CHAPTER - I

INTRODUCTION

“Integration of Information and Communication Technologies (ICT) into schooling needs serious consideration. Teacher educators, Curriculum developers, Evaluators and others will have to redefine their roles to tackle ICT rich environment and harness its full potential for the benefit of learners”


1.0 INTRODUCTION

In the context of global policy, society and global economy, each and every country is seriously thinking of heightening the degree of quality in the system of education. Globalization has permitted technical progress in the communication field which enables the users to access and exchange information at anytime and from any place in the world. Technology thus needs to play a vital role in education. In today’s competitive world the child is required to possess the skill sets, which are beyond subject knowledge and require concentration, power of assimilation and retention. In this regard, the role played by smart classroom is quite important and note worthy. The concept of ‘Smart class’ is introduced by Edu-comp, which is one of the largest education companies in India, that takes care of the entire education life cycle of students matching to universal standards.
Classroom teaching and learning have become synonymous with the concept of Smart Classroom. There is great transition from conventional methods of teaching and learning to newer methods in Smart classrooms. The idea of smart classroom is of recent origin. There are well developed e-Learning materials nowadays available, which substitute the textual content of printed textbooks for every school subject has been optimally prepared with audio-visual lessons of different kinds. These teaching learning modules are interactive in nature. Advantages of these types of lessons are that they are very user-friendly and allow the student to progress at his/her own pace, speed and time.

The good news about the systemic approach modules are plentiful. Smart class enables the teachers to deliver both learning and information as well, dynamically and immediately. It allows the learners to tap the knowledge resource of experts and catapult those messages beyond classroom walls and into the workplace. It lets the teacher to know through the magic of technology, who is learning, referring, and contributing and who is at a slow rate of learning. In spite of all these, many simply fail to embrace e-Learning. The greatest change in the past 500 years has certainly been the rate of technological progress. GDP growth has been a sequence of three technologies hunting, farming, and industry each of which has grown 100 times faster than its predecessor. The next transformation possibly involving information technology, nanotechnology, robotics, and/or artificial intelligence could move the doubling period of GDP from decades to weeks and is forecast to appear sometime this century.

Learning through smart classes gains popularity and momentum day by day. When teachers use technology, as a critical part of an inquiry-oriented, learning-teaching process, they face a set of challenges, including
➢ How to use a variety of technology applications;

➢ Using, adapting, and designing technology-enhanced curricula to meet students needs;

➢ Expanding content knowledge;

➢ Taking on new roles; and

➢ Responding to individual students needs through e-resources.

1.1 EDUCATIONAL TECHNOLOGY

Technology in education is being developed with an aim to make education more widely available to all and also to improve the quality of education, which is the order of the day and need of the hour. B.F. Skinner’s work on learning and his emphasis on the importance of reinforcement in the learning situation have created a revolution in the field of educational technology. The relationship between the objectives of education and instructional technology appears to be reciprocal. The most distinctive feature of modern society is its acquisition of science based technology. The changes that occur as a result of its impact are broadly described as effects of modernization. In modern classroom, knowledge in every subject is cumulative, so that as each year passes, there is more to be learnt.

The main aim of education should be on the awakening of curiosity, sharpening the stimulus of reactivity, developing proper interests, attitudes and values in the learners and building essential skills such as independent study and capacity to think and judge by self. Educational technology is thus largely a classroom supplement. Teachers and
learners now have easy access to film projectors, slide projectors, tape recorders, audio cassette recorders, video cassette players, overhead projectors, radio, television and computers etc. The value of teaching aid does not depend wholly on its quality itself but also upon the way in which it is used and the particular time by which it is used.

Hence the researcher, based on the above ideals of using Educational Technology, intended to find out the attitude of high school teachers towards smart classrooms in relationship to their technophobia and challenges faced by them during instruction through modern technologies.

1.1.1 ADVANCES IN EDUCATIONAL TECHNOLOGY

Verbal explanations are basically abstract and so are not easily grasped and retained. Teaching aids help to create a dynamic learning environment, by shifting emphasis from the spoken work to an instructional methodology dependent on Audio –Visual Communication media. They make a lasting effect on the learner’s mind. In India, medical facilities have expanded enormously over the years. In recent days new communication technology helps to accelerate the pace of development in the country. The country is on the threshold of a new communication revolution of which computer, satellite television and video have made major development.

It must be remembered that in the modern technological era every new generations of students must be better informed and has to learn more than the proceeding generation. This can be achieved only if the quality of teachers and teaching. Learning processes becomes superior or at the least on par with the technological advancement in education.
Education for all is an idea of critical significance before the developing countries. Knowledge, information and skills are increasingly being regarded as the major weapons in the crusade for supremacy on the economic front. Information highways are opening new prospects. Television, Telephone, Computers & Compact disc are reshaping practically every walk of our life including education. The classrooms of tomorrow could be entirely different from those of today. In these prospective reflections on the role of the teacher in the twenty first century, it is expected that the teacher has to play more critical role than heretofore notwithstanding the information – cum- telecommunication – revolution because of the challenge of changes, tensions and crises.

“The main function of education is communication of knowledge, skill and attitudes. The multimedia packages are known to have great potential in communicating these effectively”-Emery et al., (1965).

Educational Television (ETV) in India cuts across all the levels of education pre-primary, primary, secondary, higher secondary, collegiate and continuing education. Also, it takes various forms such as informal, non-formal and formal and finally post- SITE (Satellite Instructional Television Experiment) at higher education.

The world now is passing through yet another revolution – an electronic revolution, where the electronic medium has taken precedence over the rest. We see today a boon and boost in the field of television, video, computer and compact disc. The ushering in of these equipments has resulted in a change in life style. It is therefore the teachers and teacher educators are to take a serious note of this change, for the main objectives of education is to give the society at large a right type of citizen and never misfits.
The advancing technology is received among the public warmly. This is mainly due to the lasting impact it can make. For example computer-compact disc gives access to range of new experiences to the students.

1.2 ATTITUDE IN GENERAL

The concept of attitude has been visualized by educationists in different ways as it occurs both in scientific investigations and personal opinions. Social psychologists define attitudes as those states of readiness, beliefs or ideas with an emotional bearing to it. Attitudes have intellectual, biological, social and emotional components that are derived from experiences and exercise a determining influence upon a person’s behavior.

In the Indian society, education is mingled with values. Each and every family follows the traditional, moral, ethical, religious and social values. Every person who follows the norms and values has a good attitude in all areas of his life. The people in the society have both positive and negative attitude towards the field of education. The positive attitude towards education in the Indian society is value-based curriculum, student-teacher relationship, and professional ethics, whereas the negative attitude towards education could be based on lower levels of teacher-pupil interaction, boredom in studying the same old curriculum and commercialization of education.

Allport has defined an attitude as a “mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individuals’ response to all objects with it is related”. Having viewed the above facts in the present
trend in education, it is necessary for everyone to equip themselves with changes in their life for their own betterment. The life one expects should stimulate or it should provide the power of stimulating life itself by thinking more innovative and creative ideas in education. In the present study the investigator measures the Teachers Attitude towards Smart Classroom and usage of Modern Technology in teaching which the researcher feels necessary to measure, which in turn helps the teachers to be innovative in using modern technology in teaching.

1.2.1 ATTITUDE TOWARDS TECHNOLOGY

Educational Technology consists of a wide range of hardware, software and technical equipment used in schools to promote learning. Computer, CD-ROMs, the Internet, e-mail, television monitors, video equipment and satellite systems for distance learning are some of the education technologies that schools are using.

Most educational researchers, especially those who have examined large numbers of studies (meta-analyses), agree that if used appropriately, technology can improve education in the effect size range of between 0.30 and 0.40(Kulik,2002; Waxman, Connell, & Gray,2002). Technology also has proven to be an effective motivator for students with specific learning needs (such as language learning) and for accommodating learning styles. Students working in collaborative team-learning settings appear to function better when learning events are accompanied by technology use.

Another important use of technology is to provide distance-learning opportunities to students who otherwise would not have access to course offerings. Distance Education is especially important to students in rural settings because courses are less available due to
lower population densities. Obviously, addressing the needs of all students through technology use is a long term and system wide effort. School leaders, therefore, are expected to possess not only general leadership skills but also technology leadership skills. Technology leadership but require attention to some specifics of technology, especially those related to providing hardware access, updating rapidly changing technology and recognizing that professional development and the use of technology are constantly evolving.

1.3 SMART CLASS

Smart Class provides a teaching and learning solution that includes rich media digital learning materials to help students and teachers. The learning material repository consists of thousands of highly animated, lesson specific, 3D and 2D multimedia modules.

Smart Class is also used to automate some time consuming and tedious tasks like Attendance, Class Test, Test Evaluation, Assignments etc. It also generates a monthly report based on Student’s performance, Attendance record, Test report etc. and send it to the Guardians.

Smart Class used a special class layout to provide better environment for learning. In this environment we use computers, projector, and speakers etc. to make teaching and learning procedure easy and efficient.

Smart Class also includes some features like Query records, Teacher Grading system, Library Update etc. to analyze and enhance the current way of teaching.
1.3.1 OBJECTIVES OF SMART CLASS

1. To improve the current pedagogy of teaching and learning.
2. To provide an essential and effective study environment.
3. To make the teaching procedure more interesting and effective.
4. To improve the study material by using multimedia this contains highly animated 2D and 3D modules.
5. To improve the interaction between teachers and students.
6. To automate some tedious tasks like attendance, test evaluation etc.

1.3.2 Smart Classroom

A Smart Classroom is equivalent to a traditional lecture style teaching space that has technological equipments to be used to aid and enhance instruction and to enthuse all learners. Classrooms are categorized based on the equipments available: A search of the literature does not yield a single unified definition of smart classroom. Most articles characterize a classroom as "smart" depending on the equipment installed.

The equipment found in a smart classroom may vary due to the requirements of the institution that created the classroom. Many institutions have several configurations of smart classrooms. Some contributing factors to the configuration decision are the size of the classroom, the needs of the discipline being taught in the classroom, the budget, and the technology available at the time that the classroom was built.
1.3.3 CONCEPT OF SMART CLASSROOM

A Smart Classroom is one equipped with multimedia components designed to enhance teaching and learning. Although some classrooms may have slight variations, most Smart Classrooms contain the following devices: Smart Board (Interactive Whiteboard) , Ceiling mounted Digital projector , Laptop Computer , Wireless mouse , Control devices such as switchers and remotes Wall Screen , Dry Erase whiteboard , V.C.R. and D.V.D. player , Document Camera , Stylus pens (resting in pen tray) , SMART Notebook software, Amplifier and classroom speaker.

“Smart school and smart class” is an innovative concept in education. These classrooms are also called Digital or New-Media classroom. ICT is the backbone of smart classroom.

Philosophical Rationale: In parlance of educational philosophy, three terms are encountered viz. Metaphysics, Philosophy and Axiology. Out of these branches of philosophy, Epistemology and Metaphysics provide the rationale for the inclusion of smart classroom practices in teacher education programmed. Epistemology is the study of our method of acquiring knowledge. It answers the question, "How do we know?" It is concerned with how our minds are related to reality, and whether these relationships are valid or invalid. Flaws in epistemology will make it harder to accomplish anything. Methods of teaching and pedagogy are undoubtedly related to Epistemology. As per epistemology of Nyaya Darshan, there are four means of acquiring knowledge (Pramanas) as under: Perception (Pratyaksha), Inference (Anumana), Comparison (Upmana), Verbal Testimony (Shabd Pramanikta)
Out of this four, two parmesan viz. Perception and Inference have a profound bearing on teaching-learning process. Psychological research has shown that verbal information is in fact better remembered when accompanied by a visual image. What is being emphasized here is that merely delivering lecture or dictating notes on the basics and the use of ICTs without any recourse to smart classroom practice won’t do any substantial good. It would be better if direct experience is provided to the teacher-trainees regarding the use of ICT in the form of smart classroom practices i.e. Learning ICT through ICT should be the key mantra. Metaphysics is the branch of philosophy responsible for the study of existence. It is the foundation of a worldview. It answers the question "What is?" It encompasses everything that exists, as well as the nature of existence itself. It says whether the world is real, or merely an illusion. It is a fundamental view of the world around us. Without an explanation or an interpretation of the world around us, we would be helpless to deal with reality. Any flaw in our view of reality will make it more difficult to live. Metaphysics helps in the formulation of aims of education and curriculum is the means of realization of those aims. The rationale for integration of smart classroom practices in teacher education curriculum lies in the essence of the principles of curriculum construction (Pragmatist philosophy) as under: Principle of utility, Principle of interest, Principle of experience, Principle of integration
1.3.4 TYPES OF SMART CLASSROOM

Based on the availability of equipments it can be further divided into the following:

**Advanced Smart Technology:** Features a smart podium with a touch panel control system, PC and laptop connection, document camera, DVD/VCR Player, projector, and screen.

**Intermediate Smart Technology:** Features a smart podium with a control panel, PC and laptop connection, projector, and screen. May also have an overheard transparency projector.

**Basic Technology:** Includes a laptop connection, projector, DVD/VCR player, and screen. May also have an overhead transparency projector.

1.3.5 CURRENT SCENARIO OF SMART CLASSROOM CONCEPT IN INDIA

The teacher training institutions have adopted Educational Technology / Technological Foundations of Education as one of the subject (compulsory/optional) of the Teacher Education Curriculum (B.Ed. / M.Ed.). But it is a matter of regret that only a few emphasize the practical aspect in addition to the theoretical aspect. Most of the institutions do not even take pains to acquaint the pupil-teachers with the effective as well as efficient use of ICT. And a few merely make the students familiar with the basics of Educational Technology only on a half-baked theoretical basis.

Barriers to the use of ICT: Majority of the students admitted in teacher education programmed have either half-baked or poor knowledge of ICT. Inclusion of only IT literacy and ICT inputs in various teaching subjects. Availability of electricity and the
required technology is also a problem particularly in practice schools. Some teacher-educators also lack interest in ICT integration and need motivation. Aversion to innovation and anchorage to beaten track. Teacher-educators not well conversant with ICT based skills. Practical use of ICT based skills not being made. Emphasis on theoretical part only. The Society for Information Technology and Teacher Education has identified basic principles for development of effective ICT teacher education (SITE, 2002). These are:

Technology should be infused into the entire teacher education programmed: Throughout their teacher education experience, students should learn about and with technology and how to incorporate it into their own teaching. Restricting technology experiences to a single course or to a single area of teacher education, such as methods courses, will not prepare students to be technology-using teachers. Pre-service teacher education students should learn about a wide range of educational technologies across their professional preparation, from introductory and foundation courses to student teaching and professional development experiences.

Technology should be introduced in context: Pre-service teachers should learn many uses of technology because they are integrated into their coursework and field experiences. They should see their professors and mentor teachers model innovative uses of technology; they should use it in their own learning, and they should explore creative uses of technology in their teaching.

Students should experience innovative technology-supported learning environments in their teacher education programmed: Technology can be used to support traditional forms
of learning as well as to transform learning. With the view to promoting and motivating quality research in teacher education, the National Council for Teacher Education (NCTE) constituted a Research and Programmed Advisory Committee in June 2004. The NCTE’s concern is to enable teacher education institutions to prepare a workforce of trained teachers who are fully conversant with the technology. It signed a MoU with INTEL Technology India Pvt. Ltd., Bangalore, on 20th December, 2006, with a view to achieve the objectives of imparting sustained professional development of all teacher-educators from all recognized institutions and making ICT a part of teacher education curriculum.

National Mission on Education through Information and Communication Technology (NMEICT) has been envisaged to leverage the potential of ICT, in providing high quality personalized and interactive knowledge modules over the internet/intranet for all the learners in Higher Education Institution in any-time, anywhere mode. It also plans to focus on appropriate pedagogy for e-Learning, providing facility of performing experiments through virtual laboratories, on-line testing and certification, on-line availability of teachers to guide and mentor learners, utilization of Direct to Home (DTH) platforms, training and empowerment of teachers to effectively use the technology integrated methods of teaching etc.

Digital content, animations and videos make lessons rich and interesting. Students understand things easily. Today’s need is pooling of learning objects, e-content, open source material on net for free use to teachers and students. However, the use of ICT integration during teaching practice in schools has been a challenge due to low deployment of technology in schools and many other reasons. Basically the teachers/trainers are expected to initiate the use of ICT in their teaching/training. Hence
the teachers must be confident in using ICT in teaching as well as enthusiastic about its use. For this teachers should have the required professional competencies and training. Ministry of Human Resource Development conducts periodic ICT trainings for Teacher-educators in collaboration with INTEL. Till now, 9 Educator Academies have taken place in which, 216 Teacher-educators from Assam, Bihar, Chhattisgarh, Madhya Pradesh, Meghalaya, Sikkim, Uttar Pradesh, Uttarakhand and West Bengal have been trained. For 2014-15, 06 more ICT trainings are scheduled. The Bureau has also made available audio visual material on its website www.teindia.nic.in on core issues in teacher education. The Government of India has come up with the National Curriculum Framework for Teacher Education (NCFTE) 2009, which mainly emphasis on the following 5 issues: Reflective Teaching, Inclusive Education, Constructivist environment, Technology introduction, teaching for democracy. The scheme has following essentially four components. Partnership with State Government and Union Territories Administrations for providing computer aided education to Secondary and Higher Secondary Government and Government aided schools.

**Establishment of smart schools, which shall be technology demonstrators.**

Teacher related interventions, such as provision for engagement of an exclusive teacher, capacity enhancement of all teachers in ICT and a scheme for national ICT award as a means of motivation. Development of a e-content, mainly through Central Institute of Education Technologies (CIET), six State Institutes of Education Technologies (SIETs) and 5 Regional Institutes of Education (RIEs), as also through outsourcing.
Smart classroom technology integration have shown that the use of technology is determined by a wide range of factors, ranging from external factors such as access to appropriate materials and professional development opportunities to more internal factors such as awareness of the benefits of technology and personal attitudes towards technological innovations. It is said that effective smart classroom requires teacher access to computers, together with their confident and competent usage.

1.4 TECHNOPHOBIA

Technophobia can be seen as fear or dislike of an advanced complex device like computers or the technology in general. It generally refers to the sense of an irrational fear, but others contend fears are justified. It is the opposite of technophobia or technophile the love for technology. The presence of computers in the classroom is seen as a means which students would thrive in a modern learning environment. They become motivating factors as they allow students’ access to several information and they promote a greater understanding by allowing the students to learn in various ways unimagined previously (Rubin, Fernandes, Avgerinou & Moore 2010). Computer and Internet in classroom has steadily become part of that educational landscape. Growing use of computers in education has substantial benefits to their integration in the curriculum. Olaniyi (2006); Okon, Chika and Emmanuel (2007) identified factors influencing digital divide and negative attitude towards ICT as:

- Expensive devices
- Poor access
- Poor skills to use
Inadequate financial capacity

Poor internet services and low tale density

Poor power supply

Poor level of awareness

Poor technical assistance and maintenance culture

In appropriate ICT policies

Poor implementation of the policies

Population explosion

Government negative attitude toward rural areas

Low government commitment to education

People attitude and fear towards technology

1.4.1 FACTORS CONTRIBUTING TO TEACHERS’ FEAR OF TECHNOLOGY

Lack of knowledge about teaching with computers

Some teachers talk about the lack of knowledge about applying computers to teaching as their main reason for not using computers. In research about the perceptions of instructional materials, classroom teachers generally demonstrated little knowledge of the technologies (Odabasi & Namlu, 1997 cited in Asan, 2003). This problem is partly because many currently working teachers received their teaching certificates prior to the time when computer education was not available to them. Teachers felt a need for computer training, which most of them did not get.
Lack of access to computers

Access to computers at home and at schools is seen as important by many teachers. In some cases, a lack of access to computers discourages the instructors from integrating them into their teaching. Some teachers have computers in their workplace, but they are not available for class use, only for student word processing. Some do not have access to the software programs used by the students, who are expected to go on their own to the lab; therefore, these teachers are not aware of what benefits using computers could bring to their students.

Lack of confidence in computer skills

Some teachers are uncomfortable with using computers in front of a class because they have no experience with computers. One teacher says: If you're a teacher, you don't want to step into a classroom with something you don't know how it works, because you look like an idiot. It's already stressful to use something in a classroom, but if you don't know [how to use it], that's adding more stress.

According to Swain (1999) this lack of confidence in their computer skills suggests that these teachers do not see their students as a resource. They seemed to prefer the traditional role of the teacher as expert, which could imply that their discomfort was perhaps not so much with the lack of computer skills, as they claimed, but rather with the idea of relinquishing their expert role (Warschauer, Turbee, & Roberts, 1996).
Inadequacy for students' needs

Another reason for not using computers is the perception that computers cannot meet the students' needs. Some of the instructors have seen some computer programs, but they think that they are pretty stupid and too mechanical and that computers are not fast enough or rich enough. When the teachers who do not use computers are asked whether they would use computers if circumstances were different, they say no again. Some teachers express reluctance to use computers because they do not feel comfortable with the computer, yet some others who still have reservations admit seeing some benefits to using the computer, such as giving students access to other students or practicing writing skills, but they are not yet convinced of any other advantages.

The attitude of computer introducer

Some teachers do not hold a positive attitude and do not feel comfortable with computers because they have not been introduced properly to computers. Weil et al. (1990), stressing the important role played by the "introducer" of technology in the eventual development of technophobia, found that the likelihood of technophobic reactions could be reduced if the "introducer" of technology held a positive attitude about technology and felt skilled and comfortable with computers.

The Educational Testing Service (ETS) study (Martinez & Mead, 1988 as cited in Rosen & Weft, 1995) indicated that even the computer coordinators who were surveyed did not feel that they have the skills and preparation to teach computing. If the coordinators do not feel prepared, then the classroom teacher, who the ETS study showed was the most
likely "introducer" of technology, must feel even less competent. This places the students at a severe disadvantage. They are going to learn about computers and technology from role models.

1.4.2 WAYS TO OVERCOME THE FEAR OF TECHNOLOGY

If I want to have a look back at my own period of teaching experience, I could remember some instructors at my around whether at university or language institutes who have once experienced a period of hatred and extreme dislike towards computer application in class, and now are in favor of it and among the extreme supporters of it. I remember I asked them about the reasons of their change in attitude, and there were some interesting points and tips in their answers that are helpful for the instructors who are experiencing such fears and want to get rid of it in order to feel at home with the idea of technology application in class. A typical comment was: "The thing that changed my mind about computer was someone who led me through the process letting me

Do it rather than telling me what to do… an instructor who put my hands on a computer and let me play." Studies of technophobia in teachers provide some indicators of preferred solutions. According to Rosen and Weil (1990) computer phobia exists and is fixable. The question that then arises is how this factor may be reduced in technophobic teachers. Some of the suggestions for reducing technophobia include the idea of training managerial level personnel first to provide positive role models (Davidson and Walley, 1984 cited in Russell & Bradley, 1997), and using psychotherapy (Rosen and Weil, 1990 cited in Russell & Bradley, 1997). Rosen and Weil (1995) urge the use of confident computer users as role models for cyber phobic teachers, and Bloom (1985) maintains...
that cyber phobia can be reduced in education trainees by the use of skill building, including relaxation, practice and provision of basic facts about computers. However, a perceived limitation of these studies was that teachers’ experiences and preferences were given inadequate consideration as a basis for the courses of intervention suggested. In a review of the literature relevant to cyber phobia and school teachers indicated to the authors that it was necessary to ascertain not only the levels and nature of cyber phobia in teachers, but to allow teachers to suggest how it might be reduced. Of course, it is not necessary for everyone to adopt technology to the extreme of being a technophile. In most educational settings, though, it is impossible to ignore new developments, which change the way we communicate and complete necessary responsibilities.

So, the stories of people who have experienced the metamorphosis from technophobe to technophile can offer lessons for us all and also help to find solutions to the problems. After categorizing the reflection of teachers and the common points are:

**Application of skill building strategies**

One practical approach to get gradually rid of technophobia for teachers according to Bloom (1985) is to make use of the strategies including relaxation, practice and provision of basic facts about computers that comprise the skill building strategies. It could include multisensory techniques, as mentioned in Ghorjian, Alipour and Saffarian (2012) that help the teachers make students understand more easily the concepts. It can also involve considering technology as an artistic ability in which the arts, as mentioned in Dickinson
(1999 cited in Gorjian et al, 2012), are taken seriously as modes of learning and methods of teaching.

**Application of Role Models**

Rosen and Weil (1995) urge the use of confident computer users as role models for technophobic teachers. These role models must themselves feel at home with technology because a technophobic instructor will pass these attitudes and feelings to the learner. They should also be calm, clear, and very open to questions. These role models should walk the technophobic teachers through the process of using a technological device first with them pushing the buttons. Then these trainers should supervise the teachers doing the steps by themselves. They should also consider immediacy in their training sessions as a valuable characteristic of successful training where they help teachers at the moment they are having problems.

**Asking for help to avoid technophobia**

There is always someone available in a school to offer technological help. Every school has several technology savvy teachers today. Some schools even have on-site technology integration specialists or coaches. Do not be afraid to ask for help, because this leads to a better understanding. Just like teachers tell their students every day, there is no such thing as a dumb question.

**Learning technology from students**

This does not lead to students thinking their teachers are not in control of the classroom. Students love it when they can share their knowledge with others, especially their
teacher. Many a teacher has learned new strategies and techniques from students as the students, according to Bahrani (2012), are found to show mostly positive attitude to computer use in class.

**Communicating through commonly used online means as the first application**

According to Milton (2002 cited in Bahrani, 2012), mass media technologies can give the teachers as well as the learners a wide variety of activities and experiences that can support language learning in informal settings as well as the formal settings of the school. Communication especially through email as the first application is cited by teachers to cause further desire to have frequent and convenient communication with the others, such as family members and friends, as well. It seems that after using computer for this purpose, the transition to other applications gets much easier.

**1.5 MODERN TECHNOLOGY AND ITS NATURE**

In the knowledge society, the developments in Modern Technology opened up new and cost-effective approaches for expanding the reach of education to children youth as well as to those who need continuing education to meet the demands of explosion of information, fast-changing nature of occupations and life-long education. The significant development affecting education in the coming decades will be the application of Modern Technology as it has the potential to bring a drastic change in the total system of education. Computers of modern technology will not by itself solve educational problems.

Modern Technology encompasses all forms of electronic communication in both digital and analogue form. The digital electronic devices include computers, CD players, LCD
or DLP cellular telephones and satellite broadcasting while analogue devices are largely confined to conventional radio broadcast technology and audio, such as tape recorders. Bandwidth the volume of data that may flow through a communication channel is constantly increasing. In addition there are numerous ways of accessing this data. Due to the increase in bandwidth and the different forms of connectivity, the various technologies are converging into the broad field of Modern Technology; it focuses on practical use of IT. The potential of computers has been recognized as an efficient tool for obtaining knowledge and information through multimedia via internal databases (CD-ROM) external databases (Internet) or by communication with others via e-mail data conferences etc. the global spread of computers and the Internet has changed the way people communicate and develop networking. This digital revolution has made remarkable impact on education too. This Modern Technology is a tool in the hands of educationists for solving the problem in the area of education like access to education quality education internationalization of education opportunities for lifelong learning.

1.5.1 DIFFERENT FORMS OF MODERN TECHNOLOGY

Modern Technology encompasses digital electronic devices which include computers, CD players, cellular telephony and satellite broadcasting and analogue devices confined to conventional radio broadcast technology and audio such as tape recorders. Thus major ICT tools could be

Classified as:

A) Audio Form

- Audio tapes
A) Audio Form

- Broadcast talks
- Gramophone lectures and
- Tape records/audio tapes.

B) Visual Form

- CDS, websites
- Software Packages

C) Audio Visual

- CDs, motion pictures,
- Television, video films,
- Multimedia software etc.

1.5.1.1 BROADCAST TALKS

Radio broadcast and audio recordings are the sources of providing audio learning experiences to the students. In order to provide learning experience beyond school, colleges, syllabus and to relate it to social life outside classroom school broadcast programmes could be best substitute. It is not always possible for a school teacher/school in general to invite eminent people in the field for a lecture/talk, under such cases the lectures or speeches can be prerecorded and can be played in the classrooms, but possible
in colleges universities. There are various types of programmes like discussion forum, debate, quiz, speech, drama which are either live programmes or are prerecorded find their best place in the classroom instruction.

1.5.1.2 DISC RECORDS

The disc recording has a number of attributes that make it an attractive instructional medium. Its frequency response is such that it can reproduce the audio spectrum even beyond the limits of human hearing. Physically the compact disc looks like a small, silver phonograph record without grooves. The digital code is in the form of tiny pits in clear plastic protected by a thin covering of an acrylic resin. The disc is only twelve centimeters (4.72 inches) in diameter. CD’s can be programmed and the user can quickly access any part of the disc. Even they can be programmed to play in any desired sequence. The students can also selectively retrieve information. A major advantage of the CD is its resistance to damage.

1.5.1.3 AUDIOTAPES

The major advantage of magnetic audiotape over discs is that one can record own voice easily and economically and when the material becomes outdated or no longer useful, could be erased and reuse it. Tapes are not as easily damaged as discs and they can be easily stored. Records of short talks on an interesting scientific topic by eminent scientists, educationists etc can be easily reproduced in the classroom. These talks provide an inspiration to the student. Such recording could either be used to introduce a topic or to develop a topic.
1.5.1.4 VISUAL AIDS

The primary function of a visual as a teaching aid is to serve as a more concrete referent meaning than the spoken or written world. Visuals are iconic representations of the thing. When the thing being discussed is not at hand then the best referent is a visual representation of it. For effective communication it is always better to use the most realistic visual available.

1.5.1.5 DISPLAY BOARDS: DIGITIZED

Display boards are used for communicating written information. There are various types of display boards like blackboard or chalkboard, bulletin board, magnetic board, fennel board etc. The representation of the displayed material should be eye catching, colorful purposeful and educational. Bulletin board is a type of display board where paper cuttings related to scientific topics chemistry puzzle chemistry news work of student etc can be displayed. The displayed information on the bulletin board should be changed frequently and efforts should be made to display material related to the topic being taught in the classroom which will help in creating interest among students. Displayed material should have suitable heading and overcrowding of displayed material be avoided. These points need to keep in mind while digitizing. Charts of different types can be prepared by the teacher depending the instructional objectives to be achieved and need of the subject matter. Charts help in effective representation of the subject matter which is in the form of data, diagram etc. Pictures of great scientists instruments apparatus used in industry industrial processes etc could be used as teaching aid. But the pictures used should be of reasonable size depending upon the size of the class at a time one picture should be
shown and it should not be overloaded with information. Models are three-dimensional representations of reality; models can be working or non-working or even could be a solid model. Models are very helpful in making the concept clarity and also give the student an idea about the actual shape/size angle etc. of the structure under discussion. While using charts, pictures and model as teaching aids the teacher should be careful to plan their proper display. In the context of ICT all these teaching aids have their place in institutional management.

1.5.1.6 AUDIO-VISUAL AIDS

Audio-visual aids are the most important teaching aids as they involve both auditory and visual senses. It helps in giving concrete and experience. The various types of audio-visual aids are discussed below:

**Film projectors**

Film contains series of still images which are chemically imprinted; this series of transparent images when projected at twenty-four images (or “frames”) per second is perceived by humans as a moving image. Motion picture film comes in various widths and image sizes. There are different types of film projector like micro projector filmstrip projector, photographic films could be used to explain theories ideas through visualization micro-photographic films could be used to see things beyond the limits of human vision motion-picture films could be used to show things moving very quickly or too slowly which can be readily observed by human eye. Filmstrip projector is used to project a single strip. One such strip contains 40-100 separate pictures. It can be procured from central film library NCERT, New Delhi. Micro projector requires dark room for its
operation. Film projector is used for classroom purpose. The advantage of using side is that they can be arranged in any desired sequence while film strip cannot be arranged as desired by teacher.

1.5.1.7 CCTV

Closed Circuit Television (CCTV) can serve multiple purposes when utilized by the educational sector. First and foremost, CCTV can provide security services for educational buildings, guarding the technology and premises from outsiders who have intentions to harm the children, steal costly technology or vandalize school property. CCTV can also protect from threats inside the school, such as proving or disproving accusations of sexual abuse, bullying from other children, or theft from teachers or staff. More recently, CCTV has been put to work as a direct educational tool, being used as a vessel to funnel distance learning to remote areas or to non-traditional learners.

1.5.1.8 EDUCATIONAL TELEVISION PROGRAMMES

The television in the present day society is one of the most important teaching aids. It combines the advantages of a radio (broadcast) and of a film and could be used for mass education. T.V. based instructions help students to learn in a better way. Such instructions help in motivating students retaining their interest in the subject. U.G.C programmers are telecasted on Door Darshan such programs can be prerecorded and can be played in the classrooms. As the topics of discussion are announced in advance and if well qualified persons are invited to discus on the relevant topic or to give lecture teacher can easily plan his work and incorporate in classroom instruction. E.g. Gyandarshan, Gyanvani, Vyasa, Ekalavya are some educational channels.
1.5.1.9 MULTIMEDIA DEVICES

The multimedia concept involves using multiple media for a given instructional purpose. It involves integrating different media into a structured systematic presentation. Each medium in a multimedia system becomes greater than the sum of its parts. Multimedia systems are multi sensory and stimulate learning. The multimedia kit may include filmstrips, slides, audiotapes, records, still pictures, study prints, overhead transparencies, maps, worksheets, charts, graphs, booklets, real objects, and models. Commercially multimedia kits are available for various subjects.

These learning kits include sound filmstrips, cassette tapes, floor games, board games, posters, full-color photographs, activity cards, lotto cards, murals, wall charts, geometric shapes, flash cards, student workbooks, and a teacher’s manual. The kit clearly states the objectives and supported with suggested teaching strategies for using the materials. Multimedia kits can even be prepared by teachers. It is important that the components of the kit be integrated that is each component contributes to attainment of the lesson objective. Multimedia activities should also be correlated with other relevant learning activities in the classroom. Multimedia kits should be designed to teach specific knowledge and skills. They should involve the student in the learning process as he or she handles and manipulates the resource materials. It is used in making learning enjoyable as they are multi sensory. Multimedia kits are versatile in their content, range of media and variety of applications and thus contribute to learning for a wide variety of learners in many subject areas. In addition, multimedia kits provide scope for individualized instruction. Multimedia packages are available in the market related to Chemistry, Physics, Biology, Mathematics, Encyclopedia, General Knowledge etc. These packages
have great potential for bringing current and emerging ideas into the classroom and for presenting problem situations to the class in a realistic manner.

1.5.1.10 SIMULATIONS AND GAMES THROUGH COMPUTERS

Computer is a power driven machine equipped with keyboards, electronic circuit’s storage compartments and recording devices that performs mathematical operations at a high speed. It can store large amount of information and produce of retrieve it on demand. An important factor to keep in mind as we consider possible computer uses in instruction is that large numbers of educational systems already use computers for a variety of administrative purposes like purchasing, payroll, inventory, personnel, and auditing. In addition computers are widely used to serve amenity of administrative needs that are unique to education. These include the processing of information for student admissions, the continuous updating of student records, the scheduling of classes etc. there are variety of legitimate instructional uses for computers. These can be conveniently classified into four groups drill and practice, tutorial simulations and games.

1.5.1.11 INTERNET

It is a major tool for gathering, accessing, analyzing culminating, and disseminating information. With the help of computer networked through wires are connected with remote computer for accessing the information. Host computer with the help of specified website address helps in connecting to the various pages on the website. The user depending his/her requirement then navigates through different documents on the web with the help of Internet explorer/Netscape navigator.
1.6 LEARNING MULTIFACETED APPROACH

1.6.1 TEACHING LEARNING KIT

Teaching and Learning Kit is an accessible summary of educational research which provides technical guidance for teachers and schools on how to use their resources to improve the attainment of disadvantaged pupils. The toolkit summarises research into interventions to improve students’ academic achievement. It includes an analysis of each intervention’s average impact on student achievement, the strength of the evidence used to determine that average impact, and the average cost of implementing the intervention.

1.6.2 COMPUTER ASSISTED INSTRUCTION

The computer is not in itself a technology of instruction. It is a tool that can be used to present programmed instruction, programmed tutoring, simulation/gaming and other instructional formats on demand of individual learners. Computers have extensive capacity to store and manipulate information and its unmatched ability to serve many individual students simultaneously is widely used in instruction. The computer can also record, analyze and react to student responses that are typed on a keyboard.

There are two types of computer-based instruction computer-assisted instruction (CAI) and computer-managed instruction (CMI). In CAI the student interacts directly with the computer which stores the instructional material and controls its sequence. In CMI the computer helps instructors administer and guide the instructional process. The computer however store information about students and about relevant instructional materials that can be retrieved rapidly. The learner may be “on-line” to take tests. In addition the computer can diagnose the learning needs of students and prescribe optimal sequences of
instruction for them. Over and above this the computer can be used as an object of instruction, as in computer science, computer literacy and a tool that can be used as an object of instruction as in computer science, computer literacy and a tool that can be used during instruction to do complex calculations, data manipulations, and word processing. Computer systems can deliver instruction directly to students by allowing them to interact with lessons programmed into the system; this is referred to as computer-assisted instruction (CAI). Computer can facilitate most effectively the methods such as drill and practice, tutorial, gaming simulation, discovery and problem solving.

1.6.3 COMPUTER-MANAGED INSTRUCTION

Computer-managed instruction (CMI) refers to the use of a computer system to manage information about learner performance and learning resource options in order to prescribe and control individualized learning. It is a known fact that each student has different learning patterns, with the help of computer one can solve this management problem by administering diagnostic tests, scoring it, prescribing appropriate next steps, monitoring the progress of the student all the way along the learning steps, and maintaining records about student’s progress.

1.6.4 PROFESSIONAL DEVELOPMENT OF TEACHERS THROUGH TECHNOLOGY

Successful professional development in technology happens both on a personal level and on a systemic, school wide level. Many teachers can take advantage of professional development opportunities offered at the district level, such as software or Internet
workshops and incentives for taking graduate-level courses in educational technology. However teachers are responsible for their own progress in integrating technology into their daily practices.

Technology often plays the role of catalyst within a district, ushering in educational reforms that call for learner-centered practices. The American Psychological Association has established a set of learner-centered principles that focus on psychological factors primarily internal to and under the control of the learner. The learner-centered approach is based on the understanding that each learner is unique. When integrating technology into a learner-centered classroom, students individualized learning styles and strategies become apparent. It concludes that low-achieving students or those with little prior content knowledge are likely to require more structure and instructional guidance than students at higher levels of achievement. Thus a rule of thumb for selecting technology resources is that students with different levels of achievement and content knowledge require a range of technology resources. Technology resources can range from close-ended drill and practice to the open-ended. World Wide Web. Drill-and-practice software can reinforce specific types of skills or mastery of knowledge.

Technology advancements however have moved educational technology beyond the limits of drill and practice to interactive technology tools designed around learner-centered principles that call for engaged learning roles. Engaged learning changes the teacher’s role from information gatekeeper to facilitator, guide, and co-learner, with the student as explorer, producer, cognitive apprentice, and sometime teacher. In addition to educational reform methods, teachers must also re-skill in the following four technology related proficient’s areas.
1.6.5 BASIC USES OF TECHNOLOGY:

Teachers acquire basic “know-how” for operating computer hardware, software, and ancillary equipment, such as scientific probes or telecommunications cameras, as well as troubleshooting abilities to address technical problems that may arise. The novice characteristically uses preset surface toolbar features of technology to automate established practices. The intermediate user explores layered toolbar features of technology to increase productivity and efficiency. The advanced user customizes toolbar features to transform his or her daily work flow.

1.6.6 INSTRUCTIONAL USES OF TECHNOLOGY

Teachers increasingly individualize their instructional practices with technology to support various learner strategies to meet achievement standards. The novice begins to understand from a specialist how technology applications align with learning standards. The intermediate user consults with a mentor to successfully integrate technology in learner-centered ways that lead to overall standards achievement. The advanced teacher plays an active facilitation role within a community of learners, using technology to help students meet achievement standards on an individualized basis.

1.6.7 ADMINISTRATIVE USES OF TECHNOLOGY AT INSTITUTIONAL LEVEL

Teachers develop data-driven practices and manage individualized learning with the support of technology tools. The novice responds to mandated uses of technology for record keeping and scheduling. The intermediated user regularly enforces technology usage policies and draws on established management features of technology for
monitoring and reporting students’ progress as well as managing daily practices of the Institution. The advanced user personalizes and creates technology tools for managing data-driven practices, helps develop usage policies, and models ethical technology practices.

1.6.6 TECHNOLOGY FOR PROFESSIONAL DEVELOPMENT

Teachers use telecommunications and networked computer to access online courses and information resources as well as collaborate among colleagues. The novice begins to use technology as a supplemental resource for accessing professional information. The intermediate user accesses technology for up-to-date professional information and to communicate one-on-one with colleagues. The advanced user relies on a paperless, interactive information system for professional growth and purposeful collaborations among students, colleagues, mentors, parents, and business partners. Teachers need to reach an agreement on which technology proficiency criteria are most pertinent to their grade level or content area. Teacher teams can create their own technology proficiency chart to identify levels of technology use relevant in their school context. Teachers can then use the chart to assess their own progress and mentor others in area(s) where they have excelled. Students who are ready for the future know how to use technology effectively for a variety of purposes. Students who miss out on the opportunity to learn to use technology effectively miss out on vital life skills. Most schools, & colleges, however, do not have enough technology resources for every student and require rotating schedules for the use of computers in order to maintain equitable access for students.
Important to a teacher's professional growth is learning how to integrate technology resources equitably. Some activities require that all students have hands-on time with a keyboard/mouse. Other activities call for learning through technology enriched demonstrations or collaborative group work wherein teammates rotate the hands-on use of technology tools. Equitable expectations vary from school context to school context, depending on the amount and types of technology available. Nonetheless, all schools, colleges, and districts should have procedures for monitoring technology equity practices. Teachers need to familiarize themselves with and enforce these procedures when using technology in their daily practices.

1.7 e-LEARNING

e-Learning is the acquisition and use of knowledge distributed and facilitated primarily by electronic means. This form of learning currently depends on networks and computers, but will likely evolve into a system consisting of a variety of channels (e.g., wireless, satellite), and technologies (e.g., cellular phones, personal digital assistants) as they are developed and adopted. e-Learning can take the form of courses as well as modules and smaller learning objects. E-Learning may incorporate synchronous or asynchronous access and may be distributed geographically with varied limits of time.

e-Learning is instruction delivered electronically, in part or wholly, via a web browser, through the Internet, or through multimedia platforms, such as a CD-ROM or DVD (Hall, 1997). E-Learning is commonly referred to as the international use of networked information and communications technology in teaching and learning. They include online learning, virtual learning, distributed learning, network and web-based learning.
Electronic learning (or e-Learning) may be defined as learning using a computer, usually connected to a network, our society can gain tremendously from e-Learning, e-Learning increases the speed and the degree of distribution of knowledge. It also facilitates the acquisition of knowledge and skills and provides flexible learning opportunities to students. e-Learning is defined as internet – based learning in which educational actions and functions delivered by the internet are organized systematically as part of an educational program.

e-Learning covers a wide set of applications and processes such as web-based learning, computer based learning, virtual classroom, and digital collaboration. It includes delivering content via the internet/ Extranet (LAN/WAN), audio and videotape, satellite broadcast, interactive TV, and CD-ROM (ASTD, 2001)

e-Learning is training delivered on a computer (including CD-ROM, Internet, or Internet) that is designed to support individual learning or organizational performance goals (Clark and Mayer, 2003)

The Internet as a modern communication tool has changed the contents of many concepts in our lives. Many common concepts , such as, government, trade, democracy , and learning have gained new meanings by taking the prefix “e” e-Learning or web-based education is one of the important concepts and opportunities provided by the Internet. The concept of distance learning actually emerged much before the internet; actually, it is said to be as old as education.

e-Learning is based on four fundamental criteria : (1) it is networked , (2) it is delivered the end user via a computer (also web TV, cell phones, pagers and personal digital
assistants), (3), it focuses on the broadcast view of learning, i.e., learning solutions that go beyond the paradigms of training, and (4) it spans distance.

Database: collection or file of electronically stored data or unit records with software for manipulation of the data.

Downloading transaction: It refers to any procedure that aims to reproduce electronic a local storage medium or printing facility.

Electronic library resources: Every document in electronic form which needs special content to be used.

Electronic library services: A services which is either supplied from local servers or via networks.

e-Learning is commonly referred to the intentional use of networked information and communications technology in teaching and learning. A number of other terms are also used to describe this mode of teaching and learning. They include online learning, virtual learning, network, and web based learning. Fundamentally, they all refer to personal process that utilize information and communications technology to mediate as well as synchronous learning and teaching activities. On closer scrutiny, it will be clear that these cables refer to slightly different educational processes and as they cannot be used synonymously with the term e-Learning. He term e-Learning a lot more than online learning, virtual learning, distributed learning, networks or web based learning. As the letter “e” in e-Learning stands for the word “electronic”, e-Learning incorporate all educational activities that are carried out by individuals or groups working offline and
synchronously or asynchronously via networked or standalone a computers electronic devices.

**1.7.1 e-LEARNING SOFTWARE**

The development of a conceptual design model provides a typical structure of the entire education. As per the conceptual instructional design developed, the menus can be designed multimedia Flash8, XML and through many other software. The content packaging can be using A SCORM (A content packaging technique). The video files can be converted by conversion software.

**1.7.2 e-LEARNING HARDWARE**

e-Learning modules may be prepared with the help of Macintosh, IBM, Desktop, Pc, etc. the minimum hardware required are Microsoft Windows 98 and Microsoft Windows XP, Ms Windows Vista, and Ms 7,256 MB RAM. Pentium III, Min 800x600 pixels Resolution, and Flash player 8. Hence with the help of the above said hardware, one can prepare E-Learning modules.

**1.7.3 e-LEARNING MODULES**

Waller and Wilson (2001) that “ e-Learning module is the effective teaching and package created by combining e-digital content with local community and tutor support with global community engagement.” It can also be defined as “the delivery of learning, education program by electronic means’ (Derek Stockley, 2003). The E-Learning promotes the inclusion of ICT in all learning system and environments, viz. formal, non formal, informal- schools, higher and adult education and training.
The e-Learning module has been part and parcel of education and training in the western for many years now. In recent times, since the Internet took the world by storm, online become accessible to people in various parts of the world. Now the e-Learning has found its way into the educational system of developing system of developing nations as well in technology and communication has made teaching and training possible anytime.

Generally the e-Learning module is seen as offering solutions to several challenges in learning. These challenges come at a time of increasing pressure on resources, and the increasing in the student population and their modes of attendance, including learning that is part of a distance, open or flexible. Work based e-Learning can improve the flexibility and learning by

- Providing access to a range of resources and materials which may not otherwise be available or accessible, for example, graphics, sound, animation, multimedia
- Giving control to students over when and where they study at their own pace.
- Providing a student–centered learning environment which can be tailored to meet the learning needs of individual students.
- Providing frequent and timely individual feedback for example, through computer assisted assessment and positive reinforcement.
- Supporting economic reuse of high quality, expensive resources.
- Encouraging students to take responsibility for their own learning.
1.8 INTERACTIVE WHITE BOARD

The term interactive multimedia is a catch all—purchase to describe the new wave of computer software that primarily deals with the provision of information. The multimedia component is characterized by the presence of text, pictures, sound, animation and video; some or all of which are organized into some coherent program. The interactive component refers to the process of empowering the user to control the environment usually by a computer (Debbie Philips, 1977).

Nowadays, just chalk and board are not enough to attract attention of the students who are intensely exposed to external stimulus like television and computer. In the presence of a changing society, the only way to provide more effective education is redesigning teaching and learning processes systematically and using human and technology resources mutually by integrating learning and communication (Reiser, 1978).

According to Asubel, the proponent of the “Teaching via Presentation “ Strategy, instead of recording the information as is, students relating new knowledge to related concepts that they already know achieve meaningful learning and have remembered them for a long time. For this reason teachers should give lots of examples and should use visual stimulus such as graphics, charts, pictures (Akmogluet al., 2007).

1.8.1. HISTORY OF INTERACTIVE WHITE BOARD

Interactive whiteboards, also as smart Boards, are tools that have made their way into classrooms around the world. These boards allow teachers to and manufactured for use in the office. This board was used in small group meetings and round-tables. SMART board introduced their first interactive board, which was simply as LCD screen attached to a

By the late 1990s, a number of improvements had been made on the design, including the addition of an eraser, colored markers and back-lighted projection. The target marketing had also changed significantly: the technology that started as an office tool was finding its most profitable sector in the k-12 educational system. In 2001, e-Instruction released its first fully mobile interactive whiteboard. It used wireless technology to allow free movement. This allowed instructors to teach from anywhere in the classroom and removed the limitations put on the technology when it was tethered to the computer system. In 2009, e-Instruction released a system of remotes and mini-boards that allow students to interact with the larger classroom board from their desks.

1.8.2 IMPORTANCE OF INTERACTIVE WHITE BOARD

- Interactive whiteboard is suitable for learners of all ages and allows them to work collaboratively.
- It looks and can work like a conventional whiteboard. Thus it maintains the familiarity one has with the traditional whiteboard.
- It is a better option than a computer monitor when it comes to classroom presentation. While through a PC only limited number of students can be given presentation at a time, with IWB entire class can be covered very easily as it is much bigger in size.
- An IWB allows integration of audio, video, graphics, text and animation (from wide variety of media like CD-ROM, Internet, intra
net, multimedia projector, DVD, VCD, student response system, TV, radio etc) with the lessons. Thus it provided not only enjoyment and interactivity but also makes the learning styles to meet the learners need. Thus it can also help in creating a personalized learning environment.

- Anything drawn or written on the interactive whiteboard surface can be saved on a computer hard disk through a whiteboard-software. In this way teachers can save and share their work and re-used it subsequently in case a repetition is required.

- Contents from websites, blogs, forums, newspaper, wikis and other web based resources can be brought on the IWB-surface through a LCD projector. Thus it promotes r-learning.

- It is an ideal tool for conducting brainstorming sessions and other group activities when used in conjunction with response system.

- It is very powerful teaching tool as: it enhances modeling desktop-computer or laptop.

- It is a very powerful teaching tool as: it enhances modeling and presentation, allows teachers to make effective use of classroom-resources, motivates learners, improve communication and can bring in depth clarity on a topic/subject matter.

- It can also be used video conferencing, impressive sales presentations, staff training, meeting, briefings, group discussions etc and is thus an excellent ICT product for corporate sector.
1.8.3 FEATURES OF INTERACTIVE WHITEBOARDS

More and more classrooms across the India are turning from regular whiteboard to interactive whiteboards. An interactive whiteboard is created with technology that allows a whiteboard to go “live” by linking a computer and projector, usually by a USB cable. A number of features make interactive whiteboards a desirable classroom tool.

a. Interactive Capabilities

One of the main features of interactive whiteboards is the ability teachers and students have to work together on a specific lesson or activity. This is done in a few different ways, depending on the brand of whiteboard. The teacher can interact with some whiteboards by using his or her finger, while others require a special pen called a stylus. The board also works well for brainstorming. A teacher can help direct from a computer while a student is at the board.

b. Saving and Printing

The teacher can put the notes on a shared server to download on a shared server to download or post them on a web page or blog for students to access. The teacher can also have students who were absent access the notes later from the computer.

c. Graphics

Teachers can use graphs, calculators, geometric shapes, manipulative, number lines, clocks and sorting capabilities for math lessons. In science and health, the teacher can project images such as plants or skeletons onto the whiteboard and have students come up and label the graphic. In geography and social studies, use maps to show locations and
track movement of explorers or troops in war. The teacher can also build timelines and compare different political groups.

d. **Web Abilities**

If there is Internet connectivity in the classroom, teachers can bring the web up on the whiteboard. This is useful in lower grades when he or she is teaching students how to navigate the Internet, Teachers can project different sites onto the whiteboard by opening websites on the computer. The teacher can also open video clips and use features on the interactive whiteboard to pause or highlight different information.

**1.8.4. USE OF WHITEBOARD TECHNOLOGY IN EDUCATIONAL SYSTEM**

Since computers entering into education environment advances in technology used in classes increase without any slow down. One of these developments is “the interactive whiteboard technology’ that becomes more and more prevalent in our country in recent years (Shenton & Pagett, 2007). Consequently, students who do not attend to lessons can follow topics (Becta, 2003). Interactive white board can also be used in increasing students’ information communication skills, thinking skills, software utilization skills, and general learning skills such as note-taking and note preparation, Interactive white board technology increases students ‘ interest in searching information on internet and processing information.(Hodge et al.,2007).

Interactive white board technology is a technology that moves computer screen to the whiteboard by means of a projector and that enables controlling the computer by only
touching the white board with a special pen interactive white board technology makes possible to attach sound clips, videos, and animation to the course material that we already have and it is capable of stressing such as screening, zooming in and out. Particularly, its ability of internet connection makes lessons more attractive and they can be easily remembered. Interactive white board can be used in place of all traditional and modern class resources such as books, blackboard, overhead, projector maps, pictures, numerical axis, calculators, slides, and video players and its is also a useful presentation tool that enables students to access to the information having been collected for many years and taking up lots of space in bookcases with just one-touch (Becta, 2003)

- Create video files to teach a software application, a lesson, or as a review to be posted to the server or web. Example- How to create a graph in excel or hoe to burn a project to CDs.
- Use the built in maps to touch continents, oceans, countries, or states and capitals.
- Present presentation created by student or teacher.
- Have students create e-folios including samples of their work and narration.
- Digital storytelling.
- Take whole group computer or keyboarding skills.
- Brainstorming.
- Take notes directly into PowerPoint presentations
- Reinforce skills by using online interactive web sites
Creating a project calendar

Teach editing skills using editing marks.

Use in the 6 trait writing process

Use highlighter tool to highlight nouns, verbs, adjectives, etc.

Use it with Inspiration

Teaching students how to navigator the internet

Illustrate and write a book as a class. Use the record feature to narrate the text.

Use the inter writes software to create lessons in advance at home or at school. Then save them for future use or to be shared with other teachers.

Diagramming steps to a math problem.

Have students share projects during Parent/Teacher/Student conferences.

Graphics and charts with ESL learners and special education students.

Teaching vocabulary

Electronic Word Wall

End each day by having students write one thing that they learned.

1.8.5 USING THE INTERACTIVE WHITE BOARD IN TEACHING AND LEARNING

Tribute to the development of these skills. For example, there are reports that learning with the IWB helps develop autonomous learning, by means of developing a sense of self
competence (Somekh et al., 2006; Walker, 2003). Additional studies found that skilled teachers create knowledge together with students in a dynamic process during the lesson as they develop ideas and speculations and engage in critical thinking and joint ownership of the knowledge (Hennessy, Deaney, Ruthven, & Winterbottom, 2007). In this manner, the IWB may serve as a type of alter-native to the teacher as the center of attention and may enhance cooperative learning in the class, contributing to the development of autonomous learning and higher order thinking skills.

Similarly, the use of IWBs may enable the immediate collection and analysis of student work in ways not previously possible (Moss, Jewitt, Levacic, Armstrong, Cardini, & Castle, 2007), and as such, can contribute to communication skills and cooperation. Learning via the IWB is a modern methodology that allows teachers to bring various perspectives from the outside world into the classroom, through the formation of an authentic and more relevant connection to their students (Somekh et al., 2006).

In contrast to the above, other studies indicated that the use of IWBs can be perceived as an expression of local innovation (Levy, 2002) that is manifested as a short-term “Halo Effect,” that does not allow for the use of the IWB as a medium for developing higher thinking skills (BEC-TA, 2008). As such, efforts should be directed to maintaining and cultivating innovative pedagogy integrated with technology, enabling students to develop thinking and learning skills corresponding to those expected of them in the 21st century.

**1.8.6 DEVELOPING 21ST CENTURY TEACHING AND LEARNING SKILLS**

An expected long-term outcome of smart classrooms in general and IWBs in particular, is their use to develop thinking and learning skills that are appropriate for the 21st century.
As Melamed and Salant (2010) note in their literature review on the topic of integrating technology into educational systems around the world, “The school, part of whose task is to prepare the younger generation for the future, needs to recognize the world of these young children today and to know what will be required of them as they grow up. Among its responsibilities, the school has to develop in its students the skills that will be required of them in order to succeed to cope with the challenges that await them as they grow up” (p. 6). Instructors, researchers, professionals, teachers, and students all raise the question: What are the skills that will be needed by the graduates of the educational system in the 21st century?

In order to answer this question, Melamed and Salant (2010) summarized the findings of organizations, researchers, and educational experts (including: Learning & Technology World Forum, NCTE, Expert 21, Partnership for 21st Century Skills) and created a list of the most important skills in the literature that they examined.

The five central skills were as follows:

1. Information skills (literacy): Skills that relate to the ability to gather, edit, analyze, process, and connect information.

2. Higher order thinking skills: In particular, problem solving, critical thinking, and creative and entrepreneurial thinking.

3. Communication and cooperation skills: The ability to work in a team, and to belong to various communities.
4. Skills to use technological tools, despite the feeling that young people know how to do this.

5. Learning skills: In particular, the development of autonomous learning.

In this context, the question must be raised as to whether learning in smart classrooms can contribute to the development of 21st century skills, and what is the role of the IWB in this process. Findings of various studies demonstrated that various aspects of learning with an IWB help to come up in their level.

1.8.7 APPLICATION OF INTERACTIVE WHITE BOARD IN INDIAN CLASSROOMS

“Interactive whiteboards are used in many schools as replacements for traditional whiteboards or flipcharts. They provide ways to show students anything which can be presented on a computer's desktop (educational software, web sites, and others). In addition, interactive white boards allow teachers to reach their instruction and post the material for review by students who benefit from repetition, who need to see the material presented again, for students who are absent from school, for struggling learners for review for examinations. Briefly instructional blocks can be recorded for review by students—they will see exact presentation that occurred in the classrooms with the teachers’ audio input. This can help transform learning and instruction.”

These are some resources for interactive white boards. Some are specific to a certain brand, but the ideas can still be used on most of them. We aren’t specifically recommending a certain brand. Some teachers of the deaf like the SMART board because they don’t have to use a digital pen to write on the board, hindering their signing. Some
of the portable systems like the Mimio and the eBeam are good for more transient classrooms. The active Board has a lot of built-in templates and resources, but there are probably more online resources for the SMART Board (at this time).

1.9 NEED FOR THE STUDY

Countries all over the world have experienced an increasing demand for education at all levels and by all categories of learners. With a view to meeting this challenge along with other reforms in the existing Education system, attention has been given to the application of technology in the field of education. Usage of educational technology indicates that it can be an effective medium in providing quality education and training to all concerned. One of the goals of technology education is to promote technological literacy with a broad outlook and in an encompassing manner. To achieve this goal, technology education must prepare students to understand, control, and use technology. Students need to get adapted to technological change and learn to deal with forces that influence their lives, so as to potentially control their future. The paradigms for teaching technology education are changing. Technology education teachers and curriculum experts recommend a variety of differing instructional approaches such as self-paced modules, interdisciplinary methodology and problem solving techniques to educate students about technology and its impact on the society. Not all the instructional technologies are easily accessible and used by the teachers and the students during teaching learning process. The use of instructional technologies has been influenced by their availability; Technology will enhance learning, knowledge and skills while used. It
plays its role at the initial level of syllabus framing to any other academic activity by means of efficient administration. Further, the teachers’ academic and professional experiences get sharpened while they use instructional technology during Teaching Learning Process.

1.10 STATEMENT OF THE PROBLEM

With the above background suppositions, the researcher attempted to find out the attitude of high school teachers towards smart classrooms in relationship to their technophobia and challenges faced by them during instruction through modern technologies.

1.11 TITLE OF THE STUDY

The title of the study is stated as “Attitude of High School Teachers Towards Smart Classrooms in Relationship to their Technophobia and Challenges Faced by them during Instruction through Modern Technologies”

1.12 DEFINITIONS OF KEY TERMS

1.12.1 CONCEPTUAL DEFINITIONS

SMART CLASSROOM

A Smart Classroom is one equipped with multimedia components designed to enhance instruction and learning- Mushrafi (2008).
TECHNOPHOBIA

Technophobia as a negative affective and attitudinal response to technology which the technophobe acknowledges to be irrational - Brosnan (1998)

MODERN TECHNOLOGY

Modern technologies have created a "global village," in which we use all recently developed technology such as computers, CD players, cellular telephony and satellite broadcasting and analogue devices confined to conventional radio broadcast technology and audio such as tape recorders to access and communicate with students across the world.

1.12.2 OPERATIONAL DEFINITIONS

SMART CLASSROOM

Smart Classrooms are technology enhanced classrooms that foster opportunities for teaching and learning by integrating learning with technology oriented devices such as computers, specialized software, audience response technology, assistive listening devices, networking and audio-visual capabilities.

TECHNOPHOBIA

It is the fear or dislike of advanced technology through usage of complex devices, especially computers. As technologies become increasingly complex and difficult to understand, people are more likely to harbor anxieties relating to their use of modern technologies
MODERN TECHNOLOGY

Any set of productive techniques which offers a significant improvement (whether measured in terms of increased output or savings in costs) over the established technology for a given process in a specific historical context.

1.13 OBJECTIVES OF THE STUDY

The following objectives were framed in order to set a ground for research. They were to

- measure the level of attitude of High School teachers towards teaching in Smart Classrooms.
- Identify the level of Techno-Phobia among the High School teachers.
- study the level of attitude towards using Modern Technology while teaching in Smart Classroom, among the High School teachers.
- analyze the level of attitude towards teaching in smart classroom, towards modern technology and level of techno-phobia among the High School teachers with respect to the demographic variables – Gender, Age, Medium of Instruction, Pattern of Education, Stream of Subject, Type of School, Teaching Experience, Locality, Computer Ownership, Type of Computer, Knowledge about Computer and Access to Internet.
- Study the inter relationship between techno-phobia, teaching in smart class and usage of modern technology.
1.14 HYPOTHESES

The following Null hypotheses were formulated based on the objectives

1. There is no significant difference in the level of attitude towards teaching in Smart Classroom among the High School teachers.

2. There is no significant difference in the level of Techno-Phobia among the High School teachers.

3. There is no significant difference in the level of attitude towards using Modern Technology while teaching in Smart Classrooms among the High School teachers.

4. There is no significant difference in the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable – Gender.

5. There is no significant difference in the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable - Age.

6. There is no significant difference the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable - Medium of Instruction.

7. There is no significant difference the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable - Pattern of Education.
8. There is no significant difference the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable - Stream of Subject.

9. There is no significant difference the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable - Type of School.

10. There is no significant difference the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable - Teaching Experience.

11. There is no significant difference the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable – Locality of School.

12. There is no significant difference the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable - Computer Ownership.

13. There is no significant difference the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable – Type of Computer Possessed.
14. There is no significant difference the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable - Knowledge about Computer.

15. There is no significant difference the level of attitude towards teaching in Smart Classroom, usage of Modern Technology and level of Techno-Phobia among the High School teachers with respect to the demographic variable - Access to Internet.

16. There is no significant relationship between teaching in Smart Classroom and level of Techno-phobia among the High School teachers.

17. There is no significant relationship between teaching in Smart Classroom and usage of Modern Technology among the High School teachers.

18. There is no significant relationship between usage of Modern Technology and level of Techno-Phobia among the High School teachers.

1.15 METHODOLOGY

Normative Survey Method was followed to collect data from the selected teacher to analyze them statistically.

1.16 POPULATION

The Population for the study constituted the High School Teachers from Kallakuruchi Taluk of Villupuram District in Tamil Nadu State.
1.17 SAMPLE

Random Sampling technique was employed in the selection of the high school teachers who constituted the sample and the Sample Size was 700.

The following demographic variables were selected for the present investigation:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male / Female</td>
</tr>
<tr>
<td>Age</td>
<td>Upto 30 years / Above 30 yrs</td>
</tr>
<tr>
<td>Medium of Instruction</td>
<td>Tamil / English</td>
</tr>
<tr>
<td>Stream of Subject</td>
<td>Arts/ Humanities/Science</td>
</tr>
<tr>
<td>Pattern of School</td>
<td>Boys / Girls / Co-education</td>
</tr>
<tr>
<td>Type of School Management</td>
<td>State Government / Private / Government Aided</td>
</tr>
<tr>
<td>Teaching experience</td>
<td>Upto 10 years / 10 to 20 years / Above 20 years</td>
</tr>
<tr>
<td>School locality</td>
<td>Rural area / urban area</td>
</tr>
<tr>
<td>Computer Ownership</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Type of Computer</td>
<td>Desktop / Laptop</td>
</tr>
<tr>
<td>Access to Internet</td>
<td>Daily / Twice a week / once a week</td>
</tr>
</tbody>
</table>
1.18 RESEARCH TOOLS

The investigator used the following Research tools to Collect Data

1. Teacher Attitude Scale towards Smart Classroom. (TASSC) -2014, Constructed and Standardized by the Investigator and the Research Supervisor and Validated by the Experts.

2. Scale on Technophobia of Teachers (SOTOT)-2014, Constructed and Standardized by the Investigator and the Research Supervisor and Validated by the Experts.

3. Attitude towards usage of Modern Technology in teaching-2012, Constructed and Standardized by Dr. S.Rajasekar, Annamalai University, Tamil Nadu

1.19 ANALYSIS OF DATA

The term analysis refers to the computation of certain measures along with searching for the patterns of relationships that exist among the target group. The collected data were analyzed using appropriate techniques, which are mentioned below.

1.19.1 STATISTICAL TECHNIQUES EMPLOYED

The following statistical techniques employed to test the hypotheses and infer the findings.

Descriptive Analysis

- Mean
- Standard Deviation
Differential Analysis

- T - test
- F - test

Relationship Analysis

- Spearman Correlation Technique

1.20 DELIMITATIONS

The present study has been delimited to

- Certain demographic variables only viz., Gender, Age, Medium of Instruction, Pattern of Education, Stream of Subject, Type of School, Teaching Experience, Locality, Computer Ownership, Type of Computer, Knowledge about Computer and Access to Internet.

- 700 High school teachers from the Kallakuruchi Taluk of Villupuram District in Tamil Nadu State alone where chosen for the study.

1.21 CHAPTERISATION

Chapter-I of this study contains a brief Introduction to Educational Technology, advances in educational technology, Smart Classroom, Technophobia and Modern Technology and a note about the need and significance of the study, objectives, hypotheses, methodology, and delimitations.
Chapter-II contains review of the studies related to the present investigation, done in India and in other countries related to Smart Classroom, Technophobia and Modern Technology.

Chapter-III talks about the Methodology. Survey method was used to collect the data. Method of study, variables, and tools employed, sample and statistical techniques for the analysis were discussed in this chapter.

Chapter-IV contains the analysis and interpretation of the data.

Chapter-V contains the summary of procedure with, major findings and educational implications. It also includes recommendations and suggestions for the future research.

1.22 CONCLUSION

This chapter provided a general introduction, need for the study, significance and objectives of the research, statement of the problem and limitations of the study. In the following pages, the review of related studies on the areas of Smart Classroom, Technophobia and Modern Technology have been discussed.