



A CRITICAL STUDY OF THE USE OF SMART BOARDS FOR TEACHING- LEARNING

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ABSTRACT :

A recent pedagogical innovation which has had a significant impact on the way learning experiences are provided in schools is the use of Interactive whiteboards. SMART Boards are a type of interactive white boards with touch sensitive screens mounted on the wall of the classroom. A projector projects information from a computer onto the whiteboard which is displayed to the whole class. SMART Boards are now widely being used for teaching in developed countries but its potential has yet to be tapped in developing countries like India. Considering the increasing use of SMART Boards at the global level and its benefits cited by various researchers in foreign countries, it becomes imperative to study its usefulness in the Indian context. The study aimed at examining the use of SMART Boards, its strengths and limitations for teaching learning. Case study method was used. Observation and interview tools were used to collect data which was analyzed quantitatively and qualitatively. This is followed by discussion of findings in relation to the objectives of the study.



KEYWORDS : Interactive whiteboards, SMART Boards, teaching learning.

INTRODUCTION

With the advent of information and communication technology, significant changes have occurred in the pedagogical practices all over the world. One such recent innovations which has had a significant impact on the way learning experiences are provided, is the use of Interactive whiteboards. An interactive whiteboard is a whiteboard which is powered by specific software and gets converted to a computer screen visible to the whole class. It all began in 1987 when David Martin started SMART Company, which developed the first interactive whiteboards called SMART Boards. SMART Boards are touch sensitive screens mounted on the wall of the classroom and a projector projects content on it. Using special pens, teachers or students can write directly on the screen or view course content, manipulate text and images, formulate graphs and design presentations. Additional features include conversion of handwritten text to typewritten text, drag and drop boxes, option of downloading video-clips, lesson plans and saving presentation for future use.

REVIEW OF RELATED LITERATURE

Smith.H.J., Higgins.S., Wall.K. & Miller.J. (2005) in their research article have conducted an analysis of the studies on Interactive whiteboards. They found that use of these boards make the lessons more interesting and students are motivated resulting in increased attention. Visual images are stimulating and improve the recall capacity. **Schroeder(2007)** studied the impact of Interactive whiteboards on the affective aspect of students when it is combined with interactive or collaborative learning approaches. They found

that SMART Boards strengthens affective learning. Since this approach was exciting and enjoyable, emotions were heightened. Also, it strengthened the rapport between group members. The instructor plays a positive role as a facilitator of students learning instead of being the centre of teaching. **Kuroneko(2008)** has pointed out that Smart boards provide the facility to control any application from the front rather than being behind the keyboard and be in a position to interact with the students. **Weber(2010)** reported that teachers and instructional coordinator at a school in Chicago were enthusiastic about using smart boards for instruction as it provided flexibility and diverse opportunities for them as well as the students. **Digregorio. P., Lojeski.K.S. (2010)** in their study reported that teachers are using interactive whiteboards as a replacement for blackboard and reinforce didactic teaching practice. But when there is a change in approach of teachers from didactic to interactive, these boards will have more impact. **Cole(2012)** rightly points out in his research article that students become active participants as they get involved in activities. This facilitates building and retention of concepts. Also it increases the social interaction amongst the students and provides motivation especially to students who are visually oriented.

RATIONALE OF THE STUDY

Research abroad has shown that SMART Boards are widely used in the classrooms nowadays to increase students' knowledge. However this use of SMART Boards has been observed more in developed countries. Its potential has yet to be tapped in developing countries like India. Total number of schools in India is 1.3 million and only about 10 % Private schools have tapped the potential of multimedia classroom teaching whereas in Government schools it has barely made any inroads, as per statistics published in Digital Learning Magazine in 2015.

Research has consistently shown that students and teachers feel that this technology is beneficial to enhance students' attention to the task at hand and improves their ability to learn the material. **Bell (1996)** in her article "Why use an interactive white board?" gives more than a dozen reasons for using interactive whiteboards. **Buyer(2008)** in an article for ABC News reported that smart boards have changed the classrooms. Earlier school evaluation was based on memorizing data and formulas but the use of smart boards has helped the kids to think, discuss and learn rather than just cram.

Considering the increasing use of SMART Boards at the global level and its benefits cited by various researchers in foreign countries, it becomes imperative to study its usefulness in the Indian context. If SMART Boards are found to be beneficial for enriching teaching- learning experiences in the Indian scenario, their wider use in Indian schools can be planned and implemented.

STATEMENT OF THE PROBLEM

A critical study of the use of SMART Boards for teaching- learning in a public school in Delhi

OBJECTIVES

The objectives of the present study are as follows:-

- 1) To examine the use of SMART Boards for teaching learning in a private school in Delhi.
- 2) To identify the strengths and limitations of using SMART Boards

RESEARCH QUESTIONS

The research study attempts to find answers to the following research questions:-

- 1) How can the SMART Boards be used effectively to optimize learning in formal teaching learning situations?
- 2) What are the strengths of using SMART boards in teaching learning situations in Indian context?
- 3) What are the limitations of using SMART boards in formal teaching learning situations in Indian context?

SCOPE AND LIMITATION OF THE STUDY

The study covers all age groups in school at various levels i.e primary, secondary and senior secondary .The findings include the views of both teachers and students and are therefore not one-sided. A variety of techniques are used to collect and analyse data, which increase the validity and reliability of the study. Since very few studies have been carried out in India on the use of SMART boards in schools, this study provides valuable data and insight into the use of SMART boards in an Indian school. The findings of the study can form the basis of further research and scope of SMART boards in Indian schools. Although it is an in-depth study of the use of SMART boards and also provides a critical analysis including its strengths and limitations, the study is limited to one school only located in an urban setting and its findings cannot be generalized for other schools in rural or remote areas.

METHODOLOGY AND DATA ANALYSIS

The study was conducted at Greenfield School, Safdarjung Enclave, Delhi. The sample included

1. Three classes each at primary and secondary and two classes at senior secondary level.
2. Four teachers at every level i.e. primary, secondary and senior secondary.
3. Three hundred and fifty students

Case study method was used to conduct the research study. To study the use of SMART Boards in detail, the following tools were used:-

1. Observation - Three classes each at primary and secondary levels and two classes at senior secondary level were observed when the teacher was teaching using smart board.
2. Students' interview- It was used to obtain feedback regarding smart board from twenty students at every level i.e primary, secondary and senior secondary.
3. Teachers' interview – It was used to collect data from four teachers at every level i.e primary, secondary and senior secondary.

Data was analyzed both quantitatively and qualitatively. The responses were categorized into categories and percentage of respondents falling in each category was calculated. The data collected from respondents was also analyzed qualitatively in context of the objectives of the study.

RESULTS

Use of smart board for teaching learning

It was found that Greenfield school has SMART classrooms for each grade. Grades 1 to XI have two sections each with a SMART board and class XII has one section which has a SMART board. Classes were rotated in such a manner that students of each class get a chance every week to learn using SMART boards. Teachers were using Smart boards very effectively as a teaching aid for teaching various subjects. They were observed to use SMART boards in between their explanations to show modules with pictures and videos corresponding to the content. Teachers were also using Smart boards for assessing students using worksheets and exercises in the module. Students were also observed to be attentive and taking interest during SMART board presentations.

Benefits of using Smart boards

1. Students Responses

Majority of students were of the view that use of ICT is beneficial for learning. Students gave the following benefits of using SMART Boards as shown in Table 1.

Table 1: Students responses on benefits of using SMART Boards

S.NO.	STUDENTS RESPONSE CATEGORIES	PERCENTAGE
1	Audio visuals created interest	94%
2	Abstract concepts became clearer	86%
3	Presentation systematic and interesting	79%
4	Daily life situations shown made understanding easier	65%
5	Provided extra inputs not given in book	52%

2. Teachers Responses

Majority of teachers were of the view that use of ICT is beneficial for teaching in the following ways:

Table 2: Teachers responses on benefits of using SMART Boards

S.NO.	TEACHERS RESPONSE CATEGORIES	PERCENTAGE
1.	Audio-Visual presentation provided better understanding	92%
2	Helpful in summarizing the topic	78%
3	Saves time and effort of the teacher	66%
4	Instant evaluation and immediate feedback	58%
5	Useful for remedial classes	52%
6	Enriches teachers' knowledge	43%
7	Provides readily available resources for future use	39%
8	Useful for demonstration of science practicals	18%

Limitations of using smart boards

Less than 10 % respondents gave a few constraints and weaknesses in using SMART Boards in teaching learning situations. These are discussed in the following section.

Major Findings

Following are the major findings based on a detailed analysis of responses to the interview:

Benefits of using Smart boards

The major benefits of using SMART boards as per student respondents are as follows:

1. Audio-Visuals created interest: As per 94% students, pictures, diagrams, animations and videos provided the audio visual impact. Textbooks don't give so many pictures or diagrams. Also the moving pictures or diagrams (with animation) made it more lively and created interest. Such varied stimuli provided satisfaction to the sense organs, better understanding and retention.
2. Abstract concepts became clearer : As per 86% students, abstract and difficult concepts like orbital in chemistry, atomic structure, life processes like circulation of blood to body parts become very clear & were easily understood through animated diagrammatic representations & are retained for longer time.
3. Systematic and interesting presentation: - As per 79% students, the presentation presented using smart board is very systematic. For example, while presenting letter writing- first the format is presented, followed by a sample and then practice exercises. Content was also presented in an interesting manner using relevant examples.

4. Daily life situations shown made understanding easier- 65% Students reported this advantage. They quoted examples such as module on biosphere shows the plants, animals and microbes in their natural habitats. Such examples from natural environment made concepts very clear.

5. Provided extra inputs: - As per 52% students, SMART Boards help them by providing extra information and exercises which are not given in the book.

The major benefits of using SMART boards as per teacher respondents are as follows:

1. Audio-Visual presentation provided better understanding : 92% teachers said that moving pictures, diagrams and animations helped in better understanding and added variety. As per teachers, it avoided the monotony of lecture method by varying the stimulus. It motivated the students and retained their attention for a longer time.

2. Helpful in summarizing the topic: - As per 78% teachers, after the teacher has taught the topic, it is very beneficial to summarize and highlight the important concepts using smart board

3. Saves time and effort of the teacher: As per 66% teachers, it saves the time of writing sentences or drawing diagrams on the board. In English grammar, exercises are given in the form of fill in the blanks. Students just read the sentences and give the answers. In science, well labeled diagrams can be explained directly from the presentation saving time and effort of the teacher.

4. Instant evaluation and immediate feedback: - 58% teachers reported this advantage. As per Mathematics teacher, smart-boards are very helpful for evaluating the students as lots of extra problems are given. Students are asked to solve these problems and then the correct answer is displayed and students cross check step by step whether they have solved the problem correctly.

5. Useful for remedial classes: As per 52% teachers, it also provides help in explaining the difficult concepts again & giving practice to the weaker students. It not only tells the correct answer but also why the answer is wrong.

6. Enriches teachers' knowledge: As per 43% teachers, they view the presentations in their free time to update their knowledge.

7. Provides readily available resources for future use: 39% teachers reported that SMART Boards also provide the facility to make their own presentations and diagrams and save it for future use. This is a great benefit as the effort made once can be used whenever required in future also.

8. Useful for demonstration of science practicals : 18% teachers reported this advantage. As per science teachers and lab assistant, practicals like slide preparation are demonstrated on the smart board, step by step. Since these are visible to all students and any step can be repeated again, if not understood, it has great benefit. Without smart board, practical demonstration using apparatus of small size like slides, cover slip needle is not visible to a group of 30-40 students, nor can the steps be repeated again and again. Also smart board is useful for explaining the theoretical concepts related to the practical.

LIMITATIONS

Less than 10 % respondents gave a few constraints and weaknesses in using SMART Boards. These are as follows:-

1. As per some students, sometimes technical problems like poor audio quality of the presentation hampers complete understanding of the explanation and reduces their interest.

2. As per a science teacher, sometimes students get confused during practical demonstration on smart board regarding which chemical is added from which source. Live practical demonstration by teacher is better for science practical.

3. As per few students, if they watch the presentation only, with no inputs from teacher they start feeling sleepy after sometime. This may be due to the one way interaction and students being passive recipients.

4. It provides a very good escape mechanism for some insincere teachers who want to avoid teaching. They simply switch on the presentation to cover the topic and themselves don't put in any efforts.

5. It is more time consuming if teacher explains the whole topic and again covers it using SMART Boards.

6. It lacks the human touch and feelings of love and motivation which only a teacher can exhibit.
7. It is expensive.

OBSERVATIONS

Following are some significant observations in context of objectives of the study:-

1. It was observed that using SMART Boards related theory to real life situations. Example - presentation related to classification of animal kingdom showed a number of animals under each category moving about in their natural habitats. Learning in the classroom became a window to the outside world leading to a thrilling experience.
2. It was also observed that even when the teacher was absent, students' time was constructively utilized by watching the presentation.
3. Its dynamic nature, vivid and lively presentation made it a better teaching aid compared to charts, models, transparencies etc. which are static.
4. Students were very attentive and interested while watching the presentation. Discipline problems were lesser as students were busy watching & listening to the presentation.
5. There was flexibility in the way in which SMART Boards were used. Sometimes teachers used it for showing presentations, sometimes as white board or at other times showed downloaded video clippings as per need.
6. Also health hazards due to chalk- dust were avoided as it is dust - free.
7. Diagrams were accurate in dimensions, coloured and depicted the concept well. Content was typed therefore it was better than teacher's manual work on blackboard. It especially compensated for the poor blackboard work or poor handwriting of some teachers.
8. Examples taken from real life situations or interwoven into a story- form created interest. For example, fractions were taught showing a birthday cake cut into 6 pieces (fractions) for 6 people and then four more people arrived for the party. This was followed by a question i.e. how many fractions were needed now, for equal distribution amongst all people? Such real life situations retained the attention of students.
9. There were technical advantages also. For Example- Comparison was shown clearly between animal & plant cell highlighting the differences. It was also used to show magnified picture of the desired part such as cilia in motile cells, not possible otherwise. Teacher paused the presentation after brief intervals to explain certain points and ask questions.
10. In primary classes many topics are taught through play way method. Example- students were shown a video of the rhyme (with music) on the smart board- 'If you are happy and you know it' and children were asked to repeat the actions like clapping, tapping which they saw in the video. This was followed by the explanation about 'Action words or verbs'. Students were observed to be very excited and enthusiastic while learning in this way. There were lots of other activities presented on smart board and performed by the students enthusiastically.

FINDINGS IN RELATION TO REVIEW OF RELATED LITERATURE

Findings of the study corroborate with the findings of majority of the researches reviewed particularly in context of benefits of smart boards. The studies of Smith, Higgins et al(2005) have also reported similar benefits of using smart boards as reported in the present study i.e use of these boards motivates the students, resulting in increased attention. Visual images are stimulating and improve the recall capacity also. As per the present study students found learning using smart boards lively and interesting. Schroder (2007) also reported similar findings.

Digregorio. P., Lojeski.K.S. (2010) reported that when there is a change in approach of teachers from didactic to interactive , these boards will have more impact. The present study found this to be true especially in primary classes where SMART Boards were used in an interactive manner. The present study also found that lots of activities were presented on smart board and performed by the students

enthusiastically which corroborates with Cole's findings in 2012 that students become active participants as they get involved in activities.

CONCLUSION AND RECOMMENDATIONS

As per the present study, majority of teachers and students were satisfied with the use of SMART boards for teaching and learning and very few limitations were reported by a small percentage of respondents. The major benefits reported by more than 85% respondents were that moving pictures, diagrams and animations displayed on SMART Boards helped in better understanding of concepts and created interest. The observations of classes also led to the conclusion that SMART Boards are beneficial in enhancing teaching effectiveness. Also a few limitations have been reported such as technical problems. Considering these findings efforts should be made to remove the limitations and widen the reach of SMART Boards to more number of schools in India so that maximum number of students can be benefitted. Also, it is recommended that more such studies should be carried out in other schools in other states also, so that findings can be generalized at the national level.

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