CHAPTER II

REVIEW OF LITERATURE

2.1 Effects of computer use on high school students
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REVIEW OF LITERATURE

Under the umbrella of central government of India as well as state government of Maharashtra and zilla parishad, efforts have been made under the framework of various directives and guidelines with an objective to boost the computer awareness among school students of different standard. However, the review of literature made by researcher as well as opinion survey with the management, teachers, school students and parents. It was found that there is a gap between the level of expectation from schools and actual implementation about creating/implementing awareness among school going students.

Hence, the researcher was interested to find out various reasons for widening gap and to find out possible solution.

In view of the above, a study has been undertaken by the researcher to focus on the strategic efforts of different schools authorities in Pune City.

Wighting MJ (2006), has used a mixed method design to determine how far the use of computers in the classroom affects the sense of learning in a community among high school students. The main objectives of his study were to study how do high school students describe classroom community and its importance for their learning and what are the factors students consider to be important for the development of a sense of classroom community.

Secondly to study the use of technology in their classroom affects students’ sense of learning in a classroom community.

A non-random sample of 181 students who volunteered to participate in the study were selected, out of which 91 students were in Grade 9 and 90 students were from Grade 11. The sample included 89 boys and 92 students were girls.

The principal selected 12 teachers to participate, some of them used computers frequently for the purpose of teaching and the others did not. The principal determined teachers high or low technology use. The author determined equivalent of the groups regarding students’ achievement, in terms of student ethnicity. Students who attended the school were accessed on entry as being of average or above average ability. Students were drawn from different socio-economic backgrounds and some of them were from other countries.
The participants were subjected to a pre study measurement of their attitude toward computers. The questionnaire was used where the scale showed an acceptable level of reliability.

In order to collect qualitative data, the selection was made equitably from within Grades 9 and 11 by purposeful sampling. The data thus collected was analyzed to determine equivalently among classes with analysis was conducted on the data by using the SCCI to investigate the relationship of the instrument’s subscales with the criterion variable of high and low computer use in teaching. Content analysis on the qualitative data was performed by examining topics, categories of topics and patterns across questions. After analysis the data it was concluded that:

1) A sense of classroom community was present among the participants and some students were aware of a feeling community and may have benefited from it.

2) Many participants indicated that community was important to them and helped them in the learning process.

3) The students identified that there were three main factors which were important concerning sense of community and its importance for the learning. These factors included technology and the use of computers, sense of community and to their learning was the amount of trust that they learning subscale of the instruments more positively than did students who experienced little or no computer use in their class. Students favor an element of learner control which they can achieve through the use of technology

4) Students expressed that they believed that they had more control over their learning with a computer than they did through the use of books.

5) The students considered that they were learning together in a community and building on information that they acquired either individually or as a class.

The author had discussed about the student community but the factors influencing the community was not considered.

Valentine Gill, Holloways and Bingham N (2002)

The authors have explored the potentially inclusionary and exclusionary implications of Information Communication Technologies (ICT) for children through an examination of ICT policies and practices in UK schools. They
started by demonstrating that in government rhetoric ICT were trumpeted for their potential as inclusionary technologies that was to “bring Britain together” through a strategy of “IT for All”. At the same time fears were expressed about potentially exclusively consequences i.e. that technologically illiterate citizens will not be able to participate in “normal activities”, which might include skilled employment, participation in “normal” channels of communication, access to information resources etc, if this access is not provided for all.

It was observed that the provision of hardware was highly unequal between schools as some local authorities had placed greater emphasis on ICT than others.

Access to ICT alone does not equate with the use or development of skills as ICT was understood, valued and taken up or rejected differently by different groups of children. Thus those children who had access to ICT in school but resisted or rejected the opportunities available to become technologically literate tend to be socially excluded in future “Information Society” because without these skills they may be unable to participate in “normal activities”.

It is not enough for governments only to provide access to computer provision within schools, but there is a need to explicitly address how ICT is introduced within the school. In order to encourage children to take up the opportunities they have to use ICT, it is necessary to promote the social content of children’s everyday lives and peer group cultures. Technology, identifies and peer group relations transform and are transformed by each other might be regarded by children as offering a range of positive possibilities, rather than as presenting a threat to their identifies.

The author had reviewed government role, but failed to discuss about its implementation and role of teachers.

Kafai YB and Sutton’s(1999) have reviewed elementary school students computer and internet use at home. The authors surveyed 291 parents of an urban elementary school (K-6), parents reported on their computer at home, the type and frequency of their children’s educational software and internet use and expressed their views about creation of connections between computer use at home and school. The results indicated that most of the students computer use was dedicated to game playing followed by various other software activates while home computer ownership was not gender specific activities. Most of the parents suggestions for connecting school and
home focused on ways in which information about students might be obtained from the school and support through exchanges with teachers.

The author’s discussion deals with issues and potential directions in academic home computing and role of parents but did not discuss the infrastructure required at school and trained teacher in computers.

Hassana R. A. (2006) explored the use of ICT in teaching ICT, based on an analysis of the strength and weaknesses of the pedagogies and technologies used in teaching ICT in primary school in UK. To study current practice, 60 primary schools were contacted of which 10 schools were selected as representatives sample having students from different social environments, providing ICT facilities in the school, its usage level and school standards as recorded by of stated report. Thus 10 ICT coordinates and 7 teachers were interviewed, after analysing the collected data the following conclusions were arrived at.

ICT is being taught either through supporting other curriculums or using the traditional teaching method, hence there is a need to investigate new pedagogies of teaching ICT. Most of the teachers complained that the unavailability in the market of an interactive multimedia educational CD-ROM, edutainment or e-learning materials was the reason for not using them in teaching or learning the ICT curriculum. So such materials need to be made available and their influence on teaching and learning ICT curriculum be examined. Thirdly, The obstructions of teaching ICT in primary schools such as limitation of teachers ICT knowledge, difficulties in class management, lack of assessment and the gap in the children’s ICT usage in school versus home are correlated factors that should be considered when studying the effect of e-learning on teaching ICT in primary schools.

Author has exploded the use of computer by primary school students but failed to give solutions to obstacles faced by the teachers.

Scrim Shaw Peter (2004) reviewed literature on Enabling teacher to make successful use of ICT with a view to identifying the factors which are most effective in enabling and encouraging the uptake of ICT by teachers. A survey was conducted on line. And
visitors to the becta research website were invited to list the factors which enable them to integrate ICT in their teaching. The main finding were to follows-

The majority of teachers tend to prefer to use a variation of the teacher centred model. There teachers has to make full use of ICT in their work. It is necessary for them to make radical changes to the way they teach.

The personal characteristics of teachers may have influence on the extent to which they take up an innovation such as the need for different approaches to ICT implementation for different teachers.

There are three levels of teachers computer use varying in their relationship to the existing curricula. There involve using ICT as-

A supplement to the curriculum. Areinforcement on enrichment of the curriculum. Hence training provision has to be differentiated to meet the needs of teachers at each of these levels in addition to the need for individual teacher to make personal changes in order to make more wide spread use of ICT (teacher level factors); there also exists a range of school level factors which can inhibit its use Thus both teacher level and school level factor need to be addressed. Schools working independently can make successful classroom use of ICT more likely by way of the following. The role of school leadership in central is enabling teachers to engage in innovative practice. Planning is also an important factor. The elements of planning are the need for the creation of a vision statement, the importance of needs assessment and the need for a school development plan. Appropriate resourcing and flexible forward looking planning, linked closely to what teachers actually want and need at any stage, will be essential. At the same time professional development can be achieved through a variety of approaches, a combination of approaches is needed to suit the level of progress that staff individually and as a whole have already reached, reliable technical support in schools in necessary, although there are several ways in which schools might approach this whichever approach is adopted there is a need for coordination to ensure that the support is effective.

Author had described about the role of teacher’s but failed to high-light the management strategic initiatives.

Steve kennewell(2004): “Meeting the standards in using ICT for secondary Teaching “A guide to the IIT NC-The author has analyses a wide range of case studies of
effective practice of ICT teaching in order to abstract general principles to help new
teachers to understand something of the complex relationships involved in the
effective use of ICT in teaching and learning. Trainee teachers should be able to use
this understanding in order to plan for themselves, rather than merely copying their
mentors. These principles provide a basis for evaluating their own practice and
discussing how to improve. These principles are:

1) Thinking together - Teaching children how to talk together more effectively
   is a way of helping them to think more effectively. Small groups solving
   problems together show the importance of social relationships in the
   process of learning. Computers can be used effectively in group work. It
   establishes the value of integration of ICT activities based on thinking
   skills into the curriculum.

2) Thinking skills and computers - There is a little evidence that children learn
   or assimilate thinking skills by using computers but some ICT based
   activities can help teacher thinking skills when used as a resource to
   support learning dialogues. The role of the teacher in making the thinking
   aims of activities explicit, modeling good thinking strategies and designing
   learning activities so that skills learnt in one context are applied to new
   contexts.

3) ICT and citizenship: joining the dialogue and reasoning as the medium of
   teaching and learning can communicate core values promoted by
   citizenship curriculum. Talk can be stimulated by software designed to
   engage children in moral reasoning about ethical dilemma.

4) Literacy and ICT – A combination of computer based activities and
   collaborative learning can support the development of literacy. Computers
   have a special role to play in bridging the transition from oracy to literacy.
   The relationship between conventional literacy and various forms of
digital literacy is examined, as it is the close relationship that exists
between oracy, literacy and thinking skills. The combination of “thinking
   together approach” with focus on communication aspect of ICT is
important for enabling children to engage in collective thinking.

Thus the role of computers in classrooms and the crucial role of the teacher and
thinking together approach can help in raising children’s achievement across the
curriculum.
Author has briefed about the relationship between the oracy to literacy in children but failed to portrait the finding of its initiatives.

H haroon,A.M.(2009): The introduction of ICT into Ghanaian Education curriculum noted that the students access educational websites for textbooks and other educational information. The ministry of education had developed ICT policy with support of the Global e-schools and communities Initiatives(GeSCI). Regarding achievements of the introduction of ICT into the school’s curriculum, that increasing number of students have computer awareness, teaching and learning has became easier with the use of computer, students with high IQ can now find something to engage them meaningfully, there is keen and healthy competition among schools of ICT knowledge sharing. However certain challenges are still present such as inadequate trained personnel to handle the felicitation of the subject, inadequate supply of teaching and learning materials, lack of infrastructure, lack of administrative support, lack of internet connectivity, lack of power supply in the rural areas, high cost of ICT services and components and brain drain syndrome in the area of ICT professional.

Author had discussed the initiatives taken by the Ghanaian Government but failed to discuss the role of parents.

Photos Papaioannou,(2001) exploded the Cyprus primary school principal’s attitude towards ICT and their perceptions about the factors that felicitate or inhibit ICT integration in primary schools in Cyprus.

A survey was conducted among principals, using a stratified random sampling consisting of 250 primary school principals from all over Cyprus. Necessary data was collected through questionnaires. In order to collect qualitative data, eight principals were chosen for interviews based on specific criteria.

After analysis of data the main findings were as follows-Cyprus primary school principals generally hold positive attitude towards ICT. However a number of statistically significant differences were observed across genders, years of service, academic qualification, access to a computer and the internet at home, in-service training on ICT for teaching and learning purposes, existence of a computer in the
principals office, computers experience and the principals attitude towards ICT. Even though principals valued the importance of ICT in the teaching and learning process and administrative purpose, still they need more tailor-made in service training and incentives in order to transfer their theoretical enthusiasm in practice. All the principals were aware of various factors that can facilitate or inhibit ICT integration. These factors can be divided into internal factors. Internal factors were, inspiring and competent leadership, school based in service training on ICT, capable ICT coordinator, Provision of incentives to the ICT coordinator, involvement of primary stakeholders in the integration process, collaboration with the distinct ICT advisory teacher, teacher’s competence and knowledge of ICT, acceptance of the innovation from the teacher. External factors included center based in service training on ICT, pupil’s background knowledge on ICT, time available for principals to prepare the ICT integration, number of computers per class, support and maintenance on ICT, time available for principals to prepare the ICT integration, number of computers per class, support of the innovation from the ministry of education and culture.


Regarding integration of ICT’s into teaching and learning, various factors related into the successful integration of ICT were identified. For eg the affordances offered by newer technologies should prompt a fundamental rethinking of educational purpose and practice. In addition, the importance of teacher education, professional development and support to reflect fundamental reorientation of educational vision, so that practitioners can move forward boldly to seize opportunities that were unimaginable only recently.

The greatest challenges of ICT integration relate to vision, policy and leadership. ICT is changing faster than educators are able to track. In order for each sector to capitalize on the knowledge of the other sector, there is a need for closer corporation among educators, university researchers, teachers preparations personnel, government policy makers NGO’s and the private sectors. Better strategies are needed to evaluate the impact of efforts to integrate ICT, so that competing practices can be compared for further selection.
The authors have examined current issues related to technology integration and provided a contextual framework with which school principals can undertake new leadership responsibilities in this area. The leadership goals, competencies and responsibilities needed to achieve this in future. The authors draw on professional experiences as researchers and teachers/readers to build and expand on a five part leadership model, at present in use by a large urban school district to interpret multiple dimensions of technology leadership for principles. This framework can serve as a guide line for school leaders as they develop technology competencies, implement professionals growth plans, word with their community and provide daily technology leadership, mentorship and advocacy for teachers in an elementary school.

Taiwan

JiaRong Wen and Wen Ling Shih(2008)"Exploring the information literacy competence standards for elementary and high school teachers”. The main purpose of this study was to establish information literacy competence, standards because these standards play an important role in increasing teachers information literacy abilities. Establishing these standards helps in identifying elementary and high school, where they are and where they should be, so that they can adjust their learning accordingly. The main conclusions of the study may be stated as follows-

1) On the basis of conclusions of discussions, and the Delphi technique surveys, a teacher’s information literacy competence should include three dimensions namely knowledge skill and attitude and three levels ie standards, main indicators and secondary indicators. Regarding knowledge aspect, one should be able to understand the nature and the different forms of information, be familiar with the methods of searching information and to have the ability to access, explain, organize and synthesize information. As to the attitudes aspect, one should be able to realize the value and power of information technology that can enhance teaching and learning.

2) The purposed information literacy standards found that “attitude” has great impact on improving information literacy competence and the willingness of applying information technology on teaching. Thus the proposed information literacy emphasizes the importance of the aspect of attitude.
3) The standards of the ministry of education of Taiwan are not suitable as they do not include attitude dimension. Hence the proposed standards based on experienced with IT practice of teaching and learning should be suitable to teaching and learning environment in elementary and high schools in Taiwan.

Australia

Hyo-Jeong So(2009)- examined the complexity of pre-service teachers technological pedagogical content knowledge(TPCK) in the context on integrating problem based learning (PBL) and information and communication technology(ICT ). Ninety seven perceive teachers under the study were engaged in a collaborative lesson design project where they applied pedagogical knowledge about PBL design a technology integrated lesson in their subject area of teaching.

The results indicated that the areas which were difficult and challenging to the students were(1) generating authentic and ill-structured problems for a chosen content topic (II) Finding and integrating ICT tools and resources relevant for the target students and learning activities (III) designing tasks with a balance between teachers audience and student independence.”The present study suggested the potential of two explanations for such difficulties: lack of intimate connection among beliefs, knowledge and actions and insufficient repertories for teaching with technology for problem based learning.”

Birgitta Nordén: [2005]- University essay from Lunds universities /Pedagogiska institution -This study was part of the research project Learning in the ICT-extended university (LiEU), which is conducted by Centre for Learning Lund at Lund University. The purpose of this study is to describe and analyse how upper secondary school students have experienced the Young Masters Program (YMP) and their learning process in the field of sustainable development in the ICT-mediated course with issues such as preventive environmental strategies within the framework of university outreach development.

James Copper -Whether you are at the tender age of 8 or are pushing 90, computer training will make your life easier and definitely can open up a range of learning that you never thought possible. Taking part in a computer-training course is made
available in all elementary schools up to special college courses that entail exceptional programs and a dizzying array of delivery formats.

**Africa**

Sara Hennessy, David Harrison, Leonard Wamakote (2010)- Studied the teacher factors influencing Classroom use of ICT in Sub-Saharan Africa (SSA) - Recent research shows that new digital technologies in SSA have the potential to revolutionize the quality of subject teaching and learning when carefully integrated into the classroom. The role of the teacher is utterly critical here. Yet a primary barrier to teachers’ readiness and confidence in using ICT, despite general enthusiasm and belief in benefits for learners, is their lack of relevant preparation, either initially or in-service. Research indicates that, until recently, training opportunities have remained limited in availability and inconsistent in quality. This has resulted in demonstrably low proficiency in using ICT, and a general lack of knowledge about technology in teaching and learning. There are some recent examples of successful practice in developing ICT use in SSA schools through its integration in teacher education. However, according to Unwin (2005), provision has often been characterised by “well intentioned, but misplaced, supply-driven initiatives” across the continent to provide teachers and students with ICT skills. These have proved “wasteful and inappropriate”, with limited impact. Moreover, the recent global economic downturn has amplified the shortage of public funds to devote to the already expensive business of training teachers to use ICT (Commonwealth of Learning, 2004). Increasingly, large school classes and the designation of ICT as a discrete subject, lead to a dire lack of subject teachers trained to integrate technology into learning in their areas. These are fundamental challenges to be overcome before ICT capacity building can become a reality in African education.

In conclusion, this paper identifies a need for teachers and teacher educators to integrate ICT into subject teaching and learning using contemporary pedagogical approaches. Ideally teachers will be assisted to work collaboratively over time with peers, and to learn from one another’s innovations and experiences. This requires prioritisation of ITE and CPD that is pedagogically sound and aligned with wider policy interests, and means offering sufficient support and time for teachers to get to grips with new technologies. Underpinning these recommendations is development of locally produced, contextually relevant course content for both teachers and learners. The situation is already changing
somewhat via programmes such as Intel Teach that has reached over six million teachers in 40 countries worldwide. The development of databases for open educational content tailored for individual SSA countries, such as TESSA, SchoolNet Africa and Commonwealth of Learning are also making an impact. Hennessy and colleagues are currently exploring the potential for creating and integrating locally produced or adapted digital open educational resources through school-based, subject-focused professional development in the OER4Schools project. A pilot in Zambia is being conducted by a schools-Ministry-academic-NGO-private sector partnership.

Michael Auerswald & Justine Magambo(2007), Fostering ICT use in teacher education in Africa-ICTs are spreading rapidly in the world. In order to stop brain-drain, new African education paradigms need to be constructed. Multipliers in the education sector need to be trained within a scientific-theoretical framework, enabling the implementation of best practice models, which are tested in African online-communities of best practice (CoPs). Such online communities make it possible to analyse and evaluate the explicit and implicit knowledge being effective in the ICT training of teachers. The identification and transmission of best practice elements take place in a larger community of practice. The organization of a CoP is characterised by the fact that all participants share the key concepts, i.e. the core of the paradigm. The education at school in Africa should be in reference to the surrounding community. The aim of the ICT education in Africa should be the creation of CoPs, which constitutes an ongoing teacher training. On a macro-structural level the deficit on the teachers’ side can be explained by a non-existence, lack of influence or the current ineffective operating CoPs in this area. It is assumed that the production of paradigms in the area of teaching and learning can be achieved effectively by the formation and activity of African working groups. CoPs help to accomplish controlled and evolitional development of the African educational systems, which would permit phases of revolutionary radical changes. African education researchers need to realize that the education paradigms, which come from the industrial nations in their raw form, are incommensurable with the new, African education paradigms. Foreign aid in the ICT teacher-training should be regarded as a collection of best practice models which can be implemented in the education sector effectively, if they are weighted, tuned and controlled within African CoPs.
Institutions of learning are reforming their systems to accommodate new media of learning. While many of these are global organisations involved in all sectors of global development, there are also programmes initiated specifically for the development of ICTs in African teacher education on the continent. There is a need for a deeper comprehensive framework to train teachers in the appropriate use of ICTs and yet there are no standard references or methodologies to evaluate ICT in education programmes. The development of an ICT curriculum requires extra infrastructure (like CoPs), construction of teacher-trainer ICT skills and production of ICT training materials. This can help bring research and development closer to practical implementation programmes. PEA as a network, developed for such programmes and institutions, allows the sharing of training facilities and experience. Responsibilities of the institute include the providing of a forum for the sharing of both positive and negative experiences. Using the project’s website as a platform, a network of “contacts” or “experts” in departments of education in the selected universities was developed. PEA fosters the ICT use in education through establishing a CoP within African universities. This project aims at reducing the enormous digital divide with the help of an internet platform. In this network African “experts” can create successful learning environments, which could then act as examples of good pedagogical practice, checked and tuned by African CoPs, and can be transferred to other educational institutions. It is important that the examples of good pedagogical practice come from African institutions. PEA brings the participating teachers into contact with existing CoPs. Within the PEA framework, the results of the dissertation study show that the development of ICT use in selected African universities is still at a very low level. Teachers are the key agent in respect to educational change and innovation and, therefore, a foundation for any new strategy to establish CoPs for the successful implementation of teacher-training programmes in Africa.

Adebowale, O.F, Adediwura, A.A., Bada, T. A,(2009), Correlates of Computer Attitude among Secondary School Students in Lagos State, Nigeria- The findings of this research has shown that effective management of socio-demographic factors [like gender and field of study], and personality variables could significantly predict how learners will relate to the computer, their persistence at studying computing and its allied courses as well as the development of interest in computer and computer related vocations. Consequently, school counselors and vocational guidance specialists have
important roles to play in developing positive computer attitude in secondary school students by counseling them in gender relations to vocations and knowledge acquisition, usefulness of computers to students in all fields of study, counseling for confidence in handling computer and overcoming anxiety when using it. It is the view of the researchers that if these are properly managed, students attitude to computer, computing and computer vocations will be improved and many more will like to be involved in adopting computers and computing as a tool in the global march towards computerization and technological advancement. However, it is suggested that the psychological basis of gender differences and contribution of these factors to computer attitude still require the attention of researchers as this will enable school counselors to design appropriate guidance and counseling programmes which could be tailored towards improved attitude towards the computer, given the important roles computer and its applications play in the lives of man in the 21st century and beyond.

The author had studied the gender differences and contribution of these factors to computer attitude.

**INDIAN EDUCATIONAL SYSTEM**

Michael Trucane(2009) has reviewed the progress of computers in secondary schools, and noted that the challenges that India currently faces related to providing universal access to a relevant and quality education for everyone and the solutions it deploys to meet such challenges are of increasing interest and relevance to people around world. This is especially true as it relates to the use of ICT to meet a variety of educational and developmental objectives.

The Ministry of Human Resource Development (MHRD) introduced the scheme for universalisation of access to an improvement of quality at the secondary stage known as “Rashtriya Madhamik Shiksha Abhiyan (RMSA)” through the use of ICT, with an objective to transform teaching and learning through ICT.

However in rural areas where there is neither exposure to computers nor sufficient number of teachers competent in computer use, it results into merely keeping computers into classrooms. Only once teachers, students, and school administrators get more acquainted at using computers. It can then be said that beginning of the use of computers has really started. A very efficient way to achieve
this sort of comfort is through the ICT literacy courses. Otherwise putting computers directly into classrooms will be “an expensive deployment model”.

United Nations Educational Scientific And Cultural Organization (UNESCO) and Ministry of Human Resource development, Govt. of India conducted a study of ICT usage in 1000 schools of India (2005). The main objective of the study was to monitor and evaluate the use and outcomes of ICT in education in India in order to provide benchmarks for policy and programme improvements.

The survey was conducted in 2004. The number of schools was 1000 out of which 500 were in the state of Gujrat and 500 from Karnataka. Out of these 1000 schools, 602 (60.2%) were Govt. schools and 398 (39.8%) were private schools. There were 497 primary schools and 513 secondary schools. The total number of students of 1000 schools were 2,24,018, out of which, 1,21,029 were in Gujrat and 1,02,989 were in Karnataka and total number of boys was 1,25,714 and 98,304 were girls. The total number of teaching staff and rest was not teaching staff. The major findings were as follows:

- The use of ICT in education was very limited as the number of schools having an ICT department (20.4%), the availability of a budget in schools for its implementation (6.5%), the number of teachers trained ICT, per capita availability of hardware etc.

- On an average there were less than six computers per school and one computer for 72 students.

Gupta Sheetal (2011) has reviewed the use of Technology in Education in the context of Indian condition.

When we entered in to 21st century each of us has realized that knowledge as a primary source had begun to affect human endeavor in all walks of life. Knowledge is disseminated through the educational system and hence it is necessary that we should prepare ourselves to respond to the enormous challenges of knowledge era. The time has come to create a second wave of intuition building and excellence in the field of education, research and capacity building, so that we are well prepared for the 21st century. The conventional system has proved unequal to the demands of growing numbers and life long learning.
The need for interactivity in the learning process led to the computer based learning materials. But in the decades of 1970’s and 1980s the materials pasted on the web was devoid of appropriate instructional design and did not provide an interesting learning environment. By 1995 most computers were equipped with CD-Rom drive which could store vast information in audio, image and video formats. A revolutionary development in computer assisted learning came with the availability of internet in 1996. Internet emerged as the most successful educational tool because it offers a global open platform for information storage, display and communication. Though Internet has not changed the expertise of the teachers and learners teach and learn, it has helped them to change their skills and mode of operation. Even in F2F situation its use has increased flexibility in delivery and interaction. In order to realize, however, the vast promise of the highly rewarding technologies it is necessary to keep the teacher in focus and lay greater emphasis, more than ever before, on continuously attracting talent to education and nurture it as multi skilled human capital by training and retaining.

Vijaykumar R (2011) has reviewed the role of technology as catalyst of teaching and learning process in India. Information and communication Technology (ICT) has become an integral part of today’s teaching and learning process. Effective use of technology can motivate students, make our classes more dynamic and interesting and renew teacher enthusiasm as they learn new skills and techniques. However technology cannot replace a teacher but it can be used only as a supplement tool in teaching learning process, thereby enhancing learning environment. Updating the technical, professional knowledge and skills of teacher is the need of the hour. Even though teachers may have mastered the traditional pedagogies in teaching their students, the rapid changing world dictates that these are no longer sufficient. The teachers must acquire new knowledge and skills themselves before they can prepare their students to meet the demands and challenges of the 21st century. In order to make education meaningful, exciting interesting and accessible to all, technology must be linked with the process of learning. The effective handling of ICT in classroom by teachers will change the very nature of instruction processes.
Praveena K.B.(2011)- have studied the role of interactive multimedia in a multicultural country like India. Today computers can be used to deliver interactive, competency-based individualized, multimedia instruction. Deciding whether to use interactive multimedia instructions are tailored to meet the needs of all kinds of learners. Integration of interactive multimedia and technology in the classrooms helps learners to acquire skills and to be productive.

According to Richard Mayer, one of the most important promises of multimedia is that learners appreciate multimedia explanations better than just a word alone. Learners can understand pictures and sounds very easily than words. If words alone are presented to the learners they try to form their own mental images and this may cause them to miss the actual points of learning. Multimedia instructions assist students to learn more deeply and also they enjoy such learning environment.

It has been indicated by various studies that teacher who integrate technology in their classroom not only motivate their students to learn but help their students to acquire significant skills in the process (Glenda C Rakes 2006). The best pedagogical arguments for use of multimedia technologies (providing more learner convenience, satisfaction and success) may be compelling enough, but problems in relation to existing organizational cultures, structures and finances should not be overlooked.

Anandan and Gopal (2011), studied the impact of ICT in classroom instruction. The quality of education depends to a great extent on the quality of teachers who use innovation in their teaching aspect through integrating technology in the classroom instruction to give the best to the students. As technology is a powerful tool for problem solving, conceptual development and critical thinking, it helps in making the learning process a much easier for the students.

ICT has significant impact in the classroom teaching methodology. Using ICT in the classroom instruction educators would have enormous positive impact on different aspects, as teachers using ICT can plan and prepare lessons more effectively and efficiently and teachers become multifacilitators.

Transition, transformation and revolution is the scenario of today’s educational system. All the processes of learning are crossing boundaries and barriers. This technology requires a change in knowledge competencies and skills to deal with technological advancement in networking which is necessary to establish a network between students, educators, parents, institutions and libraries in the world over. The
teachers have to realize that if the students have to achieve high level of competency and competitiveness, they have to adopt technology as an integrated tool in the field of education. Thus teacher may be called as a “Teaching Technician”.

Sasmita kar (2011), has reviewed science and technology as tools of value education including electronic media which have transformed every activity of our life. But science and technology has became an instrument for distorted values. The presence of electronics has changed every activity of human life at the cost of ethics and morality. Thus it has lead to an illusion of prosperity. The continous erosion of moral values in public life as posed a challenge to education and compels educationist to reintroduced value education in school curricula as as to build social life on sound ethical grounds. As development of machines has made life very fast, we have developed a great art of doing something first and thinking about its pros and cons later. Hence there is a need to develop scientific temper in man. Scientific temper is the temper that enables one to think and act rationally. It enables one to think and weigh the pros and cons of acts first and then act accordingly.

At present the fruits of the progress of science and technology are enjoyed by a few people only where as the needs of masses are ignored. It should be remembered that there is no value of life which can happen to a single person in isolation from society. Hence the value of life should be examined beyond the individual in his relationship to others- other living and non-living being. The fruits of science and technology should be enjoyed by all. The enevitable process of development with high science and technology inputs implies that an integrated outlook based on all science and non science technology considerations be brought to bear on formation of curricula and methods of education so that the value of life of people is improved.

Deepak Jaiswal(2011): asserted that teacher education system employered by ICT driven infrastructure can promote excellence, quality instruction and leadership in a knowledge based economy. Teacher is considered to be an architect of the nation, as the future of the nation lies in the hands of teacher. On account of knowledge explosion and fast changing ICT the teachers sometimes find it difficult to cope up with the new challenges of these developments

In driven education changes the methods of content generation, content storage, content packaging and content delivery and hence offer a new paradigm of
education. These multimedia programmes and packages are intended to supplement the real classroom activities and help their assimilation easy.

Thus ICT is a powerful new development with ambitious role in the field of education. Digital and internet based multimedia transforms the present trend in the educational field. ICT has revolutionized the entire concept of education, learning and research by offering new opportunities and challenges in creation and dissemination of information by way of web TV’s and web based education, independent of time, place and pace. It is really a challenging task to strengthen ICT in educational institutions, which are unequipped or underequipped in the terms of digitalized and high tech infrastructure.

National center for education statistics and Application of computers for developing higher order thinking skills, problem-solving, group work and hands-on learning activities, however, is less extensive and less conclusive (NCES 2000d.) Two studies show positive effects (Wenglinsky 1998; Glennan and Melmed 1996), but a third study concludes that it is not known whether computers can be used for this type of teaching in a cost-effective manner with any "degree of certainty that would be desirable from a public policy viewpoint" (President’s Committee of Advisors on Science and Technology 1997.) Although it is possible that these studies are less conclusive because teachers are less adept at teaching using these new tools, it is clear that IT is becoming increasingly important in the classroom and that there is widespread interest in how these tools are being applied.

The times of India, New Delhi, March 24, 2009: Global Talent Development Corporation, NIIT has entered into a contract with the Rajasthan Council of Elementary Education (RCEE) to introduce Computer Aided Learning in 1,672 Government Upper Primary Schools in 22 districts of Rajasthan within the framework of Sarva Siksha Abhiyan (SSA). The value of the contract is Rs. 214Mn. The five-year agreement involves setting up 1,672 fully furnished modern computer labs with over 5016 computers, which will benefit 33,340 teachers and 836,130 students, cumulatively.

The times of India, Monday March 30 2009, One laptop per child scheme comes to: Pune - One laptop per child (OLPC) a global project aimed at children’s education,
will add Pune to its map soon, with zilla parishad school at Malavali set to get these laptops designed for learning and teaching.

OLAP Inc is a non-profit organization funded by multinational companies. The initiative is basically for effective education, teaching and self learning by students.

A OLPC project was introduced in India in 2007, when students of Khairat village near Karjat received OLPC designed XO laptops.

Jaykumar Rathod, (2005): studied “Development and Implementation of an information Technology Based Instructional Package for English Grammar to Gujarati medium students of Standard VIII of Jamnagar City” - The objectives of the study were to develop an IT based instructional package for teaching English Grammar to Gujarati medium students of standard VIII, to study the effectiveness of the developed IT based instructional package in terms of the achievement of the students, and to know their reactions on the developed instructional package. The development of the IT based instructional package was done through Microsoft power point. 100 students were randomly selected from standard VIII of Smt. G.S. Mehta Municipal Girls High School, Jamnagar. The conclusion if the study is that the students were found having positive reactions towards the developed IT based instructional package.

Yadav Kusum, (2004)- The objectives of the study were to develop an IT-enabled instructional package for teaching English Grammar. To implement it and to determine its effectiveness in terms of achievement of the students and opinions of students and English Teachers. There was found a significant gain in terms of students’ achievement through IT-enabled instructional package. It helped the students to learn kinds of sentences, namely, interrogative, assertive: affirmative, negative, imperative: orders or commands, and exclamatory. The students and teachers were found to have favourable opinion towards the developed instructional package.
Anil Tanaji Patil, (2006) studied the development of Multimedia Instructional System on Computer Education for B.Ed. Pupil Teachers. The Study is based on a sound conceptual framework. The Study has arrived at quite meaningful findings as follows:
1. The present setting of teaching of computer education in B.Ed. Colleges was found unsatisfactory.
2. It was found feasible to design, develop and implement a computer based Multimedia Instruction System for the Computer Education.

S. Jayaraman, (2006) conducted a study on The Relative Effectiveness of Computer Based Multimedia Learning Packages on Performance and Behavioural Outcomes of Students of Different Age Groups. Findings of the Study are as follows-
1. The CBMMLP prepared specifically for the particular concepts are significantly effective for all the age groups of students. There has been found a higher usage by higher age group students.
2. The relative effectiveness of the CBMMLP is significant for all the age groups of students who are studying class V, class VIII and class XI. The performance of the students who have learnt through CBMMLP is higher than the performance of the students who have not learnt through CBMMLP.
3. The analysis of the effect size reveals that it varies between class V, class VIII, and class XI, which is, 4.20, 2.83 and 4.72 respectively. These effect sizes are considered as large and educationally significant.
4. Higher age group students have been found to have more positive attitude towards CBMMLP than the lower age group students.
5. The higher age group students have been found more auditory preferred than the lower age group students, whereas, the lower age group students have been found more visually preferred.
6. Higher age group of students have been found satisfied more in the interaction with the CBMMLP. Also, 74.2% of class XI students were found having prior knowledge of the computer. 75% of the class V students could not express either their satisfaction or about their prior knowledge.

Anshuman Das (1998) - Media And Ict In Education: Research Review Effectiveness Of Computer Assisted Learning Material-Explored the effectiveness of computer assisted learning material on Rhymes in different modes. The study was conducted to
develop computer software on rhymes in text, graphics-text, text-music, graphics text music, and graphics-text music recital modes and to study the effectiveness of Computer Assisted Learning Material (CALM) prepared in different modes for learning the Rhymes in terms of Word meaning (lexicon), Analytical understanding, Comprehensive understanding, Writing ability, Recitation ability and LSRW ability. The second standard pupils of Baroda high schools (1996-1997) constituted the sample for the study. The study found that composite modes of presentation may not ensure higher cognitive language learning, further, intelligibility of a message is a function of sender, message, medium, mode, receiver, and the environment.

Munther Mohammed Zyoud (1999) conducted a study on Development of Computer Assisted English Language Teaching for VIII Standard Students. The study reveals that when the computer is used to its full potential, it can help the students achieve more in learning vocabulary, grammar and comprehension to the learners with different IQ, motivation and attitude. It helps the students learn better because it provides them with a lot of freedom and responsibility to learn at their own pace. The students were found to have +ve attitude towards Computer Assisted English Language instruction.

Shital Yadav (2000) conducted a Study of the effectiveness of the computer software for students of standard I. There has been found a significant gain in terms of mean achievement on the software on Alphabets and Animals. Most of the students were found to have positive reactions towards the software. Teachers welcomed the media integrated approach towards learning.

Goel, D.R., Tomar, A., Khirwadkar, A., Das, A. and Joshi, P. (2000) - Conducted a project - Implementing CAI (Computer Assisted Instructions) in Schools: An Experience. The project was conducted to study the effectiveness of CAI (Satellite, Solar System & Magnet (VIII), Pollution, Electricity, Thermal Conductivity, and Bio-gas (IX), Organic Chemistry, Optics, Periodic Table and Chemical Bonding (XI)) in terms of achievement of the students. Also an attempt was made to train teachers in the use of CAI on optics, thermal conductivity, periodic table and chemical bonding, solar system, electricity, magnetism, accountancy, photosynthesis,
geometry, Rhymes, English, cell division and balgeet. It was found that of the packages implemented through control group-experimental group design the value of “t” was not significant, whereas, for the packages implemented through single group pre-test post-test experimental group design the value of “t” was significant. The students and teachers were found to have favourable reactions towards the CAI.

Rupesh Patel (2001) conducted a study- “Learning through CALM (Computer Assisted Learning Material) in relation to selected production variables and contiguity”. The study was conducted to analyze CALM in relation to production variables and contiguity, to study the effectiveness of CALM in terms of mean achievement of students and to study the learning through various message items in relation to production variables and contiguity. 30 students of standard VIII (2000-2001) of Shreyas Vidyalaya, Manjalpur, Baroda were selected for the study. There has been found significant gain through interaction with CALM on solar system and Magnet. The status of CALM in terms of production variables and contiguity in terms of achievement has been found quite high.

Anjali Khirwadkar (1999) developed a CAI (Computer Assisted Instructions) package in subject of Chemistry for standard XI Science Students and studied the effectiveness of the developed software in terms of instructional time and achievement of students. Also the effect of software package on students’ achievement in relation to students’ intelligence level, motivation level, and attitude towards the package and the attitude of the students and teachers regarding the effectiveness of the CAI package with respect to contents, presentation, examples, illustrations, graphs and figures, evaluation items, utility of software and instructions given in the instructional manual. The developed software package was found to be effective in terms of academic achievement of the students. The students and teachers were found to have favourable opinion towards the software package. There was found an interaction effect of IQ, motivation and opinion of students on their academic achievement.

Sanjna (2001) conducted a comparative study of the effectiveness of CAI (Computer Assisted Instructions) and CMI on Pupil’s achievement in Science, their self concept
and study involvement. Both CAI and CMI were found to be contributing significantly towards the achievement of pupils in science, in developing their self concept and in increasing their study involvement. A study of effectiveness of computer science instruction at class VIII level in Valsad city,

Permar Suresh R (2002) focused on the availability of infrastructure for computer science instruction in the selected schools of Valsad city (Gujrat) with respect to medium and gender. Also an attempt was made to study the reactions of teachers and students towards computer science instruction. The mean achievement of rural students on computer science practical has been found significantly higher than the mean achievement of urban students. The Gujarati medium students have been found to score higher than the English medium students on computer science theory and total. The male students have been found to achieve higher on computer science practical than the female students.

Snehal Macwana, (2004) focused on the development of Computer Assisted Learning Material (CALM) on optics for Standard IX Gujarati medium students and to find out its effectiveness in terms of the achievement of students and Reactions of the students and teachers. The study employed experimental and control group design. Standard IX Students of Kalrav School, Halol (Section A:40 and Section B:40), and their teachers constituted the sample for the study. The CALM was found effective in terms of achievement and reactions.

Helaiya Sheetal (2004) conducted a study- “Development and Implementation of CAI (Computer Assisted Instructions) Package for Teaching Statistics to B.Ed. Students.” A CAI package was developed through Visual BASIC by the investigator on Teaching Statistics. 16 B.Ed. Students of the Department of Education, MSU, Baroda having Computer Education specialization constituted the sample for the study. Pre-test, treatment, post-test single group preexperimental design was used for the study. The treatment was found quite effective as evident through the mean gain scores and favourable reactions.

S.Sivraj Pandian (2004) – conducted a study Effectiveness of CAI (Computer Assisted Instructions) in Biology at Secondary School Level reveals that the CAI students
demonstrated significantly higher achievement gains in biology. The variables self-esteem, attitude towards Biology and computer were influenced by the CAI. In contrast the attitude of students towards school could not be influenced.

(Computer Assisted Instructions) conducted a study “Effectiveness of Computer Assisted Instruction for Primary School Students: An Experimental Study”. It is a developmental-cum-experimental study. Pre-test, Post-test design with replication groups was used for conducting the experiment. Two experimental groups along with eight replication groups, each consisting of 30 students were drawn. The characteristics of the different tools used for the study, namely, criterion tests and opinionnaires have been well established. The CAI Packages developed by the ONPEC on English language have been found effective. The CAI Packages developed by the investigator on Thai language and ONPEC on English language have been found equally effective at both the levels in Buriram Kindergarten. The CAI Packages developed by the investigator on Thai language and by the ONPEC on English language were found significantly and equally effective with all the eight replication groups. The CAI Packages developed by the investigator on Thai language and by the ONPEC on English language received favourable opinions both by the teachers and students. Replication and the repeated demonstration of the effectiveness of the CAI developed by the investigator is one of the salient features of the study.

Yadav Kusum (2004) conducted a study “Development of an IT enabled Instructional Package for Teaching English medium students of Vadodara city”. The objectives of the study were to develop an IT-enabled instructional package for teaching English Grammar, to implement it and to determine its effectiveness in terms of achievement of the students and opinions of students and English Teachers. The investigator started with a null hypothesis that there will be no significant difference in the mean achievement scores of students in pre-test and post-test. A single group pre-test and post-test design was employed for the study. 20 students were randomly selected from Std. VIII of the New Era Senior Secondary School, Baroda. Pre-test, post-test and opinionnaire were used for the study. The data were analysed through ‘t’ test, % scores and content analysis. There was found a significant gain in terms of students’ achievement through IT-enabled instructional package. It helped the students to learn
kinds of sentences, namely, interrogative, assertive: affirmative, negative, imperative: orders or commands, and exclamatory. The students and teachers were found to have favourable opinion towards the developed instructional package.

Sharma Sumita (2005) conducted a study “Effectiveness of an Instructional package in Environmental studies among students of standard VII”. The study was conducted to prepare an Instructional Package on environmental studies, to teach environmental studies with the prepared instructional package to students of Std. VII and to determine the effectiveness of the instructional package in promoting better understanding of the environment. It was a case study research involving Std.VII A of St.Xavier’s High School, Gandhinagar. The instructional package was found effective in promoting a better understanding of the environment. The analysis of the responses of the students through the interview schedule revealed an increased sensitivity towards environmental concerns and a better understanding of the environment.

Snehl Hiralkumar M.Barot (2005) conducted “A study of the effectiveness of CAI(Computer Assisted Instructions) in Sanskrit for std. VIII students.” The study was conducted to develop CAI in Sanskrit for Std. VIII students and to study its effectiveness in terms of mean achievement of students in Sanskrit and to study the reactions of the standard VIII students regarding the effectiveness of the developed CAI package. 86 students of Std. VIII of Shree Ambe Vidyalaya, Waghodia Road, Baroda constituted the sample for the study. A single group pre-test and post-test design was employed for the study. Achievement test and reaction scale were constructed by the investigator. Flash MX, Corel Draw 11 and Front Page were used for the development of software. ‘t’ value, frequencies and % responses were used for data analysis. The developed CAI in Sanskrit was found effective in teaching Sanskrit to VIII std. students. The reactions of the students towards the developed CAI in Sanskrit were found positive.

Irfan Shah (2005) conducted a study- “ICT awareness, use and need of secondary and higher secondary teachers of English Medium Schools of Vadodara city”. The objectives of the study were to study the ICT awareness of secondary and higher secondary teachers, to study the ICT use of secondary and higher secondary teachers, to study the ICT need of secondary and higher secondary teachers, and to study the
variables related with the ICT awareness, use and need of secondary and higher secondary teachers. A scale was constructed to collect the data regarding ICT awareness, use and need of a Teacher with respect to different components of ICT, like, computer, Internet, OHP, LCD Projector, Radio, TV. 12 secondary and 10 higher secondary schools were selected using stratified random sampling technique. Further 60 secondary and 50 higher secondary teachers were selected @ 5 teachers from each selected school. A total of 90 teachers out of 110 responded. Data were analyzed using frequency, percentage, mean, SD, SE of mean, ‘t’ value and ANOVA wherever necessary. There was found a low degree of ICT awareness, use and need of secondary and higher secondary teachers.

Rakesh Pardeshi (2005) conducted “A study of the relative effectiveness of CAI and CAIPI in learning Trigonometry by English medium students of Standard IX of Baroda City”. The objectives of the study were to develop the CAI and study its effectives in mono, diad and triad settings and its relative effectiveness in the three settings and through reactions of the students. The study was conducted in the three sections of Standard IX of Zenith High School, Baroda, dividing each section into two groups - experimental and control. The CAI was developed using Flash-MX, Directors and Corel Draw 11.0 along with the Internet. An achievement test was constructed for administering as pre-test and post-test. The data were analyzed through mean, SD, uncorrelated ‘t’ and ANOVA. No significant difference has been found in the mean achievement scores of the groups in mono, diad and triad. No significant difference has been found in the mean achievement scores of the experimental group in mono, diad, triad and control groups, respectively. Significant difference has been found in the mean achievement scores of the experimental group in triad and control group. The students were found to have positive reactions towards the developed CAI.

Effectiveness of ETV
(Computer Assisted Instructions) conducted a study on Instructional and feedback use of television. Teaching by teacher, teaching through television, teaching through television after traditional teaching were considered as independent variables. Scholastic achievement in school subjects (Home Science, Biology and Music) was considered as dependent variable. Intelligence, school subjects, and instructional climate were considered as moderator variables, whereas, age, grade, sex, previous
academic achievement extra coaching, television programmes viewing were considered as control variables. 450 female students studying in XI class constituted the sample for the study. A significant effect of instructions through television was observed on the various school subjects in comparison to the traditional method of teaching. For different educational stream courses (Science, Art, and Fine Art) there was a different effect of instructions through television. The feedback effect of instructions through television was found highly significant for all the courses. Intelligence was found to play a significant role in relation to the instructional use of television.

Goel D.R., Das A. and Joshi P (2000), conducted a study —“Implementation of Children ETV in University Experimental School”. The objectives of the study were to analyse ETV Programmes with respect to pedagogy and quality of programme, to study the reactions of students towards viewing ETV programmes and to study the factors impeding the implementation of ETV. The ETV programmes telecasted by the Gujarat Institute of Educational Technology from 10.2.2000 to 22.2.2000 were selected for the study. Data obtained through watching the video cassettes, observations and discussions with students were analysed through content analysis technique. The conclusion of the study was as follows – Students enjoyed watching the ETV Programmes. Learning took place by viewing the ETV programmes. The students learnt seriously from the content based programmes. The students felt that they would like to have ETV programmes in their time table. There was a lack of infrastructural facility for viewing the ETV programmes in the school. The quality of the ETV Programmes needs to be enhanced.

K. Sudhakar Reddy (2001), A study on the impact of ETV programmes on scholastic achievement of the primary school children in AP on 21 Experimental (TV Schools) and 21 Control Schools (Non-TV Schools) representing three regions, namely, Telangasna, Coastal Andhra and Rayalaseema, representing one district from each, namely, Nalgonda, Krishna and Kurnool reveals that regular and continuous exposure to the ETV programmes has a positive influence on the scholastic achievement of the primary school students. The study suggests that the participation and involvement of local teachers in production of ETV programmes should be encouraged.
Chhaya Pandey, (2002), A critical study of importance and usefulness of TV Educational Programme in the field of Education reveals that proper programmes are not being telecast for young generation related to their practical life. The time of ETV programmes is not well suitable to the students. ETV programmes are not helpful for job satisfaction. ETV programmes have been found helpful in national integration and religious cooperation.

Darshana Chaudhari (April 2005) , Conducted a study “Techno-pedagogic analysis of children ETV programmes and their effectiveness in terms of achievement with and without discussion and perception of students and teachers”. The objectives of the study were to analyze the CETV Programmes techno-pedagogically, to study the effectiveness of the CETV Programmes in terms of achievement of students, to compare the achievement of students in CETV with and without discussion, to study the effectiveness of CETV programmes in terms of reaction of teachers, and to study the views of the students on the CETV Programmes. The programmes were largely found effective techno-pedagogically in terms of media genicity, audio-visual compatibility, contiguity between text and animation and between audio and visuals, media language proficiency, use of technological aids, correspondence among communication elements, and view composition. All the six programmes were at knowledge level, 5 at understanding level, whereas 4 were at application level. Most of the programmes focused on receiving and responding. Three focused on valuing also. One of the 6 programmes focused on imitation, manipulation and articulation level. There was significant difference between the mean gain scores of control and experimental group in all the 6 programmes. In 5 out of six programmes, the mean achievement of the group with discussion was found significantly higher than that of without discussion. Children and teachers were found to have positive views regarding the programs.

Indubala U Singh (1999), Effectiveness of Educational Video Environmental Education through Video-instructional Package : An Exploration was a developmental cum experimental study. The first part consisting of the development of Video-instructional Package on ‘Environmental Pollution and Education’ and the second part concerned with the experimental try-out of the package and its two components. Video instructional package consisted of video-film and learner’s hand
book developed by the investigator was used for conducting the experiment. For evaluation of the programme a multi-faceted approach was developed and used and a number of evaluative tools were developed which included (I) criterion tests, (II) attention measures, (iii) expert’s judgement and (iv) opinionnaire for the students. The results of the present study indicate that teacher made video-instructional packages can be used effectively for creating awareness and providing information to school students. Therefore, such more attempts should be made for some other important aspects of life as per the needs of the students. The present study also recommends regarding the organization of the training programmes and work shop for teachers where development of software specially for video package can be learnt by the teachers.

Dibakar Sarangi (2000), conducted a study—“Exploring cognitive map formed due to educational video viewing among learners” to study the effects of TV Language proficiency, viewing strategy, and their interactions on the components (Concept, proposition and schema) of cognitive map in terms of corresponding map scores taking intelligence as a covariate, to study the effects of television language proficiency (TLP) and viewing strategy and their interaction on cognitive map (total score) taking intelligence as a covariate, to analyze the cognitive maps of the different television language groups in relation to different production variables namely, message track, message presentation form and message type, to analyze the cognitive maps of learners of the treatment (VS) groups in relation to different production variables namely, message track, message presentation form and message type, and To analyze the learning distortions in the cognitive maps of the students in relation to viewing strategy, television proficiency and production variables namely, message track, message presentation form and message type. Six ETV programmes for class VIII, produced and telecast by the SIET, Orrisa, Bhubaneshwar were selected, namely, The Living Fossils, Composition of water, The environment, Properties of water, The Dust particles, and Thermal expansion of matter. Intact classroom groups were used as the sample groups (composition of sample students from rural and urban background was deliberately manipulated to ensure a fine dispersal of TLP) the number of students for difference ETV was different and ranged from 155-170. Intelligence was measured with the Raven's standard progressive matrices and Television Language Proficiency with a standardized Television Language
proficiency Test (TLPT). Cognitive map data were collected through cognitive map inventories and subsequent ratings were done with rating scale. Children's learning through the ETV programmes was found to be positively influenced by their Television Language Proficiency. The Television viewing strategies, namely, Direct Viewing, Viewing with Note taking, and Advance Organizer followed by Viewing produced similar influences on cognitive map formation among the learners. The ideal cognitive maps of the sample ETV were transacted more at the concept level than at the Proposition Level. In most cases distorted transaction of the message items was more than the meaningful transaction. Learners cognitive maps contained large amount of feeble and blurred concepts and proposition, chiefly inadequate Learning, idiosyncrasies, confusion, some amount of over-learning and marginal overgeneralization. Meaningful and distorted transaction of the concepts and propositions exhibited distractive relations with message type, message form and message track. These basic relations could be instrumental for improving educational tele-production and to make TV a more potential instructional medium. The study further sensed possibilities of relationship among cognitive mapping, the said production variables and tele-instruction strategies which need further probing. This is felt that tele-visual instructional designs in general and the process of message mediation in particular need reexamination for effective education of children.

Mahesh Kumar Muchal, (2001) conducted a Study of the Effectiveness of Instructional Strategies in General Science and Social Studies in Standard X of the National Open School reveals that the video lesson has been found more effective than printed lesson. Postvideo instructional discussion has been found more effective than video lesson. Video lesson and post-video discussion have been found more effective than only video lesson, and video lesson has been found more effective than printed lesson. Learning through printed lesson and video film has been found more effective than through printed lesson when pre-test scores were considered as covariate. Learning through printed lesson and video film has been found more effective than through printed lesson when IQ scores were considered as covariate. Post-video lesson discussion and talkback have been found to be equally effective. The students who devote more time to the studies can enhance their achievement
through printed text, video lessons and discussion. The technological know how has been found to affect distance education and non-formal education differently. The achievement through distance education has been found gender independent, whereas, in non-formal education it has been found gender dependent.

Vallabh J. Vekaria (2002) conducted a study on “An exploration in the teaching of science for standard VIII on the unit of agriculture through a video instruction programmes”. The researcher developed video instructional programme and constructed a test and an opinionnaire for the students and an opinionnaire for the teachers. The video instructional programme developed by the researcher was found to be effective in the urban as well as rural areas of Saurashtra, Central Gujarat and South Gujarat. The video constructional programme was found equally effective on rural and urban areas of entire Gujarat. The effectiveness of the programme was found directly proportional to the level of achievement in all the three areas. The students and teachers were found to have positive reactions towards the video instruction programme.

The researcher had studied the effect of video instructional programme but failed to mentioned the required infrastructure and budget.

Rajendra Pal CIET,(2001) Effectiveness Of Audio conferencing & Teleconferencing An Experiment with off timing of AIR, namely, Audio-conferencing for Primary School Teachers was conducted. The focus of the study was to assess the feasibility, workability and effectiveness of audio-conferencing in the area of teacher education by using off timings of AIR. The two way audio communication method was adopted to conduct the experiment in which teachers were given telephone facility at one end and at the other end the live broadcast from the All India Radio was available. Teachers were also linked with AIR station through FAX facility available nearby. The experiment was conducted on three days. Also each day was divided into three sessions, namely, the problem session, the solution session and the discussion session. The sample included two hundred teachers on eleven teachers’ centers selected from four tehsils of Indore district. Besides this, 22 facilitators including 11 from the DIET Faculty and 11 Head Teachers/Principals of the schools where the teacher centers were fixed. The study reveals that the off timings of local AIR stations can be utilized
for local educational purposes especially in teacher education. Local Resources, both, human and material can be utilized in education through proper co-ordination.

Nishi Jain (2002) conducted a study of IGNOU Teleconferencing for Distance Learners was conducted to analyse the teleconferencing programmes of IGNOU subjects in terms of contents, methods, media and modes, to study the effectiveness of teaching the distance learners through teleconferencing in terms of mean achievement scores, to study the reactions of distance learners regarding preparation, presentation, duration, talkback, technical and non-technical problems and utility aspects of IGNOU Teleconferencing with respect to selected variables, to study the views of IGNOU Personnel involved in planning, production, co-ordination and implementation stages of IGNOU teleconferencing programmes and to study the feedback on IGNOU teleconferencing programmes with respect to views of Coordinators regarding attendance, technical and non-technical problems, motivation, participation, utility and benefits of IGNOU Teleconferencing programmes. Very few participants were found attending the teleconferencing programmes. Usually the participants were found attending the programmes attentively. Participants wanting to ask questions seemed more interested in the programmes. It was found that the time allotted for the talkback session usually was not enough. Some learners having vernacular background expressed apprehension about the comprehensibility of the programmes. There were mixed responses regarding the effectiveness of the teleconferencing programmes. Some found these programmes very exciting and wonderful, whereas others could not utilize these programmes properly. Proper coordination is required among all the personnel involved in IGNOU Teleconferencing.

Bhardwaj, M.K., Kumar Anil & Kulshrestha (2001) Utilisation Of Learning Resources At Study Centres Of IGNOU Research Project –“Effective Utilization of Learning Resources at Study Centres of IGNOU”, sponsored by the IGNOU, New Delhi was conducted by. The project was conducted to study the extent of utilization of services of Human Resources as well as Material Resources available at Study Centres of IGNOU, to find out the factors responsible for ineffective utilization of these learning resources and the remedial measures for effective utilization of various
learning resources. All the regular study centers of IGNOU of MP for management programme were included as sample. 210 students from the above Study Centres responded to the questionnaire. The counseling facilities are not being utilized to its optimum level. At some Study Centers, Counselors for specialized courses like MS-26, 27, 45, 46 etc. are either not available or not properly identified. Assignments are not serving the main purpose of becoming as teaching tool because either evaluated assignments are not reaching students in time or meaningful tutor comments are not written by the Counselors. Audio/Video Cassettes and Library Books are not being utilized to the extent as expected. Extent of utilisation of the teleconferencing facility is almost nil. Analysis Hierarchy Process (AHP) Approach of Multiple Criteria Decision Theory (MCDT) has been suggested to calculate single index of Study Centre performance which is a performance indicator of functioning of a Study Centre. Some of the remedial measures for effective utilization of learning resources at Study Centres, such as, dispatch of counseling schedule in advance, orientation of academic counselors, treating assignment as teaching tool, use of teleconferencing at all Study Centres, making library facilities more attractive have been suggested by the study.

Joshi Priya, (1999) - A Study of utilization of the Internet in Educational Research was conducted to find out the extent to which researchers in education utilize the internet and the factors affecting the utilization of Internet in Educational Research. Also an attempt was made to study the effectiveness of an orientation programme to facilitate the use of Internet in educational research. The participants were found enthusiastic to learn the use of Internet. The Manual developed by the investigator is quite useful. A Study of the Approaches Adopted by the M.Ed. Students for Information Gathering on the World Wide Web and their utility for the M.Ed. Programme was conducted by CIET of NCERT, (2003), Impact Evaluation Study Of The Centrally Sponsored Educational Technology Scheme Of GOI An impact evaluation study of the centrally sponsored Educational Technology Scheme of GOI was conducted to study the effect of media programmes on learners’ achievement in curricular (language, mathematics and environmental studies) and non-curricular areas (general awareness on contemporary issues, acquisition of life related skills and inculcation of values), to obtain opinions of the students, teachers, headmasters, parents and community members towards usefulness of educational programmes
made available through broadcast and non-broadcast modes and to make suggestions for revamping of the scheme in the light of the findings of the study. A cluster of 20 schools from each of the Andhra Pradesh, Maharashtra, Orissa, Rajasthan and Uttar Pradesh States was selected for the study. Out of these 10 schools in each State constituted the group of the experimental schools and other 10 formed the control group. Further 40-45 children of classes 3rd and 5th of primary stage of each of the selected schools were drawn for the study. Subjects of language, mathematics, social studies and science were selected for curricular areas and general awareness, life skills and inculcation of values were selected for the non-curricular areas. Achievement tests, observation schedule, and questionnaires/interview schedules were used for the study. In Andhra Pradesh the ETV programmes were telecast from Doordarshan Kendra, Hyderabad, whereas, in Maharashtra, Orissa, Rajasthan and UP these were telecast from DDKs at Mumbai, Bhubaneshwar, Jaipur and Lucknow. The audio programmes were usually available in cassette mode and played back on Radio-Cum-Cassette Players. The findings of the study indicate that students of classes 3rd and 5th in the States of Maharashtra, Rajasthan and Uttar Pradesh who were exposed to educational media programmes and accompanying pre and post telecast /playback activities gained much higher than those who did not get this benefit. The positive attitude of the teacher also seems to have influenced this outcome. In respect of non-curricular aspects also gains are significantly in favour of the experimental group for the States of Maharashtra and Rajasthan where these tests were conducted. It can therefore be inferred that the support of educational media programmes helped children do much better, establishing its impact on their learning achievement. The schools in Andhra Pradesh however seem to have defied the trend. It presented mixed findings. Children from class 3rd experimental schools from this State have shown significantly higher gains than control group of schools in mathematics and social studies but not in language and science. Insignificant gains in these subjects and science are reported for class 5th children also. Lower performance in non-curricular aspects could be due to lower number of programmes for intervention. Or their not been able to convey intended messages. The trend from the three States(Maharashtra, Rajasthan and Uttar Pradesh) clearly indicates that a planned intervention through educational media programmes is helpful in strengthening the achievement of the children. The study has reported variations in the conduct of pre-telecast activities, elements of good media programmes,namely, music, humour, demonstrations, visit to
outside places and also conduct of posttelecast activities from State to State. These need to be included appropriately for better effects. It was nonetheless observed that in one of the States, radio programmes were not used at all. Further media programmes are not included as regular activity and provision was not made for them in the timetable in many of the schools. Three out of the four States have less than 50 percent schools which had appointed custodian teachers. The deficiencies in this regard need to be addressed. Percentage of teachers using Colour TVs and Radio-cum-Cassette-Players varied markedly from State to State. There is a need to integrate media programmes in school process. There has been found acceptance of the role of educational media programmes by the teachers and parents in improving learners’ achievement both for subject related and general awareness contents. The study however points out that with systematic inputs impact of media programmes can be improved considerably.

Inamdar Sunanda & Patwardhan Anita (2004), conducted a study- “The status and functioning of RCCP and CTV Sets in the Maharashtra State Under the Educational Technology Scheme”. The survey was undertaken with a view to understanding the status of RCCP and CTV sets in Maharashtra under centrally sponsored New Educational Technology Scheme and also to know which educational audio and video programmes are listened to or viewed. Opinions of Headmasters and Block Education Officers were sought and considered in this respect. In all 5340 copies of a questionnaire were distributed in 356 blocks in 33 districts in the State. As regards interview, 295 responded. 73.43% RCCP sets and 76.52% TV sets are used in the schools. One of the main reasons for not utilizing TV sets is the irregular supply of the electricity. Out of 4848 RCCP sets, 3121 (64.31%) are kept in cupboard, and as regards CTV, 3872 sets (79.86%) are kept in the wooden cabin for safe keeping. Out of 4848, 3546 (73.14%) RCCP sets, and 3650 (75.29%) CTV sets are in working order. It is also observed that due to fluctuating voltage, some of the sets are damaged and a few of the sets are beyond repairs. The students view the programmes with pleasure and concentration. They can understand mathematical/scientific concepts/experiments shown on TV. Technical quality of the programmes is satisfactory, however, in some parts of the State, transmission is not good. The BEOs have not received any instruction from any authority to check about the condition of RCCP/TV sets nor their use in the classrooms etc. until this study was undertaken.
According to them a register is necessary to be maintained in the schools to record the number of programmes viewed and pre and post activities conducted. The study has made quite meaningful recommendations for the schools, school authorities, DIETS, SIET, Directorate of Education and the MHRD, such as, the Zila Parishad Primary Schools should delegate the responsibility of up-keep and maintenance of RCCP and TV sets to a particular Teacher. There should be provision for TV lessons in the classroom timetable. The schools should send a regular feedback to the SIET regarding utility and quality of TV programmes. Heads of the Central Primary Schools (Kendrapramukhs) and BEOs should monitor the use of RCCP and STV sets. Under the guidance of SIET and SCERT the DIETS should conduct workshops for aspiring scriptwriters. The DIETs should design a component in terms of curriculum for inservice training addressing the appropriate use of RCCP/TV sets in day to day teaching-learning for sustained impact on students. The SIET should send a schedule of the programmes to the schools well in advance for their optimum utilization. Quality of the Educational Programmes needs to be further improved. The SIET should produce and distribute audio/video cassettes and CDs based on the ETV programmes as well learning material to be used at the convenience of the teachers and learners. The SIET should have ultramodern studios, equipment and expertise to produce technically high quality programmes. The SIET should have collaboration with other media institutions to produce quality programmes and share the know-how of latest techniques. The good offices of the Director of Education may issue directives for Eos, BEOs, Kendrapramukhs and teachers to optimize the use of CTV and RCCP sets. It is necessary to set up a separate educational channel to overcome the present problem of suitability of time for telecast to schools and many other problems. EDUSAT may fulfill some of the requirements in this respect.

The researcher Deepak Kumar Shah, (2001), Status of Computers in Education -A study of prospects and applicability of computer in Education in the Secondary Schools of Eastern UP reveals that 24% of the secondary schools have computer facilities. Majority of the schools have supplementary time-table and indicated two periods for theory and three periods for practical per week. Most of the schools have software, namely, BASIC, WS, DBASE, and MS Office. Most of the schools have installed COMPAQ
computers. No financial support is provided by the government for maintenance of the computers.

The author had not discussed the issue of Course stream (Science/Non-Science), gender, family pattern, inhabitation and marital status and extent of the opinion of teachers with respect to the prospects and applicability of computer in education in the secondary schools.

Katyar Pramod Chandra (2002), conducted a study on the status of Computer Education in the schools of Gwalior. The study was conducted on 30 schools from Lashkar, Gwalior and Murar, ten schools at each of the primary, secondary, and higher secondary levels. Largely no compatible curricula and competent teachers were found at the primary level with respect to computers in education. At secondary school level no computer education was found to be offered in the Government schools, whereas, it was offered in 8% of the private schools. But the students find this subject very boring, being not implemented properly. Five of the government schools were found offering computer education at the Higher Secondary level under Vocational Education Program organized by the Bhoj Open University.

Chamnan Chantahiem (2004), Educational Media in Secondary Schools of Thailand-A Study of Availability And Utilization of Educational Media in Secondary Schools of Thailand was conducted by The study has raised as many as 20 relevant Research Questions. Majority of the teachers have showed their satisfaction in the use of educational media. 50% of the sample schools were found to have physical problems, mostly related with physical facilities of the classroom and laboratory. Such schools were not having sufficient and workable equipments, software, and infrastructure. The modern media were found to face more of problems as compared to traditional media in terms of skilled human resource. The problems related to administrative system were mostly related with the non-cooperative behaviour or due to less insight of the administrators. The problems related to supporting staff were mostly related with the proper full time appointment of the technical person. The educational media were found largely under used. The power point, CAI, and CMI were never used in their schools as responded by about 20% of the teacher sample. Suitability of available software related to Thai and English languages was perceived less as compared to
other subjects. Availability of high tech media was greater in big size schools as compared to the medium and small size schools.

The author had talked about the difficulties faced by the administrative staff about failed to site the problems with teaching staff.

Beena Y. Desai (2004) conducted a study on “A Comparative Study of the Efficacy of Teaching Through the Traditional Method and the Multimedia Approach in the subject of home science” was conducted by It is an experimental study which has employed experimental group and control group design. The sample of the study is constituted of 98 students of B.A. first year home science (2001-2002) of Smt. J.P. Shroff Arts College, Valsad. The multimedia package constituted of transparencies, pie graph, charts, diagrams, pictures, video tape, audio tape, and slide set was developed by the investigator. All the tests pretest, post-test, retention test and opinionnaires were constructed by the investigator. The intelligence test by Dr. K.G. Desai was used. The study has arrived at significant findings when caste, location, income, Std. XII examination marks, and IQ of the students were considered as co-variables. The students were found to have favourable opinions towards the multimedia approach. The study has found the relative efficacy of teaching through the traditional method and the multimedia approach in the subject of Home Science.

The Author had reflected the use of computers in Home Science but failed to reflect the influential factors like role of management.

Shailendra Rathod (2004), Bridging the gaps amongst Teaching Styles and Learning Styles Through Technologyc conducted a study on Identification of the gaps between the teaching styles of the teachers and the learning styles of the students at secondary level and exploring the possibilities of bridging these gaps through technology. The focus of the study has been to bridge the gaps between the teaching styles of the teachers and the learning styles of the learners through technology. One of the two VIII Standard Sections of Kalrav School, Panchmahal, Gujarat, India constituted of students and their teachers constituted the samples for the study. The data were gathered through Learning Style Inventory available on www.howtolearn.com and observation schedule constructed by the investigator. 34% of the students were found
to differ significantly in their learning styles. Except Mathematics Teacher, other teachers differed among their teaching styles. In Mathematics 36%, in Science 46%, in English 48% and in Social Studies 86% students differed in their learning styles with respect to the teaching styles of their teachers. The average learning styles of the whole class did not differ significantly with respect to their Mathematics, Science and English teachers’ teaching style, whereas, a significant difference was found with respect to the teaching style of Social Studies Teacher. Teachers were rarely found using the kinesthetic teaching style.

The study demonstrates the utility of various media, namely, computer, multimedia, Projecting and non-projecting media to address the needs of a variety of teachers and learners.

Maria Athaide (2005) conducted a Study of the Effectiveness of the Training Program conducted by Intel- India for Secondary School Teachers. All the five objectives of the study under Phase ‘A’ and all the eight objectives under Phase ‘B’ have been well enunciated as follows:

- To conduct an ethnographic study in a sample of secondary schools that participated in Intel’s Training Program.
- To gain entry to a sample of the 3 categories of secondary schools (SSC, ICSE, and CBSE) that participated in Intel’s Training Program ‘Teach to the Future’ for the ethnographic study.
- To describe the computer equipment and facilities that exist in the Secondary Schools that participated in Intel’s Training Program ‘Teach to the Future’.
- To carefully observe the computer related teaching activities of the Intel trained teachers in the use of computers in the teaching of their subjects.
- To interview the Principals and Teachers of the schools under ethnographic study to—
  a) Find out their satisfaction with regard to the Intel Training.
  b) Find out the extent of computer application in their teaching activities.
  c) Identify the obstacles that hindered the teachers from using the computer to teach their subjects in the school.
  d) To document their beliefs about the use of computer technology in teaching. To administer the constructed tools to the Principals and Teachers of the selected secondary schools.
To statistically analyze the quantitative data collected through the survey.
To interpret the analyzed data in the light of the hypotheses formulated in Phase ‘A’.
To triangulate the findings of Phase ‘A’ with those obtained in Phase ‘B’.

The categories of the schools under study-

The investigator has conducted ethnographic-cum-survey study. Interview, observation and questionnaires were the tools/techniques used for the study. The investigator has tried to observe the reliability of the ethnographic data through internal and external reliability techniques and triangulation, and internal, external and construct validity. The content validity and characteristics of the questionnaires were well established. For Phase-1, six secondary schools 2 each of CBSE, ICSE and SSC were purposively selected, whereas, 30 teachers were randomly selected, 10 from each type. For phase-2, that is, survey study a total of 30 secondary schools, 10 each from the three types were selected. 300 teachers was selected, 100 from each of CBSE, ICSE and SSC. The data were analyzed through frequencies, % responses, crosstabulations, Binomial test, skewness and kurtosis. The study has come out with meaningful finding as follows:

- A large majority of the Principals and Teachers were found to have high level of satisfaction with respect to Intel Training to Teachers on MS Word and MS PowerPoint, whereas, the level of satisfaction with respect to the MS Publisher was found relatively low.
- SSC teachers were found to have higher level of satisfaction than that of the ICSE and CBSE.
- Teachers having Teaching Experience >10 years & <20 years were found to higher level of satisfaction than those having < 5 years, >5 years & <10 years, and >20 years.
- Master Trainers were found to have Higher level of satisfaction than the Beginners. Higher the access to internet and computer at home and School higher was found the level of satisfaction.
- Teachers having moderate commitment were found to have higher level of satisfaction than those having high or low levels of commitment.
- A large majority (>=90%) of the selected Principals and Master Trainers showed a low extent of application of MS Publisher.
- A majority of the Principals and Teachers observed a high extent of application (browsing) of the Internet by the teachers for information/ graphic/ maps.
A majority of the Principals and Teachers observed a high extent of application of requiring technical support by the Teachers when working on the computer.

CBSE teachers were found to have higher level of application of the Intel’s Training Program than the ICSE and SSC teachers.

Teachers having Teaching Experience < 5 years were found to higher level of application of Intel’s Training Program than those having >5 years &<10 years,>10 years &<20 and >20 years teaching experience.

Master Trainers were found to have Higher level of Intel’s Training Program than the Beginners.

Higher the access to internet and computer at home and School higher is the level of application of Intel’s Teach to the Future Program.

Teachers having high commitment were found to have higher level of application of the Intel’s Training Program than those having low or moderate levels of commitment.

Teachers having a Special Time-Table were found to have higher level of application of Intel’s Training Program.

Both the Principals and Teachers were found to believe that computer technology is a powerful tool for helping teachers improve student learning.

The strengths of the Intel Training Program were reported as follows:

• Motivated the Teachers and built their confidence. Was interesting and practical for most teachers.
• Brought innovation to classroom teaching.
• Introduced teachers to effective use of MS Power Point.
• Some teachers were motivated to buy a PC.
• Introduced Internet to the teachers.
• School premises were a convenient venue.
• Syllabus well suited the first timers.
• The Encarta Encyclopedia was found useful.
• Introduced Teachers to the concept of Rubrics for assessment.

The investigator has given some meaningful benchmarks based on the grounded theory of research to strengthen the Intel Training Program and some valuable recommendations for integration of technology at the functional level.
Christopher D Moore(2005) had studied - Is ICT being used to its potential to improve teaching and learning across the curriculum? The study had following conclusions-The research about the use of ICT in teaching and learning is contradictory. Some studies highlight excellent and imaginative examples of ICT in lessons, whilst others are more sceptical and confirm that the author’s observations are not isolated incidents. ICT can provide a vast range of facilities and resources in one place that are accessible to all pupils at the same time. It can overcome shortages of textbooks and other resources that would hold back the achievement of learning objectives. ICT provides almost limitless facilities for pupils to express themselves. For example, multimedia packages provide far greater facilities than most schools could reasonably be expected to provide using traditional resources. Indeed, the output produced by the pupils using traditional resources can often be suggested by the resources that the teacher makes available and stifle pupils’ imagination. Pupils are motivated to produce high quality output using ICT. Many pupils decorate their work with borders, images and fancy fonts largely because the software enables them to do so. Only a very few pupils decorate their work in these ways when it is handwritten. Use of ICT can enhance learning, but not simply because it is used instead of traditional methods. As John and Sutherland (2004) point out, “ICT alone does not enhance learning; rather it is the ways in which ICT is incorporated into the various learning activities that is of fundamental importance”.

Somekh et al (2004) are even more sceptical: “Teachers of other subjects were less sure that ICT had any real effect, and some teachers thought it had had a negative effect on literacy and numeracy”. Teachers have to adapt their teaching styles when using ICT in lessons to adopt a more constructive approach (Becker 2000). The independent learning aspect of ICT suggests that teachers should become less directive and adopt a more ‘coaching’ and discursive approach. There is sufficient research to suggest that ICT can have a very positive and beneficial impact on teaching and learning and that this is the case in many classes. However, in order to achieve success, teachers need to ensure that they:
- are competent in the hardware and software to be used;
- plan their lessons as thoughtfully as they would do when using traditional methods;
- adapt their teaching styles to support the way in which pupils work on
computers;

- monitor carefully what pupils are doing to ensure they stay on-task;

- be aware of the breadth of facilities and information that ICT provides and ensure that students are given clear direction as to the process and desired outcomes of the learning activities. Much of the literature reviewed by the author supports the view that ICT can have a significant and positive impact on teaching and learning if it is planned and used to enhance and enrich the lesson objectives and not simply as a way of fulfilling the NC Orders or keeping unruly classes occupied. The teacher will always have an important role in the classroom, no matter how advanced the technology gets. Students require attention, praise and discipline and their learning needs to be set in the context of a curriculum that builds on prior knowledge and exposes them to new concepts and skills; something that ICT cannot do on its own.

The overall conclusion from this document is summed up by Becker (2000), who rightly challenges Cuban’s view that ICT is “largely incompatible with the requirements of teaching”:

“Under the right conditions – where teachers are personally comfortable and at least moderately skilled in using computers themselves, where the school’s daily class schedule permits allocating time for students to use computers as part of class assignments, where enough equipment is available and convenient to permit computer activities to flow seamlessly alongside other learning tasks and where the teacher’s personal philosophies support a student-centred, constructivist pedagogy that incorporates collaborative projects partly defined by student interest – computers are clearly becoming a valuable and well-functioning instructional tool.”

Gill Valentine, Dr Jackie Marsh, Charles Pattie (2005) Use of ICT for Educational Purposes: The Impact on Attainment at Key Stages 1-4

The nature and extent of home use of ICT for educational purposes The majority of pupils (89%) now have access to home based ICT. However, libraries/Internet cafes are not a substitute for lack of access to hardware at home because children who use technology at home are also the group who use it most frequently in other locations. The implication of this is a need for initiatives to encourage those children who do not have access to ICT at home or have limited access, to use technology out of lessons within the school and to develop their confidence to take advantage of provision of
ICT in other out of school venues such as libraries and Internet cafes. The majority of children in years 6, 9 and 11 reported using a computer at home for school work for 1 to 2 hours per week. Use of home ICT for educational purposes intensified with age with 14% of year 11 pupils reporting that they use it for 10 hours or more per week.

• How do pupils use ICT at home to support their learning? By enabling them to find new sources of information; enhancing the presentation of their work; providing more opportunities for revision/consolidation of learning; saving time on mundane tasks such as editing; and increasing their motivation.

• How do the level and types of home use of ICT vary? Some subjects lend themselves to ICT work at home (for example, in English ICT is used for word processing and spelling/grammar checks; in geography, history and science to find information and create presentations for projects/assessment). In contrast, in other subjects children are deterred from using ICT because of the nature of work/teaching in that specific disciplinary area (for example, English settings on word processors deter use for MFL; mathematics homework is commonly set in work books and so cannot be completed on a computer). English was the subject where most use of ICT was made by year 6 and year 9 pupils for school work outside of school; for year 11 pupils ICT pushed in English into second place. There were also patterns by age group: year 6 pupils were significantly more likely to use ICT for mathematics and science than other year groups; year 9 pupils to use it for geography and history and year 11 pupils to use it for ICT. Children who use a computer everyday or at least once a week in a particular subject are more likely to use a computer for school work in these subjects at home. Likewise, children who never use a computer at school in particular subjects are also more likely to never use a computer for these subjects at home. This has clear policy implications, in order to develop children’s ICT skills and use of computers for educational purposes, schools need to provide good scaffolding in terms of introducing children in the classroom to how technology can be used in specific subjects and to show them how this ICT use can be developed for each subject at home. Use of ICT for school work outside of lessons intensified with age due to the increasingly demands of coursework and exam revision pressures. Year 11 pupils also had more independent access to ICT at home. Younger pupils (year 6 and year 9) made more use of exploratory technologies e.g. CD ROM and DVDs, whereas older pupils had a greater emphasis on the use of specific packages to support coursework such as word processing and spreadsheets. These patterns of activities
may help teachers in planning the use of ICT in subject specific lessons, both to build on and extend different year groups’ current patterns of activity. Girls were more likely to use home computers for school work (particularly in the subjects they enjoy such as English, history and science), reflecting their more conscientious attitude to education rather than a preference for ICT. The only subject in which boys were more likely than girls to use a home computer for school work was ICT – a subject they enjoy. However, boys had access to more hardware than girls and were more intensive users of ICT at home than girls for leisure uses. This has implications for the gender educational gap, as the research also showed that high levels of leisure use of ICT was positively associated with a negative impact on educational attainment. There is, therefore, a need for education policies to re-direct boys’ interest in ICT and leisure uses of computers towards use for school work in other subjects. The gendered pattern of ICT use - girls using it for educational purposes and boys for ‘fun’ - was established as early as year 2. The impact of home use of ICT for educational purposes -How does home use of ICT for educational purposes affect pupils’ attainment? It was positively associated with a small improvement in children’s attainment in mathematics at years 6 and 9, and a modest but more extensive effect on attainment in English and mathematics at year 11. Parents and teachers also reported that using ICT improved children’s motivation and confidence. This suggests that there is a need to address pupils’ differential patterns of use of ICT at home for educational purposes. Using a home computer for educational purposes at year 2 produced little discernible impacts on pupil attainment. However, parents of year 2 children did describe less measurable outcomes such as children learning words or to type more quickly.

• Why does ICT increase pupil motivation/understanding? -Pupils preferred to do homework in subjects that they enjoyed and in subjects that they were successful in. ICT contributed both to making school work more enjoyable and also to pupils’ perceptions of achievement, thus it was motivational. Specifically, ICT was regarded as making homework less boring because children regarded using computers as: ‘cool’; interactive and multimodal texts were more interesting than books; ICT saved time (e.g. it is easier to write and revise documents on a computer than by hand) and enhanced the presentation of children’s work; the Internet was a good source of information (range and depth) and educational materials (such as revision websites); ICT enabled multi-tasking and was perceived by children to improve grades.
The nature and effects of home use of ICT for leisure purposes - • How does using ICT out of school for leisure purposes affect pupil attainment?- It was positively associated with sizeable decreases in attainment. This effect was over twice as large an effect as the positive effect of using ICT for educational purposes identified above. In other words, it is not access or general use of ICT per se that will raise attainment, but rather how the technology is used that matters. The implication of this is that redirecting children’s leisure uses of ICT towards educational purposes must be a priority.

• Is there a relationship between pupils use of ICT at home for leisure purposes and their use of ICT for education?- The more time pupils spend playing computer games, the less time they may have available for other tasks, including homework and study. Some children reported pretending to their parents that they were using the home computer for educational purposes when they were actually using it for ‘fun’. Thus, pupils need to be made aware of the disbenefits of leisure uses of ICT and encouraged to adopt a more responsible attitude to home use of ICT for school work.

• Does using ICT for leisure purposes have some benefits? A minority of parents argued that console games and non-educational computer games have developed particular skills in their children, such as making them think, or developing factual information about specific topics. However, it is hard to identify and measure these ‘gains’ because they are so embedded in pupils’ everyday lives.

  • Why pupils do or do not use ICT at home for educational purposes
  • What are the drivers of ICT use for educational purposes out of school lessons?

Pupils had positive orientations to technology because of its motivational qualities described above (e.g. made work more enjoyable, improved grades and so on) rather than because they were instructed to use ICT in this way by teachers or parents. The subjects in which pupils (in years 6, 9 and 11) used computers at home for school work at least once a week were also the same subjects in which they believed that using a computer improved their grades and in which they had most home-based electronic resources.

• What are the barriers to using ICT for educational purposes out of school lessons? These include: a lack of explicit instruction to do so by teachers; a lack confidence in how to use the technology; not regarding ICT as applicable to specific subjects; a lack
of interest in particular subjects per se; the limitations of home-based ICT (e.g. 97% of children with access to broadband used the Internet compared to two thirds of pupils with dial-up access to the Internet); the limitations of ICT available at school out of lesson time (poor specifications, inability to customize school computers, frustrations of website filters and so on) a lack of time to use school based ICT out-of-lessons (because of limited equipment, its location, booking systems); and the limited appeal of school computer clubs. Here, there are clear implications in terms of addressing how schools deliver out of school ICT opportunities for their pupils in ways that make them more attractive for children.

Use of ICT to support home-school links

• To what extent are schools using ICT to support the development of home-school links? Home school links (e.g. use of school intranet/websites; email links between home and school; advice and support from schools regarding appropriate hardware, software and web sites for children to use at home) were generally poorly developed. Children were often not aware whether their school had an intranet or not; were unable to access it because they had misplaced the instructions or passwords; or found the sites dull and not useful. Schools need to develop ICT to support home school links and to ensure that information about school intranets and websites are communicated more effectively to parents and children.

Do teachers set homework that requires use of a computer outside of school? - The high level of computer ownership (89% in this study) suggests that the digital divide in terms of hardware is now so narrow that schools need to be developing children’s home use of ICT for school work and redirecting their leisure uses towards educational purposes. Teachers were reluctant to do so because of concerns about digital divides between those pupils who have access to home based ICT and those that do not. Such approaches, however, are problematic because children, whether explicitly or implicitly, picked up the message that they should use ICT at home if they had access to it and thus were able to benefit from the advantages that it offered. As such, the digital divide is still there even though teachers did not explicitly set homework using ICT, it was just not acknowledged because pupils were using it out of ‘choice’ rather than under teachers’ direction. These findings suggest that there is a need for schools to acknowledge that a significant proportion of their pupils now use ICT for homework and that as such they need to develop its use and in doing so address digital divide issues. This means developing initiatives to support access to
ICT for the minority of pupils (11% in this study) who do not have a home computer and to make information about how to support children’s home use of ICT available to all parents rather than on an ad hoc basis to those motivated or knowledgeable enough to seek advice from teachers. It also means providing a range of opportunities in school for less ICT-confident pupils to develop their skills because children who are least likely to use computers outside of school for school work are less than half as confident at using a computer than those pupils who use computers outside of school extensively. Initiatives might include: extending the opening hours for computer and homework clubs; providing different types of computer clubs to support different types of user (e.g. girls clubs etc.); planning the location of ICT equipment around school sites to maximise pupils’ out-of-lesson access; developing links with local libraries and Internet cafes to encourage children without home based ICT to take advantages of these opportunities to use the technology outside of school. There is also a need to develop models of good practice in terms of ICT use in subject specific areas, if teachers are in turn to model use for pupils in lessons across the curriculum. These proposals all have implications for resourcing and staffing.

• Do teachers want to establish stronger ICT-based home-school links or are they resistant to the idea? Teachers interviewed in the study generally had a lack of understanding about what this might involve and were fearful about the potential impact on their time of establishing ICT home-school links, for example email contact with pupils or parents. None of the teachers interviewed had had training in developing and using home school links. Some also had concerns about security (in terms of giving out email addresses, child protection issues, spreading computer viruses and so on). There is therefore a need to clarify for teachers what would be involved and to reassure them in terms of their workloads/time management if they are to embrace training opportunities and opportunities to develop home-school links. Further attention to these matters is also needed in pre- and in-service teacher education. Do pupils currently make use of school ICT services at home? Children made very little use of ICT home-school links. However, where school revision websites were used, they were highly motivational and their use could be promoted more widely by teachers. The majority of pupils did not email their teachers for help with school work. However, year 11 pupils’ preference for using email and children’s general interest in on-line communication suggests that these forms of ICT have the
potential to be harnessed by teachers to support children’s educational activities out of lessons.

Do parents currently make use of ICT based home-school links? -Parents wanted: an email link with schools; help from schools in supporting children with school work using ICT and more information about what websites they should encourage their children to use. This is important because pupils were more likely to turn to their parents for help with using a computer for homework than a teacher; yet the ability of parents to help their children in this way varied widely according to whether they had developed ICT skills through training courses or using computers in their own occupations. Some parents were not confident or able to provide support for children’s homework on a computer. Teachers were only providing guidance about ICT use to parents who approached them for help. In addition, pupils who had low levels of home support were also more likely to never use computers in some subjects (English, history and science). Schools therefore need to address, rather than implicitly reproduce, divides in home support and parents’ ICT competencies (which is closely related to, but does not map directly on to class). However, when they did so by providing IT classes for parents after school, it was commonly those parents who already supported their children that attended. There is a need, therefore, to find ways of reaching ‘hard-to-reach’ parents. For example, family literacy and learning programmes should include sessions which address how parents can support children’s use of ICT for school work.

Summary of implications - The educational use of ICT outside of school is positively associated with a modest effect on pupils’ attainment in specific subjects, as well as being identified as bringing wider benefits including motivational effects, raising the self esteem and confidence of low achievers and enabling those with special needs or high achievers to demonstrate their ability. More importantly, leisure uses of ICT are positively associated with a negative effect on attainment. The implication of this is the need for schools to focus on pupils’ patterns of ICT use, in particular, to redirect pupils’ predominant interests in using ICT for leisure activities towards educational ends and more generally to extend pupils’ educational uses of technology outside of the classroom. The clear relationship identified in this study between subject specific use of ICT in the classroom and subject specific use of ICT for school work outside of
lessons highlights the need for good scaffolding in terms of introducing children in
the classroom to how technology can be used in specific subjects across the
curriculum and showing them how this ICT use can be developed at home for school
work. Teachers in the study, however, were generally reluctant to explicitly ask
children to use ICT for school work outside of school because of their concerns about
digital divides in access to hardware and software. This is problematic because
children, whether explicitly or implicitly, pick up the message that they should use
ICT at home if they have access to it. As such, the digital divide in terms of the
opportunity to use ICT (with the potential advantages and attainment gains it may
bring) is still there even if teachers do not explicitly set homework using technology,
it is just not acknowledged. Teachers tend to provide support for parents on an ad hoc
basis to those motivated or knowledgeable enough to seek advice so implicitly
reproducing divides in terms of home support. Rather, schools need to develop
initiatives (within school out of school lessons and with libraries and Internet cafes) to
support access to ICT for the minority of pupils who do not have a home computer; to
make information about how to support children’s home use of ICT available to all
parents; and to connect with ‘hard-to-reach’ parents who may be deterred from taking
up ICT training opportunities at their children’s school because of their own negative
experiences of education. More generally, home-school ICT links are poorly
developed. Teachers in the study had not had training in developing home-school
links, had limited understanding of what this might involve and were generally fearful
about the potential impact on their time of using ICT in this way. Further attention to
these matters is needed in pre- and in-service teacher education.

Euan Robson (2003), The author had studied ‘The ICT Strategy for Early Years’. Rapid
advances in ICT are to continue, so that its role in early years will itself be changing
and fluid. In two, three or four years time, ICT in early years settings is likely to be
quite different from at present. An important theme of this policy framework has
therefore been to value the work of early years staff, and to highlight the continued
professional development that will be necessary to support, enhance and further
develop young children’s learning using information and communications
technologies in the future. It is hoped that the opportunities for professional
development and support materials combine with this policy framework to drive
progress forward. There is an identified enthusiasm, interest and commitment among
early years staff for using ICT to promote the learning and development of young children. The process of monitoring and evaluation that goes along with the strategy will ensure this momentum is developed so that ICT becomes an integral part of learning in the early years. By getting it right in the early years, ICT can contribute to ensuring the best possible start in life for all children.
CHAPTER II
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