

Evaluating The Use Of Interactive White Board (Iwb) At Secondary Level Of Education

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INTRODUCTION

The impact of scientific and technological advancements is seen on all the actions of men around the globe. The day has come on which we cannot even think of a single day without having a touch of technology on all of our daily activities. This is the time where infants are born to the lap of the technology.

Education is accepted as a man-making process universally. Education is included in the fundamental rights of many countries. World organisations such as UNESCO and UNICEF are standing for the 'education for all'. Teaching and learning are the two major process of education. From time immemorial the approaches to these two processes have undergone many changes. In the beginning 'teaching' was given due importance to 'learning'. Education was then teacher centered. The teacher centeredness of the process was highly questioned. As a result of theoretical advancements and debates on it, education is now accepted as a learner centered process.

The learner centeredness or child centeredness demand varied skills from teachers in order to achieve the instructional objectives. In learner centeredness the nature of learning objectives is also changed. The rote-learning is no more accepted as a real learning. Learning can only be real when the learner comprehends the learning situations well. Memorizing the concepts never helps the learner to live by adjusting to the life situations. Learners must understand the concept clear and make their knowledge from it. Such learning will only be having practical utility.

Science is a subject included in core curriculum all over the world. Scientific knowledge is more experimental and process oriented. In science process is more important than its product. It is empirical. Hence the true spirit of science can only be developed among the learners if the teachers can facilitate learning in a suitable way. The teacher must be able to convert the classrooms into a laboratory and to an observation and discussion room. The teacher must use the supporting aids suitable for it.

INTERACTIVE WHITE BOARD

Interactive whiteboards otherwise known as smart boards are digital screens or digital boards used for displaying the content with the help of a digital projector. The displayed elements on the white board can then be controlled and operated by using a mouse, stylus, pen or his finger the way we operate a touch screen kiosk or a smart phone.

The operations such as clicking, dragging, copying, writing, placing and enlarging the images, hiding of some elements, screen capturing, browsing, converting of handwritten text to typed text format etc. can be easily done on the screen. The board is usually mounted onto a wall or to a stand.

Types of IWBs:

Interactive whiteboards are available in different styles, features, and sizes. The three main types of IWB technology are resistive technology, electro-magnetic and laser scanners.

i. Resistive Technology:

This supports touch based interactions. This has a soft covering surface that deforms to come in contact with a conducting plate when touched at any point. The conducting plate detects the location of the touch. Touch can be made by a finger, or a pen and therefore not need of any special hardware device for the purpose. This is the least expensive type of interactive whiteboard. SMART Boards from Smart Technology are based on resistive technology.

ii. Electromagnetic:

In this type of IWBs, an embedded wire mesh is used which uses electricity to create a magnetic field. A special type of pen having a coil at its tip is used for interactive with the board and it produces electric signals when it is pressed on the surface of whiteboard. From these electric signals, the location is detected. These types of whiteboards do not support touch interaction. Since it is operated with a pen tip, it offers high precision. In 1994, Numonics Company introduced the first electromagnetic whiteboard.

iii. Laser Scanner

This makes use of infrared (IR) laser scanners mounted at each corner. This is expensive when compared to the other two types. The board's surface is very hard and therefore supports the use of dry erase markers. Qomo Hitevision produces this type of IWBs.

iv. Ultrasound / Infrared

This is a portable IWB system consists of a bar which can be connected to any whiteboard and converts it into a interactive white board. The bar system can be connected to a computer. The bar uses a stylus pen to interact and a receiver which can detect the location of the pen by using ultrasound and infrared signals. Mimio is a famous company producing this type of IWBs.

Benefits of IWBs:

Some of the benefits of Interactive White Board in teaching-learning process are explained below.

i. Display:

The teaching and learning process demands the presentations of various elements in the classrooms including the presentation of direct and indirect experiences. The presentation of real

objects and experiences are limited inside the classrooms due to many reasons. Hence to ensure better learning, this limitation can be overcome by presenting these things digitally in the form of pictures, diagrams, charts, videos, etc. which will engage learners.

Interactive whiteboard in the classroom can be used by educators to improve the presentation content. This can easily be achieved by developing an array of material into a lesson e.g. a picture from the internet, text derived from a Microsoft Word file, graphs from spreadsheets and teacher and student annotations on the objects. Interactive whiteboards are used in display because they engage students far better compared to chalk boards or even the conventional projector-screen and whiteboards combination.

ii. Engage Learners:

All the learning activities undergoing in any classrooms must be engaging the learners. Conventional teaching method by using blackboard as the major teaching aid can not engage the learners much as it is a one dimensional aid. The Interactive White Board has multiple functions through which the teachers can present engaging content to the learners. For an example, a teacher while teaching the anatomy of human body can present real and virtual visuals in three dimensional designs. This cannot be possible to achieve in a class where the black board is the only major teaching aid.

iii. Record Classes:

Time management is always a problem for teachers while presenting any topic. In every lessons teacher has something to write or draw on the blackboard and erase it for adding more. Similarly, to have a look back to what the learners learnt in the previous sessions, the teacher may present the summary of the session on the blackboard in the beginning of a new class. All these are time taking processes. A teacher usually teaches the same topic/subject to the students of different classes. In that case also the teacher has to repeat the writing or drawing actions in each class. These difficulties can be overcome by using an Interactive White Board regularly in the classrooms. The time to time screen of the IWB can be recorded and which offers the re-use of the same either in the same classroom or the other. The recorded classes can also be shared with the students. Doing this will help the learners to pay complete attention in the learning process rather than 'note taking' process.

iv. Embedding the Resources:

Internet has mines of information and resource materials for any topic. The teacher can easily find the suitable learning resources from internet or any other sources and embed to the learning materials on the IWB. This improves the learning experiences and makes teaching less complex and more engaging.

v. Ensure Variety in Learning:

Monotonous teaching will definitely be bringing fatigue among learners quickly. IWB can accommodate different learning styles. It can be used for displaying the PPT presentations, and

also to experiment with virtual laboratories. It can be used for playing games, quizzes and also for various assessment strategies.

vi. Collaborative Learning:

Constructivist concept of learning defines education as a process of constructing the knowledge by the learners' engagements. Vygotsky accepted the learning is not simply the construction of knowledge but is the co-construction of knowledge. Using IWB in classrooms can be used for promoting group interactions. Small groups of learners can be asked to work on an issue, have interaction through video conferencing or other interactive platforms etc. can be a way to promote collaboration among learners. While playing a educational game or solving a puzzle, the group interaction can be improved.

vii. Integration of Technology:

IWB can be connected to a wide range of technologies through a computer. The operations of IWB are controlled by software installed in the connected computer. This software provides a platform to integrate the IWB with the devices such as computers, microscopes, visual presenters, still cameras, and video cameras, scanners etc. to enhance instruction. As a result, the possibilities are near endless.

viii. Easy to Use

IWBs are very easy to use. The mechanisms of the board can easily be understood by the teachers and the learners. It needs low maintenance. The boards which support require no special chalk or pen. It does not make any dust the way a chalk board make while cleaning the board.

OBJECTIVE

1. To study Infrastructure related concerns while using Interactive White Board in education
2. To study the use of the Interactive White Board in education
3. To study the students engagement and involvement while teaching by using Interactive White Board
4. To study the effectiveness of using IWB in students learning achievement

METHOD

This study was conducted on the basis of qualitative research method. The data was collected through open ended questionnaires. To elicit focused data, unstructured interview was also used. Research sample included 30 science teachers at secondary school level in Malappuram district of Kerala. Total sample included fifteen teachers from government schools and fifteen from private schools. The sample was selected by 'purposive sampling technique' to ensure their schools are facilitated with Interactive White Boards.

Table 1. Participants in the Study

Professional Seniority	n	%
1-10 years	10	33.33
11-20 years	10	33.33
20 + years	10	33.33

FINDINGS

Data was collected mainly on four major heads,

- i) Infrastructure related concerns
- ii) Use of the Interactive White Board
- iii) Students engagement and involvement
- iv) Effectiveness of using IWB

i. Infrastructure Related Concerns:***Access to IWB:***

Though the schools were facilitated with Interactive White Boards, the number of classrooms where the facility is added is not the same. The government schools had no IWB in all the classes. Some of the classes are converted to 'smart classrooms' by adding necessary arrangements including an IWB. The teachers have to see the availability of the smartclass before bringing the students into it. Private schools ensured IWB in the secondary school classes. Hence the teachers had no issue of seeing the availability of the class first. The reason lead to this disparity is due to the difference in the strength of the students of the schools and the number of classroom divisions of each standard. In government schools, students' strength is high when compared to that of private schools. Government schools have many classroom divisions at secondary level where as the private schools have one or two divisions at these levels. Hence, providing the facility in all the divisions at a level of study is difficult. So they have set some common 'smart classrooms'. In the private schools, adding the technological facilities in the classrooms may improve the school's profile and may attract more students.

Electricity:

Interactive White Board requires electricity. IWBs are connected to the computer which also requires electricity. Most the participants expressed their difficulties to tackle such 'electricity failure' issues. When the teachers come to the classrooms for presenting a lesson based on IWB, if the power failure is there, the lesson is affected. Sometimes, the power failure comes in between, which also affects the session. Only some schools have proper electricity backup systems, where these issues are not their concerns.

Hardware or Software Issues:

The IWB systems require interactive white board, connecting cables, computer (either connected to a server or a pc), a software for the IWB functions.

Though the Interactive White Board hardly requires maintenance, frequently issues are reported in connection with the connectivity and computer. If the system is turned on prior to the class, the delay start of the system consumes the precious time of the lesson. The 'calibration of the IWB' is required to be done when some positional changes are occurred to IWB. The software associated with the IWB is also bringing some issues frequently. Some teachers (mostly young teachers) are good at technology and therefore they could tackle these situations easily by correcting the faults. The others are dropping the idea of using IWB and proceeding with the conventional chalk board class sessions.

Resource Materials:

The schools are having some purchased e-content related to the curriculum. Three private schools have purchased the IWB system along with the e-content. IWBs are compatible with any type of content, PDF, PPT, Video formats, Animated and Simulated files etc. Finding the most appropriate material for a topic is the skill required in teachers. Private school teachers where the e-learning packages are bought, the job is easy. The contentment by the teachers is high when they use their materials rather than the already available ones.

ii. Use of the Interactive White Board***Use of IWB:***

There are teachers who use the IWB regularly, frequently or hardly. It is found that all the teachers are using it for their classes at least. The young teachers are found to be the regular users in general. Three government school teachers fall in 20+ years of professional seniority are regular users of IWB.

Content selection/ Development:

The private school teachers where the e-content package is installed are making use of those materials. Hardly have they added their materials to it. Government school teachers are finding appropriate materials from the internet and embedding it with the lesson. Government school teachers are also attaching the videos from the CDs provided to them by the government or administration. Private school teachers where the e-content is not provided are also doing the same way as the government school teachers do.

Time Management:

Seventy percentage of the participants opined that the time management is easy while presenting a lesson through IWB. The government school teachers where the separate 'smart class' is built do shorten the lesson up to ten minutes to manage the time lose due to the shifting of the students from their actual classes to the smart classes. The teachers prefer to use the smart class wither by joining two consecutive sessions or the sessions just after a break.

iii. Students' Engagement and Involvement:***Students' Attention:***

The teachers who use quizzes, brains storming etc. are highly in favor of using IWBs for their lessons. Few teachers opined that the students are not serious in activities and not paying complete attentions to the class while using IWBs. Rather the students are taking the session as an entertainment. Contradictory to this majority of the participants are of the opinion that the classes engage the students more in learning than in the other way of teaching.

Using of IWBs for the presentation of PPT is not so engaging to the students, few teachers opined. The class becomes interesting when the teacher tries to bring some new experience through which the concept can be made clear to the students.

Students' Participation:

Presenting the content continuously through an IWB without giving a chance to learners to involve in the learning is leading to monotonous. Teachers who use brainstorming and other discussion platforms in the classrooms say that their students are actively participating in the learning. 'Presenting a lengthy video stream is not helpful' is the opinion of some participants. The teacher has to make a pause and focus students' attention into relevant points while using videos in the lessons.

Some students are very active and come forward to take participate in activities and some are hesitated. Majority of the participants are opining that providing equal opportunities in every lesson is not possible. Hence distributing the opportunities randomly is practiced.

Students' Interest:

All the participants have opined that the students are interested to attend the classes where the teacher is using Interactive White Board. They are showing their curiosity to know the topic and the way the teacher is going to present it.

iv. Effectiveness of using IWB

The effectiveness of any teaching method or technique is measured in terms of the achievement of the students in their learning subjects. Though this study did not follow any experimental approach to evaluate the effectiveness of the use of IWBs in teaching and learning, it studied the effectiveness qualitatively from the responses of the teachers.

All the participants of this study observe that the science subject was considered to be harder to learn by some students when the subject was taught in a conventional way by using black board, chalk, text book etc. The regular use of Interactive White Board along with interesting learning materials has made a change to their attitude to the subjects. 93.3 % of the participants of this study have also observed the improvement in the students' achievement after they started to use IWB in classrooms. The degree of the change of their achievement is not evaluated. Mathematical problems related to physics subject were hard to many students since it needs

exact comprehension of the concepts. A teacher who regularly uses IWB on all his lessons has observed the changes in such students. Many of them are in the right way to solve such mathematical problems.

CONCLUSIONS

Interactive White Board is a technological tool having wide use in the education process. The IWB can be used in place of the chalk board without replacing its function. IWB can facilitate engaging experiences to the learners. The 'interactivity' of this device depends on the content with which the teacher is going to engage the learners in his classrooms. Major concerns of using IWBs in classrooms are qualitatively discussed in this paper. The participants of this study have pointed out different points from their experiences. Government and management of the schools must take due care to facilitate the classrooms with sufficient technological aids including IWBs and electricity back up for the same in order to prevent the interruption. The digital possibilities of evaluation must be accepted in order to check students learning and retention.

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