Modern Education with Smart Classroom

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Structured Abstract:

Purpose: The purpose of the present study is to review the effectiveness of Smart classroom in modern teaching-learning situation.

Design/Methodology/Approach: The study is mainly analytical in nature. The data has been collected from various publications, reports, monographs, books, journal, newspaper and internet source etc.

Findings: The researcher found that Smart Classroom is very effective in educational system. But in India this concept is not widely spread throughout the country. Only few cases are to be noticed. The Concept of smart classroom is Scientific and psychological. So students must be benefited from this concept. Smart whiteboard provides the opportunity of joyful learning.

Originality/Value: In the present study, the researcher tries to know how far this concept is student friendly and helpful for educational system.

Key words: Smart Classroom, Information and communication technology, Interactive whiteboard.

Paper Type: Theoretical Research Paper.

Introduction

We know that nation is built in a classroom. Formal education without classroom is unthinkable. In the ancient period classroom is "Gurukul" room or under the "Gurukul" tree. "Gurudeb" delivered lectures and student learn by listening. There was no any written or printed material. With the passes of time the teaching-learning procedure develops gradually. In the present days learning is learner oriented. Modern educational system always gives priority to learners psychology like as need, capacity, I.Q, etc. and technology also help educational system to make learning joyful, scientific, psychological, informative, opportunistic. The concept of classroom changes drastically in modern days. Now the classroom is SMART CLASSROOM. In the smart classroom every student has the opportunity to access world's information very easily by the help of internet within the classroom. Smart classroom also help teachers to deliver his valuable information with the help of interactive white board.

Review of Related Literature

Akcay Ahmet Oguz, Arslan Halit and Guven Ufuk (2015) performed their study on "Teachers' Attitudes toward Using Interactive Whiteboards". They found that significant differences existed for attitudes toward using interactive whiteboard based on gender and content area specialty, while no differences were found based on age and years of teaching experience.

Aytac Tufan (2013) studied on 'Interactive Whiteboard factor in Education: Students' points of view and their problems' on 202 students in primary school and high school in Ankara, Yozgat, Turkey. He found that in terms of gender there are no significant differences. There is a clear difference between primary school and high school students' views about the use of IWB. During this study it was observed that students generally had a positive attitude towards the use of IWB. Students identified teachers' inefficiency to use IWB, technical problems, insufficiency of e-materials and their wonders about the radiation and eye health as problems.

Aytekin Isman and co-authors (2012) conducted their study on "Saudi Secondary School Teachers Attitudes' towards using Interactive Whiteboard in classrooms" and they found that there were appositive attitude towards using Interactive Whiteboard. But a few number of teachers used effectively the Interactive Whiteboard effectively in the classrooms. These results indicated that the teachers need a professional development program for effective using of Interactive Whiteboard effectively to help them in improving their Teaching skills and the students learning.

Balta Nuri and Duran Muharrem (2015) studied on "Attitudes of Students and Teachers towards the Use of Interactive Whiteboards in Elementary and Secondary School Classrooms". The major findings are interactive whiteboards are highly rated by both teachers and students. Students mostly prefer the usage of interactive whiteboards in math courses, and their attitudes differ across their genders and school levels. As students get elder, their positive attitudes toward interactive whiteboard technology decrease, and it has been found out that there is no difference between teachers' and students' attitudes.

Muhanna. Dr. Wafa, Nejem. Dr. Khamis Mousa (2013) conducted a study on "Attitudes of Mathematics Teachers toward Using Smart Board in Teaching Mathematics" and they find that mathematics teachers have positive attitudes toward using a smart board in teaching mathematics and they prefer using it instead of a traditional board.

Prabhu Mr. H, Reenadavi Mrs.G., Raja Dr.P.Vaiyapuri (2015) performed their study on "Attitude of B.Ed. students towards smart classroom in Arni Taluk" and the investigation revealed that majority of the B.Ed., students studying in the Arni Taluk, Tamilnadu, India, shows a favourable attitude towards smart classroom which in turn gives a very high level of achievement for the B.Ed., students in their career.

Yapici I.Umit. and Karakoyun Ferit (2016) carried out their study on "High school students' attitudes towards smart board use in Biology classes". They found that smart board use in biology classes allows understanding of subjects more easily and rapidly, avoiding time consumption and increasing students' motivation and interest via visual elements. The students' attitude scores did not differ statistically with respect to the variables of "gender" and "smart board use time".

Objectives of the Study

The objectives of this present paper are

- To study the meaning of Smart Classroom.
- To study the concept of smart class originated.
- To study the position of smart class room in India.
- To study the concept model of smart class room.
- To study the principle of smart classroom.
- To study the role of Interactive Whiteboard in Smart classroom.

Research Questions

Researcher framed the following research questions for the study:

1. What is smart classroom?
2. How is the concept of smart class originated?
3. What is the position of smart class room in India?
4. What is the concept model of smart class room?
5. What is the principle of smart classroom?
6. What is the role of Interactive Whiteboard in Smart classroom?

Methodology

The study is mainly analytical in nature. The data has been collected from various publications, reports, monographs, books, journals and newspaper etc. Further internet source and websites are also consulted for this purpose.

Discussion

What is smart classroom?

Smart classrooms are electronically enhanced lecture theatres and classrooms. These rooms create new opportunities in teaching and learning by integrating computer, multimedia and network technology.

Northwestern University defines smart classrooms as"... technology enhanced classrooms that foster opportunities for teaching and learning by integrating learning technology, such as computers, specialized software , audience response technology, assistive listening devices , networking, and audio/visual capabilities."[24]

Origin of Smart Classes

In 1986, David Martin and Nancy Knowlton were driving through upstate New York when David first described a product idea he'd been working on to Nancy. A year later, SMART was founded. Originally, the company was the Canadian distributor for a U.S. projector company, and revenue was generated through projector sales. That revenue was directed toward the research and development of the SMART Board interactive whiteboard, which would combine the simplicity of a whiteboard with the power of a computer.

Smart classroom in India

Smart class was launched by EDUCOM in 2004. In the initial stages a soft launch across a few select geographic confirmed the phenomenal acceptance amongst private schools of all categories. At the very initial stage of launch many Indian reputed schools like Takshila, DPS Pitampura in Delhi and Cambridge- Chain of schools were the first to adopt the programme. It has been now adopted by 1000 schools across India and helps in a rapid transformation of moving technology into classrooms in India. (Corporate Diary, 2007) [9]

Concept Model of Smart Classroom

The smart classroom is highly technological concept where presentation of content is optimal, interactive, convenient access of learning resources. It is also helpful for contextual awareness, classroom layout and management. It may be summarized as Showing, Manageable, Accessible, Real-time Interactive and Testing, which nicknames "S.M.A.R.T". The five dimensions just embody the wisdom of a smart classroom feature, which can be referred to as "SMART" concept model, as shown in figure 1.

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) [8] pointed out that the multi-screen better than single-screen in the improvement of learners' achievements; Chen Changsheng (2011) [5] 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.

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, 2003) [19]. 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, colour and other factors. Furthermore, the desks and chairs must be applied ergonomic principles consistent with adolescents' body scale (Sun Shanshan, 2011) [20].

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 (2003) [6] 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 an equipped with teaching resources to support teaching and learning activities, computers, tablet PCs, smart phones, wireless projectors, interactive whiteboards. 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 natural interaction between man and machine, 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 interaction between man and machine, the interaction tends to be more natural. The Horizon Report predicts that learning analysis technology will be popularized in 4-5 years (Johnson, 2011) [12].The smart classroom should support teaching interaction comprehensively. Keep abreast of the topic of student interaction, students' difficulties and problems and to guide or help them would be smart classrooms' important function. Record interactive process and timely analyze the data obtained is the main way to achieve this function.

Testing

Testing dimension represents perception of the physical environment and learning behaviour in Smart classroom. The physical environment factors, including air, temperature, light, sound, colour, odours etc, affect the physical and mental activities of teachers and students (Li Bingde, 1991) [14].

Principles of Smart Classroom

The following are the principles for smart classrooms in terms of arrangement and pedagogical configuration which should be considered in order to transform any formal learning space into a smart classroom [4].

Flexibility of physical arrangement

The arrangement of a smart classroom and its elements should be such that it allows agile and easy variations in activities, that is, make it possible to change student grouping, the type of resources being used, use of various types of resources at the same time, ICT and non-ICT, for different students to carry out different tasks, e.g. searching information, discussing, watching a video, etc. Therefore classrooms will be supplied with varied furniture elements to achieve flexibility of space arrangement, for instance using movable, rolling desks and chairs, or stackable, folding chairs, ergonomically spaces, areas for different uses, etc.

Adaptability

In nature every teacher and every class is different, and that space can be adapted to their needs, the concept of smart classrooms includes the principle of adaptability to the type and needs of teacher and of each student. Adaptability has to do also with a space which enables the inclusion of students and teachers with special education needs.

Comfort

A smart classroom is a place where all activities are performed in comfortably –reading, watching videos, playing, listening to audios, writing, talking, debating, experimentation, and so on.

Multiplicity

This principle refers to smart classrooms having features which enable the use of various types of resources and stimuli. While teaching and learning, the arrangement should enable possibilities for creativity, reasoning, logical thinking, etc., and it should be adapted as close as possible to learners' various needs and learning styles. Thus, it should be an open space where we can have access to any source of information, either physical or in digital format particularly.

Connectivity

The concept of connectivity is two types. On one hand it is required that the learning space has good network connectivity, both local and worldwide, to use to the most the potential of mobile devices. Connectivity should be wireless, and this is fundamental to maximize physical mobility around the space and comfort in using technology. On the other hand, beyond digital connectivity there exists social and informational connectivity. Through networks, students live connected to teachers, friends, family, professionals and to a large number of information sources. This connectivity should not be underestimated by teachers, who should explore their possibilities and evaluate to what extent they can contribute to improving learning space and learning processes. To some extent this principle can be linked to the theoretical framework of Connectivism [10].

Personalization

Smart classrooms should allow students and teachers to personalize their environment according to their likes and needs. Therefore we are not referring to a standard, impersonal, cold environment, but a space which progressively teacher and students should make their own, personalizing it by means of activities which support and reinforce learning.

Order / Organization

This is an important principle, even though it is not easy to design, and attain, sustainable placing, storing, arrangement and rules of use of spaces and resources available. For this reason teachers should carefully consider the order and arrangement of spaces and resources so that these are the most adequate for the learning activities that will take place in their smart classroom.

Openness

This principle denies the concept of formal learning conducted in formal classroom, where the teacher presents information and gives a lesson in a transmissive way [15].Learning however takes place beyond the classroom space, both physically and virtually, and therefore activities put forward for smart classrooms should consider these extended learning places and learning times in order to learn beyond the classroom and the class times traditionally assigned.

Safety / Security

Smart classroom with heavy technological integration require a high degree of security. It will have an arrangement which prevents users from having physical accidents and will also be safe in terms of access to information and communication technology from the classroom.

In sum, the arrangement, structure, methodologies and principles of smart classrooms intend that learning experience be as likely as people's learning ways, preferences and styles, in a natural way and in a personal space; all this through active participation, experimentation, collaboration, solidarity, rapport, creativity, leadership, and so on.

Role of Interactive Whiteboard in Smart Classroom

In the smart classroom one of the major and vital components is Interactive Whiteboard. Without this board the concept of smart classroom is meaningless. So discussion about this component is very essential.

What is Interactive Whiteboard ?

An interactive whiteboard is a touch-sensitive screen that works in conjunction with a computer and a projector.

The interactive whiteboard is an instructional tool that allows computer images to be displayed onto a board using a digital projector. The instructor can then manipulate the elements on the board by using his finger as a mouse, directly on the screen. Items can be

dragged, clicked and copied and the lecturer can handwrite notes, which can be transformed into text and saved.

Interactive Whiteboard and Student Engagement

Learning is the most important things in educational system. In the learning process reading, asking question and interact with other person are important way. Current learning theories promote student engagement and consider it to be a key component of knowledge construction. These learning theories include the following:

• Constructivism – relies on the learner to select and transform information, construct hypotheses to make decisions and synthesize learning through personalizing knowledge

• Active learning – learners actively engage in the learning process through reading, writing, discussion, analysis, synthesis and evaluation, rather than passively absorbing instruction (e.g. lecture model of instruction)

• Whole-class teaching –brings the entire class together, focuses their attention and provides structured, teacher-focused group interaction

In case of computer integrated learning interaction occurs when student sit in front of computer. But in case of interactive whiteboard provides large workspace for hands-on work with multimedia resources. Having a space large enough for everyone to see opens a channel to higher student interaction in both teacher-directed and group-based exchanges – one can interact with the tool at the front of the class and everyone can feel involved because of the interactive whiteboard's size.

Benefits of Interactive White Board:

Interactive whiteboards can have positive impacts on teaching and learning in the areas outlin ed below.

General benefits of IWBs:

- Enable more varied, creative and engaging classrooms (Judge, M., 2007) [13]
- Increase enjoyment and motivation
- Students are able to cope with more complex concepts as a result of clearer, more effi cient and more dynamic presentation (Smith, H., 2001) [18]

- Enable teachers to integrate ICT into their lessons while teaching from the front of the class (Smith, H., 2001) [18]

Benefits for teachers:

- The ability to save and print what is on the board, including any notes made during the lesson
- The wealth of resources available, the stimulating nature of the presentation and the flexibility that the technology offers. (Higgins et al, 2005) [11]
- The benefit of being able to share and reuse materials.
- Ease of use, benefit of a tool facilitating collective viewing (Cogill, J, 2002) [7]

Benefits for students:

- Increase motivation.
- Accommodate different learning styles.
- Quantitative results.
- More interaction.

Conclusion:

Information and communication technology provides revolutionary opportunity in educational system. It influences from elementary to higher education in different level. When this ICT uses within a class room, the environment of classroom changes automatically. For the influence of ICT the concept of "smart classroom" develops. From the above discussion it is clear that smart classroom concept is very much fruitful in educational system. Now we see the benefits of smart classroom in summary.

- Improves teachers effectiveness and productivity in class
- It brings abstract and difficult curriculum concepts inside classrooms.
- Makes learning an enjoyable experience for students.
- Improves academic performance of students.
- Enables instant formative assessment of learning out comes in class.
- It also enables teachers to instantly assess and evaluate the learning achieved by their students in class.

It is clear that smart classroom has different benefits, but in our developing country the implementation of this concept is not so easy. The socio economic condition is not so good everywhere in our country. The major disadvantage of this concept is-

- Lack of electricity and internet connections in everywhere in our country

- Another disadvantage is expensive job to set up the smart classroom environment.

All things have some positive and negative sides but we always accept the positive side and try to minimize the negative side to overcome the problem. In the above discussion it is clear that the smart classroom is very effective in educational system. No doubt this system will help all involved in education as soon as it is implemented.

Suggestions

The researcher suggested that

- To improve our positive attitude towards smart classroom.

- To reduce the financial barrier as much as possible.

- Government should undertake the matter to implement the concept in nearer future throughout the India widely.

- The curriculum should be framed keeping in view the application of smart classes of teaching.

References:

1. Akcay Ahmet Oguz, Arslan Halit and Guven Ufuk (2015). "Teachers' Attitudes toward Using Interactive Whiteboards". Middle Eastern & African Journal of Educational Research, Issue 17, Year 2015, page: 22-30.

2. Aytac Tufan (2013), 'Interactive Whiteboard factor in Education: Students' points of view and their problems'. Academic Journals, Educational Research and Reviews, Vol. 8(20),pp. 1907-1915, 23 October, 2013, ISSN 1996-0816 © 2013 Academic Journals. http://www.academicjournals.org/ERR

3. Aytekin Isman and co-authors (2012). "Saudi Secondary School Teachers Attitudes' towards using Interactive Whiteboard in classrooms". Turkish Online Journal of Educational Technology; Jul2012, Vol. 11 Issue 3, p286.

4. Balta Nuri and Duran Muharrem (2015). "Attitudes of Students and Teachers towards the Use of Interactive Whiteboards in Elementary and Secondary School Classrooms". The Turkish Online Journal of Educational Technology – April 2015, volume 14 issue 2. http://www.tojet.net/articles/v14i2/1423.pdf.

5. Bautista G., *Smart Classroom. Innovando el espacio de aprendizaje con TIC*. Barcelona: Materiales didácticos UOC, 2013.

6. Chen Changsheng, Liu Sannvya, Wang Hong,&Chen Zengzhao (2011). Dual track teaching modal based on dual coding theory [J]. China Education Info, (3):52-55.

7. Chen Shijian, &Wang Chong (2003). The meaning, function and type of e-learning resources in the internet.

8. Cogill, J, (2002) How is the interactive whiteboard being used in the primary school and how does it affect teachers and training? King's College, London.http://www.virtuallearning.org.uk/whiteboards/IFS_Interactive_whiteboards_in_the_primary_ school.pdf

9. Colvin, J., Tobler, N., & Anderson, J.A. (2007). Productivity and multi-screen computer displays. Rocky Mountain Communication Review, 2(1), 31–53.

10. Corporate Diary (2007). Smart Teaching and Learning inside the Classroom.

11. G. Siemens, Conectivismo: Una teoría de aprendizaje para la era digital. 2004, Retrieved 20.11.2012 from

12. Higgins et al, (2005) Embedding ICT in the Literary and Numeracy Strategies –
    Final Report,
    Centre for Learning and Teaching, Newcastle,http://partners.becta.org.uk/upload-dir/downloads/page_documents/research/univ_newcastle_evaluation_whiteboards.doc

13. Johnson, L., S. Adams and K. Haywood (2011). The NMC Horizon Report: 2011 K[EB/OL]. [2012-2-20] http://wp.nmc.org/horizon2011/.

14. Judge, M., (2007) Research on Interactive Whiteboard Technology, Education Matters, December 2007.
    http://www.educationmatters.ie/2007/12/04/research-on-interactive-white-board-technology-launched

15. Li Bingde (1991).Theory of instruction [M]. Beijing: People's Education Press:266-267.

16. Marilla D., Svinicki R., Rice E., N. Van Note Chism, Bickford D. J., *The importance of physical space in creating supportive learning environments*. San Francisco: Jossey-Bass, 2002.

17. Muhanna. Dr. Wafa, Nejem. Dr. Khamis Mousa (2013) "Attitudes of Mathematics Teachers toward Using Smart Board in Teaching Mathematics". Contemporary Issues in Education Research – Fourth Quarter 2013, Volume 6, Number 4, Page: 373-380.

18. Prabhu Mr.H, Reenadavi Mrs.G., Raja Dr.P.Vaiyapuri (2015), "Attitude of B.Ed. students towards smart classroom in Arni Taluk". International Journal of Teacher Educational Research (IJTER) Vol.4 No.4 April, 2015 ISSN: 2319-4642.

19. Smith, H. (2001). SmartBoard evaluation: 2001 Kent NGfL.http://www.kented.org.uk/ngfl/ict/IWB/whiteboards/index.html/

20. Su Hong (2003). Basic education curriculum reform and school cultural reconstruction [J]. Curriculum, Teaching Material and Method, (7):10-14.

21. Sun Shanshan (2011). On school desks and chairs design [J]. Art Design, (8):134-135.

22. Yapici I.Umit. and Karakoyun Ferit (2016). "High school students' attitudes towards smart board use in Biology classes". Academic Journals, Educational Research and Reviews, Vol. 11(07),pp. 459-465, 10th April 2016, ISSN 1990-3839 © 2016 Academic Journals. http://www.academicjournals.org/ERR

23. http://es.scribd.com/doc/201419/Conectivismo-una-teoria-del-aprendizaje-para-la-era-digital.

24. http://www.it.northwestern.edu/education/classrooms/

Figure 1

Concept Model of Smart Classroom