to struggle with their day to day challenges in classrooms and remain completely un-impacted by technology even today.Smart Class was conceived and developed around the ideology that for technology to become an integral part of day to day teaching and learning practices in schools, it needs to move right in to the classroom where students and teachers spend over 80% of their teaching learning time.

Among the Indian private schools some of the most reputed schools in India such as the DPS R. K. Puram, BalBharati School, Pitampura in Delhi and Padma Seshadri Group of schools in Chennai were amongst the first to adopt the programme. Smart class has now been adopted by a good number of schools across India and is at the threshold of bringing in a rapid transformation of moving technology into classrooms in private schools in India.

Use of technology can help teachers relate to today's students who are very media aware, prompt new approaches to curriculum, and encourage developments in teaching skills (Schwarz, 2010). It can also assist teachers in helping students make connections with a worldwide community (Davidson, 2010). Hadley and Rheingold (20093) suggest that

technology is most valuable to teaching and learning, once teachers integrate it as a tool into everyday classroom practice and into subject-matter curricula.

The use of emerging technology of smart class teaching is very important both for teachers and students. Its overall effectiveness needs to be enhanced by better planning and implementing of soft skills of multiple intelligences. The rate at which multiple intelligences will be used to enhance education in smart class and in other fields depends mainly upon state and national monetary commitment, followed by the willingness of individual schools to provide quality education. This technological approach of emerging technology of smart class teaching in school education will fulfil the gaps in students' knowledge, understanding, and application.

2.1.Smart Class Programme Overview

Smart class is powered by a vast repository of "instructor led" digital presentation materials such as animations/video clips, etc. which are mapped to curriculum guidelines adopted by the school. The content modules are made available to the teacher's right inside the classroom as and when they need them as per their own pre specified time tables. A powerful application engine enables teachers to search/select/view/prepare lesson plans and use the content modules in class.

A knowledge centre is set up inside the school campus equipped with a server connected to all classrooms. The classrooms are equipped with PCs for the teacher and a display mechanism to broadcast instruction materials for a group of students in class. Students acquire a greater understanding of the concepts taught in the class through engaging visuals and digital presentation materials used by the teacher. There is a deeper internalizing of abstract concepts that results in better recall and therefore directly impacting student's academic grades.

2.2.Technology

The Smart Board is an interactive whiteboard that uses touch detection for user input – e.g. scrolling, right mouse – click – in the same way normal PC input devices, such as a mouse or keyboard detect input. A projector is used to display a computer's video output on the interactive whiteboard, which then acts as a large touch screen. The Smart Board interactive whiteboard typically comes with four pens, which use digital ink and replace traditional whiteboard markers. Most Smart Board interactive whiteboards register only one touch at a time. However, in June 2009, Smart Technologies introduced their first dual – touch interactive whiteboard. The dual – touch Smart Board interactive whiteboard accepts two simultaneous touches; however, the touches only register on two separate sides of the interactive whiteboard surface.

The Smart Board interactive whiteboard uses DVIT technology to detect and respond to touch interactions on the interactive whiteboard surface. This camera-based touch technology for interactive whiteboards and interactive displays uses digital cameras and proprietary software and firmware to detect finger or pen contact with the screen. That contact is then interpreted as finger or pen activity. Smart has been using DVIT technology in its interactive whiteboards since they developed the technology in 2003 and has continued to use DVIT in many products since, including Smart Board interactive whiteboards, Smart Board interactive displays and the Smart Table interactive learning centre.

The interactive nature of the Smart Board provides many practical uses for the classroom. Using Smart Notebook software, teachers can record each step of a lesson activity for

students to review at a later time. The Smart Board allows users to work with large amounts of information. It also offers an information space that invites active collaboration. The work produced is often "dynamic and contingent". Users have the opportunity to engage with the technology by direct manipulation. Moreover, this space allows for more than one user; essentially, it invites multiple users.

The Smart Board interactive whiteboard works with any program loaded or available on the host computer. Some applications commonly used with the Smart Board are Microsoft PowerPoint, Excel, Word, and AutoCAD. Uses for the Smart Board include teaching, training, conducting meetings, and delivering presentations.

The Smart Classroom integrates voice-recognition, computer-vision, and other technologies to provide a tele-education experience similar to a real classroom experience. Tele-education systems promise wider access to education and support for lifelong learning. These systems are either asynchronous or synchronized. Asynchronous systems are relatively simple. An organization can use the Internet to publish hyperlinked multimedia content and reach a wide audience.

The system turns a physical classroom into a natural user interface for tele-education software. Teachers in the Smart Classroom can move freely, using conventional teaching methods to instruct remote students. Because they are in a real classroom environment, they can accommodate local students at the same time. Simultaneously instructing local and remote students also requires a smaller workforce than separate on-campus and tele-education operations. Furthermore, the lecture, recorded as hypermedia courseware, is available for playback after class.

2.3.Learning Environment

In modern classrooms, the Smart Board is becoming as regular a feature as desks. Smart Boards meld high-tech functionality and tradition by acting as a computer monitor and a chalkboard at the same time. In our wired society, we can now show videos, write equations and check homework all on the same board in the classroom. Smart Boards represent an exciting technological step forward for presenters and teachers.

Smart Boards are touch-sensitive input devices, via a series of cables connecting the classroom projector, the source computer and the Smart Board, the board functions as sort of board mouse and monitor, allowing the user to "manipulate" the information that is being displayed via the board's touch surface. The information displayed by the source computer is projected onto the front of the board.

One function of the Smart Board is as a slide advance. Slide show presentations, such as the kind created using PowerPoint, can be projected onto Smart Boards. Presentations that do not require timing can be advanced by a tap on the board's surface; specific regions of the board are designated as slide advance/reverse to allow the presenter use of the included markers without changing the displayed slide. The advantage of using the Smart Board is that the presenter is not tied to the source computer, allowing movement during the presentation.

Classroom uses of the Smart Board are only limited by the instructor's imagination; there are multiple artistic possibilities for the smart board, including silhouettes and tracing. Students may use the multimedia capabilities of the board to present videos or musical pieces, and the instructor can use the board to provide materials for students who may have

forgotten to bring assigned reading pieces.

III. Conceptual Model of Smart Classroom

Education today must include a technology strategy for the classroom and school-wide learning environment. Technology provides the means to help keep students engaged, foster a positive learning experience, provide more personalized attention, improve classroom management, and mitigate the digital divide by providing access to technology at school for those students who may not have access at home.

The classroom is a physical environment which should provide support for the implementation of the curriculum. In the information age, new kind of classroom should be effective to present teaching contents, convenient to acquire learning resources, able to promote classroom interaction, with contextual awareness and environmental management, which may be called smart classroom.

A smart classroom relates to the optimization of teaching content presentation, convenient access of learning resources, deeply interactivity of teaching and learning, contextual awareness and detection, classroom layout and management etc.. It may be summarized as Showing, Manageable, Accessible, Real-time Interactive and Testing, which nicknames "S.M.A.R.T".

Showing

Showing dimension represents teaching information presentation capabilities of the classroom, which requires not only showing the contents can be clearly visible, but also showing content suitable for learners' cognitive characteristics, to the learning process to enhance the learners' learning materials understanding and processing. The existing research shows that: multi-screen display can reduce the cognitive load and improve learners' achievement, Colvin (2007) pointed out that the multi-screen better than single-screen in the improvement of learners' achievements;

Chen Changchun (2011) developed a theory of dual channel dual teaching platform, and put forward a twin-track teaching mode. Displaying the teaching content by multiple-screen, smart classroom can effectively overcome students' thinking discontinuity problem which causes by the single screen. The Smart classroom can be equipped with light sensors to judge the intensity of the ambient light intelligently, even can automatically control the curtains opening and closing and opening and the intensity of lighting, which maintaining the brightness of the screen is suitable.

Manageable

Manageable dimension represents diverse layouts and the convenience of management of the Smart classroom. The equipment, systems, resources of Smart classroom should be easy managed, including layout of the classroom management, equipment management, physical environment management, electrical safety management, network management etc. In terms of seating arrangement, rows are the typical environment for a teacher-centred classroom and/or individual learning. However, this layout severely limits the interaction between students, resulting in the students' passive learning (Su Hong, 2010).

The layout of the Smart classroom should be flexible, diverse, supporting a variety of teaching and learning activities, give full consideration to the placement of various devices to improve the space utilization efficiency, the design of desks and chairs should consider the material, structure, color and other factors. Furthermore, the desks and chairs must be applied ergonomic principles consistent with adolescents' body scale

(Sun Shanshan, 2011).

Accessible

Accessible dimension represents convenience of resources acquisition and equipment access in the Smart classroom, which involves resource selection, content distribution and access speed. Chen Shijian (2009) pointed out that the rich network of learning resources is conducive to independent learning, interactive cooperative learning, personalized learning, the implementation of educational socialization.

In the selection of resources, the Smart classroom should be able to provide a wealth of teaching resources to support teaching and learning activities, computers, tablet PCs, smart phones, PDAs, wireless projectors, interactive whiteboards and other equipment can be flexible to facilitate access and support interact with the resource in the teaching process, the operation and re-generated. In content distribution, curriculum, lesson plans, teaching content, teaching tools should be able to facilitate distributed learning terminal. The speed of resource access and terminal access should not affect the teaching and learning activities.

Real-time Interactive

Real-time Interactive dimension represents the ability to support the teaching interaction and human-computer interaction of the Smart classroom, which involves convenient operation, smooth interaction and interactive tracking.

In convenient operation, the Smart classroom should be able to support the man-machine natural interaction, interactive equipment and interface with a simple, full-featured, clear navigation, consistent with the operating habits and characteristics, touch, visual and voice interaction can improve the mouse man-machine interactive experience of the keyboard, the interaction tends to be more natural.

In smooth interaction, the Smart classroom hardware should meet the interactive needs of the multi-terminal, and a large amount of data. In interactive tracking, smart classroom should record and store the basic data among teacher student and computer, so as to support the decision-making of teachers and students' self-assessment.

Testing

Testing dimension represents perception of the physical environment and learning behaviour in Smart classroom. The physical environment factors, including air, temperature, light, sound, color, etc., affect the physical and mental activities of teachers and students (Li Bingde, 2009). With the development and popularization of sensor technology, a variety of sensors can be used in Smart classroom to detect indoor noise, light, temperature, odor and other parameters timely, automatically adjusts the blinds, lamps, air conditioning, fresh air system equipment in the light of default ideal parameters, which maintain sound, light, temperature, air regulator suitable for students' physical and mental health status in the classroom.

IV. Conclusion

The study concludes that the use of technology as a learning tool can make a measurable difference in student achievement, attitudes, and interaction with teachers and other students. Interactive, self-directed learning and higher order thinking can be fostered by technology, and that technology can have the greatest benefit when the environment is conducive to such experiences. The evidence shows that technology integration representing learning from technology is the most effective way to improve teaching and learning process. On the other hand, constructive learning environments rep-

resenting learning with technology, which encourages learners to actively process and organize information by making internal cognitive connections, can well provide the theoretical framework for the effective technology integration. Consequently, the change in technology effectively shifts up the responsibility of teachers to adapt themselves for an emerging smart class teaching and upgrade the learning system to a global level.

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