TO STUDY THE COMPUTER AWARENESS AMONG SECONDARY SCHOOL STUDENTS IN PUNE CITY

A Thesis submitted to

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For the Degree of

Doctor of Philosophy (Ph.D.)

Under the faculty of Management

By

Mrs. Monica Apte

Under the Guidance of

Dr. S U. Gawade

July - 2014

DECLARATION

I hereby declare that the thesis, entitled "TO STUDY THE COMPUTER AWARENESS AMONG SECONDARY SCHOOL STUDENTS IN PUNE CITY "completed and written by me has not previously formed the basis for the award of any degree or other similar title of this for any other University or examining body.

Place: Pune
Date: 23 /07 / 2014

Mrs. Monica Apte
Researcher

CERTIFICATE

This is to certify that the thesis entitled, "TO STUDY THE COMPUTER AWARENESS AMONG SECONDARY SCHOOL STUDENTS IN PUNE CITY " which is being submitted herewith for the award of the Degree of Doctor of Philosophy (Ph.D.) in Management is the result of original research work completed by Mrs. Monica Apte under my supervision and guidance.

To the best of my knowledge and belief the work incorporated in this thesis has not formed the basis for the award of any degree or similar title of this or any other University or examining body.

Place: Pune
Date: 23 /07 / 2014

Dr. S. U. Gawade
Research Guide

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ABBREVIATIONS

Abbreviation	Meaning
GeSCI	Global e-schools and communities Initiatives
ETueE	European Trade Union Committee for Education
ICT	Information and communication technology
CLASS	Computer Literacy and Studies in Schools
ET	Educational Technoloy
NeGP	National e-Governance Plan
NCTE	National Council for Teacher Education
NKN	National Knowledge Network
MCDT	Multiple Criteria decision Theory
PIK	Public Information Kiosks
NIRD	National Institute of Rural Development
VKC	Village Knowledge Centres
FRIENDS	Fast Reliable Instant Effective Network for Distribution of services
GDP	Gross domestic product
NPE	National policy on education
CABE	Central Advisory Board of education
NCF	National Curriculum Framework
CFICT	curriculum framework for ICT in Education
SCERT	State Councils of Educational Research and Training
NCERT	National Councils of Educational Research and Training
SCERT	State Councils of Educational Research and Training
SEMIS	School Education Management Information System
MIS	Management Information Systems
PMEG	Program monitoring and Evaluation Group

KVS	KedriyaVidylaya Schools
NVS	NavadayaVidyalaya Schools
MS-CIT	Maharashtara state certification in information technology
BASIC	Beginners All purpose symbolic Instruction Code
PBL	Project Based Learning
WS	Word Star
MIE	Minimal Invasive Education
MKCL	Maharashtra knowledge compotation Ltd
HTED	Higher and Technical Education Department
SCCI	Sense of Classroom Community Index
NGO	Non Government Organisation
UT	Union Teritories
CET	Centre for Educational Technology
BECTA	British Educational Communications & Technology Agency
CIET	Central Institute of Education Technology
SIET	State Institutes of Education Technology
CEP	Computer Education Plans
NIC	National Informatics Centre
NCF	National Curriculum Framework
SSA	SarvaShikshaAbhiyan
NPISE	National Policy in school education
MHRD	Ministry Of Human Resource Development
RMSA	RashtriyaMadhamikShikshaAbhiyan
UNESCO	United Nations Educational Scientific And Cultural Organization
ETueE	European Trade Union Committee for Education
CBSE	Central Board of Secondary Education
ICSE	Indian Certificate of Secondary Examination
SSC	Senior Secondary Certificate
SSA	Sub-Saharan Africa
CALM	Computer Assisted Learning Material

CBMMLP	Computer Based Multimedia Learning Packages
CAI	Computer Assisted Instructions
TLP	Television language Proficiency
TLPT	Television Language proficiency Test
AHP	Analysis Hierarchy Process
MCDT	Multiple Criteria Decision Theory
EDUSAT	Educational Satellite
ALA	American Library Association
ACRL	Association of College and Research Libraries
CFICT	ICT in Education
BOOT	build,own, operate, and transfer
CD-ROM	Compact Disc- Read Only Memeory
DVD	Digital video Disc
PDF	Portable Document format
JPEG	Joint Picture Motion Group
IRI	Interactive Radio Instruction
EDC	Educational Development Centre
DDS	Deccan Development Society
HTED	Higher and Technical Education Department
RIF	Rural Innovation Fund
RCEE	Rajasthan Council of Elementary Education
ACRL	Association of College and Research Libraries
MLL	Minimum levels of learning
VAI	Video–Assisted instructions
TCO	Total cost of ownership
DDS	Deccan Development Society

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CHAPTER I

INTRODUCTION

1.1 Introduction

1.2 Objectives of the study

1.3 Research Hypotheses

1.4 Chapter Scheme

1.1 INTRODUCTION

In the present digital era, the development in several of computer technology has reached beyond imagination and expectation. Even though computer has a lot of applications in various fields one should not forget its application in the field of education.

World is progressing rapidly with the help of computers in very lesstime, man has brought about his own progress and computer has become part of his life and its scope is increasing day by day. Computer has become most important part of ones life and one cannot act without computers in any field for eg. Banking, Education, Science, Business, Sports, Tourism etc. in all these lines work has become difficult without computers It palys an important function in the teaching and learning process therefore computer have created a revolution in the content of education and in the nature of learning process they have the capability of multiplying the human intellect beyond part conceptions and have tremendous implication in education.

Computer Awareness means the knowledge of computer hardware input devices as output devices ets and the skill of using various applications like MS word, Microsoft excel, PowerPoint, internet etc. of computer and to test the awareness of usage of computer in education and other fields.

The central and state governments have taken tremendous efforts to implement the computer education in schools. State government has introduced computer related courses in the higher secondary school and in other classes also the government has started supplying computer to higher secondary school with suitable software.Government has made computer literacy a must in every field.

The Organisation Structure

The school operates as part of the parent organisation which is the Department of Ministry of Human Resource Development (HRD), Government of India. It is important for the Principal to have an understanding of the functioning of the structure so that actions at the level of the school fit harmoniously into the objectives of the whole organisation.

In line with the Programme-Based Budget (PBB), the Principal has animportant role in ensuring that objectives has to be achieved.

Management Structure of the Ministry

The Ministry functions with a central structure at its headquarters having the responsibility of Education and Human Resources at the national levelset up to manage education in the four geographical zones.

Ministry's Headquarters

The Administrative Cadre comprises the Principal Assistant Secretaries (PAS) and the Assistant Secretaries (AS) whereas the Technical Cadre consists of the Chief Technical Officer (CTO), Directors, Assistant Directors (AD) and Administrators (Adm.). The Chief Technical Officer is the Head of the Technical Cadre and reports directly to the Permanent Secretary.

With the present structure, responsibilities at the central headquarters level are shared among seven

Divisions1 as follows:

- Co-curricular and Extra-curricular Projects and Activities
- Curriculum Development and Evaluation
- Human Resource Management and Development
- International Relations and Educational Reforms
- Planning, Procurement and Infrastructure
- Post-Secondary, Tertiary and Vocational Training
- School Management

Each of the above Divisions is headed by a Director and the tasks allocated is accomplished by an Assistant Director and Administrators. Administrative support is provided to the divisions by Principal Assistant Secretaries and Assistant Secretaries. Various other units provide support for the general administration of the Ministry.

The Zone Directorates-At the regional decentralised level, are the four Zone Directorates, each headed by a Director, who assists colleagues Directors at Headquarters, reports to the Chief Technical Officer (CTO). Directors posted at

headquarters are required to communicate with the Zone Directorates for the smooth running of all activities.

The Zone Director is assisted by an Assistant Director and by Administrators. The directorates are responsible for the management of all matters pertaining to education in their respective zone and especially for the smooth running of the schools falling within their zone.With the decentralisation of services, the following subdivisions have been set up in each directorate:

1. Human Resource Section
2. Finance Section
3. Stores and Procurement Section
4. Maintenance Unit
5. Educational Psychologists and Social Workers Unit

Each Principal is responsible for his own school but he has to report to the Zone Director who has the responsibility for the smooth running of all schools in the Zone from the pre-primary to the secondary level. The education ministry has to be constantly kept informed, through the Director of Zone, of the running of the school and its performance.

1. The Ministry has to be constantly kept informed, through the Director of Zone, of therunning of the school and of its performance.

2. For all the issue pertaining to services and procedures the principal has to communicate it to the zone Director.

3. With decentralisation, Heads of School are empowered and, at the same time, required to take necessary action at their end towards solving problems at their level. Problems should be referred to the Director of zone only when the means required are beyond the school's capacity or resources.

The school

The school community consists of teaching- staff, non-teaching staff, students and parents. With each of the stakeholders having its own personality, needs and

expectations, the Principle is required to create favourable environment to cultivate mutual understanding and harmony.This will result in whole team working collectively and collaboratively, towards promoting the interests of all students and the school community at large.

The Students

The students are central goal of the school and all the activities of the institution are functioned towards promoting their interest. In this respect, it is important to highlight that the student community legitimately needs to understand the decisions taken and even to take part in their making. Thus, in a spirit of good governance, the Principal should, as often as required, consult students and en-list their participation for the effective running of the school.

The Principal and his staff should work towards providing a good education to all students, irrespective of their varying abilities. All students are to be treated with respect and provided equal opportunities to learn together.

This holistic view is adopted in the planning of classroom activities in order to provide to each and every student opportunities for participation and sharing in the work of the class through a wide range of working methods and individual treatment.

The Principal-The Principal has the overall responsibility for the smooth and effective functioning of the school and, as such, he is the empowered authority within the institution. However, this also makesthe Principal accountable to the higher authorities.

As the leader, the Principal builds and escort his teams in providing them with the required support and motivation, listening to their views, their problems and valuing their effort, support and contribution.

Sharing and ownership of the vision of the Ministry-Sharing and ownership of the vision of the Ministry is essential from all sections, i.e from headquarters to schools: The Head of school has to ensure that actions taken at the level of the school are in line with the Ministry’s vision and policies and are functioned towards its

implementation. Principal is also responsible for facilitating the implementation of all reforms and educational projects with a view of attaining the national goals for education. In line with the vision of the ministry, the Principal has to perform his duties which are of three kinds: administrative, pedagogical and socio- cultural.

Administrative: Organising work, forming of committees, attending and chairing meetings, attending to files and mail,writing reports, supervising staff and administration of personnel matters, administration of student matters,including organisation of examinations and enforcement of Rules and Regulations, management of human,financial, material and infrastructural resources.

Pedagogical: Controlling the implementation of the curriculum, planning, organisingand monitoring of teaching and learning and other educational activities, managing learning resources and ensuring the quality of the education imparted at school.

Socio-cultural: Promoting culture and social values, enhancing school environment, promoting personnel hygiene, developing partnership with the community.

Among Principals numerous responsibilities, the following need to be underlined:

- To ensure that most important activity i.e teaching and learning takes place effectively and efficiently in the institution
- To plan and implement strategies for school improvement
- To ensure the security and safety of all staff and students at school
- To ensure the maintenance of the school building and premises
- To ensure the security and safety of all assets and equipment at school
- To manage and supervise the staff working under him, ensuring that they are aware ofand stand by official instructions
- To make optimal use of all resources allocated to the school

The teaching Staff

Teachers are responsible for the over all development of the students, imparting them necessary knowledge and skills as well as building their character and personality so that they become learned, responsible and disciplined citizens. They have to prepare students and ensure their readiness for further studies and for the global competiveness as well as for life in society.This approach is based on the four pillars: learning to know, learning to do, learning to live together and learning to be.

The administrative staff

The administrative staff comprises of the senior School clerk, computer operator, Library officer and office staff. They provide all the necessary support to the Principal in the accomplishment of his administrative duties. Details of their duties are laid down in their servicebook .

School Bodies–The Senior Management Team (SMT)

It comprises of –

- The Principal
- The Vice-Principal
- Senior members ofteaching staff

Their role in Scool- To create and implement a shared vision within the school community.To help the Principle make important decisions regarding school policy and Orientation . To help in the formulation of the School Development Plan that will usefully direct actions at the level of the school.

The Student Council- It ensure a smooth flow of information between management and students.It consist of representatives of different segment of the student community which are elected by the students thmselves.It must be ensured that each class has a class coordinator.

Objectives of student council-

- To promote positive relationships as the basis for a whole school culture
- To inform the Principal of inadequacys within the school premises
- To express the opinions and feelings of fellow students and share their problems.
- To participate in the organisation of school activities such as Sports day, Annual day,Project competitions etc
- To draft its rules and regulations and submit them to the Principal for approval.

The Parent Teacher Association(PTA)-It consist of all parents who are themembers of the association. The managing committee comprises a given number of parents elected during the Annual General Assembly. The Principle acts as advisor to the association

Objective of the parent teacher association (PTA)-

- To promote the welfare of students
- To provide support to the school and help towards enhancing
- Its physical environment, equipment and other facilities
- To raise funds and provide financial support for school projects and the organisation of events such as sports day ,annual day etc,

The Social Partners

The school is as an open system connected to and interacting with its environment. A closed system is one which is isolated from its environment and independent of external factors. At the same time, otherinstitutions like NGO's,Industry partners ,parentsplay an important role in the common educational enterprise and it is important thatthe school develops dynamic partnerships with the community, enlisting its support in the accomplishment of its mission.The Principal acts as the interface between the school community and the management at ministry's level,facilitating the communication between the two.

The Information System

At all stages of planning and control, decisions have to be taken in response to choices and optionsregarding how the school responds to its environment and how its internal activities are to be run. However, decisions are not made without information and for this reason the head will need toexamine how data produced at the school are being collected and processed to provide information tomanagement.He will thus ensure that the school has a system of information that is organised in a satisfactory mannerto collect relevant data and to readily provide accurate, up to date and timely information, therebyallowing him to make informed decisions at the right time.The use of information technology for creating and maintaining the database is highly recommendedas it certainly eases and quickens both the processing and the retrieval of information (informationreporting).

Steering the system

In order to drive the system towards its goals, the Principle, as the manager of the institution has to attend to two very important tasks among others: planning and controlling the activities of the school.

General principles of school strategic planning-

According to Fayol (1918), planning is a kind of future picture wherein proximateevents are outlined with some distinctiveness, while at the same time remote events appear progressively less distinct.

According to Teddy (1993), planning is a method or techniques of looking ahead. In brief, planning is deciding in advance what to do, how to do it, when to do it and who is to do it.

Strategic plan is an analytical thinking that goes on top level of management that determines the appearance of the organisation (of school) at the point in future.
A strategy determines the direction in which the organisation needs to fulfil its vision and mission.

According to Peter Drcker(2004) strategic planning is the analytical thinking and commitment of resources to action
A strategic plan acts as a road map for carrying out the strategy and achieving longterm results

Why is school strategic planning important-Without a strategic planning, a school is like a car without a driver.
- We develop the strategic plan to:

- Set objectives
- Determine how to use our resources and maximize the use of resources both human and non-human resources.
- Facilitate the formulation of a school vision and mission
- Help in innovation and build a team with common vision
- Facilitate resource mobilization

Benefits of strategic planning-The following are some of the benefits of the school strategic planning-

- The school strategic planning enables stakeholders to establish clear priorities
- It provides a sense of direction: planning saves the school from drifting and avoids aimless activities.
- It encourages innovation and creativity: Innovation and creativity are features of a school that is growing and developing.
- Helps in coordination: Sound planning helps to harmonize activities and efforts within the school from different departments.
- Guides decision-making: Planned targets serve as the criteria for the evaluation of different alternatives so that the best course of action is chosen.By predicting future, planning helps in taking future- oriented decisions.Sound plans prevent hasty judgements and haphazard actions.
- Provides a basis for decentralisation: Planning helps in the delegation of powers and authority to lower levels of management.
- It provides efficiency in operations: Facilitates optimum utilisation of available resources.
- Facilitates control: Planning provides the basis for control. Plans serve as standards for evaluation of performance.

School strategic planning process-The school as a learning centre has to address those development problems by contributing effectively to the achievement of the objectives set at different levels: District level, national level and international level. Therefore, the school strategic plan should take into account macro planning at different levels. The school strategic plan should be based upon the following foundations to be effective:

- The Millennium Development Goals (MDGs) – internationally agreed targetsto improve people's lives.
- The National vision and economic development.

- The specific objectives of education in India and expected outcomes and policies in Education

Stakeholders' analysis

Stakeholders of schools are: The Ministry of Education and other ministries, the local authorities, school suppliers, different partners in education, parents, NGO's. Their stake in contributing towards mobilising the school resources how they will share on the existing resources.

Plans for Implementation

In order to implement the school strategic plan covering a long period i.e 3 or 5years, the school management committee and other school stakeholders will need to proceed by breaking down long-term activities into small and short term actions for an easy execution of the long plans. Plans for implementation commonly known as operational plans are asked upon a period of a year (annual action plan), a term/semester and on a day(diary management plan).Furthermore, every person with a role to play in implementing the strategic plan should have a clear understanding of their individual responsibilities, for example through an annual activity plan.The head teacher is accountable for the overall progress of the strategic planning through coordination.

Development of the annual action plan

Action plans define how we get where we want to go, the steps required to reach our strategic goals. They identify who will do what, when and how. Here are things to consider when developing annual action plan:

There are 5 key steps are involved in school development of the strategic plan-

Step 1- related to the situation analysis enables to detect the strengths,weaknesses, opportunities and threats of the school at a given time.This step gives out the picture of the situation that needs to be reversed. We use SWOT technique as an approach.

Step 2- related to problem analysis(problem identification). This is an exercise in addition to a SWOT analysis which helps the school management team to understand what the challenges or problems are that are hindering the development of the school. The problem known as CORE PROBLEM will help in step3 where we set our objectives. The problem tree approach was used to find out causes and effects of the core problem.

Step 3 -is about setting objectives for the school plan. It is about converting the core problem and its causes and effects into a positive situation, as if the situation was addressed and improved. The objectives should be designed in a way that they fit with the specific objectives of education in Pune.

Step 4- is about putting together objectives and strategies into a reasonable log frame.

Step 5- is concerned with breaking down the long-term objectives into specific activities to be carried out annually, half-yearly, monthly, weekly and even daily as appropriate.

MONITORING AND EVALUATION

Why do monitoring and evaluation?

Through monitoring and evaluation, one can:

- Review progress
- Identify problems in implementation
- Make adjustments so that you are more likely to make difference.

Importance of monitoring and evaluation

It enhances the level of accountability in school management: the contractual engagement in strategic plan implementation puts each and every active school committee member in a situation that obliges him to provide evidences that activities undertaken are in the school plans and will help in achieving the school vision and objectives. A reporting system which is done weekly,monthly, termly, annuallyshould

be setup to provide a mechanism for determining whether stakeholders are meeting their responsibilities.

It enables effective coordination: To achieve its goals, activities included in the school strategic plan should be coordinated so that various services are ordered to make a smooth functioning of schools.

For an effective coordination, the school management committee should organise different meetings in order to find out and know the progress of activities and operate useful adjustments for innovative measures in plan implementation.

It helps in conducting control over implementation: Once an error occurs, it is always good if the management identifies it on time. It is always the role of the management committee to regularly check planned activities in order to prevent any risk of making inappropriate decisions.

It enables to review progress or celebrate success once planned objectives and strategies are achieved and implemented.

Controlling the system:

Control is the process of ensuring that resources are obtained and are used both effectively (resources are used to achieve the desired ends) and efficiently (input resources produce the optimum amount of outputs) in the accomplishment of the objectives. Feedback is required for the manager to take control measures and ensure that actual results do not deviate from the expected results or goals. A dashboard or control panel is useful for monitoring performance. The Principle will examine, together with his collaborators, relevant feedback provided on the dashboard in order to assess the functioning of the institution and find explanations to the results being output. This will allow him, if need be, take corrective measures to enhance performance.

Fig. 1.1School strategic framework

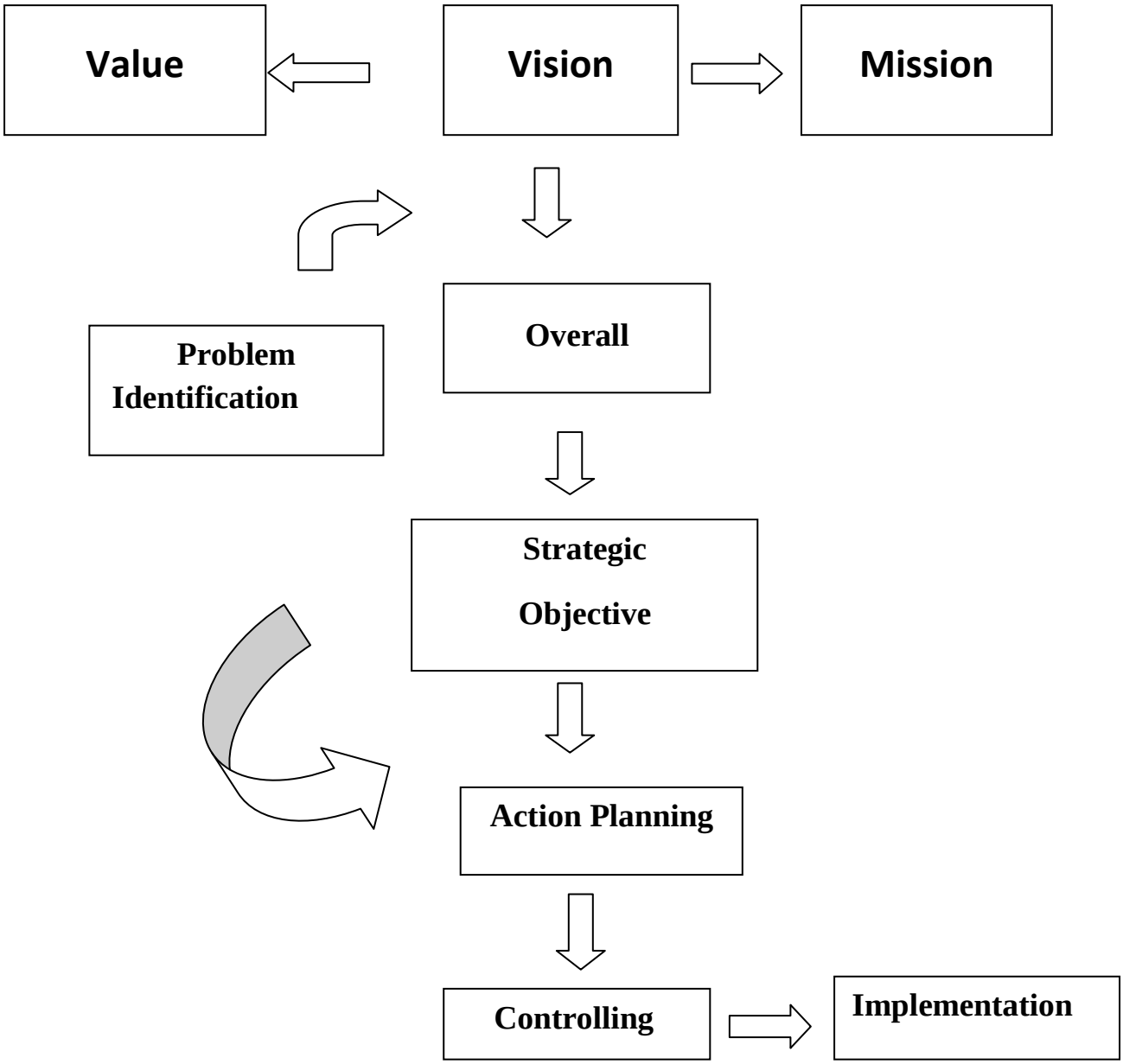
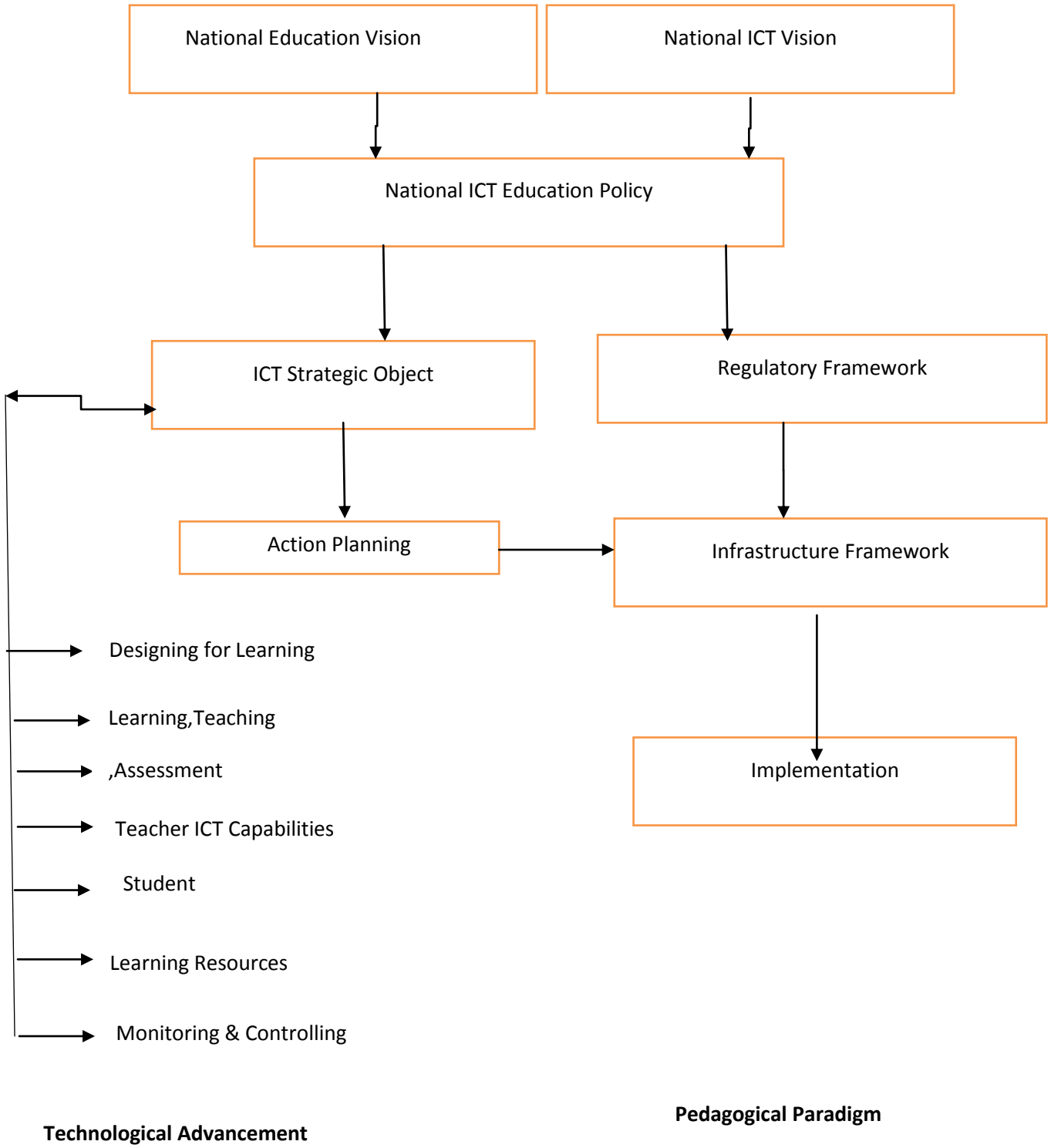


Fig – 1.2 POLICY FRAMEWORK AND DEVELOPMENT



Some of key aspects of information

1. Information -Information consists of data that have been retrieved, processed for informative or inference purposes, for forecasting and for decision making (Ckumar, 2004).In simpler term the processed data is information.

1.1 Role of Information-Every society has its own significant resource. In agricultural society, labour was essential input.In industrial society, capital played a vital role and in information society, information has become a strategic resource. Therefore preservation and access of information is an essential factor in human progress. It is also an essential input for decision-making (Dhiman, 2005).

Thus, information is certainly

- a vital element for creativity and innovation;
- a basic resource for learning and thought ;
- a key resource in creating more knowledgeable citizens ;
- a factor that enables citizens to achieve better results in their academic lives, with regard to health; and at work ;
- important resource for national socio-economic development.

1.2 Information Society and its impact -Human society is always changing and moving towards better socio-economic and cultural situation than ever before. The present society is becoming increasingly more centered on information handling, processing, storage and dissemination using microelectronic based technologies, especially those made available through convergence of computer with telecommunication namely IT. Therefore, the present society is called information society. In this society information is key resource and plays an important role.The term information society and similar concepts such as information age and knowledge economy describe a society in which there is a great dependence on use of information technologies to produce all manners of goods and services (Lal, 2008)

1.3 The need for Effective use of Information- Information has become a vital source for world economies and is certainly the basic component of education. Information is a vital element to technological and scientific change. It poses several challenges to individuals of all walks of life: students, workers, and citizens. The

current information overload requires people to validate and assess information to verify its reliability. Information by itself does not make people information literate.

1.2 Information Literacy -Final report of American Library Association (ALA) Presidential Committee (1989) on information Literacy states, "to be an information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information"(IFLA)

1.2.1 Need for Information Literacy-Information Literacy is increasingly important in the contemporary environment of rapid technological change and proliferating information resources. Because of the complexity of this environment, individuals are faced with diverse information choices in their academic studies, the work place and in their personal lives. Information comes to them in unfiltered/formats, raising questions about its authenticity, validity and reliability. In addition, information is available through multiple media, including graphical, audioand textual posing large challenges for society. Information Literacy forms the basis of lifelong learning. It is common to all disciplines, to all learning environments and all levels of education. It enables the learner to master the contents and extend their investigations. Association of College and Research Libraries (ACRL) sets following standards of Information Literacy.An information literate individual is able to

i) Determine the extent of information needed.

ii) Access the needed information effectively and efficiently.

iii) Evaluate information and its sources critically.

iv) Incorporate selected information in to one's knowledge base.

v) Use information effectively to accomplish a specific purpose; and

vi) Understand the economic, legal, and social issues surrounding the use of information, access information ethically and legally (ACRL, 2002).

1.2.2 Other "Literacy" -Concepts related to Information Literacy is linked with other types of related literacies, but it should be differentiated from them, especially from information technology, media literacy, network literacy, digital literacy, network or Internet literacy, "computer literacy" and "media literacy". Computer and media literacies are clearly defined by Horton (F. Horton, Jr., personal communication, December, 2004) in the followingterms (IFLA, Information Literacy Guidelines)

1.2.2.1 Computer Literacy-The knowledge and skills necessary to understand information and communication technologies (ICTs), including the hardware, the software, systems, networks (both local area networks and the Internet), and all of the other components of computer and telecommunications systems.

1.2.2.2 Media Literacy-The knowledge and skills necessary to understand all of the mediums and formats in which data, information and knowledge are created, stored, communicated, and presented, i.e., print newspapers and journals, magazines, radio, television broadcasts, cable, CD-ROM, DVD, mobile telephones, PDF text formats, and JPEG format for photos and graphics.

1.3 E-Information Literacy-It is conceivably the foundation for learning in our contemporary environment of continuous technological change. As information and communication technologies develop rapidly, and the information environment becomes increasingly complex, educators are recognizing the need for learners to engage with the information environment as part of their formal learning processes.Information literacy is generally seen as pivotal to the pursuit of lifelong learning, and central to achieving both personal empowerment and economic development.E-information literacy is a natural extension of the concept of literacy in our information society

1.3.1 Requirements for E-Information Literacy

To acquire E-information literacy knowledge on other literacies is neccessary for users, as:

- Traditional notion of literacy - to read and write.
- Computer literacy - to understand and operate computers which are interfaces between networked information and end users.
- Media literacy - to understand different media storing networked information and use them.
- Traditional Information literacy - to locate, select, evaluate and use effectively.

1.4. Information literacy and various initiatives in India

Information literacy is a vital skill to survive in the information age. Today's age is full of Information and Communication technology (ICT) enabled services in every field of human life. Information is growing rapidly day by day and being codified in the digital form. Government is also keen to make the citizens information literate about its policies and programmes for various sections of the society. The Third Wave book, Alvin Toffler divided history of the evolution of human society into three major eras, or waves. The first wave, from 8000 BC to 1750 AD was termed the agricultural revolution, and was based on agricultrure as the world's primary occupation. In the second wave, from 1750 to 1955, the rise of industrial civilization and the industrial revolution marked the main occupation. The developed world was engaged in or moving toward mass production of industrial goods. The third wave, which began in the mid-1950s, is sometimes referred to as the information age and is based on the delivery of services. In the transition to the information/ knowledge based society, the important aspects are - development of ICT infrastructure for information accessibility and information literate citizen. If the large number of citizens becomes information literate, they will be able to utilize a substantial amount of information resources for the generation of wealth towards welfare of the society. They can be a driving force in demanding adequate information infrastructure. The information literacy also play a major role in e-literacy of the country.

1.4.1 The National e-Governance Plan (NeGP)

It is a holistic view of e-Governance initiatives across the country, integrating them into a collective vision, a shared cause. Around this idea, a massive countrywide infrastructure reaching down to the remotest of villages is evolving, and large-scale digitization of records is taking place to enable easy, reliable access over the internet. The ultimate objective is to bring public services closer home to citizens, as articulated in the Vision Statement of NeGP .Make all Government services accessible to the common man in his locality, through common service delivery outlets, and ensure efficiency, transparency, and reliability of such services at affordable costs to realise the basic needs of the common man"

1.4.2 Policy objectives-Policy objectives of the Department of Information Technology Government of India:

- e-Government: Providing e-infrastructure for delivery of e-services.
- e-Industry: Promotion of electronics hardware manufacturing and IT-ITeS industry.
- e-Innovation / R & D: Providing Support for creation of Innovation Infrastructure in emerging areas of technology.
- e-Education: Providing support for development of e-Skills and Knowledge network.
- e-Security: Securing India's cyber space-Many states in India come out with IT policies, highlighting IT in education policy initiatives and thus making the future generation a " Techno-savvy" and to be " information literate" , viz, Goa State IT Policy 2005, Haryana IT Policy 2000, Jammu and Kashmir IT Policy 2004, Kerala IT Policy 2007,Madhya Pradesh IT Policy 2006, Manipur IT Policy 2003, Mizoram IT Policy 2001, Nagaland IT Policy 2004, Orissa ICT Policy 2004,Uttaranchal ICT Policy 2006, Uttar Pradesh IT Policy 2004, West Bengal,IT Policy 2004 e.t.c.IT policies of some prominent states are stated below

1. Andhra Pradesh ICT Policy 2005-2010

- Development of skills in ICT for employment opportunities.
- 'Future Skills Unit' to track technology trends and identify the future requirements in terms of skills and training.
- Training incentives.
- Harnessing new technologies, IT education in School curriculum.
- Secondary and Vocational Education.

2. Assam Information Policy of Assam 2000 (ITPA, 2000)

- Objective-To encourage and accelerate the use of IT in schools, colleges in the state to enable the youth to acquire skills and knowledge to make them highly employable.
- Encouragement for the use of IT in all educational Institutions.
- Special grants to put up the necessary infrastructure.
- Teaching for school children the use of computers
- Three months course in IT for the college students.

3. Chhattisgarh IT and ITeS Policy

- Objective: 100% IT literacy in all high schools and colleges in a phased manner.
- Computer literacy and skills in IT.
- Use of IT to enhance the effectiveness of teaching in other subjects.

4. Gujarat IT Policy

- Objective: Compulsory computer education would be introducedin all schools from class-V onwards.
- Provide internet connectivity to all schools in the state
- Creation of State Library Networks
- Setting up Gujarat Institute of Information Technology.
- Promotion of Gujarati on Computer.

1.6. Information Literacy:

Government Initiatives-In a knowledge society, knowledge itself becomes the factor of productions, and plays a central role in driving economic and social development. Knowledge driven industries compare to have much higher economic growth both in terms of volumes and revenue, manufacturing industries and agriculture. This segment also requires intellectually motivated, creative, competitive decision makers. This workforce would use information resources, information services and information systems judiciously, rationally and adequately to pursue their professional goals, organizational goals, and social goals. The utilization of information resources can be habituated and sensitized through the information literacy competency development programmes. The information literacy is required at every stage and sphere of a person's life, starting from the school education to higher education, from social life to professional life (Ghosh, 2006).Information and Communication Technologies (ICT) is being used worldwide as a tool for social welfare, better governance, illiteracy eradication and poverty removal. ICT is also being used as a tool for empowering certain social groups, like farmers, women, artisans and common citizens. In India, ICT is also at the grass root level through various initiatives and pilot projects on experimental basis. The private public partnerships have been established across India. Government of India and state governments are also taking appropriate steps in sustaining economic growth, employment generation and

strengthening information infrastructure. Following are the various initiatives, taken by the Central and State governments in India .

1.6.1 National Knowledge Commission of India

To establish a knowledge-oriented paradigm of development and to address the digital divide in India the Government of India has established National Knowledge Commission in June 2005 with the following aims.

- Build excellence in the educational system to meet the knowledge challenges of the 21st century and increase India's competitive advantage in fields of knowledge.
- Promote creation of knowledge in S&T laboratories.
- Improve the management of institutions engaged in intellectual property rights.
- Promote knowledge applications in agriculture and industry.
- Promote the use of knowledge capabilities in making government an effective, transparent and accountable service provider to the citizen and promote widespread sharing of knowledge to maximize public benefit.The National Knowledge Commission (NKC) has five distinct focus areas:

  (i) Access to Knowledge: Providing access to knowledge resources through strengthening library and information infrastructure and networks, promoting and adopting open access literature, open courseware and open source software.

  (ii) Knowledge Concepts: Nurturing intellectual capabilities and enhancing professional skills, including information handling skills of youths.

  (iii) Knowledge Creation: Making self-sufficiency in knowledge creation; strengthening indigenous research capabilities in science, technology and medicine areas; generating knowledge for social development.

  (iv)Knowledge application: Deriving maximum benefits from intellectual assets, applying knowledge in fields like agriculture, industry, health, education, etc.

(v) Knowledge Services: Making governance and government functionaries more accountable, transparent and sensitive to the causes of common men.

1.6.3 Rashtriya Computer Literacy Drive

Presently the Information Technology touches its peak. The total world is globalised through Computerization. Each and every phase of life is categorized through the development of this technology. Today, with the advent of E-mail & Internet, information retrieval has come down within the snap of fingertips. Computers have changed information processing in a dramatic way. To give acceleration to make India 100% Computer Literate, it is highly essential to take 'IT' education to the grass root level. Until & unless the end-users are educated in the right way to handle the technological aids, our goals cannot be achieved.

1.6.3.1 Rashtriya Computer Literacy Drive- The Birth of an Idea Rashtriya Computer Literacy Drive is an initiative by Sunita Infotech to make **"India 100% computer literate…"** and spread the Quality Education on IT with a difference. The objective of the mission is to enable individuals & enterprises nationwide to achieve greater success by providing knowledge, skills, solutions & services through pioneering efforts and usage of appropriate technology at a very affordable cost. The fees collected is being low, will help the economically backward as well as Organised sector of the urban and rural areas respectively.

1.6.4 National Knowledge Network (NKN)-In the initial phase of NKN, following projects have been taken up and their status is as follows:

- Up-gradation of the NICNET at 15 locations to handle gigabits of speed has been completed in December 2008. The locations are: Delhi (Delhi), Chandigarh ,Jaipur (Rajasthan), Gandhinagar (Gujrat), Hyderabad (Andhra Pradesh), Bhopal (Madhya Pradesh), Kolkotta (West Bengal),Bhuwaneshwar (Orissa), Mumbai (Maharashtra), Chennai (Tamil Nadu), Guwahati (Assam),Thiruvananthapuram (Kerala), Bangalore (Karnataka), Lucknow (Uttar Pradesh).

- Creation of minimum infrastructure at 40 Institutions (out of 57 Institutions) to connect to NKN have been completed. The Institutions includes: IIT- Gandhinagar (Gujarat), IIT-Mumbai (Maharashtra), TIFR Mumbai (Maharashtra), BARC Mumbai (Maharashtra), IIT-Hyderabad (Andhra Pradesh), IIT-Patna (Bihar), VECC Kolkotta (West Bengal), IIT Kharagpur (West Bengal), IIT - Chennai (Tamil Nadu), IGCAR, Delhi (Delhi), IIT-Guwhati (Assam), IMTEC (Chandigarh), **IITM-Pune (Maharashtra), CDAC Pune (Maharashtra)**, IGIB- JNU (Delhi), IGIB-Okhla (Delhi).

1.6.5 National Digital Library

With the advent of digital technology and internet connectivity, Digital Libraries have the ability to enhance access to information and knowledge. They also bridge barriers of time and space. National Digital Library is an initiative taken by Government of India to establish the Digital Library of India. The project is ongoing and the prominent activities under this project are as follows -

Setting up of Mega Centres and Scanning Centres in collaboration with IISc, Bangalore and Carnegie Melon University, USA.Under the collaborative programme, scanners for these centres were provided by CMU, USA, under Million Book Universal Digital Library Programme. The digital data generated by these scanning centres under this activity is web enabled on "Digital Library Initiatives" web site http://www.new.dli.ernet.in.

Government of India Portal- This is the National Portal of India, developed with an objective to enable a single window access to information and services being provided by the various Indian Government entities. The content in this Portal is the result of a collaborative effort of various Indian Government Ministries and Departments, at the Central/State/District level. This Portal is mission mode project under the National E-Governance Plan.It covers following area-

SWIFT Jyoti -One of the most popular offerings under the NIIT SWIFT umbrella of programs, SWIFT Jyoti has been effectively used to proliferate computer literacy among the masses and help India bridge the digital divide.Targeted at the broadest section of society-from six to sixty year olds-SWIFT Jyoti has enabled a large number of individuals citizens to experience their first brush with computers.

e-Choupal-It is an unique web based initiative of ITC's agri-business divisions, offers the farmers of India all the information, products and services they need to enhance farm, productivity, improve farm-gate price realisation and cut transaction costs. Farmers can access latest local and global information on weather, scientific, farming practices as well as market prices at the village itself through this web portal in regional languages,.

FRIENDS (Fast Reliable Instant Effective Network for Distribution of services) **Model**-One of the very first and the most successful initiatives Kerala government put in place was the Fast Reliable Instant Effective Network for Distribution of services (FRIENDS). The aim of the project is to create a single window, enabling the citizens to pay taxes and other utility payments. The project was first launched in Thiruvananthapuram Corporation in 2000. The FRIENDS counter today handles bill payments of seven departments: revenue, motor vehicles, civil supplies, local bodies, universities,electricity, water, and telephones. The FRIENDS centers are conceived as a multi purpose service center, helping not only bill payment services but also acting as a information kioskas on government activities.

Akshaya Project-Akshaya was started as a e-literacy project in 2002 in Malappuram district of Kerala. It is an efforton the part of the IT department to 'bridge the digital divide'. The project has helped in taking IT to the remotest part of Kerala. The project aims at providing e-literacy to one person in every family.

Education Technology-

There is also a prevalent belief that modern technologies are better than older ones. The key phrases in ET are appropriate technology,that is, appropriate to the task in hand for meeting specific educational objectives, and the organization of all available resources into a workable system, which is checked again and again to ensure that it is appropriate and changing it where it is not working. Formative evaluation and summative evaluation are essential parts of ET. In applying the discipline of ET to the field of education, it is imperative that the media choice must relate to instructional design as well as to what is available and eminently usable. The same is true of methods and techniques.ET could be defined in simple terms as the efficient

organisation of any learning system, adapting or adopting methods, processes, and products to serve identified educational goals. This would involve:

- •Systematic identification of the goals of education, taking into account nationwide needs (higher scalability, for instance), the system capabilities, and the learners' needs and potential.
- • Recognition of not only the immediate needs of children but also their future needs in relation to the society for which we are preparing them.
- • Designing, providing forand enabling appropriate teaching-learning systems that could realise the identified goals.
- • Developing a range of support systems and training, creating the enabling systemic conditions/materials, reaching these to the school system, and training teachers and students to use them.
- • Research into existing and new techniques,strategies and technologies for solving problems of education, enabling judicious and appropriate application of technology.
- • Appreciation of the role of ET as an agent of change in the classroom, influencing the teacher and the teaching-learning process, and its role in systemic issues like reach, equity, and quality.

India recognized the importance of ICT in education as early as 1984-85 when the Computer Literacy and Studies in Schools (CLASS) Project was initially introduced as a pilot with the introduction of BBC micro-computers. A total of 12,000 such computers were received and distributed to secondary and senior secondary schools through State Governments. The project was subsequently adopted as a Centrally Sponsored Scheme during the 8th Plan (1993-98). During the 8th Five Year Plan the Scheme was widened to provide financial grants to institutions which were given BBC Micros and also to cover new Government Aided Sec./Sr. Sec. Schools. Assistance included annual maintenance grant for BBC micros and purchase as well as maintenance of equipment for new Schools. 2598 schools having BBC Micros were covered under the CLASS scheme during the 8th Plan for providing Instructors, maintenance of hardware, consumables and text books for students and training of teachers in schools. In addition, 2371 schools were covered with new hardware and services which included Rs.1.00 lakhs for hardware configuration and Rs.1.30 lakhs per annum for recurring costs. Rs.0.80 lakhs per annum was kept as the recurring

costs for schools which had already been covered under the BBC-Micros scheme.NIC was identified as the nodal agency for 301tilizatio the contract for the supply of hardware. The use and supply of software was limited, coverage was confined to Sr.Secondary Schools and the students of class XI & XII had to undergo a Computer Course Module.National Task Force on Information Technology and Software Development (IT Task Force) – constituted by the Prime Minister – in July, 1998 has made specific recommendations on introduction of I.T. in the education sector including schools

The relevant paragraphs are:

Vidyarthi Computer Scheme, Shikshak Computer Scheme and School Computer Scheme to enable students, teachers or schools respectively, keenon buying computers to do so under attractive financial packages. These schemes will be supported by a suite of initiatives such as lowering the cost of PCs, easy instalment bank loans, computer donations by IT companies and other business houses, bulk donations of computers by NRI organizations, large-volume bargain price imports, multi-lateral funding, etc.Computers and Internet shall be made accessible to schools, polytechnics, colleges, and public hospitals in the country by the year 2003.The concept of SMART Schools where the emphasis is not only on Information Technology in Schools, but also on the use of skills and values that will be important in the next millennium, shall be started on a pilot demonstrative basis in each State.

The Report recommended provision of computer systems to all educational Institutions upto Higher Secondary/Secondary schools utilises the investments (about 1-3%) of the total budget during the next five years.The recommendations of the Task Force have been approved by the Council of Ministers.The ‘ICT in Schools’ scheme is a window of opportunity to the learners in the schools of India to bridge this digital divide. The scheme is not a simple merger of the earlier CLASS and ET Schemes but is a comprehensive and well thought-out initiative to open new vistas of learning and to provide a level playing field to school students, whether in rural areas or in the metropolitan cities.

The ‘ICT in Schools’ Scheme is not a standalone scheme but actively solicits the partnership of States, Union Territories & other organizations in a mutual endeavour

to bridge the heterogeneous proliferation of ICT across different socio-economic and geographic segments in the country. This partnership is manifest in the structure of financing the initiative, in encouraging the development of long-term Computer Education Plans, the setting-up of Smart Schools by KVS/NVS in States as technology demonstrators and in providing for supplementing the States efforts in these areas with no attempt being made to supplant the State Schemes. The centrally sponsored scheme of 'Educational Technology' and 'Computer Literacy and Studies in Schools' have been suitably modified keeping in view the past experience,the feedback which has been received and changing needs to form the new scheme of 'Information and Communication Technology in Schools'. The component regarding financial assistance to States/UT's for purchase of RCCPs and CTVs under the erstwhile Educational Technology Scheme has been weeded out.

Objectives of Scheme

1. To establish an enabling environment to promote the usage of ICT especially in HigherSecondary and Secondary Government Schools in rural areas.Critical factors of such an enabling environment include widespread availability of access devices, connectivity to the Internet and promotion ofICT literacy.
2. To ensure the availability of quality content on-line and through access devices both in the private sector and by SIET(State Institutes of Education Technology).audio-visual medium and satellite-based devices. Enrichment of existing curriculum and pedagogy by employing ICT tools for teaching and learning.
3. To enable students to acquire skills needed for the Digital world for higher studies and gainful employment.
4. To provide an effective learning environment for children with special needs through ICT tools.
5. Promote critical thinking and analytical skills by developing self-learning. This shall transform the classroom environment from teacher-centric to student-centric learning.
6. To promote the use of ICT tools in distance education

Details of the Scheme

Components- The present scheme has essentially four components. The first one is the partnership with State Governments and Union Territories Administrations' for providing computer-aided education to Secondary & Higher Secondary Government Schools. The second is the establishment of SMART schools which shall be technology demonstrators. Universalisation of Computer Literacy through the network of KVS and NVS to neighbouring schools is the third component. The fourth components relates to the activities of SIETs.

Implementation Partners

States/UT Governments, State Institutes of Education Technology, Kendriya Vidyalaya Sangathan, Navodaya Vidyalaya Samiti, Government and Government aided schools systems. Moreover, financial assistance would also be provided to short-listed NGOs/Trusts/Societies and Companies for software development, teaching tools, designing training models, evaluation, monitoring and other contingent expenditure. The State/UT Governments shall be free to partner with private organizations or integrate it with other similar schemes for implementation of the 'ICT in schools' scheme including providing for maintenance. The implementation of the scheme will be multi-modal. The Ministry of Human Resource Development shall consider the entry of the private sector in a Buildown-operate or annuity modal wherever possible. The direct procurement of hardware by the state would be the last resort. The National Council for Teachers Education shall be associated with the scheme in the context of training of teachers in computer-aided learning. The Rehabilitation Council of India would play an important role in projects involving introduction of use of technology for the education of children with special needs.

Financial Parameters

1. Under the CLASS component of the ICT scheme, the Union Government would provide 75% of financial assistance to State/Uts. The balance 25% of funds would be contributed by the State Governments/Uts. The scheme also provides for contribution of 25% of funds from the MPLAD scheme in addition or as an alternative to State Government contribution. Assistance shall be provided to special category states in the ratio 90:10.

It may be noted that even in the revised norms, it is proposed to have greater inbuilt flexibility. The States would have the option to incur expenditure on the above items or any other item like generators, preparation of labs for computers including civil repairs and cabling and provision of electricity depending upon their needs and resources, subject to overall maximum limit of Rs.6.70 lakhs per school.

The provision for software include Learning Management Systems & curriculum based courseware apart from operating systems & other application software.An amount of Rs.1 crore would be kept aside annually for the Department of Secondary and Higher Education for development of software, teaching tools, designing training models, evaluation, monitoring and other contingent expenditure.Ministry of Human Resource Development shall endeavour to utilise content development through National education portal.

The British EducationalCommunications & Technology, Agency (BECTA), UK could be considered as a modal incorporating elements of public private partnership.KVS and NVS would convert one school per State/UT into a SMART school subject to availability of funds. A grant of not more than Rs.25 lakhs would be given per SMART school. This limit may be reviewed in the future if needed. A sum of Rs.2.5 lakhs shall be provided as recurring costs which includes maintenance, consumable, Internet usage & monitoring costs.In SMART Schools the emphasis would not only be on the use of Information Technology but also on the use of skills and values that will be important in the next millennium. It is hoped that at least one section (of 40 students) in each of the class IX –XII will be fully computerized. Thus a school having 160 computers where 40 computers for each IX to XII classes called a SMART school under the scheme. However, keeping in view the fact that this target cannot be achieved in one go, it is proposed to provide 40computers to such identified schools. A grant of not more than 25 lakhs per school would be given to KVS/NVS for the purpose.Both KVS and NVS have identified the schools which will be converted into a SMART School.

Kendriya Vidyalayas and Navodaya Vidyalayas would be given funds at the rate of Rs.20,000/- per neighbourhood school to impart computer literacy to not more than ten neighbourhood schools within a radius of 3 to 4 kilometers to cover 8,000 such schools over 3 years. The course shall be imparted in the local language if such a demand is received from the beneficiary school. An Advisory committee consisting of the Principal of the Mother School and all Principals of participating schools will manage and oversee the programme.The financial assistance to SIETs shall be in the project mode. The financial assistance would be provided to SIETs on the basis of the project proposals submitted by SIETs. These project proposals shall be submitted to the Project Monitoring and Evaluation Group which shall assess the proposals submitted as to their utility and quality. Progressively, the administrative expenses of SIETs shall be reduced to zero within five years.

The national policy on education 1992 stressed upon employing **educational technology** to improve the quality of education .The policy statement led to two major centrally sponsored schemes, namely educational technology (ET) and computer literacy and studies in school(CLASS)providing way for a more comprehensive centrally sponsored scheme called "information and communication technology in school in 2004". The significant role of ICT in school education seen stressed in the National Curriculum Framework (NCF) 2005 .Use of ICT for quality improvement in education was included in various programs such as "Sarva Shiksha Abhiyan (SSA)", and in norms of schooling recommended by Central Advisory Board Of Education (CABE) in its report on universal secondary education in 2005.

The choice of ICT for holistic development of education needs to have sound base of policy. "The incentive of ICT policy in school education is inspired by the tremendous potential of ICT for outreach and improving quality of education". This policy provides guidelines to assist the state in making optimum use of ICT in school education within a framework of a national policy.

The main goals of policy are to create:

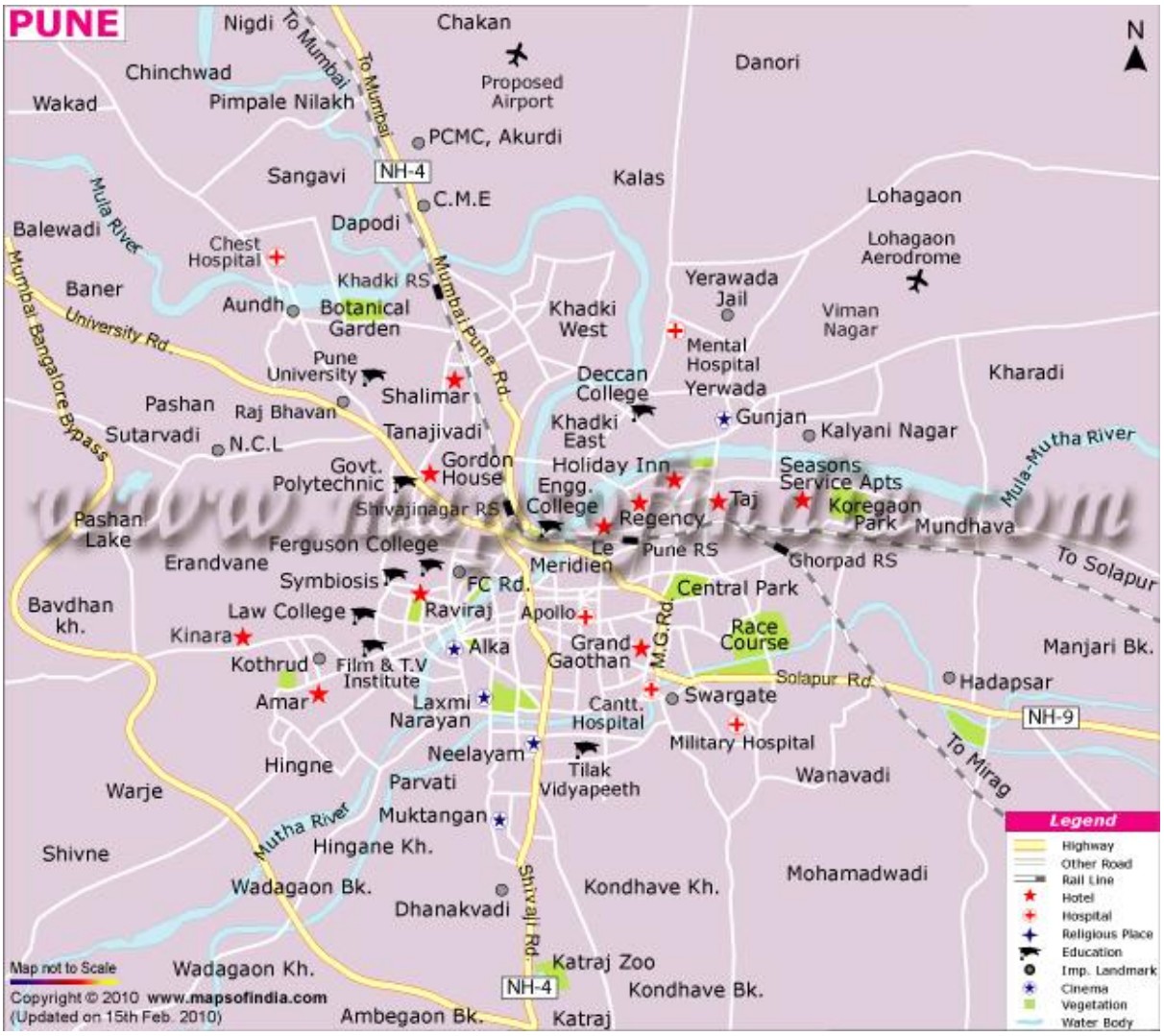
1. Environment to Develop an ICT knowledgeable community
2. An ICT literate (teacher and student), community who can deploy, utilize, benefit from ICT and contribute to a national building
3. An environment of collaboration and sharing conductive to the creation of demand for optimal utilization of optimum returns on the potential ICT in education.

IT revolution has significantly transformed 'the grammar' of India industry. But the impact of ICT has been less significant, on account of various reasons. However a large number of private schools have introduced computers to their students which have resulted in a 'huge digital divide' between private and government aided school which could not make progress in the progress of computer aided learning.

It has been realized that technology based solutions are key to revitalizing education system of India and making it's future generation competitive at global level, still the challenge is how effectively and quickly we integrate digital technologies into education system of India . The government had introduced Right to education act, Sarva Shiksha Abhiyan and allocated about one billion dollar in the eleven plans for national mission on education through ICT. The National Policy in ICT in school education (NPISE) aimed at introducing a phased ICT literacy programmed in all primary and secondary school in Indiawithin the 11th (2007-12) and 12th plan (2012-17) periods.

A large number of new technology education companies and marketing survey are providing various equipment like interactive white boards, laptops, and curriculum – mapped digital content, school management teaching assessment software, science math and language laboratories and large number of other products and services. As new information and communication technology offer a good opportunity to rapidly create 21st century learning technology environment. Let us hope the Indian education system will make rapid progress in ICT based education in India at faster rate.

PUNE CITY MAP



Source :-http://www.mapsofindia.com/maps/maharashtra/pune.htm

Map 1.1 – Map of Pune city

About the pune city

Nickname(s): Queen of the Deccan, Oxford of the East, Pensioners' paradise

Pune is the eighth largest metropolis in India and the second largest in the state of Maharashtra. It is situated 560 metres (1,837 feet) above sea level on the Deccan plateau at the right bank of the Muthariver. Pune city is the administrative headquarter of Pune district and was once the centre of power of the Maratha Empire.

Pune is the cultural capital of Maharashtra. Since the 1950-60s, Pune has had traditional old-economy industries which continue to grow. The city is now also

known for Research Institutes,Manufacturing, Automobile, Government & Private sector, Information technology (IT) and Educational, Management, Training institutes that attract migrants, students and Professionals not only from India but also students from South east Asia, Middle East and African countries.

Pune was an important centre in the social and religious reform movements of the late 19th century. Prominent social reformers and freedom fighters lived here, including Bal Gangadhar Tilak, Vitthal Ramji Shinde, Dhondo Keshav Karve and Mahatma Jyotirao Phule. Dr. Raghunath Karve Vinayak Damodar Savarkar resided in Pune when he enrolled in Fergusson College in 1902.

Eminent educationist of Pune

Mahatama Phule- Pune is a city with cultural heritage and is also land of social thinkers, social reforms and social revolutionaries who have not only moulded and enriched all facts of life of Maharashtra but have also made singular contribution to growth and development of India.

Savitribai Phule- First Indian Lady Teacher. Country's first school for girls was started at Bhide's wada in Pune and Savitribai was nominated as the first head mistress of the school in 1848.

Dr. Dhondo Keshav Karve- popularly known as Maharishi Karve, was a social reformer in India in the field of women's welfare. Karve continued the pioneering work of Mahatma Phule and Savitribai Phule in promoting women's education.

Prestigious Institutes in Pune -Some of the most prominent and prestigious institutesPune include: Deccan College which is the oldest college in western India and specializes in Archaeology;College of Engineering, the second oldest college in India; Fergusson College which wasestablished in 1885 and ranks among the top colleges in India; Agriculture College which is again one of the oldest colleges in India; Gokhale Institute of Politics and Economics, one of the oldest and most reputed college for Economics in India; SNDT Women's University, a university exclusively meant for women; Symbiosis Pune which is ranked as one of the best business schools in India; Tilak Maharashtra Vidyapeeth and Bharati Vidyapeeth. Pune also has to it’s credit reputed educational institutes dedicated to Defence forces -National

Defence Academy Pune, Armed Forces Medical College, Institute of Armament Technology (IAT) and Army Institute of Technology (AIT) and the College of Military Engineering (CME).College of Engineering-Set up in the year 1854, this is the third oldest engineering institute of Asia. The COEP was also one of the first institutes built by the British in pre-independent India.

Commerce-Pune is one of the fastest developing cities in the world. It is one of the important hubs for the IT industry and is home to software MNC's like Wipro, IBM, Infosys, Symantec and many others.

Research Institutes

Pune is home to some of India's important research institutes. Some of the major research centres are:

- National Chemical Laboratory (NCL): one of the leading chemical research establishments in India
- Indian Institute of Science Education and Research, Pune (IISER, Pune)
- Inter-university Centre for Astronomy & Astrophysics (IUCCA)
- National Centre for Radio Astrophysics (NCRA)
- Centre for Development of Advanced Computing (C-DAC)
- Electronics Test and Development Centre (ETDC): under the STQC directorate, it is a leading testing and certification centre.
- National Institute of Virology (NIV)
- National Research Centre for Grapes (NRCG)
- Gokhale Institute of Politics and Economics
- Central Water & Power Research Station (CWPRS)
- National Centre for Cell Science (NCCS)
  Automotive Research Association of India (ARAI)
- Indian Institute of Tropical Meteorology (IITM): scientists at IITM has made significant achievements in tropical weather
- National Informatics Centre (NIC)
- Armament Research Development Establishment (ARDE)
- High Energy Materials Research Laboratory (HEMRL)
- Centre for Materials for Electronics Technology (CMET)
- Bhandarkar Oriental Research Institute (BORI)

- National AIDS Research Centre (NARI)
- Agharkar Research Institute (ARI)
- Army Institute of Technology (AIT)

Major Universities in Pune

- University of Pune
- Dr D Y Patil University
- Bharathi Vidyapeeth Deemed University
- Deccan College Post Graduate and Research Institute
- Institute of Armament Technology
- Gokhale Institute of Politics and Economics
- Symbiosis International University
- Tilak Maharashtra Vidyapeeth
- Indian Institute of Science Education and Research
- Dnyaneshwar Vidyapeeth

Education Statistics of Pune

Total Literacy Rate	87.19%
Female Literacy Rate	81.13%
Male Literacy Rate	92.72%
No. of Literate People in Pune	7288517
No. of Universities	9
No. of Defence Forces Institutes	7
No. of Engineering Institutes	61

1.2 OBJECTIVE OF STUDY:

Taking into consideration these developments the present study has been undertaken "To study the computer awareness among secondary school students in Pune city". The main objects of the present study were as follows:

1. To study the computer awareness among secondary school students in Pune city
2. To study computer awareness among parents
3. To study the role of teachers/instructors in developing computer awareness among secondary school students
4. To study the strategic efforts undertaken by various school authorities in developing the computer awareness among secondary school students

1.3 HYPOTHESIS:

1. Computer awareness among secondary schoolstudents is more in Central Boards schools and Private schools as compare to Aided/Granted schools and municipal schools.

2. Computer awareness of students depends on the educational and economic background of the parents.

3. Computer awareness of students depends on the skill, experience and specialized training of computer teachers/instructors.

CHAPTER SCHEME OF THE PRESENT STUDY

Chapter I	Introduction
Chapter II	Review of literature.
Chapter III	Role of education in a developing country like India and Research methodology adopted for the present study
Chapter IV	National policy on information and communication technology in school.
Chapter V	Role and responsibilities of computer teachers and parents of the students.
Chapter VI	Analysis and interpretation
Chapter VII	Conclusion and Finding
Chapter VIII	Bibliography and references

CHAPTER II

REVIEW OF LITERATURE

2.1 Effects of computer use on high school students

2.2 The Digital Generation

2.3 Elementary school computer and internet use

2.4 ICT as a learning tool

2.5 Enabling teachers to make use of ICT

2.6 Meeting the standards

2.7 The introduction of ICT in Ghangian educational curriculum

2.8 Work Family Challenges and Women Empowerment

2.9 Indian Educational System

REVIEW OF LITERATURE

Under the umbrellra of central government of India as well as state government of Maharastra 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 finnd 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 student 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 on 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 requird 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 unavailing 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 primay 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 staffindividually 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 "Aguide 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.Traniee 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 relationalship between the oracy to literacy in children but failed to portrait the finding of its initiatives.

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 maintence 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.

John LeBaronetal(2009):"Research Report for GeSCI Meta-Review of ICT in Education"

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.

Flanagan L and Lcobsen m (2003):"Technology leadership for the twenty first century"

The authors have examined current issues related to technology integration and provided a contextual framework with which school principals cab 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 Africaand Commonwealth of Learning[15] 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 educationparadigms 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. Theaim of the ICT education in Africa should be the creation of CoPs, which constitutes an ongoingteacher 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 evolutional 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 esablishing 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 relevalent and quality education for everyone and the solutions it deploys to meet such challenges are of increasing interest and relevalence 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 out comes 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 Gujarat 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 centaury 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 if offers 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 satiation 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 programmmes 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 educationalstream 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 genderindependent, 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)conductedA 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 teleconferencingprogrammes 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 IGNOUA 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 utlisation 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 Maharashrtra, 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. Thestudents 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 abut faied 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 opinionnares were constructed by the investigator. The intelligence test by Dr. K.G. Desai was usedy. 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 managment.

Shailendra Rathod (2004)**,**Bridging the gaps amongst Teaching Styles and Learning Styles Through Technologyconducted 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 onwww.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 Programconducted by Intel- India for Secondary School Teachers**.** All the five objectives of thestudy under Phase 'A' and all the eight objectives under Phase 'B' have been wellenunciated 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' forthe 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 trainedteachers in the use of computers in the teaching of their subjects.

To interview the Principals and Teachers of the schools under ethnographic studyto-

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 computerto 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 selectedsecondary 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, observationand 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 Power Point, 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 < 5years, >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 hand-written.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 re-directing 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 nowledgeable 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: xtending 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 ofICT 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 isproblematic 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 thosemotivated 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 ofICT 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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CHAPTER III

ROLE OF EDUCATION IN A DEVELOPING COUNTRY LIKE INDIA

1. Introduction
2. Changing Role of Educational sector
3. Quality parameters of school education
4. IT in Education

3.1 INTRODUCTION

Over a long period of time it was believed that accelerating rate of physical capital formation was necessary for attaining higher rate of economic development and raising the standard of living of the people in a developing country. But in the last three decades economic research has revealed the importance of human skills and knowledge of the people especially labour force. It is not only the quantitative expansion of educational opportunities but also the qualitative improvement of the type of education which is imparted to the people especially working people that hold the key to economic development. On account of its significant contribution to economic development, education has been considered as a human capital formation and expenditure on educational activities for the people as investment in men or human capital. According to Harbinson (1973) "Human resources constitute the ultimate basis of production, human beings are the active agents who accumulate capital, exploit natural resources, build social, economic and political organizations and carry forward national development. Clearly a country which is unable to develop the skills and knowledge of its people and utilize them effectively in the national economy will be unable to develop anything else.

It was also realized that merely physical capital formation will not automatically promote economic development because it needs human hands to make physical capital operative and it is the efficiency of production of human hands ultimately contribute to economic development of a developing country.

Several empirical studies conducted in developed countries especially in USA regarding sources of growth ie contributions made by various factors such as physical capital, physical labour or man hours, education etc. concluded that education or the development of human capital has been a significant source of economic growth. Solow(1957) who was the first economist to measure the contribution of human capital to economic growth estimated that, for United States between 1909 and 1949, 57.5 percent of the growth in output per man hours could be attributed to the residual factor which represents the effect of the technological change and of the improvement in the quality of labour mainly as a consequence of education.

Denision(1983) studied the "Trends in American Economics Growth(1929-82)" Concluded that during this period the USA's total national output increased at a rate of 2.9 percent per annum, increase in labour input accounted for 32 percent and the remaining 68 percent was due to the increase in productivity per worker. Then the contributions of education per worker, capital formation, technological change and economies of scale. He concluded that 28 percents points of contribution to growth in output due to growth in labour productivity was due to technological changes, 19 percent points due to education per worker and 9 percent points due to economics of scale. Thus it may be concluded that education and technology progress together made 42 percent contribution to growth in national product, this research explains the role palyed by skilled persons and technology in increasing the national product and ultimately in promoting economic growth.

Baker(1960) also measured income differential arising from the cost on expenditure incurred in acquiring a college education in the US. His estimates showed that the rates of return on education in USA for urban white collar population were 12.5 percent in 1940 and 10 percent in 1950.

Schultz(1961) studied the relationship between expenditure on education and consumer income and also the relationship between expenditure on education and physical capital formation for the USA during the period 1900-1956 and concluded that, when measured in constant dollars,"the resources allocated to education rose about three and a half times relative to consumer income in terms of dollars and relative to the gross formation of physical capital in terms of dollars. Thus investment has been 3.5 times more attractive than investment in physical capital.

Thus expenditure on education is to be considered as an investment, like investment in physical capital because it increases productivity of the labour which contributes to growth of natural income of country. Educated workers get higher wages which is benefit not only the individual but also to the society as a whole. Higher productivity leads to higher income, higher output and higher standard of living.

Education can be seen as a product or process and considered in a board sense or a technical sense. In its broad sense education refers to any act or experience that has a formative effect on the mind, character or physical ability of an individual. In its technical sense education is the process by which society, through schools, colleges and universities and other institutions, deliberately transmits its

cultural heritage- its accumulated knowledge, values and skills from one generation to another.

Education refers to all experiences in which students can learn something byof :

1. **Instructions**-refer to the intentional facilitating of learning toward identified goals, delivered either by an instructor or other forms.
2. **Teaching** – refers to the action of real live instructor designed to impact learning to the student.
3. **Training**- refers to learning with a view toward preparing learners with specific knowledge, skills or abilities than can be applied immediately upon completion.

Education plays a crucial role in a social and economic development of a nation. Education refers to "Sensitivities and perceptions that contribute to national cohesion, a scientific temper and independence of mind and spirit thus furthering the goals of socialism, secularism and democracy, enshrined in our constitution". Education develops man power for different levels of the economy. It provides a necessary base for developing research and development, which ultimately leads to national self defense. Thus education is a unique investment for developing human capital.

3.2 CHANGING ROLE OF EDUCATIONAL SECTOR

Education plays a crucial role in the life of a child by shaping his behavior. Teachers, parents, policy makers and society desire certain changes in the behavior of a child which are expected to take place through education, so as to enable him to survive by facing challenges and grow under dynamic and complex environment and satisfy, and to be able to maintain healthy relations with his fellows and lead a successful and richer life. Conditions of survival in a society are also changing. In the past century the literacy rate of Indian population was much lower because during those days literacy was not essential for survival. People were engaged in various life supporting activities such as farming, spinning etc.

Not necessary but skill and knowledge was sufficient leading to economic development, machines replaced men and different forms of careers originated. In order to adopt these careers different types of skills becomes necessary. This led to the increase in the knowledge of reading, writing and arithmetic described as

"Three Rs."Now we experience revolutions in almost all the fields affecting human life experience information revolution, technological revolution giving rise to a knowledge society. Now life has become technology or gadget based where gadgets are available for most of the activities carried out by human beings. This technological advance made the field knowledge quite vast. Hence to lead life successfully under present conditions certain very different types of skills becomes necessary.

Hence the national policy on Skills Development was approved by the Government of India in 2009, where certain basic skills required to acquire by the students were identified. Some of these skills are:

1. Communication and presentation
2. Acquiring and processing information
3. Synthesizing knowledge
4. Integrating knowledge from other disciplines
5. Leadership
6. Analytical skill.
7. Language skill
8. Computer science skill
9. Creative thinking
10. Problem solving
11. Public relations management skills

Now it is the responsibility of the educational system to develop students right from his childhood towards young and matured student through systematic formal education, to enable him to become an idle citizen of modern India.

Modern society is knowledge and technology based society where connectivity is driving the economy. Hence knowledge is considered as the primary productive resource. It is the innovative capacity which empowers the knowledge society. In order to develop a well informed society, efficient and effective utilization of knowledge is necessary. Developing countries especially India aims at promoting knowledge based societies. As knowledge era exposes us to a completive world, knowledge has to be used as a crucial weapon for developing knowledge society. Thus the prosperity of the knowledge society will depend on, creation,

development and maintenance of knowledge infrastructure and knowledge workers. According to Venkata Subramanian(2000), knowledge society means "creating sharing and using knowledge as the key factor in bringing about prosperity and well being of people". A great historian Alvin Toffler (1980),developed the idea that power at the dawn of civilization resided in the 'muscle power' , then got itself associated with 'wealth' and in 20th century it shifted its focus to 'mind'. Thus the evolution of the shifting foundations of economy is characterized by shift from physical power to wealth power to mind power. Thus "The economic, social, cultural and technological changes in the national and international scene contribute to the knowledge society."

India can attend higher rate of growth if India becomes stronger in the knowledge sector and information technology is properly exploited. Thus India can overcome the problem of poverty, generate wealth at a higher rate and can play a significant role at the global level.

In order to develop knowledge society, information has to be structured for fulfilling basic conditions of interactivity, mobility and convertibility, ubiquity and globalization, as Toffer(1990) has pointed out. The societal transformation can be achieved by way of developing educational facilities, improving governance. There measures will generate employment opportunities, rapid increase in productivity and promoting rural prosperity. In this context information and communication technology (ICT) can play a crucial role if it is included in educational and training fields for achieving desired results.

Since last decade there has been significant progress in knowledge and information sectors in India. Now India has attained a position among ICT oriented countries. On account of extensive use of satellites, televisions, computers, internet etc. there has been a flow of knowledge and information. However the benefits of knowledge are equally distributed, which has resulted in developing " Islands of prosperity and continents of ignorance poverty, illiteracy over population, backwardness and poor health". In orders to develop and maintain knowledge society three types of networks are needed. These are electronic network, the transport network and the river network. Electronic network helps in generating wealth and permits

knowledge top spread in each and every corner of the world. Thus knowledge multiplies and contributes to generating wealth significantly. Transport network promotes mobility of men and materials, economically. River network helps in achieving rural prosperity by way of increasing productivity of agriculture and related activities.

The future, stability and development of any society depends upon it ITC use and knowledge technologies. Education is an effective tool for empowering the people and society. It promotes participation of citizen in the process of progress and prosperity of a nation. There is a direct relation between education and society.It serves, as education originates from the society and contributes towards bringing about social changes and in turn gets itself changed by an individual but also of the society. Education not only promotes development of individual but also that of the society.' Education is not only about putting the individual in contact with values, but also raising him to the level of these values and then extending this process from the individual level to the society thus increasing it value and functionality".

When educational inputs are properly planed and used effectively, then it can increase national output, cultural richness and build positive attitude towards technology. It increases efficiency and effectiveness of the governance. Education not only develops new values but also strengthens competencies and develops commitment and sharpens the ability to self-examination, self-monitoring and also self-criticism.

The main purpose of education in a country like India is to bring about human resource development and contributes towards transforming it into knowledge society. This can be achieved through quality teachers and quality content. The real capital in knowledge society is its knowledge workers. Society will aim at creating knowledge intensive environment and developing processes to create, share and protect knowledge. Education is considered as an engine of personnel, social and economic growth.

Indian educational system consists of primary or elementary education, secondary education, higher education and tertiary education. Universalisation of elementary

education was given the top priority, since Indian Independence. It includes not only three Rs (reading, writing and arithmetic) but also aims at bringing about harmonious development of the child. It provides necessary base for secondary education. Secondary education is the connecting like between primary education and higher education. It plays a crucial role in the lives of the students. This is the stage where young people should be able to decide about their own future according to their own tasks, preferences and aptitudes so that they can acquire the skills and abilities for enjoying a successful adult life. It has been realized that, if India aims at attaining and maintaining higher rate of economic and social development, then significant improvements at the secondary educational structure are necessary. According to view of the Kothari commission, secondary education enables students to carry responsibilities of life on their shoulders and can get engaged in useful commercial activities. Higher education deals with education imparted in colleges, universities and various types of institutions, with the aim that the students understands himself prevailing conditions of the society and develops himself physically, psychologically and morally so as to enable himself to make contribution towards developing a knowledge society which can ultimately result in social and national development. The scope and role of tertiary education has increased since last four decades. It includes learning and teaching at the high level of conceptual and intellectual skills in various disciplines. It is much more diversified and includes new types of institutions. Tertiary education policy is given high priority as it is a major driver of economic competitiveness in an increasing knowledge driven global economy. It contributes towards social and economic development through four major strategies.

1. The formation of human capital through teaching.
2. The building of knowledge bases through interaction with knowledge users.
3. The dissemination and use of knowledge through interaction knowledge uses.
4. The maintenance of knowledge through inter generational storage and transmission of knowledge.

National knowledge Commission recommended in the context of education in India as follows-

Our educational system should realised itself at the earliest to meet the needs of the present day challenges and be fully geared to participate in the societal transformation. Knowledge society enriches information society through

innovation. Information society enriches agriculture and manufacturing through value addition. National knowledge commission (NKC) believed that providing universal access to quality school education is the corner stone of development and minimum necessary condition for any progress towards making India knowledge society. The commission focused on five key aspects of knowledge: which is, enhancing access to knowledge, reinvigorating institutions whereas knowledge concepts are imparted, creating a world class environment for creation of knowledge, promoting applications of knowledge for sustained and inclusive growth and using knowledge applications in efficient delivery of public services.

Thus it may be concluded that-

The basis of future society is education, a life long process and knowledge and information represents the key variables in the development of society. Education not only civilize man but also includes moral values and principals for living out a better social life in the world. Education is the important path to development knowledge society. Education can provide not only the best technological potential innovators, can create an advance in knowledge and create economic growth.

As population develops, society also develops. When individual undergoes more educational, he becomes able to face new challenges generated by the knowledge based society and economy. Thus investment in education becomes the most important investment of the society, as knowledge society produces commodities of high knowledge value.

3.3 FRESH FOCUS ON SECONDARY EDUCATION

The schools are divided into three types-

Aided/Granded schools – The schools getting permanent aid from the government of Maharashtra.

Non-aided schools or Private schools-These schools do not have any grant from state or central government.

Municipal Schools- These schools are run by the Pune municipal corporation.The education department of corporation takes charge of these schools.They provide the necessary infrasture required, library, laboratories etc.

Central board schools- For the current study undertaken are the schools running under the control of central government.they are having grant directly given by the central government.

The education department of Maharashtra state has decided to identify deficiencies in the existing secondary schools, establish new schools and develop state specific norms for physical facilities under the Rashtriya Madhyamik Shiksha Abhiyan(RMSA),for which Rs. 711crs have been allocated in fiscal budget 2013-14.

The aim of the state is to improve the standard of secondary education in terms of access to education, physical facilities including laboratories,computer lab, libraries art and craft, toilet blocks and quality of education with focus on science, math's and English under the scheme. The state project coordinator has drafted different schemes for improving the standard and quality of secondary education in the state.

The scheme aims at ensuring that, all secondary schools have physical facilities, staff and supplies according to the prescribed standard. According to the course coordinator, "Providing required infrastructure like blackboards, furniture, libraries, science and laborites, computer lab and appointment of additional teachers and in service training teachers will be on priority list once the scheme is approved.

The state education department has also proposed to increase the number of Kendriaya Vidyalaya and Jawahar Novodaya Vidyalayas in view of their importance as pace setting schools and strengthen their role.

3.4 QUALITY PARAMETERS OF SCHOOL EDUCATION

Education plays imperative role in the process of the advantage of an individual's country and his destiny. Education is a fundamental right in India and an important millennium development goal to which India is totally committed, various religious philosophers have provided essential ingredients of value based

school education in India .Education in India considered the most powerful means of modification of human behavior this described as the means of all around development of personality and values among the human beings. Education without anchoring in human values is incomplete and may create unidirectional citizens. Hence the national policy of education, as revised in 1992 had emphasized the need for substantial improvement in quality of education, to achieve essential levels of learning. The programmed of Action 1992 stressed the need to lay down Minimum levels of learning (MLL) at primary and upper primary levels. This need originated from the basic concern that irrespective of caste, creed, location or sex, all children in India must be given access to quality education of comparable standards. Thus the MLL strategy was seen as attempt to combine quality with equity.

Education is one of the important factors that shape the personality of a child of a high quality. The quality of education is basic to the European Trade Union Committee for Education (ETueE). A quality education system must manage to provide all children and young people without distinction of any kind, with a comprehensive education and with an appropriate preparation for working life. Life in society and private life in the form of further education within vocational schools, colleges, universities or other educational institute's .However parents and student tend to measure quality of education by the level of performance in the form of marks or grades obtained in the examination. But the concept of quality of education is an umbrella concept which includes all those aspects of education which make it efficient and good. It includes availability of infrastructure such as buildings, trained teachers and quality of instruction, course, syllabi etc. Thus quality of education includes all this aspects.

Indicators of quality education are stated to be as follows .educational system that gives every child-

1. A better quality of life.
2. Access to opportunities leading to a productive life.
3. The potential to find answers to problems.
4. Education that contributes to peace.

5. The knowledge of and respect of history, culture, music and the environment in which it lives.
6. A healthy life style, quality in relationship, family and community life and knowledge of financial management for life after school.
7. Enrollment in tertiary education.
8. Opportunities for employments.
9. A realistic teacher – student ratio.
10. Adequate qualifications, salaries and conditions of service for teachers teaching in schools.
11. Infrastructure that meets the needs of students and staff.
12. Resources for students to acquire various skills.
13. Employments opportunities for school level and those with post secondary education

According to global monitoring report of UNESCO (2006) the child performance needs to be treated as a parameter of quality in school education. The Childs knowledge and skills nature of knowledge and it s relation with the child own nature and the approach used by the curriculum designer and teachers while preparing curriculum and textbooks respectively are the vital parameters. Distances from these parameters quality parameters deteriorate the quality in school education.

UNICEF (2000) and UNSECO (2004) have recognized five parameters of quality education which are learner, priorities, context, environment and outcomes thus quality parameter learner for whom the educational infrastructure is the first and most important condition. Understanding priorities to improve efficiency is necessity for example schools should be housed in pucca buildings, environment should be such that the wastage of working does due to bad weather conditions can be minimized with improving buildings so that the outcome can be improved but in India a large number of schools do not have safe pucca buildings for their schools and infrastructure is also remains a neglected field.

Syllabus contents and methods of instruction have to be made learner centric and outcome based the pupil teacher ratio should be kept at lower level so that a

teacher can give proper attention to each student, so as to improve the quality of education.

In order to become a good citizen it is necessary to have better performance in various subjects covered by the study along with habits, attitudes, values and life skills. The factors associated with success of these areas which are related to the conditions of learning environment also the indicators of quality of school education.

Quality issues in school education are thus related to quality of infrastructure and support services, opportunity time, teacher characteristics and teacher motivation, free service and in service education of teachers, curriculum, and teaching learning material, class room's processes, pupil education, monitoring and supervision etc. Thus improvement in these parameters and its maintenance is the grave concern for the educational system as a whole.

As students come from different backgrounds quality education focuses on identification of the varieties of each individual nurturing these varieties for holistic development of the individual students. Thus, nurturing each student to optimize his potential is a crucial parameter of school education.

Optimization of potential of each school is a parameter of school education. Continuous search for improvement is a parameter. Mukhopadyaya(1999) has mentioned four qualities which are informed, cultured, emancipated and self actualized which indicate educatedness. Thus quality in education can be indicated by educationist of the product of the school.Availability and use of modern technology supported required resources in school enables the teachers to meet challenges of globalization and give updated knowledge to the students to bring out quality.

In the countries which affected by the political economy of colonialism, the tension between quality and equality continues to be an obstacle to social and policy changes according to J.P.Naik, equality, quality and quantity is an elusive triangle which has country pulls in the shape of diamonds and resistance to school education in India. Hence for maintenance of equality and quality in Indian school education has been essential and guiding parameter for quality education.

3.5 IT IN EDUCATION

The use of IT in education is not only economical but also highly effective. It enables to improve the quality of education and making knowledge available to a large number of students at the same time.

Technology is a branch of science which deals with machinery and equipments systems their design and application and making continuous efforts in improving them.Technology means scientific other organized knowledge that uses various activities easy and simple in practice. Scientific and other organized knowledge include skills, experience and common sense. In case of the use of technology human beings use it efficiently and effectively and hence it becomes a part of social life system.

The process of education of any type includes two types of educational activities.
Non – interactive Educational Activities Reading a book, observing TV or video program listening a lecture writing essays solving arithmetical exercises/examples etc. which are done by a student independently are non interactive educational activities. Indian educational system has been dominated by such type of educational activities under these activities there is no involvement of individual response either of the teacher or other students. These activities provide mainly the information about the subject. Such information enables most of students to convert it into development of knowledge for which interactive educational activities are needed.
There will be hardly any Eklavaya to learn on his own without any help from his teacher or guide. Most of the students need help of a teacher especially for interactive educational activities.

INTERACTIVE EDUCATIONAL ACTIVITIES

In case of non interactive educational activities its easily possible to use IT for making high quality education with maximum availability. For the development of such type of high quality educational aids initially efforts capital and time has to be given only once.

As IT contributes significant towards promoting interactive educational activities, an attempt has been made to review the national policy on ICT in school education in India in the following chapter.

RESEARCH METHODOLOGY

3.5 Secondary Data

3.6 Primary Data

3.7 Questionnaires

3.8 Field visits

3.9 Interview

RESEARCH METHODOLOGY

The main objective of the present study is to study the computer awareness among school going children in Pune city. The necessary data was collected from the secondary and primary sources.

3.5 SECONDARY DATA:-

1. Available data from the reports of various committees publish by the Government department, relating to the computer education (ICT awareness) of the school, students in India and Maharashtra state.
2. Research papers/ Articles on the subject of computer education for school student published abroad and in India in various journals and magazines.
3. Books,Ph.D thesis relating to computer education for school students, publish abroad and in India.

1. PRIMARY DATA :

In order to collect primary data it was necessary to determine the sample and the sample size. The data relating to the schools in Pune district was available with Pune Zilha Parishad, Education division (Secondary) which gives the details of medium wise number of secondary schools in Pune district.

The section of secondary education under Maharashtra state school education department has been functioning through Zilha Parishad of States. All the government approved secondary schools in a district, included in secondary education department are functioning, which include granted, non-granted and permanently without grant(Private schools) having different medium of instructions. These schools include, schools with standard 5th to 10th,5th to 12th, standard 8th to 10th and standard 4th to 12th. The administration of the schools is carried out by secondary school division.

In all these schools, various scheme for the benefit of the society and students are implemented.According to the governments criteria annually various post in these schools are ascertained and accordingly salaries of the staff in grantable schools are finalized.

Educational officers (Secondary Education) are in charge of the wage Board and the secondary education division and their assistance and other employees

cooperate in implementing various schemes for reaching upto the ultimate beneficiaries.

In the present age of information and technology (computer),secondary education division carries out its work with the help of computer. Hence without considering cost, various circulars, government rules and regulation and information about various schemes relating to the secondary education is declared on the website**(http://www.punezp.org/edumadhyamic.html)**. Similarly information about finalized list of employees, provident fund, medical bills etc. is also given on the website.

The information about the secondary school in Pune city.

Period of survey 2010-11

Category	No. of Schools	Percentage
Granted	**205**	**52.69**
Private Schools	**151**	**38.81**
CBSE	**33**	**8.50**
Municipal	**5**	**100**
Total	**440**	**100.00**

In addition there are school affiliated to the central board like Central Board of Secondary Education (CBSE) and Indian Certificate of Secondary Examination (ICSE)in Pune city. In the year 2010-11, there were 21 CBSE schools and 12 ICSE schools. Thus there were 33 Central Board schools in Pune city. Thus there were 356 aided and private schools and 33 Central Board schools and 5 municipal schools having 10th standard. Total no of schools were 440. In order to calculate sample size following formula was used.

Formula for estimating sample size

$$SS = \frac{Z^2*(p)*(1-p)}{C^2}$$

where

Z= Z value (eg. 1.96 for 95% confidence level)

P= Percentage Picking a choice, expressed as decimal (0.5 used for sample size needed)

C= confidence interval, expressed as decimal (eg. 0.15=+/- 15)

$$SS = \frac{(1.96)^2 * 0.5 * (1-0.5)}{(0.15)^2}$$

$$= \frac{(3.8416) * 0.5 * 0.5}{(0.0225)}$$

$$= \frac{3.8416*0.25}{0.0225}$$

$$= 44$$

Correction of finite population

$$SS = \frac{SS}{1 + \frac{ss-1}{Pop}}$$

where

Pop is population

The modified sample size

$$= 44 \Big/ \left(1 + \frac{43}{440}\right)$$

$$= 44$$

When 10 percent sample of 440 considered, we get 44 schools.The stratified convenient sampling method was used for the study as per following stratum.

Aided schools	21
Unaided /Private	15
Central Board schools	03
Municipal schools	05
Total	44

Sample size for parents and students

Formula

$$SS = \frac{Z^2 * (p) * (1-p)}{C^2}$$

Where

Z= Z value (eg. 1.96 for 95% confidence level)

P= Percentage Picking a choice, expressed as decimal (0.05 used for sample size needed)

C= confidence interval, expressed as decimal (eg. 0.05=+/- 5)

$$SS = \frac{(1.96)^2 * 0.5 * (1-0.5)}{(0.15)^2}$$

$$= \frac{(3.8416) * 0.5 * 0.5}{(0.15)^2}$$

= 44

Thus for the purpose of present study a sample size of schools was 44 and 10 students studying in the standard 10th were selected who were willing to respond and their parents were covered. Thus the sample included 44 school,440 students and 440 parents

The technique used for collecting necessary data were-

1. Questionnaires
2. Field Visits
3. Interviews

3.4 QUESTIONNAIRES :-

Three sets of questionnaires were prepared and tested (pilot study) for collecting required data for the present work

Set 1) The first set of questionnaires was prepared for schools for collecting data relating to the recognition of the schools, respondent title , age, years of service, year in which school started computer education, number of computer labs and number of computer for students, sources of obtaining hardware and software, no. of computer teacher, no. of lectures for computer education, qualification and experience of computer teachers, subject learned by the students, attending seminars and computer workshops, training program, teaching methodologies used etc.

Set 2) The second set of questionnaires was prepared after testing for the school students which included questions relating to the sources of help in solving difficulties while using computers, purpose of using computers , use of internet, usefulness of computers and applications, subjects for which were used etc .

Set 3) The third set of questionnaire was finalized after testing for the parents of the students selected for the study which included personal data relating to the age, educational qualification, annual income, occupation and the purpose for which computers were used by them, their expectation about computer education and sources of learning computers by their children etc.

1. Field visits :

Various schools selected for study were visited in order to get additional information about available infrastructure, computers labs, and environment under which teaching computer was conducted in various schools.

2. Interview

In order to know about the policies, strategies, budgetary allocation and goals relating to the computer awareness among secondary school students, interviews were conducted with the school authorities, senior teacher, administrative staff, while facing problem in implementing these policies and strategies etc.The data thus collected has been analyzed and interpreted in order to arrive at meaning full

conclusion and suggestion are given for making computer awareness among school going children more effective

CHAPTER III

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CHAPTER IV

ROLE OF TEACHERS AND PARENTS

1. Introduction
2. Responsibilities of Teacher
3. Teaching Approaches
4. Training Teachers for changing scenario
5. Role of ICT in Teacher Education
6. Role of Parents

4.1 INTRODUCTION

Teacher is said to be a maker of man. He is the foundation of all education . Any attempt of national reconstruction is not possible without active participation of other teacher.

A nation is built by its citizens and citizens are moulded by teachers[1].Teacher is said to be a maker of nation.

The education Commission has stated that "the quality and competence and character of teachers to be the most significant factor influencing the quality of education and its contribution to national development.

Hindu civilization counsiders teacher as the true representative of the God. Teacher or Guru is considered as representative of Brahma, Vishnu and Shiva and is responsible for creating and sustaining knowledge and destroying the ignorance.

The role of teacher is not limited to the classroom teaching, but it extends to building up of human, vigorous nation and society at large.

At present, any individual can be teacher if he satisfies the necessary conditions stated in government rules. However "the real role of a teacher is an architect of the nation. It is implies that, the best, intelligent, sagacious proficient members of the society should be enabled to qualify for this noble profession."[2]

Development of a nation depends upon the contribution of the teachers. A teacher impacts knowledge of his students, in the classroom. He guides each student to develop their potentialities. These students, later on become doctors , engineers, managers, lawyers, teachers etc. professionals. Thus teaching is a mother profession giving birth to several other professionas.[3]

The future of a nation is built through the process of education, hence talented, enthusiastic and learned teachers are necessary for the progress of a society and nation. "The world of tomorrow will be born from the schools today." Thus the teacher contributes significantly towards building a strong nation.[4]

According to Singh and Raju (2006) a teacher is a person who is directly engaged in instructing a group of students.[5]

A teacher is a person known as a guide or helper in the process of learning, in many societies, academic subjects are given priority, but teachers' duties include

instruction in craftsman ship or vocational training, spirituality civics in community roles or life skills.

Teachers need to understand a subject enough to teach its essence to students. The goal is to develop a sound knowledge base on which the students will be able to build as they will be exposed to different life experiences. The passing of knowledge from generation to generation helps students to grow as an ideal members of the society.

Good teachers can translate information, provide good judgment, experience and wisdom in to relevant knowledge, that a student can easily understand, assimilate , retain and also pass on to others.

Various studies conducted in US concluded, that "the quality of teachers has been the single most important factor affecting performance of the students and that the countries which score highly on international tests, have multiple policies is place to ensure that the teachers they employ are as effective as possible."[6]

The National Knowledge Commission has observed that, teachers are the single most important element of the school system.

A teacher is always a learner, it is an unending process. A teacher can improves the academic skills by gaining mastery of over the syllabi and related areas, such as

1. Understanding new ideas in order to become aware of current issues.
2. Critically evaluate problems.
3. Developing leadership qualities.
4. Having interest in continuously updating and furthering knowledge.

A teacher should adopt professional skills, to have the ability to demonstrate intellectual capacities and competent as an effective and efficient teacher.

4.2 RESPONSIBILITIES OF TEACHER

A teacher has to fulfill various responsibilities, which may be summarized as follows.

1. A teacher should be expert in his subject.
2. He should be enthusiastic about teaching students.
3. Encourage co-curricular activities like debate, quiz, writing etc.
4. Encourage initiatives and creativity among the students.
5. Train the students in the art of answering questions satisfactorily.
6. He should be available to the students even outside class hours.
7. Show concern for student.
8. Identify weak students and provide remedial teaching techniques.
9. He should have good communication skill.
10. He should be expert in teaching so that each and every student in the class understands clearly the subject taught.
11. He should have ability to explain difficult concepts in simple terns.
12. He should behave like a friend, philosopher and guide.
13. His behaviour should be such that the students will remember him during their lives.
14. He should frame such questions that students research and learn by themselves without any help, is promote self organized learning.

CHANGING ROLE OF TEACHERS

As the needs of society change, the role of teacher also changes. The National curriculum Framework 2005 has recommended a paradigm shift from role memory to learning by understanding. Hence, curriculum should help students to develop their own thinking and ideas through experience, action and reflection. School should facilitate the process of knowledge construction and help them to become independent thinkers capable to solving their everyday problems.[1] Current school improvement programmes are embedded in the philosophy of constructivism.[2] The constructivist approach to learning is based on some common assumptions of constructivism.[3]

1. Complex challenging learning environment and authentic tasks.
2. Learning through social negotiation and shared responsibility.
3. Multiple representations of the context.
4. Understanding that ,knowledge is constructed
5. Students-centered, instruction.

According to Collins (1991), students benefit from constructivist approach such as experiential learning becausethey learn to apply knowledge.

1. The learning environment fosters invention and creativity.
2. They see the implications of knowledge and
3. They learn that knowledge is organized for appropriate used in context.

A basic premise of constructivism is that individuals live in their own world of personal and subjective experiences. Hence the role of teacher is being transformed from the imparter of knowledge to facilitator of conditions which will help the learner in the process of knowledge construction.[4]

Thus the emphasis changes from the instructor and the content to the learner. This dramatic change of role implies that a facilitator needs to display an entirely different set of skills than merely a teacher. A teacher feels whereas a facilitator asks, a teacher supports from the front while a facilitator supports from the back, a teacher gives answers according to a set curriculum, a facilitator provides guidelines and creates the environment for the learner arrive at his own conclusions. A teacher mostly gives a monologues, a facilitator is in continuous dialogue with the learners.[5]

According to Sharma a teacher should:

1. Be a leader of democratic learning group.
2. Accept students autonomy and initiative
3. Tailor teaching strategies to permit students responses.
4. Encourage students to analyse,interpret and predict.
5. Ask open ended questions
6. Use raw data as primary sources and interactive material.

To this list it may be added that a teacher should try to identify potential among the students and provide environment to develop it which will contribute towards development this personality.

TEACHING –

Teaching is a complex art and it depends on method of teaching, curricula, infrastructure, use of technology etc. it is a demanding job that requires indepth knowledge of subject content and age specific pedagogy. It also calls for various skills such as leadership, creativity, administration, patience etc. Teachers are required to develop goals for classroom instruction, so as to develop lesson plans which carrying out effective classroom management. They should monitor the special needs of every child and promote educational advancement and knowledge.

Good teachers are models of social and moral leadership which influences their students and contributes towards generating stimulus for all round growth of a country. A teacher has to create a suitable learning environment and develop positive attitude towards teaching and aspire for good environment.

As Kothari Commission (1964-66) observed,"of all the factors which influence quality of education, the quality and competence and character of the teachers are the most significant." The quality of education depends upon various factors like teaching of which the learner is exposed, the educational facilities, environment available in the classrooms and the temperament and approach of a learner towards study. Hence the teacher has to acquire, all the skills. Skills which are essential for his teaching profession esp. soft skills, which refers to personality traits such as communication skill, facility with language, personal habits, friendliness, optimism etc.

It is said that "as is the teacher, so is the child". Zakir Hussen asserts that the teacher is indeed architect of our future. Sir John Adam views the teacher as the seal maker of man. Vivekanand stated that the true teacher is he, who immediately comes down to the level of the student, transfer his soul to the student's soul and sees through and understands through his mind. Such a teacher can teach effectively. Tagor observed that it is not the subject of study, organization and equipment in the school, but he living contact between the mind of the teacher and mind of the taught, which is important Gandhiji have advocated inspirational methods of teaching and has given dignified and admirable position to the teacher.

The task of teaching, now, has been a real challenge as we are living in a fast changing worlds. The youths also have to face various challenges especially competition in every aspect of life. So they have to be prepared to face these emerging challenges in building their career.

4.3 TEACHING APPROACHES.

Experts have suggested various approaches for effective teaching by the teacher. Some of these are as follows:

1. **Learner Centered Approach**

In the fast changing world, the role of the teacher and student in the classroom has to be considered. The learner is at the centre and focus is not on encouraging teachers activities but on the learned activities where the teacher has to play a role of a person who diagnoses i.e. he has to think why a particular student goes wrong, what is his knowledge base. Thus the teacher has to diagnose perfectly and correctly the things skillfully without discouraging disappointing and without curbing the spirit of the student. In this content, negotiation plays a vital role in uniting teacher and students.

B) Communication based Approach

Teaching is not a one way communication activity, where a teacher delivers a speech and learners are mute listeners. Under this approach students generally get bored. The best way is to promote interaction in the classroom by away of creating a variety of situations between learner and learner(pair work),learner and teacher (equity based), learner and material (thinking) group work. Such methods help students to learn and remember lively.

1. **Skill-based Approach**

According to this approach listening, reading and writing skills are given priority. These skills are not to be taught but have to be acquired by vigorous practices. Teachers have to keep classrooms live and allow the students to struggle with the subjects to find out meaning and search the true sense of the subject. This approach emphasizes, making students independent learners and learners are kept engaged in the activities required for learning the subject. Teacher is expected to watch listen, ask questions to know about how much they have learned. Teachers have to take

place at the back benches, allowing students to go ahead. The mistakes of the students are to be taken as milestones in learning. The students are not taken for granted as clear states but they come with their previous knowledge. So the duty of the teachers to make them to use their knowledge through interaction and activities with skilful corrective measures.

2. **Constructivist Approach**

Constructivist means construction of knowledge in the sense that learners actively construct their knowledge on the basis of materials presented to them (experience) [6].The mind can put together these ideas it has and make new complex ones.[7]Constructivism is a theory about knowledge and learning .The term constructivism has become popular in recent years. The term refers to the idea that "individuals, through their interaction with the environment, construct their own knowledge and meaning.[8]The constructivist revolution offers a new vision of the learner as an active sense maker and suggests new methods of instruction. It facilitates presentations of materials in a constructivist way and engage, students in an active explorative learning."The new approach allows the learners to have more control over their own learning, to think analytically and critically, and to work collaboratively".[9]This approach is an effort at educational reform and a revolutionary vision of instructional strategies.

The National curriculum Framework (2005) recommended that curriculum should help learners to be constructors of knowledge and emphasized the active role of teachers in relation to the process knowledge construction. Education is a process of acquiring information and knowledge. Hence learning should emphasis the development of meaning and understanding students should be able to acquire experience and learn by themselves and apply what they learn to various unpredictable situations that they might face over the course of their wordly lives.

4.4 TRAINING TEACHERS FOR CHARGING SCENARIO

It is observed that, teachers nearly utilize 25-30% of their potential while imparting education to students, still they are retained on their jobs. If the same teachers are properly trained and well equipped with their knowledge, skills and teaching techniques they will be able to work 80% to 90% of their capabilities. For

improving the performance of teachers, concept of behavioural sciences such as, motivation, career planning and development etc. are used. Training and development of can be one of the means used to improved quality of education through the efficient and effective use of learning techniques. When teachers are trained and equipped, with appropriate skills, attitudes and knowledge required for effective teaching, they can fulfill changing needs of educational areas.

Constructivism is a descriptive theory of learning and not a formula for teaching. The basic principles followed. While constructivist teacher preparation programme were as follows:

1. Establishing an inclusive democratic environment of trust and mutual respect.
2. Utilizing students background knowledge and experience.
3. Providing a curriculum directed as content pedagogical knowledge in the context of doing "real work".
4. Developing a climate of sharing to form a community of learner.
5. Producing an understanding that all knowledge is partial and positional.
6. Negotiating an assessment protocol that rewards an intrinsic motivation and is both, performance based and authentic.
7. Creating an educational program that is informational and transformational by exposing and reflecting on beliefs.
8. Shaping a climate, where questions reflecting on experience become a professional way of life.[10]

Teachers educators have to take a lead for practicing constructivism, by developing constructivist and inclusive environment in their own classrooms, so as to become a role model for future teachers. Thus the ultimate responsibility of training teachers in the area of constructivism lies with the teacher educated. Constructivist teacher education includes two major traditions, one is the developmental and the second one is social reconstruction. [11]

The developmental tradition emphasizes teaching students how to teach in a constructivist manner by way of focusing on direct instructions in theory and practice, without complimentary opportunities for inquiry, discovery or self

examination. Thus this approach is prescriptive in nature. The teacher education concentrate on teaching that is essentially antithetical to the approach, students are intended to employ in their classrooms.[12]

Under social reconstruction tradition, attempts are made to help teacher's education students in constructing their own prior knowledge and attitudes, study how these understandings have been evolved, explore the effects they have on actions and behavior and consider alternative conceptions and premises that are more useful to put in the process of teaching. It includes critical analysis and structured reflections on the knowledge of formal course and every day practical experience.

According to Richardson (1997) there are two main factors which affect the approach taken by teachers and teacher education in forming constructivist settings, of which one is the extent to which the social is acknowledged.

As a critical factor is learning and second, individual cognitive development and the specific content, subject matter or discipline. Some subjects like mathematics are more bounded than others by rules, formula and procedures. They are regarded by teachers as producing problems and tasks to which these are correct answers. Individual interpretations and construction of ideas and concepts are less likely to be encouraged by teachers than in case of other subjects such as literature and writing.[13]

4.5 ROLE OF ICT IN TEACHER EDUCATION.

Teacher is described as the architect of the nation, as future of the nation lies in hands of teacher. It is the education which makes one a teacher. Teacher education is provided by way of systematic operations of various agencies involved in it.Educational Commissions and a number of expert committees have discussed the aims of teacher education in India, but most of the Universities and Institutions of higher learning find it difficult to live up to these great expectations. They have remained as bodies for conducting stereotyped examinations and degree awarding centers. The quality and reliability of such examinations and degrees is

sometimes questionable. "One of the main reasons is the inadequate academic , professional and pedagogic preparation and insufficient level of knowledge and the skills of the faculty." In addition traditional methods of teaching, outdated knowledge and information, lack of skills, attitude of aptitude and authenticity of their sources of knowledge are some of the issues. On account of information and knowledge explosion, fast changing ICT, the teachers sometimes find it difficult to cope with the new intellectual challenges, generated by the changes in global and local environments. Hence, it has become necessary for the teachers to acquire new knowledge and use authentic and reliable information.

In the context of present socio-economic environment, teachers have to help their students in the process of learning, growing in future, developing study skills, conducting fundamental research, examining evaluating and assessing information and developing a new structure of knowledge, that enable them to face challenges and develop themselves in future."All these expectations may be met only through need-based, goal oriented and meaningful in house discussion, conferences, symposia, workshops, refresher and orientation courses, crash courses, capsule courses and subject-based courses, inter disciplinary and holistic approaches to education and quality research and by enriching the existing libraries and making use of the user-friendly ICT with contextually appropriate and firm pedagogical scaffolding ."The teacher educators as well as teachers have to work hard continuously towards achieving this goal.

A teacher plays a significant role in classroom teaching, learning processes as well as social engineering also. Perspective Empowered teachers the highly respected in the society. This perspective is in academic, intellectual, social, physical and national spheres.

A National Policy on ICT in School education has focus on leveraging technology, more them connecting schools and having a few PCS in Schools. It recognizes that ICT can play an important role in all aspects of school education such as contest distribution, knowledge sharing, digital delivery of educational contest, capacity building , teacher training using interactive tools and applications for improving basic skills , in students, helping students with special needs, promoting distance educating, creating vocational courses and management of school and ecosystems."

These are many benefits of using ICT in imparting classroom teaching. It helps in improving efficiency in teaching and learning, provides means to develop personality, increases motivation due to active participation of students, provides opportunity for self paced learning, enables to have easy access to information, enable, better learning retention and performance of the students. It provides multisensory learning experience. The main areas in which IT has been employed in educational setups are management, administration, and academic operation, education delivery, digitization of content, capacity building research & collaboration resulting in knowledge sharing.

Teachers use ICT for planning and preparing lessons efficiently, use interdisciplinary approach, guiding students and developing effective teaching tools and modules.

Technical tools used in teaching include computer assisted instructions (CAI), complete assisted learning (CAL), Video–Assisted instructions (VAI), LCD projectors, power point presentation, smart Boards, You Tube, slideshare,e-mail,blogs,CCTV,etc.

Takawade (2003) has stated about IT driven educationespecially multimedia programs and packages "are changing the methods of content generation, content stograge,content packaging and content delivery and hence offer a new paradign of education.[15]

ICT is the content of 21st century in the context of teacher education.It must fullfill following objectives-

1. It provides excitement to the learners eye,ear and head.
2. ICT satisfies needs of teachers by providing items and pacakages of higher standard and of greater interest.
3. It helps in transforming definition of literarcy ,learning and knowledge by way of including multimedia digitized literarcy
4. Multimedia provides a king of centrol over the learning environment to the student,teachers to enable them to have experience learning from their failures and practices.
5. Unlike books, it is interactive in nature, generates motivation and interest among the learners which helps in meeting individual needs effectively

6. It develops ability of self learning and interacting individually, as the learners gets vast experiences effectively and efficiently

The main obstacle of teacher education can be summarised as follows-

1. Lack of physical facilities
2. Lack of financial resources
3. Lack of support and services
4. Rigid framework
5. Storage of expert staff
6. Lack of research orientation
7. Crisis of interpersonal relations
8. Decision making by external agencies
9. Lacking computers and time for the use of computers by the learners
10. Lack of access to internet

These obstacles need to be removed to make teacher education more efficient and effective

It may be concluded that "the education system empowered by ICT driven infrastructure can have a great opportunity to come upt to the centre stage and ensure academic excellence, quality instruction and leadership in a knowledge based society ".ICT has revolutionised the whole concept of education,learning and research by way oof providing new opportunities and challenges in creation and dissemination of information by way of web TV's and web based education independent of time, pace and place.It is a challenging task to strengthen ICT in education because majority of the institutions are not well equipped in the terms of digitized and high tech infrastructure.

4.6 ROLE OF PARENTS

A parent is primary helper, monitor coordinator, observes, record keeper and decision maker for the child. The most important duty of parents is to look after their children and to take interest in their welfare and progress."Successful parenting entails both effective components in terms of commitment, empathy and

positive regard for children." [16]. Parenting begins during or before pregnancy and continues through a balance of lifespan. Parenthood plays a crucial role in the process of development of a child and also to the development of the society through long term investment in children.

Parents are first and lifelong teachers and guide of every child. The main task of parents in each generation is to prepare children of the next generation for the physical,social, economic and psychological situations in which the children have to survive and grow.

Parental involvement is defined as a "positive interaction between a parent and their child." Parented involvement includes a wide range of activities but generally refers to parents and family members use and investment of resources in their children's schooling Such investments take place in or outside of school, with an intention to improve learning of children. At home parented involvement includes such activities as helping in doing homework, reading with children, discussion about developments in school etc. Involvement at school includes parents volunteering in the classroom, attending plays, sports and other events organize by school etc. Involvement at school includes parents volunteering in the classroom, attending plays, sports and other events organized by schools. It also includes school based involvement, focused on such activities as driving on a field trip, staffing a concession booth at school games, coming to school for scheduled conferences or informal conversations, volunteering at school and serving on a parent- teacher advisory board .[17]

The foundation of a child's future is laid in the family. In later life it becomes difficult to demolish or reconstruct these foundations. The infant begins his life under the fostering affection and care of his parents and other near and dear ones who are closely associated with his family. As" he grows, he receives the first lessons of life in his family and tries to imbibe habits, ideals and patterns of behavior of family members". Thus the family has a deep influence on him. The various activities of family and need for intercommunication make the child to equip itself with a working of vocabulary. He receives his first lesson of speech in his family. Extensive research activities conclude that the Home environment is the most important influence on academic performance of a child. Parental or

family involvement is beneficial to parents, teachers, students and the community at large.

"The most common learning modalities are kinesthetic learning based on hands on work and engaging activities, visual learning based on observation and seeing what is being learned and auditory learning based on listening to instructions. The brain develops according to the quality and quantity of motivation the children receive from their parents." Many of the values later transmitted by the school are first inculcated in the child at home. So home environment influences the study habits of the students. The good study habits depend upon the responsibilities of the parents.

Parent involvement includes parent child interactions that communicate positive attitudes about school and importance of education to the child. "Parental involvement affects student achievement because these interactions affect students' motivation, their sense of competence and the belief that they have control over success in school". Parents can be involved by checking homework, communicating with the teacher and attending school functions. "When schools and families work together to support learning, every one benefits, students do better in school and in life, parents become empowered, teachers moral improves, schools get better and communities grow stronger (NCIPIE 2002).

Parents should take care to raise a well behaved child who is willing to learn , parents should provide an-encouraging home atmosphere so that child's commitment to learn will increase Epstein (2001) has concluded that there are six types of parent involvements, which are parenting, communicating, volunteering, learning at home, decision making and community involvement. Psychologists and educators agree on the importance of early years in developing habits that are preserved by the child. A child should come to school with qualities of character that are valued by his family, school and community. "These qualities include honesty, respect caring about others, following directions of teacher and school rules, taking responsibility and making good moral choices." The main role of parents is to provide care, love and training to their children." "The parents' involvement is absolutely essential to a child's eventual success ."

The parental influence is the most important factor for any achieving child. A child develops according to the quality and quantity of the stimuli received by the child from his family members. The positive outlook of every member of the family and favorable environment molds child to prepare to study and have a good character. Most of the parents take care of physical needs of the child, but at the same time they should take care about their children's intellectual, emotional and spiritual development. Uneducated and poor parents need to be trained by the schools and the government.

CHAPTER IV

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CHAPTER V

THE NATIONAL POLICY ON INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN SCHOOL EDUCATION.

1. Introduction
2. Government Schemes of Computer Education
3. Vision of Policy
4. Mission of the Policy
5. Scope of ICT
6. Information and Communication Technologies in Schools
7. ICT literacy and competency Enhancement
8. Implementing Strategies
9. ICT infrastructure
10. Automated and ICT managed school processes
11. School Management Information System (School MIS)
12. Implementing and managing the policy
13. Computer Education Initiatives In India

5.1 INTRODUCTION:

India realized the role of information and communication technology(ICT) in education in 1984-1985 when the computer literacy and studies in schools (CLASS) was introduced on pilot basis, the project was later on adopted as a centrally sponsored scheme during the seventh Five Year Plan (1993-1998).The scheme was extended in eighth plan to provide financial grants to institutions covered earlier and to include new government aided secondary and senior secondary school.The financial assistance included annual maintenance grant and for purchasing equipments for new school, during this period 2598 schools were covered.

In july-1998, a national task forcewas constituted on information technology and software development (IT task force).To make recommendations on introduction of IT in education sector including school.The report recommended the provision of computer system to all educational institutions upto higher secondary schools by suitable investments (about 2-3 %) of total budget during the next five years.On the basis of the recommendation of task force and the advice of the planning commission, in year 2001-2002, a revised class scheme was introduced by making the provision of Rs. 845 million.

Based on the feedback submitted by the government and the evaluation study conducted by an independent agency the CLASS scheme was modified and greater flexibility was introduced. The new scheme was called "ICT@Schhols", this scheme was comprehensive and systematic initiative to open new opportunities of learning to the school students. The scheme aimed at attaining partnership of states, union territories, and other organization "in a mutual endeavor to bridge the heterogeneous proliferation of ICT across different socio/economic and geographic segments in the country." This partnership was to cover the financial initiative encouraging development of long term computer education plans setting up of smart schools by KVS/NVS in states as technology demonstrations and for providing support to the states efforts in these areas.

India is a federal country and the subject of education is in the concurrent list of the constitution which make both the union of states responsible for it.

5.2 GOVERNMENT SCHEMES OF COMPUTER EDUCATION.

The government of India, during fourth Five Year Plan, introduced the first formal educational scheme in 1972. Radio has been used in India since last several year large numbers of learners.

In 1986 the national policy on education was announced and it was modified in 1992, so as to stress employing educational technology to improve the quality of education. The statement led to two major centrally sponsored schemes, Educational Technology (ET) and Computer Literacy and Studies in Schools (CLASS) which were more comprehensive centrally sponsored schemes. These schemes led to Information and Communication Technology @ Schools in 2004. Educational technology scheme had an important place in another scheme on upgradation of science education. The national curriculum framework 2005 also emphasized the role of Information and Communication Technology(ICT) in school education. The use of ICT for quality improvement was also included in government of India flagship programme on education, namely Sarva Shiksha Abhiyaan(SSA). The ICT was also included comprehensively in the norm of schooling recommended by Central Advisory Board of Education(CABE) in its report on universal secondary education in 2005 on account of conversions of technologies, it has become necessary to take a comprehensive view about various possible information and communication technologies for improving quality of school education in India.

5.3 VISION OF POLICY:

"The ICT policy in school education aims at preparing teachers and youth to participate creatively in the establishmentand growth of knowledge society leading to all round socio-economic development of the national and global competitiveness."

5.4 MISSION OF THE POLICY:

"To devise, catalyse, support and sustain ICT and ICT enabled activities and processes in order to improve access, quality and efficiency in the school system."

Policy Goals:

The ICT policy in school education will try to create:

1. An environment to develop an ICT knowledgeable community.

2. An ICT literate teacher and student community who can deploy,utilize,benefit from ICT and contribute to nation building.
3. An environment of collaboration, cooperation and sharing, conductive to the creation of a demand for optional utilization of and optimum returns on the potential of ICT in education.

1. To improve universal, equitable, open and free access to state of art ICT and ICT enabled tools and resources to all students and teachers.
2. Development of local and localized quality content and enable students and teachers to partner in the development and critical use of shared digital resources.
3. To develop professional networks of teachers resources persons and schools to catalyze and support resources sharing ,upgradation and continuing education of teacher, guidance, counseling and academic support to students and resources sharing, management and networking of school managers and administrators.
4. Research, evaluation and experimentation in ICT tools and ICT-enabled practices in order to inform, guide and critically utilize the potential of ICT in school education.
5. Motivate and enable wider participation of all sections of society in strengthening the school education process through appropriate utilization of ICT

5.5 SCOPE OF ICT:

" Information and Communication Technologies are defined as all devices, tools, content, resources, forums and services, digital and those that can be converted into or delivered through digital forms, which can be deployed for realizing the goals of teaching learning enhancing access to and reach of resources , building of capacities , as well as management of the educational system."These will include hardware devices connected to computers, software applications, interactive digital content, internet and other satellite communication devices, radio and television services, web-based content repositories, interactive forums, learning management systems and management information systems." "These also include processes for digitization, deployment and management of content, development and deployment of platforms

and processes for capacity development and creation of forums for interaction and exchange."

5.6 INFORMATION AND COMMUNICATION TECHNOLOGIES IN SCHOOLS:

ICTs have helped in convergence of a wide range of technology based and technology mediated resources for pre purpose of learning. Hence it has become opposite to employ ICT as an omnibus support system for education.

ICT are not only delivery channels but medium providing opportunities for collaboration, sharing and peer learning and constructing digits learning resources at the various levels in the educational system. The process can result into extensive use of digital learning resources in the educational system. This will provide critical requirements of an educational system, namely reducing isolation by way of connecting teachers, schools, teacher educators and creating digital resources on very large scale in different languages.

5.7 ICT LITERACY AND COMPETENCY ENHANCEMENT:-

The policy defines ICT Literacy in terms of levels competency, based on the stage of schooling at which a student or teacher introduced to ICT. These stages are suggestive and their adoption depends on local conditions. These levels need to be revised periodically to suit the changes in the technology.

Stage 1 Basic:

This stage covers the basics of computers and includes operating a computer, storing, retrieving and managing data.Use of computer for data processing tasks, connect, disconnect and troubleshoot basic storage, input, output devices. It also includes connectivity to the internet, using e-mail, web surfing, using search engines, keeping computer updated ,virus free, operating and managing content from external devices like sound, recorders, digital cameras, scanners etc. Thus various public educational software applications of different subjects should be used by teachers and students after learning to use them. These softwares should form the part of basic component. This exercise has been successfully used in the kerala's educational system. In loss of science, Kalzium, Kstars, Stellarium, PhetKTechLab are being used. For teaching

mathematics Geogebra, Tux Math and K Bruch are useful. For English K Hangman, K anagram, K letters are used other software tools can also be used whenever required to increased competency and ICT Literacy.

Stage 2 Advanced:-

This stage includes "Creating and managing content using a variety of software applications and digital devices, using websites and search engines to locate, retrieve and manage content, tools and resources, install, uninstall and troubleshoot simple software applications etc."

5.8 IMPLEMENTING STRATEGIES:-

The ICT literacy programme was implemented in all secondary schools in the states including government and private schools in the states including government and private schools during the period of Eleventh Five Year Plan period. Under the programme states were to develop the curriculum for ICT literacy only with course materials according to the stages discussed above in order to achieve uniformity.

These were to be in the form of self instructional materials soas to enable the teachers and students to process them by themselves. This programme was expected to provide a set of generic skills along with conceptual knowledge.

The boards of secondary education were to develop a scheme for evaluation. ICT was to be an additional subject, with separate listing of marks / grades with the award of a certificate of proficiency. The ICT literacy programme was to be extended to the upper primary stage by the end of the twelveth Five year Plan. The states having appropriate qualifications were to be engaged in various schools. These teachers were to function as the ICT coordinators of the schools. As the necessary infrastructure will develop qualified technical assistants were to be appointed.

A curriculum framework for ICT in Education(CFICT) was to be developed at national level so as to provide the basis for states to develop their curriculum.Regarding the scope of ICT enabled teaching and learning process , it was to include a variety of techniques, tools, content and resources aiming at improving the quality and efficiency of the teaching-learning process, "ranging from projecting

media to support a lesson , to multimedia self learning modules, to stimulations to virtual learning environments, there are various options available to the teacher to utilize various modes ICT tools for effective pedagogy including digital resource creation." Thus attempts were to be made to use ICT tools to transform usual classrooms into ICT-Enabled classrooms.

All teachers having basic competency to handle these resources were to be encouraged to adopt ICT enabled practices in teaching learning process. In order to serve this purpose appropriate software applications, digital content, tools and resources were to be made available. Through proposed digital repositories. Teachers were to participate in selection and critical evaluation of digital content and resources. They were to be encouraged to develop their own digital resources, sharing them with colleagues through the digital repositories. The schools equipped with EDUSAT terminals, DTH and other media devices relevant activities were to be planned and incorporated into the time schedule of the school initially teachers were to use computer lab for the purpose of teaching learning process and later on to develop more classrooms progressively by equipping them with appropriate ICTs so as to make way for ICT enabled classes.

States were to initiate to prepare courses in different aspects of the ICT for higher stage of the secondary stage, taking into consideration the requirements of the students in various streams. Such course were to be modular in design to enable students to select appropriate software application based on current needs of higher education, as well as job prospects. These courses were to be frequently revised to keep pace with emerging trends in ICT. To teach these students a post graduate teacher with appropriate qualification was to be appointed. An ICT lab attendant on technical assistant with appropriate qualification was to be appointed to manage the ICT/ multimedia Resource Lab.

5.9 ICT INFRASTRUCTURE:-

ICT Infrastructure was classified into core ICT Infrastructure and enabling Infrastructure core ICT infrastructure included hardware, network and connectivity and software.

1) Hardware:

The states were to establish state of the art, appropriate, cost effective and adequate ICT and other enabling infrastructure in all secondary schools taking into consideration the size of the school, needs of the ICT programme and time sharing possibilities states were to define an optimum ICT infrastructure in each school. Two students were to use one computer at a given time, and at least one printer, one scanner, projector, digital camera, auto recorders and such other devices were to be the part of infrastructure.

Each school was to be equipped with at least one computer laboratory with at least ten networked computer to start with. Each laboratory was to has a maximum of 20 computers so as to accommodate 40 students at a time. A student computer ratio of minimum 10:1 was to be progressively achieved in all schools. Exclusive laboratories with appropriate hardware and software was to be provided for higher secondary classes and at least one classroom was to be equipped with appropriate visual facilities to support an ICT enabled teaching learning. Appropriate hardware for satellite terminal was also to be proved to selected schools in a progressive manner. Computer were also to be provided at the library, teacher's common room and head office of the school. To achieve the objective of automated school management and professional development activities.

ICT enabled education was to be extended and classroom practices were to be developed through the use of digital devices such as still and video cameras, music and audio devices, digital microscope and telescope, digital probes for investigation of various physical parameters. States were to make appropriate choices and increase the use of such devices in the classroom. Outsourcing of hardware maintenance was considered desirable but core curricular and pedagogical processes were not to be outsourced. The ICTs were to be used by teachers to teach regular subject also.

2) Network And Connectivity:

All the computers in a school were to be the part of a single local network so that optimum sharing of resources can be achieved. Internet connections were to be provided to the laboratory, teacher's common room and the head office of the school. Each school was to be served with broadband connectivity of at least 2 Mbps

capacity. The number of computers with internet connectivity was to be governed by the available bandwidth, to ensure adequate speed. A mechanism to have offline access to internet content was also to be set. Teachers and students were to be educated for making safe use of internet. Firewall and other security measures were to be implemented to block in appropriate sites and to guard the school network against misuse of the ICT facilities. Appropriate guidelines for network connectivity were also to be developed.

3) Software:

A wide variety of software applications and tools are necessary for meeting the demands of broadband ICT literacy and ICT enabled teaching learning programme.

In order to increase the range of skills and conceptual knowledge of the teachers and students, graphics and animation, desktop publishing, web publishing, databases and programming tools were to be used. A judicious mix of software was to be introduced in schools to keep total cost of ownership(TCO) at the minimum level.

"Creation and widespread dissemination of software compilations, including specialized software for different subjects, simulations, virtual laboratories, modeling and problem solving applicatios" were to be encouraged, freeware, free and open source software applications were to be preferred.

4) Enabling Infrastructure:

In order to maintain the ICT facility efficiently the enabling infrastructure was to be defined, established and maintained. Regular and regulated supply of electricity, appropriate electrical fixures, adequate power backup and support, alternative source of energy was to be ensured. Teacher and students were to be trained in the safe use of electrical outlets and fittings. Physical facilities like large room, proper lightening and ventilation, durable furniture suitable for optimizing space and long hours of working were to be established. Adequate safety precautions and rules for use were to be established. Portable fire distinguishes was to be placed in each laboratory and teachers and students were to be trained in using it. Even fire drill was to be implemented. All equipments and resources were to be insured against theft and damage.

5) Digital Resources:

The state was to provide universal equitable open and free access to ICT and ICT enabled tools and resources to all students and teachers. India has diversity of educational linguistics and social conditions; it calls for a wide variety of digital content and resources for different subjects, grade levels and languages. The states were to maintain and share e-content as per open standards which are free of royalty, non commercial and maintained publically. Sharing of digital content and resources require the development of teachers who were to function as self help groups. "Providing peer support, showcasing best practices and exchange of knowledge how". Applications for developing content and simulations in various subjects were to be encouraged to facilitate sharing of tools, code and content, especially for easy translation into different languages and for its wide use. Digital content development was to take place in phases. Initially difficult to teach and understand concepts were to be taught, later on developing of content for all concepts and finally more sophisticated interactive ICT tools for teaching and learning of virtual laboratories. The e-content was to be in the form of e-books, animations, lessons, exercise, interactive games, models and simulation videos, presentation slides, plain text materials graphics or any combination of these.

The proposed web based digital repositories were to host a variety of digital content suitable to the needs of different levels of students and teachers. Raw content resources such as photographs, video, audio and animation were to be remodeled to develop multimedia learning objects.

Teachers and students were to be encouraged to develop e-content and a collaborative way. "Text books, teachers/students guide, question banks, laboratory manuals, problem sets, activities, notes etc and other print based learning resources available in public domain" were to be digitized and deployed on national and state level web based digital repositories. Educational standards and instructional designs for a variety of digital content including interactive multimedia materials and learning objects.

Widespread sharing and dissemination of digital content was expected to promote infusion of ICT into classroom practice. Suitable open standards for inter-operability, web based sharing and appropriate norms for free access was to be defined to increase use of digital content and resources.

The school library was to search, collate and categorize digital resources and make them available to the teachers and students. The school library was to be digitized in cataloging and library automation was to be introduced for facilitating access to the digital resources. Thus an automated library with internet access was to catalyze the use of digital resources in all classes.

Capacity Building:

Capacity building of in-service teachers has been the key to the widespread infusion of ICT enabled practices in schools. A phased out program of capacity building was to be planned. These teachers were to be provided Induction Training and Refresher Courses. The Induction trainings were to be imported by the Regional Institute of Education , National Councils of Educational Research and Training (NCERT), State Councils of Educational Research and Training (SCERT) or such other institutes of the central and state governments, to be completed before the commencement of the academic year. The refresher trainings were to be carried out every year to enable the teachers to share, learn and keep upto date with the latest trends in ICT based teaching learning processes. After completion of induction training teacher's evaluation was to take place to ensure that the minimum competency has been achieved.

Regarding capacity building through pre service teacher education, teacher education were to be suitably trained and oriented to use ICT in their pre service teacher training programs. National Council for Teacher Education (NCTE) has laid down guideline about availability of ICT infrastructure in each such a training institute. NCTE was to prescribe appropriate curriculum in ICT to be revised periodically, for such teachers.
Capacity building of heads of schools was also considered as it plays a crucial role in establishment and optimal utilization o ICT and ICT enabled education practices in schools. All such heads of schools were to undergo orientation in ICT and ICT enabled education training programs. School heads were to be trained in processes leading to automation of administration, management and monitoring of the school system and will play proactive role in the implementation of School Education Management Information System (SEMIS).

ICT was to be used to achieve the goals of inclusive education in schools. ICT software and tools to facilitate access to persons with disabilities like screen readers,

Braille printers etc. were to be part of ICT infrastructure, in schools, similarly ICT was also to be used for open and distance learning.

5.10 AUTOMATED AND ICT MANAGED SCHOOL PROCESSES:

States were to adopt "An e-governance and automated school administration program for school, build capacities for its implementation and deploy school based management information systems (MIS). These MIS were to be integrated with the proposed state wide web based School Education Management Information System."

A school wide local area network enables automation of various processes. For example, library automation, locally cashed offline access to internet resources, offline automation, maintenance of records, student tracking, resource planning etc. As the existing ICT infrastructure will be used. It will result in increasing efficiencies, save time and cost thus the school wide area network will be useful for promoting this automation.

At the system level the policy aims at creating a web enabled networked environment, in which schools, teachers, students, school staff and school managers and community participates in the process. This implementation will include the School Education Management Information Systems(SEMIS), digital repositories of tools, content and resources, professional development, and platforms of continuing education and guidance, counseling and other student support service.

Schools are to define norms for automation of school processes for administration and management. Development and implementation of an MIS system is to be undertaken in both, online and offline modes. The information collected by the MIS has to be broad in nature, and includes trucking of students and teachers, from their academic needs.

States have to adopt an e-governance and automated school administration program for schools, and build capacities for its implementation and use of school based management information system. These MIS will be integrated with the national level web based school education management system (SEMIS).

5.11 SCHOOL MANAGEMENT INFORMATION SYSTEM (SCHOOL MIS):

A nationwide network will be established in which school teachers, students, school managers and community will participate. This implementation includes the school MIS, digital repositories of tools, content and resources, professional development and platforms of continuing education and guidance, counseling and other services of student support.

School MIS will be a single window clearing house on all information related to the secondary school system. The information facilitates research and analysis activities and guide decision making at different levels in the educational system which will contribute to increasing efficiencies. States will define the norms for automation of school process for administration and management MIS system development and implementation will be in online and offline modes. The norms defines standards of technology including languages, fonts, word processors, technical dictionaries etc. open standard will be adopted for facilitating universal access to information, context and resources.

5.12 IMPLEMENTING AND MANAGING THE POLICY:

In order to implement and manage the policy the following measures are to be used.

1)Program Monitoring And Evaluation Group (PMEG):

The department of school education and literacy has the responsibility of guiding the implementation of the ICT program in schools all over India. The PMEG will setup the task groups, invite institutions or professionals, to develop norms, specifications, evaluation reports, white papers etc. to guide the state governments in implementing the ICT program.

2) Inter-Ministerial Group:

An inter-ministerial group consisting of members of ministry of HRD, ministry of communications and department of space, ministry of power, ministry of new and renewable energy, ministry of labor and ministry of rural development etc. will be setup to guide technological choices and "Specifying cost effective and optimum

infrastructure and connectivity". The group reviews the state of art technology, connectivity and inter sartorial convergence, taking into consideration, its relevance to the goals of ICT, feasibility of implementation in the school sector, appropriateness in terms of finance, environmental 'footprints', need for training and learning curves for use and managing the system. The group will regularly review technological choices and provide the guidance to state governments in making proper investments and to maximize educational benefits.

The reviews of technological choice includes standards and norms for computer configuration, input output devices including scanners, printers, projects, operating systems and system software applications including virus scanners, productivity applications and educational software, power conditioning equipment and other digital equipment such as camera and audio recorders. In addition it includes norms for edusat terminals, norms for pricing of infrastructure like telephone, internet and electricity. States will be guided in the context of establishment and management of the infrastructure.

3) National and State Level Agencies:

These agencies include the national council of Educational Research and Training, The Central Institute Of Educational Technology, The National Institute of Open Schooling, The State Council Of Educational Research and Training, and The State Institute of Educational Technology will develop curriculum , resources and capacity building programs. These will serve as models for adaption and implementation of the system.

All the public funded national and state level agencies will be partners in developing, compiling and making available digital content resource and tools. Norms also will be developed for quality and open access for digital contents. Public funded broadcast agencies, both at the state and national level and agencies managing the EDUSAT networks will be engaged in wider dissemination of support services and resources.

The main role of state include, defining norms, standards, guidelines and framework to Enable various aspect of the programme and to facilitate and monitor the implementation of the programme. Thus their tasks include :

1. A programme of action, a road map and feasible timeline.

2. Guideline based on national standards and norms for infrastructure, implementation process, capacity building programme, monitoring and evaluation criteria, target etc.
3. Framework for procurement, development in repositories and use of digital content.
4. Providing facilities for widespread participation of all stakeholders, community and private partners in various aspect of the ICT programme.
5. Development and maintenance of the infrastructure and digital repositories.
6. Development and phases implementation of an appropriate capacity,building framework.
7. Mobilization private and community sources.
8. Development of an appropriate legal regulatory framework.
9. Monitor and evaluate the implementation.

4) Programme of Action:

The states are to draw up a programme of action to inform and guide about various aspects as the ICT programme such as developing infrastructure management of programme development of resources, capacity building, monitory and evaluation of the programme.

Based on suitable road map and timeline, state where the ensure coverage of all government and government aided secondary and higher secondary schools by the end of eleventh plan, and also to ensure similar development in all unaided schools through their state boards of affiliation. The programme was to be expanded to the upper primary stage, covering all the school by the twelfth plan. The state words to set up and institutional mechanism for the implementing the ICT programme under existing educational system by delegating responsibilities to the school levels, through experimenting different model based on past experience.

5) Advisory Group :

The department of education of the states was to appoint advisory group to direct the implementation of the ICT programme and also monitor and evaluate them. The

advisory group consists of repetitive of concern department, reputed engineering institute of the state, university etc. taking in to consideration the various tasks related to technical educational financial and administrative areas. The department of education of the states was to synergize with appropriate department and the state level agency to establish connectivity and electricity in all schools, which include norms for prizing quality of service and maintenance finalize through negotiation.

The states were to adopt standards suggested by the inter ministerial group at the national level for all aspect of the ICT implementation especially technology mix, specification of equipments, selection of software and connectivity selection and development of digital resources and capacity building programs. Prevailing norms in the state where to b utilized to phase out, dispose of or exchange old and obsolete equipments, by way of taking care to minimum avoidable up gradation and generation of electronic waste.

States were to enter into agreements with the vendor/agency for processing software License. These MOUs/agreements were to involvestrict compliance, causes to ensure quality of equipments and service and minimum downtime.

Regarding models of ICT infrastructure, build,own, operate, and transfer (BOOT) models of ICT infrastructure was to be preferred different combination of services like equipments manpower, software were to be tried out and appropriate combination, based on feasibility and cost effectiveness were to be adopted by the states. Based on description and obsolesce norms the state can choose to use a build, own and operate (BOOT) model. However as it was decided to use free software, it cannot be a part of BOOT. Hence it will cover hardware, purchase and maintenance. Learning resources i.e., software and content should not be encouraged as its detrimental to educational aims and principles.

States were to expose the possibilities of sharing the infrastructure partly or wholly with the community to extend education or train youth after school hours or similar purpose. The states may try for community partnership models for optimum utilizations of infrastructures and resources while ensuring safety of school property.

States were to involve mechanism for bulk purchase, rates contracts based on dynamic pricing and school wide licensing of software of low cost operation.

However prevention of resources is not allowed according to recent amendments in the policy. Only digital resource can be publically owned be used for the purpose

Regarding regulatory measures the policy documents states that," access to internet enhance the risk of inappropriate content reaching children appropriate advisors for regulating access monitoring internet activity and education of teachers and children will be taken up at the instance of the advisor group. Heads of schools and teachers will be trained in appropriate and regulatory measures."

States were to drawn up an appropriate incentive scheme for teachers, students and schools to recognize and promote initiative and talent."Easy loan schemes for procuring ICT equipments and resources, awards and professional support packages and a variety of similar incentives will be considered. States will also explore the possibility of partnership and sponsorship with the government and private agencies like banks, corporations and charitable institutions.", all states should be provide interest free loans to all teachers to purchase inexpensive laptops for them self's"

5.13 COMPUTER EDUCATION INITIATIVES IN INDIA

Recognizing the potential of ICT many state govt. have taken initiatives to introduce students, specially high school to computer educations private sector govt. partnerships are being tried and several house NGOs are actively participating in these activity some of this initiative are described below

SIET Pune- Accordingly to the Deputy production in charge, stated that:

1. In 2009-10:- 102 video and 103 audio programmes were produced by SIET PUNE.
2. In 2009-10:- 100 learning objects were produced in consultation with CIET.
3. IT was decided to produce audio programmes for communication skills in English as it is in great demand.
4. Video programmes produced SIET PUNE are shown on DD
5. For 2009-11, SIET PUNE sought financial assistance of Rs. 408.40 lakhs for 200 video programmes for TV, 100 multimedia learning objects, 200 audio programmes, training, workshops, digitization of old programmes, repair of equipments, replacement of centralization AC plan, purchase of new technology equipment, vehicle maintenance, office expenses library.

Bhandup Municipal School Project, Mumbai

The Bhandup Municipal School Project is the brainchild of Dr. Kusum Kamat, who retired as the Education Officer of the Mumbai Mahanagar Palika. The children in municipal schools are almost always from the marginalized classes. Knowing their difficulties, Dr.Kamat wanted to enable teachers to provide education that is multilevel, multi-graded, cooperative, and fun. This, she thought, would be possible if teachers could become educational technologists, assess theneeds of each individual child, and induce the student to learn at his/her own pace, moving up to higher skills after mastering lower-skill tasks, and cooperate with other teachers and children. To test her ideas, two municipal schools in the Bhandup slum area in Mumbai were taken up as pilot experimental schools for which CASP-PLAN gave her some seed money. These schools had 2,000 children in Classes I–IV, and 38 teachers. After assessing the different problems faced by these children in respect of their homes, parental illiteracy, poverty, health problems, irregular attendance, and low achievement, Dr. Kamat looked at the problems faced by teachers. These related to large classes, with different achievement levels of children, irregular attendance, lack of interest in schooling (on the part of both parents and children), and the absence of refresher courses for teachers. Dr Kamat believed that it was important to make teachers understand that even low achievers could become good students, that education could be made interesting, and that the learning pace should be set to suit the level of each child. If parents found that their wards were doing better at school, their cooperationwould come in time. The teacher's role was, therefore, pivotal. How to make the teacher a facilitator, manager, and organizer of instruction was the crux of the problem. Learning materials were necessary; they had to be made available at a low-cost or no-cost basis, because if the project was to be worthy of replication extra money could be provided.Dr Kamat's teacher-training programme aimed at improving the understanding and efficiency of teachers and sought to make them identify learning sources/experiences in keeping with the needs of pupils and their individual talents and personalities; teachers had to ensure that the children developed self-learning skills. It was necessary to prepare diagnostic tests to plan remedial measures, learn to organize learning situations to facilitate the active participation of learners, and plan/organize activities for students in such a way that they would be given opportunities to showcase their talents, increase their interest in learning, and make them feel confident. Other important goals were to establish a rapport with

parents, find solutions to improve school attendance, seek the cooperation of parents and the community in organising school activities,and cultivate the interest of parents in the academic performance of their wards.Once teachers understood that steps such as multigraded learning, the freedom to move 19 about in class, and multilevel materials designed to suit the needs of children all help in making children learn better, both they and the children began enjoying what they were doing. The municipal corporation agreed to free teachers from teaching duties on Saturdays (which was, in any case, half a school day) so that teachers could spend their time in planning the next week's lessons and prepare materials. Students often brought waste material like bus tickets and empty cartons and matchboxes to school, which the teachers then used to make these materials. At the pilot stage, some money was needed for teacher training. But later when the pilot became replicable and was introduced from two schools to many more schools, it became possible to provide such training within the normal budgets of schools. The training consisted in exposing teachers to new techniquesby way of demonstrations by resource persons and experts, visits, seminars, and conferences.They were given scope to experiment with new methods and report their findings to others at seminars. This kind of planning, interaction, and exposure helped teachers to solve their own problems. The evaluation showed that teachers were enthusiastic, children were learning, attendance had improved, and parental cooperation was more forthcoming.After evaluating the programme, certain changes were made. It was then decided to extend the programme to 18 more schools. These had 165 teachers and 8,500 pupils. In this phase, too,the programme worked quite well and showed good results. The municipal administration then took over the programme and extended it to many more schools. But its vision was limited to the more traditional types of teaching. Further, there was more emphasis on cognitive learning. The training unit staff was also not able to train teachers independently. At the end of the first year, itwas noticed that teachers were not motivated to change. During the last phase, a multimedia package of textual materials and video programmes for training purposes was developed. This package has helped experts to reach teachers independently of those organizations that are in charge of elementary education. The package is now widely used in the DPEP programme and in those districts of Maharashtra where the district education officers are interested in helping tobring about a change in the educational system.

Gram Mangal project, **Maharashtra**

The Gram Mangal project, established in 1982, works in the adivasi belt of Maharashtra that borders on Gujarat. When Anutai Wagh, who had worked for a long time with Tarabai Modak and Dr Ramesh Panse, first came to the area, there was no drinking water, no electricity, and no roads, let alone a school. The adivasis were very poor, and the two social activists realized that unless the villages become self-reliant communities, by undertaking development programmes, there was no way that conditions would improve. They started many development activities, and later also concentrated on early childhood education as part of the development programme. After working for three years on getting basic amenities like drinking water and roads, they began working on the educational programme. Gram Mangal does not take any grants from the government, but supports all useful activities that the government undertakes in the area. They also work in collaboration with other NGOs The organisation is supported by the larger community. Their educational efforts are concentrated on vikaswadis, teacher-training programmes, health care programmes, and technical/vocational education programmes. Gram Mangal also undertakes research programmes. They now have several vikaswadis in nine villages.The curriculum is child-centric and related to the adivasi child's environment. In the early years, the local Warli language is used and later Marathi is introduced. A lot of educational material, both locally prepared and bought from elsewhere, is used. Gram Mangal also maintains a bank of educational materials. This project as well as the Pastapur project illustrate the need to forge close links between development and education.

Avehi Abacus Project

The Focus Group paper talks about the need to build knowledge content for young children in a multidisciplinary mode around what is relevant to a child. Those who support the tradition of imparting knowledge in terms of subjects may like to look at the way an NGO has organized this Shanta Gandhi, who had been engaged for a long time in early education and Bal Bhawan work.Conceived the idea of Abacus in 1952, when she was working in village Nikora on the banks of the Narmada. She began by seeking answers to the questions of adivasi and non-adivasi childrenrelating to their surroundings, primarily through drama and song. She began discussing various themes and topics like evolution, how life emerged, why we are what we are, and how

we have reached here. In 1981, Avehi, an audio-visual research centre, was launched. In 1990, Avehi took up the Abacus programme in Mumbai and operates its programme using developing learning materials in 180 schools in two wards of the Mumbai Municipal Corporation. The materials developed are predominately visual and very attractive, and are welcomed by both teachers and students as the schools are located in slum areas and have no libraries. These are meant for students in Classes V and VI, and appear in the eight languages used in these schools. The programme also operates in 100 schools in Chandrapur and Yavatmal districts.The materials are thematic and arranged around the following topics:

• Myself, my body, and our needs. Understanding that I am unique, but so is every one of us. Still we share common needs, so we are interconnected. Understanding the world and the web of life. This helps in understanding that the earth fulfils all our needs and that our life binds us together, both the living and the non-living. How do societies develop? Where have we come from? This helps in understanding who we are and the mechanisms that bring people together. Understanding society and its structures.

• The way we live and where we are today. What are the roles of social institutions like the family, the state, class and caste? What roles do they play in our lives? How relevant are they? How do they influence us? Having understood the importance of these institutions, what do we accept, or reject, or challenge?

• Exploring change. Change is inevitable. We can either be passive and react to the change once it happens, or if we understand change, we can learn how to be proactive, and hasten a change that is good or resist a change that is unwelcome.

• Where are we going? What do I want in life? What will I be encouraged to do? What will take me further? What will determine my future and the future of the world around me? The organisation running Avehi Abacus Project consciously works with the system and uses the existing space and SUPW (Socially Useful Productive Work) time to address these themes during one-hour sessions. The first 10–15 minutes of the session are spent in introducing an ideathrough a story or flip chart. Then there is discussion or activity to connect what has been discussedto the lives of the students. This may involve group activity or worksheets. These activities emphasise values such as

working together, respecting each other and the dignity of others, respecting labour and all living things, and working for peace. Children debate and discuss the issues and come up with solutions.

In-Service Teachers' Training through the Multi-Media Approach (SITE)

Organised by the Centre for Educational Technology (CET), NCERT in 1975–76

Educational objective: Show teachers that "Science by Doing" is a good method for teaching science, and get them to practise it.Educational problem: The Science Department of NCERT had launched the programme to introduce science from Class III, but primary schoolteachers—numbering about 1.6 lakhs—did not have much idea about how this could be done. The summer courses organised for thispurpose could not reach such a vast number of teachers quickly.The availability of the ATS-6 communication satellite loaned for a year by the USA to India made it possible to beam television broadcasts to backward areas. About 2,400 villages in backward areas in six states were equipped with electricity and television sets. However, as the one-way telecast of a 22-minutes programme was hardly adequate to the task of bringing about attitudinal change, it was decided that though the telecast would be used as a novelty and for providing materials that were not easily available, the training programme would consist of multi-media in the form of textual materials, activities for illustrating how "Science by Doing" can be taught (the real mainstay of the programme), radio programmes, and radio-vision programmes. Interactivity was also essential. This was provided by having a facilitator (a high-school science teacher who had received orientation in the multi-media package). Each medium was designed to fulfill the special task assigned to it in the instructional design of the course. All the materials were translated into the various languages of the region and made available. Fail-safe alternative materials (in case the telecast failed on account of the vagaries of electricity supply) were also prepared.Ten teachers from the villages surrounding a television village were invited to attend a two week course at every television village. Evaluation teams from CET sampled the attitudes and knowledge of teachers prior to the beginning of the course. There were summative evaluations as well.14 The deficiencies noted were rectified in the second course. This time the course time was increased from 10 to 13 days, and two groups and two teacher-facilitators worked in 1,200 television villages. More activities were added. Similar formative and summative evaluations were done. Before the satellite footprint

was drawn back from India, nearly 48,000 teachers were trained in one year. The course was considered to have been successful in reaching its objectives as CET and SCERTs kept on getting letters from teachers asking for information. A study of the retention of attitudes and practices was done six months later, and it was found that a large number of teachers were teaching "Science by Doing". Where they did not do so, it was more on account of administrative failure than the teachers' unwillingness. Many states continued to use the materials even after the telecast was discontinued.

Using Radio In An Interactive Mode

The use of radio broadcasts in multi-media mode (viz., textual materials, interventions by teachers) was undertaken earlier (viz., in teaching Hindi as the first language to children in Rajasthan, or to children in Madhya Pradesh who used a variant of Hindi as their mother tongue). But in recent years, several programmes using radio in the interactive mode have been undertaken. Radio has many plus points: first, making audio programmes for both broadcast and non-broadcast modes is a much cheaper proposition than making video programmes; second, audio is very suitable for language learning; and third, given the erratic power supply in urban and rural India, battery operated radios work quite well.

The Centre is running one such programme for Learning Resources of Pune for teaching English to Classes V, VI, and VII. Approximately 85 radio lessons, each of 15-minute duration, have been broadcast since 2001, three times a week, using AIR as the conveyer. These programmes were first broadcast to all urban and rural schools in Pune district. Since 2004, the programmes are being broadcast to municipal schools in Mumbai. The Hindi–English version of these programmes is being used in Classes IV and V of the municipal primary schools in Delhi. Since 2003, the programme has also been extended to Jharkhand for Classes IV, V, and VI.

The same programme is broadcast once in the morning and once in the afternoon. The programme provides pauses for teachers and children to respond. It gives opportunities to children during the lesson to speak in English and a variety of child-friendly formats such as song, drama, and language games are used. The lessons also promote democratic values.Comparative studies show that, after listening to 90 radio lessons, children spoke far more English than Class VII students of the same school

who had not been exposed to the programme. After three years of radio interventions, rural students from Class VII spoke far more English and wrote better English than rural students from Class IX who had not been exposed to the lessons. Teachers have been quite appreciative of these efforts.

Keli-Kali Radio Programme in Karnataka (Government of Karnataka, AIR)

The Keli-Kali radio project was initiated in 2000–01 in two districts (Raichur and Gulbarga) of North Karnataka to provide support to classroom teaching. About 2,50,000 Class III students in 5,000 schools benefited from the broadcast aimed from two radios stations. The process of the development of the radio lessons involved the following steps:

1. Identification of hard spots;
2. Teachers' training in script development;
3. Development of scripts and editing;
4. Production of programmes by AIR;
5. Preparation of teachers' handbooks and orientation of Block Resource Centres (BRCs)and Cluster Resource Centres (CRCs);
6. Training of all teachers by BRCs and CRCs;
7. Provision of funding by the state government for the purchase of radio sets, RCCPs (Radio-cum-Cassette Players) and dry cells;
8. Discussion in CRCs meetings about stocktaking, reporting, and sorting out problems relating to ensuring the listening of the radio lessons;
9. Organization of audio-conferencing with teachers and BRCs/CRCs for getting feedback;
10. Documentation and research to determine the effectiveness of the project.

In 2001–02, the project was extended to 13 districts covering students of Classes III and IV in about 14,780 schools. In 2002–03, the project was extended to Class V and covered 49,640 schools. In all, 258 lessons relating to EVS, Kannada, and mathematics were broadcast. In 2004–05, the project was extended to Class VI.

Radio Broadcasts in Andhra Pradesh and Himachal Pradesh-"Vindam Nerchukundam" (Let us listen, let us learn) in Andhra Pradesh, similar to the Keli Kali programme, was begun in Vishakapatnam in 2002 for Class III students. In 2003,

it was extended to Class IV and in 2004, to Class V. The programmes were broadcast from four AIR stations.The programmes benefited about 29 lakhs students and 1.5 lakhs teachers. Similarly, in Himachal Pradesh, a radio broadcast entitled "Gyankalash" was initiated in 2000 for students of Classes I–V during the evening hours.

Interactive Radio Instruction in Karnataka, Chattisgarh, Jharkhand, and Madhya Pradesh - The Interactive Radio Instruction (IRI) programme is a USAID-funded project and organised by the Educational Development Centre (EDC). It is similar to Keli Kali, but included interactivity during the programme. It was implemented in 2004–05 in two blocks (50 schools in each block) of North Karnataka, and 72 schools of Bangalore and Chamarajnagar district. In contrast to Keli-Kali, in the IRI programme experts developed the master plan and scripts after holding discussions with teachers. Private production agencies did the production work. Programmes were subjected to formative evaluations. The multigrade approach was adopted and was aimed at Class IV and V students. A strong research component (pre- and post-test designs with qualitative data from schools) was included. The subjects covered were science, social science, and mathematics. A total of 72 audio programmes have been developed.Almost all the steps followed in the IRI programme of Karnataka have also been followed in Chattisgarh and Jharkhand. However, the radio broadcast is meant for Class I and II students. Three blocks are covered in each state. The programme began in 2004–05. Radio sets were supplied by EDC. In Chattisgarh, a total of 115 programmes broadcasted by March 2005. In Jharkhand, a total of 86 programmes has been broadcasted. Twenty-eight audio programmes has been broadcasted in Madhya Pradesh.

Enabling People through Educational Technology: The Pastapur Effort -The Deccan Development Society (DDS), based in Hyderabad, is a two-decade-old grass-roots organisation working with women's Sanghams (voluntary village-level associations of the poor) in about 75 villages around Zaheerabad in Medak district of Andhra Pradesh. The 5,000 women members of DDS represent the poorest of the poor in their village communities. Most of them are dalits. DDS has a vision of consolidating these villages into vibrant organs of primary local governance and federate them into a strong pressure lobby for women, poor and dalits. This vision is

being translated into reality through continuing dialogues, debates, and educational and other activities with the people, facilitated by DDS.Over the years, the programmes have evolved from meeting the simple sustenance needs of sangham members to empowering them so that they can address the larger issues of food security, natural resource enhancement, education and health needs of the region. The integration of various activities is intended to retrieve women's natural leadership positions in their communities and to fight their lack of access to control over their own resources. These activities, alongside ensuring earth care and preserving useful traditional knowledge, have also resulted in human care by giving the women a new-found sense of dignity and public profile in their village communities. The activities of DDS have assumed various forms, which centre around the principle of autonomy of the local community—autonomy over food production, autonomy over seeds, autonomy over natural resources and their management, autonomous markets, and autonomous media.The initiative aimed at autonomous media is particularly relevant in the context of the focusGroup's suggestions. Transcending the barriers of non-literacy, the DDS women's groups have successfully produced videos to conduct a dialogue with their sanghams and inform the outside world of the accomplishments of their fellow members. A stunning film, "Why Warangal farmers do not like BT Cotton", on the ills of genetically modified cotton seeds, produced by these women, has been showcased around the world. Their compelling statements on why they should have media of their own is forcing the academic and development world to rethink media policies. The women have also established a Community FM Radio Facility, controlled and operated by them. Grouping themselves into a rural women's media collective, the DDS Community. Media Trust, the women have been taking up social issues and concerns, video-documenting their findings, with their own original perspectives. These films have been featured in many international meets, and the group has worked with international organisations in training similar women's communities in Third World countries like Bangladesh, Sri Lanka, Pakistan, and Peru.DDS also runs Paccheshale, an alternative school, and the sanghams run 40 balwadis.Speaking to the women, one realises the power and autonomy unleashed in the minds of these individuals; their work showcases an alternative way in which education and development can be thought of, as something that is not bogged down by narrow definitions revolving around literacy.

Internet Connectivity for Indian Villages-

The TeNet group of IIT Madras along with n-logue communications pvt. ltd., Chennai has provided Internet connectivity in the villages of India.They use this facility to drive education, health, and livelihood in the connected villages. It uses indigenously wireless technology to provide connectivity to a village. TeNet group finds a local entrepreneur in each village and helps him/her to set up a low-cost Internet and provide services in these villages. The total cost of the kiosk is Rs. 50,000, which includes wireless connectivity, computer, printer, power back-up, camera, and local language software as well as the cost of training the kiosk operator and six months' unlimited Internet charges. The operator needs to earn Rs. 3,500 every month to break even. The kiosk provides multiple services to the village in order to earn this sum.Today n-logue has over 2,000 kiosks in about 30 districts in different states.One of the main services provided by the kiosk is educational. In addition to providing computer training and offering courses at various levels, including utility courses such as "how to make a bio-data" and "how to take good photographs", a major area of emphasis has been coaching children to pass the SSLC examinations, especially in subjects like English, science, and mathematics. Online courses are aimed at children seeking to learn the subjects, practice for the exams and also take mock tests (which are graded) to prepare for the SSLC exams. In addition, some online live video lectures (with interactivity) are provided with the aim of putting some of the best teachers in front of rural children. At the same time, in response to popular demand acourse on spoken English is being run for rural children and this has been very popular.The group is very conscious of the fact that education in rural areas through Internet kiosks is in its infancy, and that it needs to do much more to advance this project.

Initiatives in Slums of Delhi - Children learn to use computers quickly if they are allowed to play with them.Dr Mitra and his colleagues build a computer into a wall near their office in Delhi. The monitor screen was visible from the other side of the wall.They also embedded a touch pad into the wall. Children came running out of the nearest slum and stuck to the window like glue. A few hours later, Dr Mitra and his colleagues found that the children were surfing the Net. Within a period of six months, the children had taught themselves many computer operations. How did they do this? Dr Mitra observes that in playing with the pad and the mouse, an accidental

discovery is made. For example the cursor changes into a hand-shaped icon when a child hits the graphical users'surface. Others repeat this by learning from the first child. Most of their learning is through such discoveries; they verbalize it in their own way. This vocabulary encourages them to perceive generalizations, for example, "When you click on a hand-shaped cursor, it changes to the hourglass shape for a while and a new page comes up." They memorise entire procedures for doing something, for example, how to open a painting programme and retrieve a saved picture. They teach each other new and shorter procedures for doing the same thing whenever one of them finds such a shortcut. The group divides itself into the "knows" and the "know-nots". However, they realise that a child who knows will part with that knowledge in return for friendship and exchange of information as opposed to fighting over the ownership of physical things, where they would use force to get what they did not have. A stage is reached when no further discoveries are left to be made, and the children occupy themselves with practising what they have already learned. At this point, intervention is required to introduce a new "seed" discovery Usually a spiral of discoveries follows and another cycle of self-instruction begins.Within the next six months, the children of the neighbourhood had learned, mostly on their own, all the mouse operations; they could open and close programmes, and surf the Internet and download games, music, and video. When asked how they had learned to do all these operations,they said that they had taught themselves. They described the computer in their own language, often coining words to explain what they saw on screen. The hourglass symbol was "damru"; the mouse cursor was, "sui" (needle) or "teer" (arrow). The media gave this experiment considerable publicity. Dr. Mitra and his colleagues at NIIT call it Minimal Invasive Education (MIE). The media described it as the Hole in the Wall. That name has stuck. Funding and requests for information came from different governments. The programme is now operating in several places in Delhi, Madhya Pradesh, Maharashtra, and even Cambodia.The funding has helped in trying out the experiment in diverse human and climatic conditions.Wherever they found an appropriate place and a friendly panchayat or school, the NIIT engineers built a little structure with three computers facing the road. This plan is now the standard design for the Hole in the Wall project. To overcome the problems of dust, erratic power supply, the threat of adults taking over the experiment, etc., a number of modifications were made. The NIIT people are confident that their computers would work anywhere. If a computer

goes into the hang mode in a remote village in Kanyakumari, NIIT engineers can solve the problem because the NIIT software enables NIIT scientists to "see" their computers from anywhere through the Internet. Their new software ensures that nothing can be deleted, even by accident. By keeping the window (the "hole") in the wall low to the ground, adults are prevented from using the computers.Observations were made in 26 locations, with 100 computers placed in remote villages. Focus groups were tested for nine months, and the results compared with those yielded by control groups and other frequent users. An estimated 40,000 children use these computers. They have all made themselves computer literate. The average icon test scores stand at 40 per cent in nine months. Dr Mitra and his colleagues now have proof of effectiveness of self-regulated learning,and are confident that such learning can happen anywhere in the world, to any child, in any climate. Egypt and South Africa have now borrowed this learning methodology. Dr Mitra says that groups of six- to thirteen-year-old children do not need to be "taught" how to use computers. They can learn by themselves. Their ability to do so seems to be independent of their social, economic, and educational background, literacy levels in the English language or any other language, ethnicity and place of origin, i.e. city, town or village, sex, etc. Surfing of pornographic websites by the children is quite rare. Teachers have often recorded gains in enrolment, attendance, and school examinations, particularly in subjects that deal with computing skills, English vocabulary and usage, concentration and attention span, problem-solving skills, and, above all, in working together and exhibiting self-regulation.

Computer Education Initiatives

As a technology, this is one of the most rapidly changing sector, requiring drastic upheaval in basic understanding. One of the aspects of this technology is the drive it provides to a variety of applications in a diverse market, creating jobs that were up till now unheard of. Makers, users, marketers and a host of service providers have found avenues of employment both in India and abroad. This in turn has catalysed the inflow of capital, fuelling an upsurge in infrastructure and services. India, having taken an early initiative in the area has emerged as a leader in the IT arena. Traditional ways of setting up and running courses cannot meet the demands of this job market. Initiatives taken by a few private bodies such as NIIT and Aptech , a number of institutions offer an enormous range of short- and long-term courses,

rapidly responding to changing technologies and market trends. The inbuilt openness of the system that they have evolved has also allowed professionals to keep pace with modern trends, re-skilling themselves in specialised hardware, software, and applications. The courses are of different levels, enabling both the new user of software applications and the expert programmer to pick and choose. The Internet and the publishing industry have also pitched in making available one of the largest and most regularly updated libraries accessible to anyone who desires to benefit from it. The computer education industry has demonstrated an ability to respond rapidly to changing needs setting up need-based courses, offering skill-based certification mechanisms, generating peer tutors and teachers all of which have implications for education in other spheres as well, especially in light of attempts to provide education for all.

Head Start Programme in Madhya Pradesh

The computer-aided learning programme in Madhya Pradesh was introduced three years ago.2,718 schools covered under the Head Start programme. Each school has been given a minimum of three systems with backup power of three hours. The centres are located in cluster centres (housed in primary school buildings). The CDs are developed by the Rajiv Gandhi Shiksha Mission, Bhopal and distributed to all the schools. The programmes are developed on the hard spots identified by the teachers. The mission has trained the teachers of these schools in using the CDs effectively in the classroom. The topics cover all the subjects being taught in schools, including science, mathematics, social science, English, and Hindi. The programme is interactive in nature and has an inbuilt self-evaluation system. Research conducted recently shows significant gains in mathematics followed by science, social science, English and Hindi.

1. Computer-Aided Instruction in Kerala

The IT @ School Project was started in Kerala as a computer-aided instruction project in 2003 for the benefit of Class VIII students. In the year 2005 the project has been extended to Classes IX and X. The state has developed the syllabus for computer education. This project is being implemented in about 2,735 schools. 25,700 computer systems have been provided. Three students share one system. Four hours per week is allocated to computer class.Two hours are spent on theory classes and two hours on practical assignments. Students give online examinations. The funding for this project has come from

different sources, including the development funds of MPs and MLAs. Rs. 18 crore have been spent for this project. Each student is charged not more than Rs. 25 per month, and in the case of SC/ST students the state reimburses the amount.

2. Maharashtra Knowledge Corporation Limited (MKCL)

The Higher and Technical Education Department (HTED), Government of Maharashtra appointed the Professor Ram Takwale Committee in January 2000 to offer recommendations regarding the universalisation and integration of IT in all the institutions dedicated to higher and technical education in the state. The committee submitted its report to the government on 25 April 2000. It recommended the creation of a special-purpose agency, viz., the Maharashtra Knowledge Corporation Limited (MKCL), for the speedy, effective and self-supporting universalisation and integration of IT in higher and technical education in the state. The government appointed a Special Working Group to implement the recommendations of the committee.A unique joint venture where individuals, organisations, both private and government and educational institutions participate as equals has been initiated. The flag ship course of the corporation, the MS-CIT (Maharashtra State Certification in Information Technology) programme, is a joint venture of HTED; it trained providers initially in about 425 different educational institutions, i.e. in ITIs; arts, science, commerce, law, and B.Ed. colleges; engineering colleges and polytechnics, etc. MKCL aims to develop a world-class, globally competitive, flexible and value- based educational system that is responsive to the individual, institutional and social development needs of the people of Maharashtra and India. The mission of the corporation is to integrate in a selfsustainable manner an IT education and IT-enabled education into basic teaching, learning and management so as to achieve the goal of preparing graduates for the knowledge-based economy of the twenty-first century.

Corporate Initiatives in ICT for Schools

Recognising the immense potential of ICT as a job market, many state governments have taken initiatives to introduce students, especially those in high schools, to

computer education. Some of these initiatives have gone beyond providing basic computer literacy and are trying to integrate computers into education as well.

A variety of private sector–government partnerships have been tried and a large number of corporate houses and NGOs are participating in computer education in schools. Some of these initiatives are described below-

1. Technology Initiatives by the Azim Premji Foundation

1. A combination of aspirations, desires, and perceived benefits resulted in over 10,000 elementary schools in India having access to computers. While this achievement contributed to heightened expectations, the lack of appropriate content for children in the local language had a dampening effect on the effective utilization of these computers. The Azim Premji Foundation has begun creating content on CDs to meet this requirement. Keeping the child as the main player in the story, the CDs aim to attract and retain the interest of children in learning through the medium of animated cartoons. Forty-minute-long modules in the local language, with options in English and Hindi have been created to make Learning Play and Assessment Fun. The modules relate to competencies that the child is taught in school like language, mathematics, science and cocurricular topics (like fan, telephone, and television) to expose the child to the urban environment.
2. These modules are used as supplements to classroom teaching. To facilitate the effective use of this content in the schools, a detailed training programme for teachers on computer-aided learning package was developed and conducted in partnership with state governments.In January 2005, there were 69 titles for children in Classes I–VIII. Each title has three language options: regional language, national language Hindi, and international language English. The content is available in eight languages: Kannada (64); Telugu (42); Tamil (35); Urdu (18); Oriya (6); Gujarati (4); Gurmukhi (3); and Malayalam (1). Children in over 4,600 schools are using these titles across the states in India.

2. Mahiti Sindhu Programme in Karnataka

1. The Mahiti Sindhu programme was initiated in Karnataka in the year 2000 and is has been implemented in 1,000 secondary schools. The

state government pays three institutions (**NIIT, Aptech, and EDUCOM**), which in turn take up the responsibility of training teachers and maintaining computers in schools. Each class gets four periods per week. Schools with fewer than 150 students got fivecomputers with one server; schools with 150–250 students got nine computers with one server and schools with 250–500 students were provided with 14 systems. Subject-based CDs were supplied by the external agencies. The project evaluation is being carried out by an external agency.Similar initiatives has been taken in the schools of Andhra Pradesh, Kerala, Delhi, Madhya Pradesh, and Chattisgarh.

3. NIIT providing computer education across 1672 schools in Rajasthan

In 2009NIIT has entered into a contract with the Rajasthan Council of Elementary Education (RCEE) to introduce Computer Aided Learning in government primary schools in 22 districts of Rajasthan within the framework of Sarva Siksha Abhiyan (SSA). The value of the contract is Rs.214,0000. It is a five-year agreement involving setting up 1,672 fully furnished modern computer labs with 5016 computers, which will benefit 33,340 teachers and 836,130 students, cumulatively.

NIIT had an IT education contract in the school segment in India of 2005 schools from the Government of Andhra Pradesh. Also it has orders from the Maharashtra and Bihar State governments to provide computer training in 900 schools.

NIIT programs are designed to enable students to acquire skills necessary for the knowledge economy. NIIT's computer aided education programs provides effective learning environment for students in subjects like Mathematics, Science, English ,Geography and History with special tools to promote critical thinking and analytical skills leading to student centric learning. Recognizing the potential of Information and Communication Technologies to transform the teaching–learning process in the non-formal and formal education and its potential in changing the way teachers and learners gain access to knowledge and information. NIIT's ICT in Education focuses on using IT to enhance the quality of teaching and learning.

For over a decade, NIIT has worked with Governments of Andhra Pradesh, Assam, Chhattisgarh, Himachal Pradesh, Karnataka, Madhya Pradesh, Meghalaya, Tamil Nadu, Tripura and West Bengal to offer computer education in schools. Additionally, NIIT has also joined hands with many private schools in the country to help students discover the pleasure of learning through computers.

4 Intel Corporation's Teach to the Future Programme

The Intel Corporation has initiated a programme of computer-aided instruction in coordination with 12 state governments, the Kendriya Vidyalaya Sanghatan, and the Navodaya Vidyalaya Samiti.The programme aims at a professional development for teachers. This course helps teachers to use technology in support of project-based learning and to encourage active inquiry and higher-order thinking. Participating teachers receive resources incorporating the Internet, multimedia, and assessment tools aligned with the local board curriculum framework. More than 4,00,000 teachers have been trained since the programme began in February 2000 in India. Apart from this direct initiative involving computer education, Intel has also started a National Science Fair aimed at infusing the discovery among school children and increasing their interest in science and mathematics. It allows students to improve their scientific aptitude, and experiment with everyday problems and find scientific solutions to them. It is a platform for Indian students to showcase their talent and win different awards. Intel had a tie up with different state government science exhibitions/fairs.They selects two projects from each state for the national fair every year. This provides an opportunity to government school students to compete at the national and international levels. Intel India hadtie up with a educational and social institutions in the country for supporting community needs; this includes a Technology Training Centre at Bharatiya Vidya Bhavan, Hyderabad to provide job-oriented training to students and unemployed youth; the Cyberskool Programme, started in association with the National Council of Science Museums, aimed at providing training to people who do not have easy access to IT; and a Technology Training Lab at the National Association for the Blind, New

Delhi, which offers basic courses in computer usage and screen reading software for the visually impaired.

5 Microsoft's Project Shiksha

According to Microsoft Corporation India, Project Shiksha aims to accelerate computer literacy in India by providing a comprehensive programme that includes software solutions, comprehensive training for teachers and students, development of a world- class IT curriculum, and scholarships for teachers and students. Teachers are exposed to an IT literacy curriculum with the key objective that they will return to the classroom and use IT interventions in their teaching. Over 80,000schoolteachers and 3.5 million students across government schools will be trained to strengthen their IT proficiency.This project has MoUs with the states of Maharashtra, Madhya Pradesh,Andhra Pradesh, Karnataka, West Bengal, and Uttaranchal. Microsoft Corporation India is also running a programme for the teachers of the Municipal Corporation of Delhi (MCD) and the Army Public Schools through Project Shiksha.

LEARNINGS FROM THE PROJECTS

While computer education have been taken quite seriously by many state governments and by private sectors, most of these programmes are aimed at preparing students for the job market. In addition, the programmes are software- centric, i.e. they emphasise the learning of a specific set of software tools. There is an need to throw light on technology and the learning of specific tools. A balanced generic curriculum, where computers are relegated to their due place as tools, and where they extend the horizons of other subjects, is a must. The availability of appropriate software in Indian languages, and in adequate numbers catalyse this process.

Microsoft's experience (Fourth Annual Convention, National Alliance for Mission 2007-The Grameen Gyan Abhiyan Creating Grassroots ICT entrepreneurs One of the challenges in bridging the digital divide is language - most of the people do not understand English. Today Microsoft has software in 14 Indian languages - Hindi, Oriya, Bangla, Tamil, Telegu, etc. Even Vista is now available in local languages. People should be able to interact with the computer in the language they know best.However many people don't know even the local language. Microsoft has

engaged with NGOs to develop local entrepreneurs e.g. with Jai Kisan, Drishti, etc.There are 16000 kiosks run by such entrepreneurs all over the country.It takes six months of talking to the entrepreneurs before this can be set up. Microsoft soon realized that there was no traffic for the kiosks.After examining the reasons which are required to interact with the government an e-governance were open to the people specifically for things like employment exchange registrations, death and birth.

a) Access and connectivity: Currently they are in 8,000 locations set up by Microsoft, but certanly thecountry needs more than 100,000 knowledge centres so that the villagers can use them and get the right information.Jyoti programme is covers 17 states through 11 NGOs. Two million people have acquired vocational skills. Rs. 35 crores has been spent in providing these training. Under Siksha programme implemented with the help of state governments, 1.6 lakhs teachers and 8 million students have been benefited.

b) Content and services: Developing content and services is also crucial. In project Saksham, Microsoft developed technology needed for the rural community. The Rural Innovation Fund has been an initiative in the right direction because it is helping to create applications, which can be used in these kiosks by people to add value in their area.

c) Capacity Building:- Capacity building is important for adoption of the new applications as and when these are introduced. For the system to be sustainable, the services should be relevant to the local needs. At the same time it should be profitable for an entrepreneur to run the kiosk. The main challenges in setting up successful rural ICTs are: providing good connectivity,which involves a cost factor, finding a good location for the village knowledge centre,providing power to run the computers, and making the right content available in the right language. Lack of universal literacy in rural areas complicates it further.

Microsoft's search for relevance: New ict initiatives in different fields

Microsoft focuses on transforming education through various innovations in various countries and societies. In India, under its programme called 'Shiksha' it has trained

1,60,000 teachers across 10 IT academies in different states. About 6-7 million students have been reached through these teachers. However, the country needs 500 million teachers. Digital study hall is provided which makes it possible for children in remote villages to get the benefit of other good teachers in other parts of the country.Microsoft is working with number of different companies like Brilliant Tutorial etc.- who have been for a long time in the business of training students for competitive exams as well as companies which promote tutoring.Under the Jyoti Programme more than 600 community learning centres have been set up where 20 million people, primarily women, have benefited through training. Under this prrogramme the traditional chikankari works of Lucknow have benefited through improved design.Under project Vikas an effort is made to bring IT to manufacturing clusters and thereby help to increase production. Three pharma clusters in Ahmedabad have been selected. In the garment sector the cycle time was brought down from 90 days to less than 60 days and the inventory was reduced by more than 20% in less than a year.The primary challenges include:

1. Ensuring relevance across all learner groups
2. Delivery through variety of channels including mobile phones, TVs, etc.in the knowledge centers
3. Creating partnerships in order to achieve more and to become more effective.

Rural Innovation Fund (RIF)-Rural Innovation Fundwas constituted by Microsoft and telecentre.org (a collaborative initiative of Microsoft, International Development Research Centre, Canada and the Swiss Agency for Development and Cooperation) for Grameen Gyan Abhiyan (Mission 2007) with the intention of:

1. Helping communities with limited access to technology to realize their potential
2. Promoting local IT based social entrepreneurial ventures
3. Fostering ICT based entrepreneurship in rural areas among the youth
4. Encouraging organizational, individual and local software entrepreneurial endeavors towards developing cost effective, practical and innovative applications and solutions benefiting society. Collaborating & supporting organizations specializing in service

development in areas where distribution channels to reach the poor are either weak are missing altogether.

CHAPTER VI

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CHAPTER VI

ANALYSIS AND INTERPRETATION OF DATA

1. Respondents from school
2. Respondents as parents
3. Respondents as students

ANALYSIS AND INTERPRETATION OF DATA

As stated earlier the necessary data was collected with the help of question areas, one each for school representative, parents and students . The data thus collected has been analyzed and interpreted in to following pages, in order to achieve at meaningful conclusion.

Respondents from school

Table 6.1.1 Recognition/Affiliation of schools

Recognition	Types of School				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Maharashtra State Board	21	-	15	5	41 (93.19)
Central Boards	-	03	-	-	03 (6.81)
Total	**21 (47.73)**	**03 (6.81)**	**15 (34.09)**	**5 (11.37)**	**44 (100.00)**

(Source : Primary Data)

Regarding recognition/afflation of the 44 schools covered by the study 41(93.19%) out of which 21 from aided/granted schools, 15 were from private category of schools and 5 from Municipal corporation which were recognized/affiliated to the Maharashtra state secondary and higher secondary education board and the rest 3 schools were recognized by Central Board of secondary education (CBSE).

Table 6.1.2 Teacher respondents of the Schools

Recognition ⇨	**Types of School**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Computer Teacher (%)	16 (36.36)	03 (100.00)	12 (27.27)	5 (100.00)	36 (81.82)
Lab instructor (%)	05 (23.81)	-	03 (20.00)	-	08 (18.18)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

From table no. 6.1.2 it is evident that out of 44, 36(81.82%) respondents were computer teachers and the rest 8(18.18%) were the lab instructor. 23.81% of lab instructor were from aided schools while 20% of lab instructor are from Private schools.36.36% and 27.27% of respondents were computer teacher which were from the category of aided/granted schools and private (Non-aided) schools. 100% of respondents were computer teacher which belongs to the group of central board schools and municipal schools.

Table 6.1.3 Educational Qualification of the computer teacher

Qualification of thecomputer teacher	**Types of School**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Graduate (%)	14 (51.85)	-	11 (73.33)	2 (40.00)	27 (61.36)
Postgraduate (%)	-	03 (100.00)	04 (26.67)	-	07 (15.91)
Other(MS-CIT) (%)	7 (33.3)	-	-	3 (60.00)	10 (22.72)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

Table no. 6.1.3 indicates the qualification of the respondents. Out of 44 respondents 27(61.36%) which consisted 11 from private school , 14 from aided/granted schools and 2 from municipal schools were graduates, similarly 7 out of 44(15.91%), consisting 3 from central board schools and 4 from private schools were postgraduate. 10(22.72%) were having MS-CIT certifications. Thus, majority 27(61.36%) of the respondents were graduates and rest were post-graduate and MS-CIT certification holders. 3(60.00%) of the respondents from municipal schools were MS-CIT certification.

Table 6.1.4 Age wise classification of computer teacher

Age Group of computer teacher	**Types of School**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to 30 Years (%)	21 (100.00)	02 (66.67)	04 (26.67)	4 (80.00)	31 (70.45)
More than 30 years (%)	-	01 (33.33)	11 (73.33)	1 (20.00)	13 (29.54)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

Table no. 6.1.4 gives the details of age wise classification of the respondents. It can be noted that 31 out of 44(70.45%) respondents were from the age group up to 30 years of age and the rest 13(29.54%) were more than 30 years of age , Thus majority that is more than 2/3rd of the respondents from the relatively younger age group.

Table 6.1.5 Years of service of computer teachers

Years of service of computer teacher	Types of School				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**	**Total schools**
Up to 3 (%)	06 (28.57)	-	-	3 (60.00)	09 (45.45)
3-5 (%)	14 (66.67)	-	11 (73.34)	2 (40.00)	27 (61.37)
5-10 (%)	01 (4.76)	03 (100.00)	02 (13.33)	-	06 (13.63)
10 and more (%)	-	-	02 (13.33)	-	02 (4.54)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

Regarding the years of service of the computer teachers 09 out of 44(45.45%) were having experience of teaching up to 3 years.While majority 27 out of 44(61.37%)were having teaching experience up to 3-5 years and 03 teachers(100.00%) from cental board and 2(13.33%)teachers have teaching experience in the range of 5-10 years. Only 2 computer teachers (13.33%) from private school were having teaching experience ofmore than 10 years. Thus 06(13.63%) of teachers from aided/granted schools, central board and private school were having teaching experience of 5-10 years.09(45.45%) from aided/granted schoolsand municipal schools teachers were having teaching experience of upto 3years.

Table 6.1.6 Year in which schools started computer education

Year of start of computer education	Types of School				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
1998 (%)	01 (4.76)	03 (100.00)	-	-	04 (9.09)
2000 (%)	-	-	02 (13.33)	-	02 (4.54)
2004 (%)	20 (95.2)	-	11 (73.34)	5 (100.00)	36 (81.81)
2011 (%)	-	-	02 (13.33)	-	02 (4.54)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

Table no 6.1.6 gives the detail about the year in which computer education started in the school covered by the study. In the year 1998, one school from aided category and all 3 schools from central board started computer education. Thus, 9.09% of the total number of schools, started with the computer education in 1998 , 2 private school started with it in the year 2000. However majority of the schools 21 out of 20 aided schools, 11 out of 15 schoolsfrom private category and 5 municipal schools started computer education in the year 2004 and 2 private schools started with it in the year 2011. Thus, Majority of the schools covered by the study that is 36 out of 44(81.81%) started with computer education in the year 2004.

Table 6.1.7 Computer Labourites/school

No. of computer Lab	Types of School				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
One (%)	19 (90.48)	03 (100.00)	13 (86.67)	5 (100.00)	40 (90.90)
Two (%)	02 (9.52)	-	02 (13.33)	-	04 (9.09)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

Table no. 6.1.7 gives the details of the computer laboratories in the schools covered by the studies. It can be observed 40 out of 44, consisting of 19 from aided schools , 3 from central board schools ,13 from private schools and 5 from municipal schools accounting for (90.90%) of the total were having 1 computer lab. The rest 4 schools consisting of 2 schools from private category and 2 from aided category were having 2 lab in each schools. Thus about 90.90% of the schools covered by the study were having only 1 lab in each school.

Table 6.1.8 Number of Computers in Schools

No. of computer's	Types of School				
	Aided/Granted Schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
24 (%)	14 (66.67)	-	11 (73.34)	5 (100.00)	30 (68.18)
30 (%)	05 (23.81)	-	-	-	05 (11.37)
40 (%)	-	03 (100.00)	02 (13.33)	-	05 (11.37)
60 (%)	02 (9.52)	-	2 (13.33)	-	04 (9.09)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

Out of 44, 30(68.18%)schools including 11 private,14 aided schools and 5 from municipal corporation have 24 computers in their labs.5(11.37%) aided schools had 30 computers in each of their laboratories. There were 5(11.37%) schools,3 from Central Board and 2 from private schools were having 40 computers in each of their labs.Also, 2(9.52%) granted/aided schools and 2(13.33%) private school had 60 computer in their labs.

Table 6.1.9 Number of Schools having computers connected to internet

No. of computer's connected to ⇩ internet	**Types of School**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
01 (%)	15 (71.43)	03 (100.00)	13 (86.67)	-	31 (70.45)
10 (%)	-	-	02 (13.33)	-	02 (4.55)
Nil (%)	06 (28.57)	-	-	5 (100.00)	11 (25.00)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

From the table 6.1.9 it is evident that 31 out of 44 (70.45%) of the schools consisting of 15 from aided school category and all from central board were having one computer connected with internet. Two private school were having 10 computers connected with internet however 11 out of 44 schools (25.00%) consisting of 6 aided schools and 5(100%) municipal schools were not having any computer connected to the internet.

Table 6.1.10 Computer teacher's views about number of computer in their schools

Computer teachers view	Types of School				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**	**Total schools**
Sufficient (%)	-	03 (100.00)	-	-	03 (6.81)
Not sufficient (%)	21 (100.00)	-	15 (100.00)	5 (100.00)	41 s(93.19)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

Table 6.1.10 gives the details about the respondent views relating to the sufficient number of computers in their schools. All the respondent(computer teacher) from the aided schools, private schools and municipal schools expressed their views that number of computers that were available for the student were not sufficient. Only the teachers from central board schools felt that these number was sufficient.Thus it is necessary that no. of computers available in aided schools , private schools and municipal schools needs to be increased so as to enable most of the student to handle computer for improving their expertise using computers.

Table 6.1.11 Sources of getting software for school

Source of getting software for school	Types of School				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Purchase from market (%)	3 (6.81)	03 (100.00)	10 (66.67)	-	16 (36.36)
Created by teachers (%)	-	-	04 (26.67)	-	04 (9.09)
Contract basis (%)	18 (40.90)	-	01 (6.66)	5 (100.00)	24 (54.54)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

The table 6.1.11 deals with the sources of getting softwares required by the school students.16 out of 44 (36.36%) of schools purchased software required for their school from the market. Theirwere only 4(26.67%) of private schools which motivated the teachers to create it for their students. 6.66% of private school ,5 (100%) municipal schools and 18(40.90%)of aided schools got it on contract basis.Thus it is desirable that the computer teacher need to be motivated to develop software according to the requirement of the school for teaching various subject in the class rooms.

Table 6.1.12 Authorities designing computer curriculum

Authority designing computer curriculum	**Types of School**				
	Aided/Granted Schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Concerned Board (%)	21 (100.00)	03 (100.00)	12 (80.00)	5 (100.00)	41 (93.18)
School teachers (%)	-	-	03 (20.00)	-	03 (6.81)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

Regarding authorities responsible for designing computer curriculum, from table no 6.1.12 it is evident that 41 out of 44 schools consist of 21 aided schools, 3 Central schools ,12 private schools and 5 municipal schools use computer curriculum preferred by their respective boards. In case of only 3 private schools computer curriculum was prepared by the teachers. The computer teachers should take initiative to prepare computers curriculum taking into consideration to abilities of students in order to make computer awareness more effective.

Table 6.1.13 Number of computer teacher per school

No. of computer teachers per school ⇩	Types of School				
	Aided/Granted Schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**	**Total schools**
One (%)	20 (95.24)	01 (33.33)	12 (80.00)	5 (100.00)	38 (86.36)
Two or more (%)	01 (4.76)	02 (66.67)	03 (20.00)	-	06 (13.63)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

From the table no. 6.1.13 it may be observed that 38 out of 44(86.36%) of the schools cover by the study which includes 20 out of 21 aided schools, one from central board school ,12 from private schools and 5 from municipal school had one computer teacher. The rest of the schools were having two or more computer teachers per school, thus the number of computer teacher per school should be increased to give better attention towards teaching and learning of each of the student.

Table 6.1.14 Nature of appointment of computer teacher per school

Appointment of computer teacher ⇩	**Types of School**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Permanent (%)	9 (42.86)	03 (100.00)	10 (66.67)	-	22 (50.00)
Temporary (%)	12 (57.14)	-	05 (33.33)	5 (100.00)	22 (50.00)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

Table no. 6.1.14 shows that 22 out of 44(50.00%) schools consisting of 9 aided schools, 03 central Board schools and 10 private schools were having permanent computer teaching faculty. 12 schools from aided category , 5 from private schools and 5 from municipal schools, thus total 22 schools out of 44(50%) had appointed computer teaching faculty on temporary basis. It is desirable to point computer teaching faculty on permanent basis so that they can fully concentrate on continuously improving computer awareness and use of computers for various purpose by the students.

Table 6.1.15 Frequency of class in computer teaching in schools per week

Computer Classes per week ⇩	**Types of School**				
	Aided/Granted Schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Once (%)	15 (71.43)	-	11 (73.33)	5 (100.00)	31 (70.45)
Twice (%)	6 (28.57)	3 (100.00)	4 (26.67)	-	13 (29.54)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

Regarding frequency of computer teaching from table No. 6.1.15 it can be observed that, in case of 31 out of 44(70.45%) schools consisting of 15 from aided schools ,11 private schools and 5 from municipal schools allotted one class per week.28.57% of aided/granted schools,100% of central boar schools and 26.67% of Private(Non-aided) schools allocated two classes per week.Thus 70.45% of schools allocated computer teaching class once per week.

Table 6.1.16 Factors affecting teachers familiarity with computer technologies

Factors	Types of School				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Years of teaching (%)	10 (47.61)	03 (100.00)	14 (93.33)	3 (60.00)	30 (68.18)
School status (%)	10 (47.61)	02 (66.67)	12 (80.00)	2 (40.00)	26 (59.09)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

From the table No. 6.1.16 it can be noted that 30 out of 44 (68.18%) of the school representative, the number of years of teaching was the dominant factor affecting teachers familiarity with computer technologies, followed by the school status (59.09%).More experience teacher have significantly higher familiarity with computer technologies which can be used for teaching students more effectively and efficiently.

Table 6.1.17 Percentage of budget allocated for computer department

Percentage of budget ⇩	**Types of School**				
	Aided/Granted Schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Less than 2% (%)	21 (100.00)	02 (66.67)	13 (86.67)	5 (100.00)	41 (93.18)
More than 2% (%)	-	01 (33.33)	02 (13.33)	-	03 (6.81)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

When the percentage of budget allocated for computer department is taken into consideration from the table no.6.1.17, 41 out of schools 44(93.18%) allocated less than 2 percent of their budget only 3(6.81%) schools allocated more than 2 percent of their budget which consist of one from central board category and 2 from private category.Taking into consideration the need of computer awareness among the school student at least 5% of the budgetary funds should be allocated for computer departments in there schools.

Table 6.1.18 Grades of students using / learning computer in their schools

Grades of students using computer	Types of School				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
First (%)	05 (23.81)	03 (100.00)	5 (33.33)	-	13 (29.54)
Fifth (%)	16 (76.19)	-	10 (66.67)	5 (100.00)	31 (70.45)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

From the table no 6.1.18, it is observed that 31 out of 44(70.45%) schools consisting of 16 aided schools,10 private schools and 5 from municipal schools provided facilities for learning /using computers from fifth standard. 13(29.54%) schools consisting of 5 aided schools, 3 central board and 5 private schools provide computer education right from the first grade or standard. Taking into consideration the role of IT in human lives it has become necessary to start teaching and learning computers from the first standard/grades.

Table 6.1.19 Subject learn by the student up to Xth Class

Sr.No	Subject ⇩	Types of School				
		Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
1	Keyboard operation	21	03	15	5	44
2	Mouse operation	21	03	15	5	44
3	Word processing	21	03	15	5	44
4	Email exchange	21	03	15	0	39
5	Web surfing	20	03	15	3	41 (93.18)
6	Data retrieval	21	03	15	5	44
7	Drawing/Paint	21	03	14	5	44
8	MS-Excel	21	03	15	5	44
9	Setting sites	11	02	15	-	28
10	Programming C,C++	16	03	14	-	33 (75.00)
11	Algorithm	21	03	15	-	39
12	Database	17	03	15	-	35
13	MS-PowerPoint	21	03	15	5	44
14	No specific skills/topics	17	02	15	1	35
15	Other	17	03	15	-	34
	Total	**21**	**03**	**15**	**5**	**44**

(Source : Primary Data)

The table no 6.1.19 contains responses about the subject or techniques by the students up to 10th class. All the student from all the schools covered by the study learn various subject such as keyboard operation, mouse operation, word processing, data retrieval, spread sheet/excel, Paint. The students 33(75%) have learnt Programming C,C++and 93.18% of students have web surfing. Private and CBSE school students learn all the subject described by there board.While the all municipal school students does not learn to develop websites ,Programming in C,C++ , Database , Algorithm

Table 6.1.20 Number of schools sendingteachers for attending seminarsand other computer events.

Attending Seminar and other computer events	Types of School				
	Aided/Granted Schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Computer workshop (%)	-	02	04	-	06 (13.63)
Seminar (%)	05	03	02	-	10 (22.72)
Orientation Programme (%)	01	-	-	-	01 (2.27)
Training Programme (%)	01	-	02	4	07 (15.90)
Not attended (%)	15	-	10	1	26 (59.09)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

From the point of view of the development of the teachers and gaining knowledge about emerging trends in computers , it is necessary that school should regularly send their computer teacher to attend computer workshop, seminars, training and orientation programs.The table No. 6.1.20 show that only 10(22.72%) of schools covered by the study send their computer teachers for attending seminars on computer and 6(13.63%) schools sent their teachers to attend computer workshops.Only 01(2.27%) aided/granted school sends its teacher for orientation programme.26(59.09%) of schools did not send their teachers for orientation programme,training programme in computer or computer workshop.The schools

should take initiative to send their teachers for participating in computer workshop, seminars and other computer related activities.

Table 6.1.21 Number of teachers visiting computer stores and exhibitions per school

Response ⇩	**Types of School**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**	**Total schools**
Visiting computer stores (%)	02 (9.52)	01 (33.33)	03 (20.00)	-	06 (13.63)
Visiting Exhibitions (%)	02 (9.52)	02 (66.67)	02 (13.33)	-	06 (13.63)
Not visited (%)	18 (85.71)	-	10 (66.67)	5 (100.00)	33 (75.00)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source: Primary Data)

From the table 6.1.21 it can observed that only 6(13.63%) out of 44 schools computer teachers visit computer stores and computer exhibitions in order to be aware about recent development in computer and availability of computers and computer related items used for computer teaching and learning, it is desirable that school authorities should send computer teacher to visit computer stores and computer exhibitions.

Table 6.1.22Teaching methodologies used by the teachers in their schools

Teaching Methodologies ⇩	Types of School				
	Aided/Granted Schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**	**Total schools**
CD presentation in classrooms	03	03	14	-	20 (45.45)
Use of Internet while teaching	05	02	05	-	12 (27.27)
Using LCD in the classrooms	-	03	05	-	8 (18.18)
Preparing through Internet	13	03	12	-	28 (63.63)
Reading computer magazine	-	01	-	-	01 (2.27)
Reading internet magazine	-	01	-	-	01 (2.27)
Do not use	-			5 (100.00)	5 (11.36)
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

Table No. 6.1.22 reveals that in the case of 20 out of 44 schools (45.45%) use CD presentation in classroom for teaching computers.18.18% school use LCD in the classroom for teaching computer in their studies. 100% of municipal schools teachers did not use these tools for teaching compters.

Table 6.1.23 Computer usage by the teachers

Subjects	Types of School				
	Aided/Granted Schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**	**Total schools**
Science	2				2
History	05	02	05	-	12
Geography	-	03	05	-	8
English	13	03	12	-	28
Maths	-	01	-	-	1
Do not use	-			5 (100.00)	5
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	**44 (100.00)**

(Source : Primary Data)

From the table 6.1.23 it has been observed that maximum use of computer by teacher is for the English subject folled by history.Only one computer teacher from central board school use computer for teaching subject maths.100% municipal school teachers does not use computer for teaching.

Table 6.1.24 Bringing innovation to classroom teaching

Seminar Conducted	Types of School			
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**
MS-Powerpoint (%)	7 (33.33%)	3 (100%)	11 (73.33%)	0
Internet (%)	9 (42.85%)	3 (100%)	14 (93.33%)	0
Educational CD's (%)	6 (28.57%)	3 (100%)	13 (86.66%)	0
Total	**21**	**03**	**15**	**5**

(Source: Primary data)

From the table 6.1.24 it is observed that computer teacher uses MS-powerpoint ,Internet technology to bring interest in teaching

PARENTS TABLES

Table 6.2.1 Agewise classification of the parents

Age group of parents ⇩	**Aided/Granted schools**	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**	**Total schools**
25-35 (%)	63 (30.00)	03 (10.00)	12 (8.33)	43 (86.00)	121 (27.50)
35-45 (%)	121 (57.63)	18 (60.00)	88 (58.33)	7 (14.00)	234 (53.18)
45-above (%)	26 (12.38)	09 (30.00)	50 (33.34)	-	85 (19.31)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

Table no.6.2.1 deals with age wise classification of the parents of the students covered by the study. From the table it can be observed that 234 out of 440(53.18%) of the parents were from the age group 35-45 years followed by 19.31% of the parents were from the age group 45 years and above. The parents belonging to the age group 25-35 years were 121 out of 440(27.50%) of the total number of the parents. This pattern of the age group of the parents has been similar in case of aided/granted schools, central boards' schools and private schools. Thus the majority of the parents belong to the middle age group of 35-45 years of age.

Table 6.2.2 Educational qualifications of the parents

Qualification of parents ⇩	**Aided/Granted schools**	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Undergraduate (%)	188 (82.52)	03 (10.00)	12 (8.00)	50 (100.00)	253 (57.50)
Graduate (%)	13 (6.19)	06 (20.00)	86 (57.33)	-	105 (23.86)
Post-graduate (%)	09 (4.29)	21 (70.00)	52 (34.67)	-	82 (18.63)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(source : Primary data)

Regarding the educational qualification of the parents, Undergraduate parents accounted for 253(57.50%) of the total 440 parents, where parents of the students of aided/granted schools accounted for 82.52% out of 210,but only 10% out of 30 and 8% out of 150 from the central boards schools and private schools.The percentage of graduates parent was the highest at 57.33% in case of private schools.21(70%) of the 30 parents from the central boards schools were post-graduate.Thus among total number of parents 253 out of 440(57.50%) were undergraduates and the rest were graduates and post graduates.Also 100 % of parents from municipal school are undergraduates.

Table 6.2.3 Annual Income of Parents

Annual Income(in lakhs) of parents ⇩	**Aided/Granted schools**	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to 2 (%)	68 (32.50)	-	25 (16.67)	50 (100.00)	143 (32.50)
2-3 (%)	115 (55.00)	06 (20.00)	12 (8.33)	-	133 (30.22)
3-5 (%)	11 (5.00)	05 (16.67)	12 (8.33)	-	28 (6.36)
5 and Above (%)	16 (7.50)	19 (63.33)	101 (66.67)	-	136 (30.90)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

Table No.6.2.3reveals that, out of the total 440 parents, 136 (30.90%) had their annual income Rs. 5 lakhs and above.Out of 30 (63.33%) parents of the students from central Board's schools and 101 out of 150 (66.67%) parents of the students from private school had their annual income of Rs.5 Lakhs and above.133(30.22%) out of 440 had the income range between Rs.2 – 3 lakhs respectively. In the case of aided/granted schools 183 out of 210 parents (87.14%) were having their annual income up to Rs. 3 lakhs only.Annual income of municipal school parents is up to 2lakhs only. Thus annual income of parents of the students from aided/granted schools and municipal schools was relatively lower than that of the parents of the students from central board's schools and private schools. In other words, relatively financially better of parents prefer central board's school or private schools.

Table 6.2.4 Occupation wise classification of the parents

Occupation of parents ⇩	**Aided/Granted schools**	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Professional (%)	95 (45.24)	03 (10.00)	24 (16.00)	-	122 (27.72)
Business (%)	26 (12.38)	15 (50.00)	110 (73.34)	-	151 (34.31)
Service (%)	82 (39.05)	12 (40.00)	16 (10.66)	11 (22.00)	121 (27.50)
Housewife (%)	05 (2.38)	-	-	-	10 (2.27)
Other (%)	02 (0.92)	-	-	39 (78.00)	41 (9.31)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

Regarding occupation of the parents of the students covered by the study, it can be observed from the table No.6.2.4 that 122 out of 440 parents (27.72%) were professionals and 151(34.31%) were from the business sector, followed by 121(27.50%)were from the service sector . Housewives accounted for 2.27% and other 9.31% only. Thus majority of the parents (89.53%) were from the business, professional and service sector.

Table 6.2.5 Parent's Responses about the use of computers

Sr .no	Parent's Responses ⇩	Aided/Granted schools	Central board schools	Private(Non-Aided) schools	Municipal schools	Total schools
I)	Do you use Computer for personal/ professional purposes	26 (12.3)	21 (70.00)	100 (66.67)	0 (0)	147 (37.04)
II)	Is computer education is must for your children	200 (95.24)	29 (96.67)	150 (100.00)	50 (100.00)	439 (97.18)
III)	Have you computer at home for children.	47 (22.38)	26 (86.67)	137 (91.67)	0	210 (53.85)
IV)	If not, are you thinking of thinking to buy it for your children?	152 (72.38)	03 (10.00)	12 (8.33)	4 (2.00)	171 (42.82)
V)	Do you buy latest software and hardware for your child to upgrade his/her talents?	42 (20.00)	18 (60.00)	100 (66.67)	0	160 (41.03)
VI)	Having computer would lead to better utilization of children's time?	168 (80.00)	28 (93.33)	125 (83.33)	36 (72.00)	357 (81.11)
VII)	Whether the school is teaching computer as per the	142 (67.62)	21 (70.00)	113 (75.00)	12 (24.00)	288 (65.45)

	practical needs?					
VIII)	Do you help your child in gaining knowledge about computer?	42 (20.00)	19 (63.33)	125 (83.33)	0	186 (47.69)
IX)	Does computer education has positive effect on student.	173 (82.38)	26 (86.67)	137 (91.67)	33 (66.00)	369 (83.86)
X)	Do you visit computer stores and exhibitions with your children?	26 (12.38)	12 (40.00)	62 (41.67)	0	100 (22.72)
XI)	Does your child use computer more to play games than to gain knowledge?	05 (2.38)	09 (30.00)	38 (25.00)	0	52 (11.81)
XII)	Is your child use computer to download movies, games, songs?	100 (47.6)	08 (26.67)	38 (25.00)	0	46 (10.45)
XIII)	Are your children aware of latest updates in hardware and software?	80 (38.09)	04 (13.33)	113 (75.00)	0	197 (47.47)
	Total respondents	**210**	**30**	**150**	**50**	**440**

(Source: primary data)

It was observed that 147 out of 440 parents (37.04%) were using computer for personal/professional use, and this percentage ranged between 70% in case of the parents of central boards students but only 12.38% of the parents of the children from

aided/granted schools, 117 out of 440 (30.00%) of the parents responded that their children were aware about latest updates in hardware and software and this percentageis 75% in case of parents of students of private school. Regarding visiting computer stores and exhibitions along with their children, 100 out of 440(25.64%) of the parents responded that they were doing so while the rest of the responded especially the parents of granted/aided schools were not visiting computer stores and exhibitions along with their children . Thus it can be concluded that the parents of the students from the central boards schools and private schools are relatively aware about the use of computers by their children and their awareness needs to be promoted in case of the parents of the children from aided schools.

Table 6.2.5 exhibits parent's responses about the usefulness of computer education to their students, 379 out of 440 parents (97.18%) stated that the computer education has been must for their children attending schools. All the parents of the students of private schools completely agreed with this view. Thus parents have realised the importance of computer education for their children. Next 336(86.15%) of the parents responded that the computer education had positive effect on the student's academic achievement. In case also parents of private school students accounting for 91.67% have realized it. 321(79.40%) of the parents responded that having computer would lead to better utilization of students time of academic activities. In this respect 28 out of 30 (93.33%) of the parents of the students from central boards and 93.33% parents of private schools students and 80% of aided school responded favorably . when asked about whether in the school teaching of computer was as per practical needs? 273 out of 390(70.77%) of the parents responded favorably. This percentage varied between 75.00% in case of private schools to 67.72% in case of aided/granted schools, 210 out of 390 (53.85%) of the parents covered by the study responded that they had a computer at their home for their children and this percentage was 91.67% in case of parents of private school students but 22.38% of the parents of the children from aided/granted school. However 72.38% of these parents were thinking about purchasing a computer for their children this reflects parent's awareness about the need of computer education for their children. Regarding helping their children in gaining knowledge about computer, 186 out of 440 (47.69%) of the parents were helping them, and this percentage varied from 83.33% in case of the parents of private school children to only 20% in case of parents of aided/granted school children.

Table 6.2.6 Parent's Expectations about computer subject to their children.

Sr.No	Parent's Expectations about computer subject	Aided/Granted schools	Central board schools	Private(Non-Aided) schools	Municipal schools	Aided/Granted schools
		Yes	Yes	Yes	Yes	%
I)	To help children to pursue their future career	210 (100.00)	30 (100.00)	137 (91.67)	50 (100.00)	89.01
II)	To increase children's social interest.	152 (72.38)	13 (43.33)	88 (58.67)	40 (80.00)	66.59
III)	To enhance children's knowledge.	205 (97.62)	29 (96.67)	137 (91.67)	50 (100.00)	95.68
IV)	To enhance student's communication ability.	153 (72.85)	26 (86.67)	116 (77.33)	16 (32.13)	70.68
V)	To help children to survive in modern society.	126 (60.200)	19 (63.33)	98 (65.33)	19 (38.00)	59.54
VI)	To nurture children's attitude and their power to think.	58 (27.62)	21 (70.00)	113 (75.00)	6 (12.00)	45.00
VII)	To help them better understand truth good and beauty	105 (50.00)	16 (53.33)	50 (33.33)	6 (12.00)	40.22
VIII)	To complete different projects	84 (40.00)	24 (80.00)	125 (83.33)	2 (4.00)	53.40
IX)	IQ – test	142 (67.62)	23 (76.67)	113 (75.00)	2 (4.00)	63.63

(Source: primary data)

Table no 6.2.6: Shows the responses of the parents of the students regarding their expectations about computer education to their children. From the data presented in the table the following findings have been arrived at.

1. Almost all the parents covered by the study expected that providing computer education to their children tends to help their children to pursue their future career.

2. 371 out of 440(95.13%) of the parents expected that the computer education to their children tends to enhance children's knowledge.

3. 75.64% of the parents covered by the study expected that the computer education helped in enhancing student communication ability.

4. 71.28% of the parents expected that computer education to children improved their ability in IQ – test.

5. 64.87% of the total parents expected that computer education tends to increase children's social interest. This percentage was 72.38 in case of parents of the students from aided/granted schools.

6. 62.31% of the total parents expected that computer education helps their children to survive in modern society.

7. 59.74% of the total parents expected that computer education helps their children to complete different project. This percentage was 83.33% in case of parents of private school children but 40% in respect of parents of students from aided/granted schools.

8. 49.23% of the total parents expected that computer education helps the student to nurture their attitudes and their power to think also.

9. 43.85% of the total parents expected that, computer education to their children helps them in better understanding about truth, good and beauty. This

percentage ranged between 53.33% in case of parents of students of private schools.

Thus it can be concluded that the main expectation of parents about computer education to their children helps in pursuing their career, to enhance children's knowledge, performance in IQ – test, increasing children's social interest helping children to survive in modern society and completing different projects by their children.

Table 6.2.7 Parent's Responses about sources from where child learns more about computer effectively.

(mean value)

Parents Response ⇩	**Aided/Granted Schools**	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**
Parents	2.80	3.40	3.75	0
Teachers	4.20	4.18	4.41	4.89
Friends	3.28	2.50	2.67	0
Relatives	3.22	1.70	2.08	0
Books	1.87	2.60	1.67	0

(Source: Primary data)

Table No.6.2.7, exhibits parents responses about sources from where children learnt more about computer effectively. When the mean values of these responses are taken into consideration, it was observed that, parents of all the categories of school students gave top priority to teachers. Thus, teachers tend to play a crucial role in teaching and learning of computer education. Parents of the students were given second priority by the parent. Thus parents also play an important role in the places of teaching and learning computer by the student. Friend's relatives and books as a source are given third, fourth and fifth priority by the parents.

STUDENTS TABLE

Table 6.3.1 Locations where students use computers

Location where student use computers	**Types of school students**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Home (%)	67 (33.50)	26 (86.67)	129 (86.00)	-	222 (50.45)
School (%)	205 (97.62)	29 (96.67)	136 (90.67)	50 (100.00)	420 (95.45)
Cyber café (%)	05 (2.50)	08 (26.62)	14 (9.33)	25 (50.00)	52 (11.81)
Friend's home (%)	10 (5.00)	02 (6.67)	50 (33.33)	-	62 (14.10)
Other places (%)	10 (5.00)	02 (6.67)	36 (24.00)	1 (0.02)	49 (11.13)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

The students tend to use more than one location for using computers. From the table number 1, it is evident that, 420 out of 440(95.45%) of the students from different types of schools use computers at their respective schools. This percentage ranges between 97.62% in case of granted/aided schools to 90.67% in private schools. The percentage of the students using computers at their homes/houses stands at 50.45% for all the school students and it varies from 86.67% of the students from central boards to 32.50% of the students from the aided/granted schools. Some of the students could take advantage of using computers at their friend's homes. In the case of total students this percentage was 15.90% and it varied between 33.33% in vase of private schools to only 5% in case of aided schools. Only a few students used computers located at cyber café, and other places. Thus it can be concluded that most of the students used computers located at their respective school and their own houses.

Table 6.3.2 Sources of help in case of difficulty while using computers.
(Mean Values)

Sources of help	**Aided/Granted schools**	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**
Parents	3.20	5.56	5.21	1.11
Teachers	5.90	4.63	4.52	2.98
Friends	4.70	3.90	3.67	2.56
Relatives	3.55	2.33	2.90	0
Books	3.50	2.40	3.38	0
Others	0.65	1.20	1.89	0

(Source: Primary data)

Regarding sources of help in case of difficulty while using computers by the students, it was observed that, in case of the student's from central boards schools and private schools, their parents play an important role, followed by teachers and friends, whereas teachers play an important role in solving difficulties faced by the students in granted schools followed by friends and relatives books and parents. Thus from the table 2, it may be concluded that teachers, parents and friends are the main sources of help for the students covered by the study in helping for overcoming the difficulties while using computers.

Table 6.3.3 Time devoted by the students for using computers for homework and other assignments.

Time devoted by the students(hrs/ per week)	**Types of school students**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to one hour (%)	173 (82.38)	15 (50.00)	100 (66.66)	-	288 (65.45)
1 – 5 hours (%)	32 (15.24)	07 (23.33)	30 (20.00)	-	69 (15.68)
More than 5 hours (%)	05 (2.38)	08 (26.67)	20 (13.34)	-	33 (7.5)
Do not use	-	-	-	50 (100.00)	50 (11.36)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

Regarding time devoted by the students, for using computers for home work and other assignments, 288 out of 440(65.45%) of the students use for period upto one hour per week and this percentage ranged from 82.38% in case of aided schools to 50% in case of students from central boards. The students using computers for this purpose for the period of 1 – 5 hours were 69 out of 440(17.69%) and this percentage ranges between 23.33% in case of central boards schools to 15.24% in case of aided/granted schools, the students using computers for more than 5 hours per week were 33 out of 440(7.50%) and this percentage varied from 26.67% in case of the students from central boards schools to 2.38% in case granted/aided schools. 100% the students of municipal school does not use computer for homework and assignment.Majority of the students uses computers for home work and other assignments for the period up to one hour per week.

Table 6.3.4 Time spent by the students for playing computer games

Time(hrs/week) for playing computer games	Types of school students				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to one hour (%)	173 (82.38)	15 (50.00)	100 (66.66)	37 (74.00)	325 (73.86)
1 – 5 hours (%)	32 (15.24)	07 (23.33)	30 (20.00)	13 (26)	82 (18.63)
More than 5 hours (%)	05 (2.38)	08 (26.67)	20 (13.34)	-	33 (7.5)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

From the table No. 6.3.4 it is observed that the students enjoy using computers even for playing computer games 173 out of 210 (82.38%) students from granted schools spend time upto one hour per week and 2.38% of them spend time for more than 5 hours per week. 74% of municipal school students uses computer for playing games upto one hour per week.While 26% of municipal school students use it for 1-5 hrs. per week.The central board school students spending time for playing computer games for the period for 5 or more hours per week account for 26.67% of the total number of students, whereas in the case of private school students the same percentage has been up to nearly 13.34 percent. Thus the number of students playing computer games has been relatively higher in the case of central boards students and private schools students.

Table 6.3.5 Students using computer for MS – Excel

Time(hrs/per week) for MS – Excel	**Types of school students**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to one hour (%)	147 (70.00)	07 (23.33)	21 (14.00)	41 (82.00)	216 (49.09)
1 – 5 hours (%)	21 (10.00)	10 (33.33)	94 (62.67)	-	125 (28.40)
More than 5 hours (%)	42 (20.00)	11 (36.67)	21 (14.00)	-	74 (16.81)
Do not use (%)	-	02 (6.67)	14 (9.33)	9 (18.00)	25 (5.68)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

The table No. 6.3.5 shows the number of student using computers for MS – Excel. It may be noted that 216 out of 440 (49.09%) students covered by the study, use computers up to one hour per week and this percentage varied between 14.00% in case of private schools to 70.00% for the students from granted/aided school to 82% in case of municipal school. The number of students using computers for 1 – 5 hours per week for MS – Excel was 125 out of 440 (22.82%) and this percentage has been 62.67%, 33.33% and 10.00% in case of private, central boards and aided school students. 11 out of 30 (36.67%) students from central boards schools used computers for this purpose for the period of more than five hours per week. In case of municipal coorperation schools 18.00% of the students did not use computers for this purpose. Thus majority of the students used computers for MS – Excel for the period of upto one hour per week.

Table 6.3.6 Students using computer for MS – Word

Time(hrs/week)for using MS-Word	Types of school students				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to one hour (%)	137 (65.24)	10 (33.33)	57 (38.00)	39 (78.00)	243 (55.22)
1 – 5 hours (%)	63 (30.00)	04 (13.33)	57 (38.00)	-	124 (28.18)
More than 5 hours (%)	-	06 (20.00)	21 (14.00)	-	27 (6.13)
Do not use (%)	10 (4.76)	08 (26.67)	15 (10.00)	-	33 (7.5)
No response (%)	-	02 (6.67)	-	11 (22.00)	13 (2.95)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

Table no. 6.3.6 presents the number of students using computers for MS – Word by the students from different schools covered by the study. It may be noted that 243 out of 440 (55.22%) of the students used computers for this purpose for the period less than one hour per week, and this percentage varied from 65.24% in case of aided schools to 33.33% of the students from the schools recognized by the central boards to 78% in case of municipal school students. The number of students using computers for MS –Word for the period of 1 – 5 hours per week varied from 38% of the students from private schools to 13.33% of the students from the central board's schools.The number of students using computers for this purpose for the period of more than 5 hours per week stood at 8.46% only. Thus it may be concluded that most of the students covered by the study used computers for less than one hour per week for the purpose of MS-Word.

Table 6.3.7 Students using computers for downloading software

Time(hrs/week) for downloading software	Types of school students				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to one hour (%)	26 (12.38)	16 (53.33)	64 (42.67)	-	106 (24.09)
1 – 5 hours (%)	05 (2.39)	03 (10.00)	71 (47.33)	-	79 (17.95)
More than 5 hours (%)	-	04 (13.33)	15 (10.00)	-	19 (4.31)
Not using it (%)	179 (85.23)	05 (16.67)	-	47 (94.00)	231 (52.50)
No response (%)	-	02 (6.67)	-	3 (6.00)	05 (1.13)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

Regarding the students using computers for downloading software from table number 6.3.7 it can be observed that, out of total 440 students from different types of schools, 106 (24.09%) of them use computers for up to one hour per week, whereas 231 (52.50%) do not use, computers for this purpose. When the students from different categories of the schools are taken into considering 64 (42.67%) students from private schools and 26 (12.33%) from aided schools and 16 (53.33%) from central boards schools use computer for less than one hour per week for downloading software; 71 students (47.33%) from private schools use computers for this purpose for the period of 1 – 5 hours per week, and 15(10%) of these students use computers for more than 5 hours per week. It is worth nothing that 179(85.23%) out of 210 students from aided schools and 47(94.00%) from municipal schools do not use computers for this purpose.

Table 6.3.8 Students using computers for browsing

Time(hrs/week)for browsing	Types of school students				
	Aided/Granted Schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to one hour (%)	21 (10.00)	12 (40.00)	57 (38.00)	9 (18.00)	99 (22.5)
1 – 5 hours (%)	05 (2.50)	05 (16.67)	29 (19.33)	-	39 (8.86)
More than 5 hours (%)	-	06 (20.00)	14 (9.33)	-	20 (4.54)
Do not use (%)	184 (87.50)	04 (13.33)	50 (33.34)	31 (62.00)	269 (61.13)
No response (%)	-	03 (100.00)	-	10 (20.00)	13 (2.95)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

Table no 6.3.8 presents number of students using computers for browsing 269 (61.13%) of the students do not use computers for browsing,out of which 184 (87.50%) students from aided/granted schools and 62% of municipal school students do not use computers for browsing. However, 99 out of 440(22.50%) students covered by the study use computers for browsing and this percentage ranges from 40% in case of central boards schools students to 10% in the case of granted schools, for the period of less than one hour per week. The students accounting for 36.37% from central board's schools and 57.33% of the students from private schools use computers for browsing. Thus the percentage of the students using computers for browsing was highest among the central schools covered by the study followed by private school students.

Total 6.3.9 Students using computers for playing games

Time(hrs/week) for playing games	Types of school students				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to one hour (%)	32 (15.00)	08 (26.67)	64 (42.67)	11 (22.00)	115 (26.13)
1 – 5 hours (%)	-	03 (10.00)	50 (33.33)	19 (38.00)	72 (16.36)
More than 5 hours (%)	10 (5.00)	15 (50.00)	14 (9.33)	-	39 (8.86)
Do not use (%)	168 (80.00)	04 (13.33)	22 (14.67)	20 (40.00)	214 (48.63)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

Regarding students using computers for playing games 64(42.67%) students from private schools and 32 out of 115(15%) of the students from aided schools use computers for playing game for the period less than one hour per week. In the case of central boards school students (50%)use computers for playing games for more than 5 hours per week. Thus the tendency of the students from private schools and central board's schools has been higher than the students from aided / granted schools.Students using computers for playing games 214(48.63%) students covered by the study do not use computers for this purpose.

Table 6.3.10 Students using computers for playing online games

Time(hrs/week) for playing online games	**Types of school students**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to one hour (%)	32 (15.00)	08 (26.67)	50 (33.33)	20 (40.00)	110 (25.00)
1 – 5 hours (%)	21 (10.00)	67 (53.33)	50 (33.33)	10 (20.00)	148 (33.63)
More than 5 hours (%)	-	05 (16.67)	21 (14.00)	2 (4)	28 (6.36)
Do not use (%)	157 (75.00)	01 (3.33)	29 (19.34)	18 (36.00)	205 (46.60)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

From the table no 6.3.10 it is observed that the tendency of playing online games has been higher in case of private and central based schools students , as 157 out of 210 (76%) of the students from granted/ aided schools did not play such games. The students playing online games for the period up to 5 hours a week accounted for 80% in the case of central board schools students and 66.66% of the students from private schools, and this percentage has been 25% only in case of aided schools as 53 out of 210 students were interested in it.36% of municipal school students does not play online games.

Table 6.3.11 Students using computers for chatting

Time(hrs/week) using computers for chatting	Types of school students				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to one hour	11 (5.00)	08 (26.67)	50 (33.33)	1 (02.00)	70 (15.90)
1 – 5 hours	-	04 (13.33)	50 (33.33)	-	54 (12.27)
More than 5 hours	05 (2.50)	02 (6.67)	21 (14.00)	-	28 (6.36)
Do not use	194 (92.50)	16 (53.33)	29 (19.34)	49 (98.00)	288 (65.45)
Total	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

Table 6.3.11 presents the number of students using computers for chatting purposes, from different types of schools covered by the study. Out of 30(26.67%) students from central boards and 50 out of 150 (33.33%) students from private schools use computers for chatting for the period less than one hour a week. The central board's students accounting for 20% and 47.33% of the student from private schools are using computers for chatting, for the period of more than one and five hours a week. It may be noted that 194 out of 210 (92.50%) of the students from aided/granted schools do not use computers for the purpose of chatting. Similarly 53.33% of the students from central board schools also do not use computers for chatting purpose.98% of municipal school students does not use comuter fo chatting.

Table 6.3.12 Students using internet at home

Time(hrs/week) using internet at home	**Types of school students**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total schools**
Up to one hour (%)	05 (2.50)	06 (20.00)	79 (52.67)	-	90 (20.45)
1 – 5 hours (%)	37 (17.50)	10 (33.33)	71 (47.33)	-	118 (26.81)
More than 5 hours (%)	05 (2.50)	14 (46.67)	-	-	19 (4.3)
Do not use (%)	163 (77.50)	-	-	50 (100.00)	213 (48.41)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

The table no.6.3.12, exhibits the no. of students using internet at their homes. When the total number of students is considered 90 out of 440 (23.08%) of them were using internet up to one hour a week and this percentage was 52.67% in the case of the students from private schools, 20% in case of the students from central board schools and only 2.50% for aided/granted schools. The number of students using internet at home over a period of 1 – 5 hours per week in case of private schools central board schools and aided school students respectively was 71 (47.33%), 10 (33.33%) and 37 (17.50%). The tendency of using internet at home was observed to be higher (43.67%) among the students from central boards schools. Students from municipal schools do not use computers for this purpose

Table no 6.3.13 Students using internet at their schools

Time(hrs/week) using internet at their schools	Types of school students				
	Aided/Granted Schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**	**Total schools**
Up to one hour (%)	16 (7.50)	27 (90.00)	93 (62.00)	-	136 (30.90)
1 – 5 hours (%)	10 (5.00)	01 (3.33)	43 (28.67)	-	54 (12.27)
More than 5 hours (%)	-	02 (6.66)	14 (9.33)	-	16 (3.63)
Do not use (%)	184 (87.50)	-	-	50 (100.00)	234 (53.18)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 (100.00)**

(Source: Primary data)

From the table 6.3.13 it can be observed that the number of students using internet in their schools was 136 out of 440 (30.90%), over a period of up to one hour per week and this percentage was 7.50% for aided school students,90.00% for central board and 62.00% for private school students. Students using internet at their schools for a period of 1 – 5 hours per week is 3.33% and 28.67% in case of central board and private schools and 10 % for aided schools. The tendency of using internet at schools was higher in private school students (100%) followed by central board's schools (96.67%) students. 234 out of 440 (53.18%) of the students total schools students were not using internet at their schools, as in case of most of these schools internet connectivity was not available specially in case of municipal schools where no internet connection was available. Also many times failure of electric supply were the reasons as reported by the students.

Table 6.3.14 Students using internet at their friend's house.

Time(hrs/week) for using internet at their friend's house	**Types of school students**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**	**Total schools**
Up to one hour (%)	16 (7.50)	11 (36.67)	79 (52.67)	-	106 (24.09)
1 – 5 hours (%)	-	01 (3.33)	71 (47.33)	-	72 (16.36)
More than 5 hours (%)	05 (2.50)		-	-	07 (1.60)
Do not use (%)	189 (90.00)	16 (53.33)	-	50 (100.00)	255 (57.95)
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	**440 00.00)**

(Source: Primary data)

From the table number 6.3.14, it is evident that the number of students using internet at their friend's houses was 106 out of 440 (24.09%) in case of total number of students who were using internet for the period of less than one hour per week. This percentage was 52.67% among the students from private schools and it was lowest at 0% in case of municipal schools.02(6.67%) the students from central board's schools use internet at friends house for more than 5 hours.189 out of 210 (90%) of the students from aided schools were not using internet at their friends houses. None of the municipal school student use internet at friend house.Thus it is concluded that the tendency of using internet at the friend's house was higher among central board schools students and private schools students.

6.3.15 Students using internet at cyber cafe

Time(hrs/week) using internet at cyber café	Types of school students				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**	**Total schools**
Up to one hour (%)	26 (12.50)	09 (30.00)	143 (95.33)	21 (42.00)	199 (45.22)
1 – 5 hours (%)	05 (2.50)	05 (16.68)	07 (4.67)	4 (8)	21 (4.77)
More than 5 hours (%)	-	04 (13.32)	-	-	04 (0.90)
Do not use (%)	179 (85.00)	12 (40.00)	-	25 (50.00)	191 (43.40)
Total (%)	210 (100.00)	30 (100.00)	150 (100.00)	50 (100.00)	440 (100.00)

(Source: Primary data)

From the table no 6.3.15 it is evident that the number of students using internet at cyber cafes, for a period up to one hour per week was 199 out of 440(45.22%) and this percentage varied from 95.33% among the students from private schools to 12.50% among the aided schools.42.00%of the students of municipal school uses internet at cyber cafe. The tendency of using internet at cyber café over a period of 1 – 5 and more central board's schools as compared to the students from the other type of schools.

Table 6.3.16Student's view about useful location of computers with internet access.

(Mean Values)

Location / useful	**Aided/Granted schools**	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**
Computer lab	3.80	2.73	3.52	4.50
Classrooms	3.45	2.00	2.00	3.75
Student's homes	3.80	2.90	3.33	4.30
Community libraries	2.86	2.33	2.67	1.13

(Source: Primary data)

The table No. 6.3.16 shows the mean values of the student's views about useful location of computers with internet access. Mostly the students from various categories of schools covered by the study, expressed their views about location of computer labs and at the student's houses followed by classrooms thus the overall preference of the students about location of computer labs and student's homes.

Table 6.3.17 Student's views about usefulness of computers and computer applications

(Mean Values)

Sr.No	Computer and its applications / schools	Aided/Granted Schools	Central board schools	Private(Non-Aided) schools	Municipal schools
I	Retrieval of information from internet for school work	1.97	3.17	2.67	0.2
II	Accessing information on CD/DVD	2.25	2.23	2.76	0.12
III	Classroom presentations by teachers (PowerPoint/CD's/ DVD's	1.45	2.27	2.62	0
IV	Online interaction with other students for homework / school work. MS-Excel/FrontPage MS Word	2.93 3.00 2.63 -	2.27 2.23 1.77 -	2.62 2.43 1.95 -	0

	PowerPoint Any other	-	0.77	2.67	

(Source: Primary data)

From table 6.3.17, it can be noted that the students from central board's schools give more importance to computers and computer applications for the purpose of retrieval of information from internet for school work, followed by the students from private schools for the same purpose.

The students from private schools prefer computers and computer application for accessing information on CD/DVD with mean value 2.76, followed by the students from private schools (2.27) and the students from aided schools (1.45).

The students from private schools (2.43) and these from central board's school (2.23) felt that computer and computer applications are more useful for online interaction with other students for homework school work.

Most of the students from aided schools felt that computer and computer applications are more useful especially MS Excel, FrontPage, as well as MS Word , for serving their purposes.The least usage of computer tools was observed with municipal school students.

Table 6.3.18 Students using various tools in computers

(Mean Values)

⇩ **Various tools**	**Aided/Granted schools**	**Central board schools**	**Private (Non-Aided) schools**	**Municipal Schools**
MS – Word	1.80	2.23	2.86	1.22
MS – Excel	1.62	1.77	2.19	1.34
MS – Access	1.70	1.80	1.90	1.56
MS – PowerPoint	1.72	2.33	2.86	1.89
Reference from internet	1.39	3.17	2.62	0
Submitting assignments by e – mail	1.00	2.17	1.57	0
Online discussion with teacher	1.00	2.07	1.47	0

(Source: Primary data)

From the table no 6.3.18 it can be concluded that the students from private schools and central board's schools prefer the use of computers for MS – Word , MS – Power-Point, reference from internet. The students from central Board's schools students useinternet for submitting assignments by e – mail and online discussion with their teachers. The tendency of the students from aided schools and municipal school was observed to be relatively much lower as compared to other schools' students. The tendency of using various computer tools was least in municipal school students.

Table 6.3.19 Students responses about subjects for which computers should be used.

Subjects	**Aided/Granted schools**	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**Total**
Mathematics	168 80.00	22 73.33	98 22.27	-	288 (65.45)
Science	166 79.04	25 83.33	135 80.67	-	326 (74.09)
History	32 15.24	26 86.67	140 93.33	-	198 (45.0)
Geography	143 68.10	27 90.00	132 88.89	-	302 (68.63)
English	26 12.38	19 63.33	112 74.67	-	157 (35.69)
Marathi	26 12.38	01 3.34	32 21.33	-	59 (13.40)
Social sciences	143 68.09	26 86.27	137 91.34	0	306 (69.54)
General Knowldge	95 45.23	23 76.66	132 88.00	10 (20.00)	260 (59.09)
Projects	132 62.85	28 93.33	135 90.00	-	295 67.04
Other information	103 49.04	26 86.67	137 91.33	-	266 60.45
Do not use	-	-	-	40 (80.00)	40 9.09
Total	**210 100.00**	**30 100.00**	**150 100.00**	**50 (100.00)**	**440 100.00**

(Source: Primary data)

Table no 6.3.19 represents the responses of the students from different types of schools covered by the study. When all the students are taken into consideration then 288 out of 440 (65.45%) and 326 (74.09%) out of 440, prefer to use computers for teaching the subjects of mathematics and science respectively.More than 50% of the students from aided, central Board's and private schools prefer computers to be used for teaching and learning mathematics.

In case of private schools 80.67% of the students preferred computer technology to be used for science subjects and 93.33% of them expressed their views that this technology should be used for mathematics and history also. 10 (20.00%) out of 50 students from municipal schools uses computer for general knowledge purpose. 40(80.00%) of students does not use computer for any purpose.

VERIFYING THE OBJECTIVES:

Taking into consideration these developments the present study has been undertaken to study the computer awareness among secondary school students in Pune city. The main objects of the present study were as follows:

1. To study the computer awareness among secondaryschool students in Pune city

2. To study computer awareness among Parents

3. To study the role of teachers/instructors in developing computer awareness among secondary school students

4. To study the strategic efforts undertaken by various school authorities in developing the computer awareness among secondary school students

Objective 1 - To study the computer awareness among secondary school students in Pune city

In order to study the above objective the following tables were analyzed.

The students tend to use more than one location for using computers. From the table number 6.3.1, it is evident that, 420 out of 440(95.45%) of the students from different types of schools use computers at their respective schools. This percentage ranges between 97.62% in case of granted/aided schools to 90.67% in private schools. The percentage of the students using computers at their homes/houses stands at 50.45% for the school students and it varies from 86.67% of the students from central boards to 32.50% of the students from the aided/granted schools. Some of the students could take advantage of using computers at their friend's homes. In the case of total students this percentage was 15.90% and it varied between 33.33% in case of private schools to only 5% in case of aided schools. Only a few students used computers located at cyber café, and other places. Thus it can be concluded that most of the students used computers located at their respective school and their own houses.

From the table 6.3.2 regarding time devoted by the students, for using computers for home work and other assignments, 288 out of 440(65.45%) of the students use for period upto one hour per week and this percentage ranged from 82.38% in case of aided schools to 50% in case of students from central boards. The students using computers for this purpose for the period of 1 – 5 hours were 69 out of 440(17.69%) and this percentage ranges between 23.33% in case of central boards schools to 15.24% in case of aided/granted schools, the students using computers for more than 5 hours per week were 33 out of 440(7.50%) and this percentage varied from 26.67% in case of the students from central boards schools to 2.38% in case granted/aided schools.

100% of the students of municipal school does not use computer for homework and assignment as they do not have computer at home. Majority of the students uses computers for home work and other assignments for the period up to one hour per week.

The table No. 6.3.5 shows the number of student using computers for MS – Excel. It may be noted that 216 out of 440 (49.09%) students covered by the study, use computers up to one hour per week and this percentage varied between 14.00% in case of private schools to 70.00% for the students from granted/aided school to 82% in case of municipal school. The number of students using computers for 1 – 5 hours per week for MS – Excel was 125 out of 440 (22.82%) and this percentage has been 62.67%, 33.33% and 10.00% in case of private, central boards and aided school students. 11 out of 30 (36.67%) students from central boards schools used computers for this purpose for the period of more than five hours per week. In case of municipal schools 18.00% of the students did not use computers for this purpose. Thus majority of the students used computers for MS – Excel for the period of upto one hour per week.

Table no. 6.3.6 presents the number of students using computers for MS – Word by the students from different schools covered by the study. It may be noted that 243 out of 440 (55.22%) of the students used computers for this purpose for the period less than one hour per week and this percentage varied from 65.24% in case of aided schools to 33.33% of the students from the schools recognized by the central boards to 78% in case of municipal school students. The number of students using computers for MS –Word for the period of 1 – 5 hours per week varied from 38% of the students from private schools to 13.33% of the students from the central board's schools.The number of students using computers for this purpose for the period of more than 5 hours per week stood at 8.46% only. In case of municipal schools 22.00% of the students did not use computers for this purpose.Thus it may be concluded that most of the students covered by the study used computers for less than one hour per week.

Regarding the students using computers for downloading software from table number 6.3.7 it can be observed that, out of total 440 students from different types of schools, 106 (24.09%) of them use computers for up to one hour per week, whereas 231 (52.50%) do not use, computers for this purpose. When the students from different categories of the schools are taken into considering 64 (42.67%) students from private schools, 26 (12.33%) from aided schools and 16 (53.33%) from central boards schools use computer for less than one hour per week for downloading software; 71 students (47.33%) from private schools use computers for this purpose for the period

of 1 – 5 hours per week, and 15(10%) of these students use computers for more than 5 hours per week. It is worth nothing that 179(85.23%) out of 210 students from aided schools and 47(94.00%) from municipal schools do not use computers for downloading software.

Table no 6.3.8 presents number of students using computers for browsing, 99 out of 440(22.50%) students covered by the study use computers for browsing and this percentage ranges from 40% in case of central boards schools students to 10% in the case of granted schools, for the period of less than one hour per week. 269 (61.13%) of the students do not use computers for browsing,out of which 184 (87.50%) students from aided/granted schools and 62% of municipal school students do not use computers for browsing. However the students accounting for 20.00 % from central board's schools and 9.33% of the students from private schools use computers for browsing for more than 5 hours/week. Thus the percentage of the students using computers for browsing was highest among the central schools covered by the study followed by private school students.

Table 6.3.11 presents the number of students using computers for chatting purposes, from different types of schools covered by the study. Out of 30(26.67%) students from central boards and 50 out of 150 (33.33%) students from private schools use computers for chatting for the period less than one hour a week. The central board's students accounting for 20% and 47.33% of the student from private schools are using computers for chatting, for the period of more than one and five hours a week. It may be noted that 194 out of 210 (92.50%) of the students from aided/granted schools and 49(98.00%) from municipal schools do not use computers for the purpose of chatting. Similarly 53.33% of the students from central board schools also do not use computers for chatting purpose.

The table no.6.3.12, exhibits the no. of students using internet at their homes. When the total number of students is considered 90 out of 440 (23.08%) of them were using internet up to one hour a week and this percentage was 52.67% in the case of the students from private schools, 20% in case of the students from central board schools and only 2.50% for aided schools. The number of students using internet at home over

a period of 1 – 5 hours per week was 71 (47.33%), 10 (33.33%) and 37 (17.50%) in case of private schools central board schools and aided school students respectively. The tendency of using internet at home war observed to be higher (43.67%) among the students from central boards schools. Students from municipal schools do not use computers for the purpose

From the table 6.3.13 it can be observed that the number of students using internet in their schools was 136 out of 440 (30.90%), over a period of up to one hour per week and this percentage was 7.50% for aided school students,90.00% for central board and 62.00% for private school students. Students using internet at their schools for a period of 1 – 5 hours per week is 3.33% and 28.67% in case of central board and private schools and 10 % for aided schools. The tendency of using internet at schools was higher in private school students (100%) followed by central board's schools (96.67%) students. 234 out of 440 (53.18%) of the students total schoolsstudents were not using internet at their schools, as in case of most of these schools internet connectivity was not available specially in case of municipal schools where no internet connection was available. Also many times failure of electric supply were the reasons as reported by the students.

From the table number 6.3.14, it is evident that the number of students using internet at their friend's houses was 106 out of 440 (24.09%) in case of total number of students who were using internet for the period of less than one hour per week. This percentage was 52.67% among the students from private schools and it was lowest at 7.50% in case of aided schools.02 (6.67%) the students from central board's schools use internet at friends house for more than 5 hours.189 out of 210 (90%) of the students from aided schools were not using internet at their friends houses. All the students from municipal schools does not use internet at friends house as their friends were not having internet at their home. Thus it is concluded that the tendency of using internet at the friend's house was higher among central board schools students and private schools students.

From the table no 6.3.15 it is evident that the number of students using internet at cyber cafes, for a period up to one hour per week was 199 out of 440(45.22%) and this percentage varied from 95.33% among the students from private schools to 12.50% among the aided schools.42.00%of the students of municipal school uses internet at cyber cafe. The tendency of using internet at cyber café over a period of 1 – 5 and more central board's schools as compared to the students from the other type of schools covered by the study.

The table No. 6.3.16 shows the mean values of the student's views about useful location of computers with internet access. Mostly the students from various categories of schools covered by the study, expressed their views about location of computer labs and at the student's houses followed by classrooms thus the overall preference of the students about location of computer labs and student's homes.

From table 6.3.17, it can be noted that the students from central board's schools give more importance to computers and computer applications for the purpose of retrieval of information from internet for school work, followed by the students from private schools for the same purpose.

The students from private schools prefer computers and computer application for accessing information on CD/DVD with mean value 2.76, followed by the students from private schools (2.27) and the students from aided schools (1.45).

The students from private schools (2.43) and these from central board's school (2.23) felt that computer and computer applications are more useful for online interaction with other students for homework school work.

Most of the students from aided schools felt that computer and computer applications are more useful especially MS-Excel, FrontPage, as well as MS-Word , for serving their purposes.The least usage of computer tools was observed with municipal school students.

From the table no 6.3.18 it can be concluded that the students from private schools and central board's schools prefer the use of computers for MS – Word , MS – PowerPoint, reference from internet. The students from central Board's schools prefer computer use for submitting assignments by e – mail and online discussion with their teachers. The tendency of the students from aided/granted schools was observed to be relatively much lower as compared to other schools' students. The tendency of using computer tools was least in municipal school students.

Table no 6.3.19 represents the responses of the students from different types of schools covered by the study. When all the students are taken into consideration then 288 out of 440 (65.45%) and 326 (74.09%) out of 440, prefer to use computers for teaching the subjects of mathematics and science respectively.More than 50% of the students from aided, central Board's and private schools prefer computers to be used for teaching and learning mathematics.

In case of private schools 80.67% of the students preferred computer technology to be used for science subjects and 93.33% of them expressed their views that this technology should be used for mathematics and history also. 10 (20.00%) out of 50 students from municipal schools uses computer for general knowledge purpose. 40(80.00%) of students does not use computer for any purpose.

It is thus concluded that the response of the students covered by the study, in respect of use of computer technology for subject's mathematics, science, history, social science, project, geographyand other information.

Objective 2 - <u>To study computer awareness among Parents</u>

In order to study the above objective the following tables were studied.

From the table 6.2.5 which tells about Parent's Responses about the use of computers It was observed that 147 out of 440 parents (37.04%) were using computer for personal/professional use, and this percentage ranged between 70% in case of the parents of central boards students but only 12.38% of the parents of the children from aided/granted schools, 117 out of 440 (30.00%) of the parents responded that their children were aware about latest updates in hardware and software and this percentage 75% in case of parents of students of private school. Regarding visiting computer stores and exhibitions along with their children, 100 out of 440(25.64%) of the parents responded that they were doing so while the rest of the responded especially the parents of granted/aided schools were not visiting computer stores and exhibitions along with their children . Thus it can be concluded that the parents of the students from the central boards schools and private schools are relatively aware about the use of computers by their children and their awareness needs to be promoted in case of the parents of the children from aided schools.

Table 6.2.5 exhibits parent's responses about the usefulness of computer education to their students, 379 out of 440 parents (97.18%) stated that the computer education has been must for their children attending schools. All the parents of the students of private schools completely agreed with this view. Thus parents have realised the importance of computer education for their children. Next 336(86.15%) of the parents responded that the computer education had positive effect on the student's academic achievement. In case also parents of private school students accounting for 91.67% have realized it. 321(79.40%) of the parents responded that having computer would lead to better utilization of students time of academic activities. In this respect 28 out of 30 (93.33%) of the parents of the students from central boards and 93.33% parents of private schools students and 80% of aided school responded favorably . when asked about whether in the school teaching of computer was as per practical needs? 273 out of 390(70.77%) of the parents responded favorably. This percentage varied between 75.00% in case of private schools to 67.72% in case of aided/granted schools, 210 out of 390 (53.85%) of the parents covered by the study responded that they had a computer at their home for their children and this percentage was 91.67%

in case of parents of private school students but 22.38% of the parents of the children from aided/granted school. However 72.38% of these parents were thinking about purchasing a computer for their children this reflects parent's awareness about the need of computer education for their children. Regarding helping their children in gaining knowledge about computer, 186 out of 440 (47.69%) of the parents were helping them, and this percentage varied from 83.33% in case of the parents of private school children to only 20% in case of parents of aided/granted school children.

Objective 3 - To study the role of teachers in developing computer awareness among secondary school students

In order to study the above objective the following tables were studied.

From the Table 6.1.5regarding the years of service of the computer teachers out of 27(61.37%) were having experience of teaching up to 3 - 5 years , 09 respondents(45.45%) were having teaching experience up to 3 years and 6(13.63%) teachers have teaching experience in the range of 5-10 years. Only 2 respondents (4.54%) were having teaching experience of more than 10 years and they belong to private school. Thus majority (61.37%) of teachers are having teaching experience of 3-5years.

Table No.6.2.7, exhibits parents responses about sources from where children learnt more about computer effectively. When the mean values of these responses are taken into consideration, it was observed that, parents of all the categories of school students gave top priority to teachers. Thus teachers tend to play a crucial role in teaching and learning of computer education. Parents of the students were given second priority by the parent. Thus parents also play an important role in the places of teaching and learning computer by the student. Friend's relatives and books as a source are given third, fourth and fifth priority by the parents.

From the table No. 6.1.16 it can be noted that 30 out of 44 (68.18%) of the school representative, the number of years of teaching was the dominant factor affecting teacher familiarity with computer technologies, followed by the school status (59.09%), 18(40.91%) area of the study and 10 (22.70%) responded that gender was the factor affecting teacher familiarity with computer technologies. Thus more experience teacher have significantly higher familiarity with computer technologies which can be used for teaching and learning of the students more effectively and efficiently.

From table No. 6.1.20 and from the point of view of the development of the teachers and gaining knowledge about emerging trends in teaching computers to students it is necessary that school should regularly send their computer teacher to attend computer workshop, seminars, training and orientation programs. The table No. 6.1.20 show that only 10% of schools covered by the study send their computer teachers for attending seminars on computer and 6 schools sent their teachers to attend computer workshops.The schools should take initiative to send their teachers for participating in computer workshop, seminars and other computer related activities.

Table No. 6.1.22 reveals that in the case of 32 out of 44 schools (82.05%) use CD presentation in classroom for teaching computers followed by the teachers in 20 (51.28%) schools prepare to CD/DVD and 18% school LCD use in the classroom for teaching computer in their studies Other techniques such as reading computer magazine and internet magazine and using internet for study by the student and by the teachers teaching computers need to be made popular among the teachers and students by way of motivating them to do so.

Objective 4 - <u>To</u> study the strategic efforts undertaken by various school authorities in developing the computer awareness among secondary school students

In order to test the above mentioned hypothesis the data presented in the tables below is taken into consideration.

Necessary data has been presented in the following tables.

From the table 6.1.5 regarding the years of service of the computer teachers 27(61.37%) were having experience of teaching up to 3-5 years , 09 respondents(45.45%) were having teaching experience up to 3 years and 6(13.63%) teachers have teaching experience in the range of 5-10 years. Only 2 respondents (4.54%) were having teaching experience of more than 10 years. Thus majority (61.37%) of teachers are having teaching experience of 3-5years.

Table no. 6.1.7 gives the details of the computer laboratories in the schools covered by the studies. It can be observed 40 out of 44, consisting of 19 from aided schools , 3 from central board schools ,13 from private schools and 5 from municipal school accounting for (90.90%) of the total were having 1 computer lab. The rest 4 schools consisting of 2 schools from private category and 2 from aided category were having 2 lab in each schools. Thus about 90.90% of the schools covered by the study were having only 1 lab in each school.

From the table 6.1.8 it was found that out of 44, 30(68.18%)schools including 11 private,14 aided schools and 5 from municipal corporation have 24 computers in their labs.5(11.37%) aided schools had 30 computers in each of their laboratories. There were 5(11.37%) schools,3 from Central Board and 2 from private schools were having 40 computers in each of their labs. 4 out of 44(9.09%) schools which included 2 each schools from aided and private schools .

From the table 6.1.9 it is evident that 31 out of 44 (70.45%) of the schools consisting of 15 from aided school category were having one computer connected with internet. Two private school were having 10 computers connected with internet however 11 out of 44 schools (25.00%) consisting of 6 aided schools and 5 municipal schools were not having any computer connected to the internetTaking into consideration huge amount of information which is available on internet it is necessary to have more number of computers connected to internet, so as to trained the student to use internet for purpose require by them.

The table 6.1.11 deals with the sources of getting softwares required by the school students.16 out of 44 (36.36%) of schools purchased from the market. There were only 4 schools out of 15 private schools (26.67%) which motivated the teachers to create it. One private school,5 municipal schools and 18(40.90%)of aided schools got it on contract basis.Thus it is desirable that the computer teacher need to be motivated to develop syllabus according to the requirement of the school students for teaching various subject in the class rooms.

From the table no. 6.1.13 it may be observed that 38 out of 44(86.36%) of the schools cover by the study which includes 20 out of 21 aided schools, one from central board school ,12 from private schools and 5 from municipal school had one computer teacher. The rest of the schools were having two or more computer teachers per school, thus the number of computer teacher per school should be increased to give better attention towards teaching and learning of each of the student.

Table no. 6.1.14 shows that 22 out of 44(50.00%) schools consisting of 9 aided schools, 03 central Board schools and 10 private schools were having permanent computer teaching faculty. 12 schools from aided category of schools, 5 from private schools and 5 from municipal schools, thus total 22 schools out of 44(50%) had appointed computer teaching faculty on temporary basis. It is desirable to point computer teaching faculty on permanent basis so that they can fully concentrate on

continuously improving computer awareness and use of computers for various purpose by the students.

When the percentage of budget allocated for computer department is taken into consideration from the table no.6.1.17, 41 out of schools 44(93.18%) allocated less than 2 percent of their budget only 3(6.81%) schools allocated more than 2 percent of their budget taking into consideration the need of computer awareness among the school student at least 5% of the budgetary funds should be allocated for computer departments in there schools.

Table No. 6.1.22 reveals that in the case of 32 out of 44 schools (82.05%) use CD presentation in classroom for teaching computers followed by the teachers in 20 (51.28%) schools prepare to CD/DVD and 18% school LCD use in the classroom for teaching computer in their studies Other techniques such as reading computer magazine and internet magazine and using internet for study by the student and by the teachers teaching computers need to be made popular among the teachers and students by way of motivating them to do so.

TESTING THE HYPOTHESIS:

1. Computer awareness of students is more in Central Boards schools and Private schools as compare to Aided/Granted schools and municipal schools.

2. Computer awareness of students depends on the educational and economic background of the parents.

3. Computer awareness of students depends on the skill, experience and specialized training of computer teachers/instructors.

Hypothesis 1 - Computer awareness among secondary schools students is more in Central Boards schools and Private schools as compare to Aided/Granted schools and municipal school.

In order to test the above mentioned hypothesis the data presented in the tables below is taken into consideration.

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Table 6.3.1) Locations where students use computers

Location where student use computers	**Types of school students**				
	Aided/Granted schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal schools**	**P-value**
Home (%)	67 (33.50)	26 (86.67)	129 (86.00)	-	**0.01**
School (%)	205 (97.62)	29 (96.67)	136 (90.67)	50 (100.00)	
Cyber café (%)	05 (2.50)	08 (26.62)	14 (9.33)	25 (50.00)	
Friend's home (%)	10 (5.00)	02 (6.67)	50 (33.33)	-	
Other places (%)	10 (5.00)	02 (6.67)	36 (24.00)	1 (0.02)	
Total (%)	**210 (100.00)**	**30 (100.00)**	**150 (100.00)**	**50 (100.00)**	

Since the p-value is 0.01 which is less than 0.05.Hence the hypothesis "Computer awareness among secondary school students is more in Central Boards schools and Private schools as compare to Aided/Granted schools and municipal schools" is accepted

Also necessary data has been presented in the following tables

Table 6.3.2-Regarding sources of help in case of difficulty while using computers by the students, it was observed that, in case of the student's from central boards schools and private schools, their parents play an important role, followed by teachers and friends, whereas teachers play an important role in solving difficulties faced by the students in granted schools followed by friends and relatives books and parents. Thus from the table 2, it may be concluded that teachers, parents and friends are the main sources of help for the students covered by the study in helping for overcoming the difficulties while using computers. While in case of municipal school students it is only teacher who solve difficulty of students.

Table 6.3.3 Regarding time devoted by the students, for using computers for home work and other assignments, 288 out of 440(65.45%) of the students use for period upto one hour per week and this percentage ranged from 82.38% in case of aided schools to 50% in case of students from central boards. The students using computers for this purpose for the period of 1 – 5 hours were 69 out of 440(17.69%) and this percentage ranges between 23.33% in case of central boards schools to 15.24% in case of aided/granted schools, the students using computers for more than 5 hours per week were 33 out of 440(7.50%) and this percentage varied from 26.67% in case of the students from central boards schools to 2.38% in case granted/aided schools. 100% the students of municipal school does not use computer for homework and assignment.Majority of the students uses computers for home work and other assignments for the period up to one hour per week.

Table 6.3.7-Regarding the students using computers for downloading software from table number 6.3.7 it can be observed that, out of total 440 students from different types of schools, 106 (24.09%) of them use computers for up to one hour per week, whereas 231 (52.50%) do not use, computers for this purpose. When the students from different categories of the schools are taken into considering 64 (42.67%) students from private schools and 26 (12.33%) from aided schools and 16 (53.33%) from central boards schools use computer for less than one hour per week for downloading software; 71 students (47.33%) from private schools use computers for this purpose for the period of 1 – 5 hours per week, and 15(10%) of these students use computers for more than 5 hours per week. It is worth nothing that 179(85.23%) out

of 210 students from aided schools and 47(94.00%) from municipal schools do not use computers for this purpose.

Table no 6.3.8 presents number of students using computers for browsing- 269 (61.13%) of the students do not use computers for browsing out of which 184 (87.50%) students from aided/granted schools and 62% of municipal school students do not use computers for browsing. However 99 out of 440(22.50%) students covered by the study use computers for browsing and this percentage ranges from 40% in case of central boards schools students to 10% in the case of granted schools, for the period of less than one hour per week. The students accounting for 36.37% from central board's schools and 57.33% of the students from private schools use computers for browsing. Thus the percentage of the students using computers for browsing was highest among the central schools covered by the study followed by private school students.

Table 6.3.11 presents the number of students using computers for chatting purposes, from different types of schools covered by the study. Out of 30(26.67%) students from central boards and 50 out of 150 (33.33%) students from private schools use computers for chatting for the period less than one hour a week. The central board's students accounting for 20% and 47.33% of the student from private schools are using computers for chatting, for the period of more than one and five hours a week. It may be noted that 194 out of 210 (92.50%) of the students from aided/granted schools do not use computers for the purpose of chatting. Similarly 53.33% of the students from central board schools also do not use computers for chatting purpose.

The table no.6.3.12, exhibits the no. of students using internet at their homes. When the total number of students is considered 90 out of 440 (23.08%) of them were using internet up to one hour a week and this percentage was 52.67% in the case of the students from private schools, 20% in case of the students from central board schools and only 2.50% for aided schools. The number of students using internet at home over a period of 1 – 5 hours per week was 71 (47.33%), 10 (33.33%) and 37 (17.50%) in case of private schools central board schools and aided school students respectively. The tendency of using internet at home war observed to be higher (43.67%) among

the students from central boards schools. Students from municipal schools do not use computers for the purpose.

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5 and more central board's schools as compared to the students from the other type of schools covered by the study.

The table No. 6.3.16 shows the mean values of the student's views about useful location of computers with internet access. Mostly the students from various categories of schools covered by the study, expressed their views about location of computer labs and at the student's houses followed by classrooms thus the overall preference of the students about location of computer labs and student's homes.

From table 6.3.17, it can be noted that the students from central board's schools give more importance to computers and computer applications for the purpose of retrieval of information from internet for school work, followed by the students from private schools for the same purpose.

The students from private schools prefer computers and computer application for accessing information on CD/DVD with mean value 2.76, followed by the students from private schools (2.27) and the students from aided schools (1.45).

The students from private schools (2.43) and these from central board's school (2.23) felt that computer and computer applications are more useful for online interaction with other students for homework school work.

Most of the students from aided schools felt that computer and computer applications are more useful especially MS-Excel,MS-FrontPage, as well as MS-Word for serving their purposes.

From the table no 6.3.18 it can be concluded that the students from private schools and central board's schools prefer the use of computers for MS–Word, MS – PowerPoint, reference from internet. The students from central Board's schools prefer computer use for submitting assignments by e – mail and online discussion with their teachers. The tendency of the students from aided/granted schools and municipal schools was observed to be relatively much lower as compared to other schools' students.

Table no 6.3.19 represents the responses of the students from different types of schools covered by the study. When all the students are taken into consideration then 288 out of 440 (65.45%) and 326 (74.09%) out of 440, prefer to use computers for

teaching the subjects of mathematics and science respectively.More than 50% of the students from aided, central Board's and private schools prefer computers to be used for teaching and learning mathematics.

In case of private schools 80.67% of the students preferred computer technology to be used for science subjects and 93.33% of them expressed their views that this technology should be used for mathematics and history also. 10 (20.00%) out of 50 students from municipal schools uses computer for general knowledge purpose. 40(80.00%) of students does not use computer for any purpose.

From table 6.1.5 , regarding the years of service of the computer teachers out of 44(61.37%) were having experience of teaching up to 3 - 5 years , were having teaching experience up to 3 years and 03 teachers(100.00%) from cental board and 2(13.33%)teachers have teaching experience in the range of 5-10 years. Only 2 computer teachers (13.33%) from private school were having teaching experience ofmore than 10 years. Thus 5(27.8%) of teachers from central board and private school were having teaching experience of 5-10 years.09(45.45%) from aided category and municipal schools teachers were having teaching experience of upto 3years.

From table 6.1.8, out of 44, 30(68.18%)schools including 11 private,14 aided schools and 5 from municipal corporation have 24 computers in their labs.5(11.37%) aided schools had 30 computers in each of their laboratories. There were 5(11.37%) schools,3 from Central Board and 2 from private schools were having 40 computers in each of their labs.Also, 2(13.33%) private school had 60 computer in their labs.

From the table 6.1.9 it is evident that 31 out of 44 (70.45%) of schools consisting of 15 from aided school category and all central board schools were having one computer connected with internet. Two private school were having 10 computers connected with internet however 11 out of 44 schools (25.00%) consisting of 6 aided schools and 5 municipal schools were not having any computer connected to the internet. Taking into consideration vast amount of information which is available on internet it is necessary to have more number of computers connected to internet, so as to trained the student to use internet for purpose require by them.

From the table no. 6.1.13 it may be observed that 38 out of 44(86.36%) of the schools cover by the study which includes 20 out of 21 aided schools, one from central board school ,12 from private schools and 5 from municipal school had one computer teacher. The rest of the schools were having two or more computer teachers per school, thus the number of computer teacher per school should be increased to give better attention towards teaching and learning of each of the student.

The table 6.1.11 deals with the sources of getting software's required by the school 16 out of 44 (36.36%) of schools purchased from the market. There were only 4 school out of 15 private schools (26.67%) which motivated the teachers to create it. One private school ,5 municipal schools and 18(40.90%)of aided schools got it on contract basis. Thus it is desirable that the computer teacher need to be motivated to develop software according to the requirement of the school for teaching various subject in the class rooms.

Table no. 6.1.14 shows that 22 out of 44(50.00%) schools consisting of 9 aided schools, 03 central Board schools and 10 private schools were having permanent computer teaching faculty. 12 schools from aided category of schools, 5 from private schools and 5 from municipal schools, thus 22 schools out of 44(50%) had appointed computer teaching faculty on temporary basis. It is desirable to point computer teaching faculty on permanent basis so that they can fully concentrate on continuously improving computer awareness and use of computers for various purpose by the students.

Table 6.1.17 -Percentage of budget allocated for computer department

When the percentage of budget allocated for computer department is taken into consideration from the table no.6.1.17, 41 out of schools 44(93.18%) allocated less than 2 percent of their budget only 3(6.81%) schools allocated more than 2 percent of their budget taking into consideration the need of computer awareness among the school student at least 5% of the budgetary funds should be allocated for computer departments in their schools.

Table No. 6.1.22 reveals that in the case of 32 out of 44 schools (82.05%) use CD presentation in classroom for teaching computers followed by the teachers in 20

(51.28%) schools prepare to CD/DVD and 18% school LCD use in the classroom for teaching computer in their studies Other techniques such as reading computer magazine and internet magazine and using internet for study by the student and by the teachers teaching computers need to be made popular among the teachers and students by way of motivating them to do so.

Conclusion:

It is thus concluded that the response of the students covered by the study, the hypothesis "Computer awareness among secondary schools students is more in Central Boards schools and Private schools as compare to Aided/Granted schools and municipal schools" is accepted.

Hypothesis 2 - Computer awareness of students depends on the educational and economic background of the parents.

In order to test the above mentioned hypothesis the data presented in the tables below is taken into consideration.

Necessary data has been presented in the following tables.

Table 6.2.2 - Regarding the educational qualification of the parents, Undergraduate parents accounted for 253(57.50%) of the total 440 parents, where parents of the students of aided/granted schools accounted for 82.52% out of 210,but only 10% out of 30 and 8% out of 150 from the central boards schools and private schools. The percentage of graduates' parent was the highest at 57.33% in case of private schools. 21(70%) of the parents from the central boards schools were post-graduate. Thus among total number of parents 253 out of 440(57.50%) were undergraduates and the rest were graduates and post graduates. Also 100 % of parents from municipal school are undergraduates.

Table No.6.2.3 reveals that, out of the total 440 parents, 136 (30.90%) had their annual income Rs. 5 lakhs and above. Out of 30 (63.33%) parents of the students from central Board's schools and 101 out of 150 (66.67%) parents of the students from private school had their annual income of Rs.5 Lakhs and above.133(30.22%) out of 440 had the income range between Rs.2 – 3 lakhs respectively. In the case of aided/granted schools 183 out of 210 parents (87.14%) were having their annual income up to Rs. 3 lakhs only. Annual income of municipal school parents is up to 2lakhs only. Thus annual income of parents of the students from aided/granted schools and municipal schools was relatively lower than that of the parents of the students from central board's schools and private schools. In other words, relatively financially better of parents prefer central board's school or private schools.

Table 6.3.1-The students tend to use more than one location for using computers. From the table number 1, it is evident that, 420 out of 440(95.45%) of the students from different types of schools use computers at their respective schools. This percentage ranges between 97.62% in case of granted/aided schools to 90.67% in

private schools. The percentage of the students using computers at their homes/houses stands at 50.45% for all the school students and it varies from 86.67% of the students from central boards to 32.50% of the students from the aided/granted schools. Some of the students take advantage of using computers at their friend's homes. In the case of total students this percentage was 15.90% and it varied between 33.33% in vase of private schools to only 5% in case of aided schools. Only a few students used computers located at cyber café, and other places. Thus it can be concluded that most of the students used computers located at their respective school and their own houses.

Conclusion:

The data presented in the above tables it can be concluded that "Computer awareness of students depends on the educational and economic background of the parents" is accepted.

Hypothesis 3 - Computer awareness of students depends on the skill, experience and specialized training of computer teachers/instructors.

In order to test the above mentioned hypothesis the data presented in the tables below is taken into consideration.

Necessary data has been presented in the following tables.

Table no. 6.1.3 indicates the qualification of the respondents. Out of 44 respondents 27(61.36%) which consisted 11 from private school , 14 from aided/granted schools and 2 from municipal schools were graduates, similarly 7 out of 44(15.91%) , consisting 3 from central board schools and 4 from private schools were postgraduate. 10(22.72%) were having MS-CIT certifications. Thus majority (61.36%) of the respondents were graduates and rest were post graduate and MS-CIT certification holders.

From thetable 6.1.5Regarding the years of service of the computer teachers out of 27(61.37%) were having experience of teaching up to 3 - 5 years , 09 respondents(45.45%) were having teaching experience up to 3 years and 6(13.63%) teachers have teaching experience in the range of 5-10 years. Only 2 respondents (4.54%) were having teaching experience of more than 10 years. Thus majority (61.37%) of teachers are having teaching experience of 3-5years.

From the point of view of the development of the teachers and gaining knowledge about emerging trends in teaching computers to students it is necessary that school should regularly send their computer teacher to attend computer workshop, seminars, training and orientation programs. The table No. 6.1.20 show that only 10% of schools covered by the study send their computer teachers for attending seminars on computer and 6 schools sent their teachers to attend computer workshops.The schools should take initiative to send their teachers for participating in computer workshop, seminars and other computer related activities.

Teaching methodologies used by the teachers in their schools

Teaching Methodologies ⇩	**Types of School**				
	Aided/Granted Schools	**Central board schools**	**Private(Non-Aided) schools**	**Municipal Schools**	**p-value**
CD presentation in classrooms	03	03	14	-	0.01
Use of Internet while teaching	05	02	05	-	
Using LCD in the classrooms	-	03	05	-	
Preparing through Internet	13	03	12	-	
Reading computer magazine	-	01	-	-	
Reading internet magazine	-	01	-	-	
Do not use	-			5 (100.00)	
Total (%)	**21 (100.00)**	**03 (100.00)**	**15 (100.00)**	**5 (100.00)**	

(Source : Primary Data)

Since the p-value is 0.01 which is less than 0.05.Hence the hypothesis "Computer awareness of students depends on the skill, experience and specialized training of computer teachers/instructor" is accepted

From the table 6.1.21 it can observed that only 6 (13.63%) out of 44 schools computer teachers visit computer stores and computer exhibitions in order to be aware about recent development in computer and availability of computers and computer related items used for computer teaching and learning, it is desirable that school authorities should send computer teacher to visit computer stores and computer exhibitions.

Conclusion:

The data presented in the above tables it can be concluded that "Computer awareness of students depends on the skill, experience and specialized training of computer teachers/instructors" is accepted.

CHAPTER VII

FINDINGS, CONCLUSIONS AND SUGGESTIONS

1. Student's Response
2. Parents Response
3. School Teachers/Respondents
4. Suggestion
5. Scope for Future Study

MAJOR FINDINGS

Present research was undertaken with a view to study computer awareness among school going secondary students in Pune city and necessary data was collected from selected schools, students and their parents. The data thus collected is analyzed and interpreted to arrive at meaningful conclusion. The conclusion/findings are presented below-

7.1STUDENT'S RESPONSE

1. 95.45% students use computer in schools followed by 50.45% of them use computer at home. Thus 95.45% of the students use computers in schools (Table 6.3.1) ,pp-217
2. Regarding source of help in case of difficulty while using computer,majority(mean value- 4.89) of the students depended on their school teachers followed by parents .This indicates the important role played by parents and teachers in promoting computer literacy among school students (Table 6.3.2) ,pp-218
3. 65.45% students use computers for doing homework and other assignment; This percentage is higher (82.38%) from students of granted/aided schools (Table 6.3.3) ,pp-219
4. 73.86% students spent time for playing computer games, up to one hour a week..Only 26% of municipal school students use it for 1-5 hrsper week. 7.5% of the total number of students did not use computer for playing games (Table 6.3.4) ,pp-220
5. Students using computers for MS-Excel accounted for 49.09% students, for the time upto one hour per week, where the students from aided school accounted for 70% students and students from municipal school accounted for 82%. studetns. (Table 6.3.5), pp -221
6. 55.22% students use computers for MS-word per week.While 7.5% students does not use MS-word. (Table 6.3.6),pp-222
7. Regarding the use of computers for downloading software.46.35 % of students use computers for this purpose , where as 94.00% of municipal school students does not use computers for downloading (Table 6.3.7), pp-223

8. Using computers for browsing has remained a neglected activity as only 35.92% of the students use computers for browsing Those students who do not used computers for browsing were 61.13% .(Table 6.3.8) , pp-224
9. 48.63% students did not use computers for playing games, those who use computers for this purpose accounted for 26.13% (Table 6.3.9) , pp-225
10. The tendency to use computers for playing online games is 34% in private and 27% in central board students as compared to the aided schools students which is 15%.While 75% of student does not use computer for chatting.(Table 6.3.10),pp- 226
11. The practice of using computers for the purpose of chatting was observed to be common among the students from private and central board schools. The percentage of the students not using computers for chatting was 92.50% from aided schools,53.23% from central board and 19.34% private school students. Also 98.00% of students from municipal school do not use computer for chatting(Table 6.3.11), pp- 227
12. Regarding using the internet at home, 77% of the students from aided schools did not use it because of non availability of computers and computer connectivity with internet. However, 46.67% of the central board schools students used internet at home for more than 5 hours a week.None of the student from municipal school uses internet at home as they don't have computer at home. (Table 6.3.12) , pp- 228
13. 100% students from the central board and private schools use internet at their schools mostly for a period of upto one hour per week, 90% of the students from aided schools and 100% students from municipal schools do not use it because of non availability of internet at their schools (Table 6.3.13) ,pp- 229
14. It was observed that the tendency of using internet at the friend's house was relatively higher 42.05% in case of the students from private schools ,central board schools and aided schools .100.00% of municipal school students were not using internet at their friends house (Table 6.3.14) ,pp-230
15. 45.22% of students use internet at cyber cafes. 85% aided school students and 50.00% of municipal school students were not using internet at cyber café as they are not able afford it. (Table 6.3.15), pp-231
16. Regarding students views about useful location of computers with internet access, majority(mean 3.52) of the students preferred it at computer

labfollowed by students own houses(mean 3.33),as compared to the availability in their classroom(mean 2.00) (Table 6.3.16),pp-232

17. 67% of students felt that the computers should be used be for teaching subjects mathematics,history, geography and science. (Table 6.3.19) ,pp-236

7.2 PARENTS RESPONSE

1. 53.18% parent's respondents were from the age group 35-45 years.(Table 6.2.1), pp-206
2. 57.50% of the total parent respondents were undergraduates.23.86% of parents were graduates.70% of the parent's of students from the central board schools were post graduates. (Table 6.2.2), pp-207
3. 30.22% of the total respondents (parents) had their annual income in the range of Rs. 2-3 lakhs and 30.90% of parent's had their annual income in the range of Rs. 5 lakhs and above. Majority of the parent's(32.50%) were having annual income upto 2 lakhs of Rupees. (Table 6.2.3), pp -208
4. 27.72% of parents were professional, 34.31% of the parent's were businessmen followed by 27.50% service sector. Housewives accounted for 2.27% and other 9.31% . (Table 6.2.4), pp-209
5. Regarding the parent's view about the computer education, 97% of parent's had the view that in modern times computer education is a must for their children.86% of the parent responded that computer education has positive effect on their children academic performance and 79% of them had the view that having computer led to better utilization of children time. (Table 6.2.5) , pp-210
6. 97% of the parents expected that, computer education helps children to pursue their carrier and 95% parents expected that computer education helps in enhancing children knowledge.76% of the parents expected that computer education enhances children communication ability.According to 62% of parents computer education helps children to survive and grow in modern society.(Table 6.2.6) , pp-213-215
7. Majority of the parents (4.89 mean value) agreed that their children learn more about computer from teachers, followed by parents and friends.Hence teacher plays an important role. (Table 6.2.7) ,pp - 216

7.3SCHOOL TEACHERS/RESPONDENTS

1. Out of 44 schools selected for the study 21(53.85%) were aided/granted schools. 03(7.39%) were central boards schools,15(38.46%) were private schools and 5(11.37%) were municipal (Table 6.1.1), pp-180
2. 93.18% schools were recognized by the Maharashtra state secondary and higher secondary board and 7.69% schools were recognized/affiliated to the central board (Table 6.1.1), pp-180
3. Among 44 respondents from the schools, 36(79.49%) were computer teachers.Out of which 16(36.36%) are from aided/granted, 5(100%) from municipal schools, 3(100%) from private schools and 12(27.27%) and 8(20.51%) were lab instructor (Table 6.1.2) ,pp-181
4. 61.36% respondents ie computer teachers were graduates,15.91% were post graduates in computers and the rest 22.72% were having MS-CIT certifications. Thus, majority of the respondents were graduates only (Table 6.1.3), pp - 182
5. Out of 44 respondents(computer teacher) from schools, 70.45 % were from the age group of upto 30 years and the rest 29.54% were above 30 years of age. The majority of the computer teachers were below the age group of 30 years ie were relatively younger teachers (Table 6.1.4) ,pp-183
6. 61.37% of the computer teachers were having teaching experience in the range of 3-5 years, 20.45% were having teaching experience upto 3 years, 13.63% of teachers have experience in range of 5-10years.Only 5% teachers had experience of 10 or more years. Thus majority 61.37% of teachers are having teaching experience of 3-5years (Table 6.1.5) ,pp-184
7. 81.81% schools started computer education in their schools in the year 2004,9.09% schools had started computer education in 1998 and 2 schools in 2000 and 2011 respectively. Thus, majority 81.81% of the schools covered by the study started imparting computer education in their schools in the year 2004 (Table 6.1.6) ,pp -185
8. Regarding computer lab in the schools, 90.90% of the schools were having only one computer lab and 9.09% schools were having two computer labs. (Table 6.1.7),pp-186
9. 68.18% schools having 24 computers in schools. 11.37% schools are having 30 computers and 5 schools out of which 2 from private schools and 3 from

central board schools were having 40 computers in their labs. 9.09% schools, two from aided schools and two private schools having 60 computers in there labs. (Table 6.1.8),pp-187

10. 70.45% of the schools were having one computer connected with internet. Two private schools were having 10 computers connected with internet. All 100% municipal schools were not having any computer connected to the internet.(Table 6.1.9),pp- 188
11. 93.19% respondents of schools responded that the number of computers available in schools is not in sufficient number.(Table 6.1.10),pp-189
12. 36.36% of the schools, had developed software required in computer lab through the teachers and all the 5 municipal school obtained softwares on contract basis. Thus,majority (54.54%) of the schools covered by the study obtained software on contract basis.(Table 6.1.11), pp-190
13. 100% aided schools, 100% central board schools ,100% municipal schools and 80.00% private schools had designed computer curriculum prepared by their respective boards.20.00%private schools had designed computer curriculum through their school teacher (Table 6.1.12) ,pp-191
14. 85% of the schools covered by the study had only one computer teacher (Table 6.1.13), pp-192
15. 56% schools had permanent computer teachers (Table 6.1.14), pp-193
16. Regarding computer period in the schools per week- 67% schools teach computer subject only once per week while 33% schools have two periods per week (Table 6.1.15), pp-194
17. Years of teaching - 68.18% and school status 59.09% were the most important factors, according to the respondents, affecting teacher's familiarity with computer technologies (Table 6.1.16), pp-195
18. 93.18% of the schools allocated less than 2% of the budgetary funds for computer department (Table 6.1.17) , pp-196
19. 70.45% schools starts imparting computer education in their school from the fifth standard, while the rest 29.54% of the schools had started it fromthe first standard (Table 6.1.18) , pp-197
20. Subjects learnt by the students are power-point presentation (100%), drawing (100%.),web surfing (93.18%) .These were important subjects learnt by the students. (Table 6.1.19), pp-198

21. 22.72% schools out of 44, sent their teachers to attend seminars related to computer. 59.09% schools did not send their teachers to attend computer workshop/seminar/orientation programmes. (Table 6.1.20), pp - 200
22. 75.00% of the computer teachers never visited computer stores or computer exhibitions. (Table 6.1.21), pp-202
23. Regarding teaching methodologies used by the teachers 45.45% used CD presentation in classrooms, 63.63% teachers prepared study material through internet (Table 6.1.22),pp-203

Other findings

1. Strategic efforts made by management of schools to benefit the students by extending them computer education and to create awaremess. (Table 6.3.19),pp -236
2. Central government policies for computer educationhelped students to gain 100% computer awareness.(Table no6.1.18),pp-197
3. Grant given to aided/granted schools is Rs.20,000 per annuam.(Table no 6.1.17),pp -196
4. Due to aid (computers) given by IT industry to aided/granted schools ,students are able explore more information in computers and are more inclined towards computer subject helping them to decide their carrier in computers.
5. All CBSE board faculties are having post graduation in computers which helps students to get knowledge about computers beyond the syllabus.(Table no6.1.3), pp -182
6. Also private schools appoint post graduate computer science faculty for teaching computer for school children which helped children to explore new areas in computer .(Table no 6.1.3), pp -182

CONCLUSIONS

1. Majority(95.45%) of the students use computers in schools (Table no. 6.3.1) ,pp-217
2. Teachersandparents plays an important role in promoting computer literacy among school students.(mean value- 4.89) (Table no. 6.3.2) ,pp-218
3. 100% the students of municipal school does not use computer for homework and assignment.Majority of the students uses computers for home work and other assignments for the period up to one hour per week. (Table no. 6.3.3) ,pp-219
4. The number of students playing computer games has been relatively higher(26.67%) in the case of central boards students and private schools students.(Table no. 6.3.4) , pp- 220
5. Frequency of using MS-Word by the students has to be increased for improving computer awareness among the school students. (Table no. 6.3.6) ,pp-222
6. Usage of computer for downloading software is less(6%) in case of municipal school students andonly14.77% of aided/granted school students use computer for downloading software. (Table no.6.3.7) , pp-223
7. Using computers for browsing has remained a neglected activity as 61.13% of the students do not use computers for browsing specially from aided schools which accounted for 88% and 40% municipal schools does not use computer for this purpose. Thus the percentage of the students using computers for browsing was highest among the central schools(74.76%) covered by the study followed by private school students. (Table no. 6.3.8) , pp - 224
8. The tendency to use computers up to one hour a week for playing online games is higher in private(34%) and central board students (27%) as compared to the aided schools students (15%).While (75%) of student does not use it for this purpose . (Table no. 6.3.10), pp -226
9. 98.00% of students from municipal school do not use computer for chatting.(Table no.6.3.11) , pp - 227
10. 46.67% of the central board schools students used internet at home for more than 5 hours a week and 47.33% of the private schools students used it for the period 1-5 hours a week.None of the student from municipal school uses

internet at home as they don't have computer at home.(Table no. 6.3.12),pp-228

11. 100% students from municipal schools do not use internet at school because of non availability of internet at their schools (Table no. 6.1.9) ,pp-188
12. Students felt that the computers should be used be for teaching subjects mathematics,history, geography and science.(Table no. 6.3.19) ,pp-236
13. Most of the students were using computers for MS- Office and reference from internet. (Table no. 6.3.18), pp-235
14. Maximum(57.50%) parent respondents were undergraduates.**(**Table no. 6.2.2), pp-207
15. Majority of the parent's(32.50%) were having annual income upto 2 lakhs of Rupees. (Table no. 6.2.3), pp -208
16. 97% of parent's had the view that in present times computer education is a must for their children.(Table no.6.2.5),pp-210
17. 97% of the parents expected that, computer education helps children to pursue their carrier and 95% parents expected that computer education helps in enhancing children knowledge. (Table no.6.2.6),pp-213
18. Majority of the parents (4.89 mean value) agreed that their children learn more about computer from teachers, followed by parents and friends.Hence teacher plays an important role. (Table no.6.2.7),pp-216
19. Majority(61.36%) of the school teachers were graduates(Table no.6.1.3), pp -182
20. Majority (61.37%) of teachers are having teaching experience of 3-5years (Table no.6.1.5) ,pp-184
21. 81.81% of the schools covered by the study started imparting computer education in their schools in the year 2004 (Table no.6.1.6) ,pp -185
22. Respondents of schools responded that the number of computers available in schools is not in sufficient number.(Table no.6.1.10) , pp - 189
23. Majority of the schools covered by the study obtained software required in lab on contract basis.(Tableno.6.1.11), pp-190
24. 67% school teach computers only once per week while 33% schools have two periods per week (Table no.6.1.15), pp-194
25. Municipal schools,central board schools, aided/granted schools covered by the study had only one computerteacher (Table no.6.1.13), pp-192

26. Majorityof the schools were having only one computer lab.(Table no.6.1.7), pp-186
27. Central board schoolshad permanent computer teachers (Table no.6.1.14) ,pp-193
28. Centralboard schools teachers and private schoolsteachers used CD presentation in classrooms and prepared study material through internet. (Table no. 6.1.22),pp-203

7.5 SUGGESTION

Present educational system has been characterized by transition, transformation and revolution which call for a change in knowledge, competencies and skill to deal with rapid technology advances.

In India, education has been included in a concurrent list. Hence the central and state government has taken steps to perform and to promote computer awareness among the school children. However the progress in this respect has not been up to the expectations in account of various reasons.

Proper education is necessary to make the student an ideal citizen, understand the society and the social environment. School education can become efficient and effective through quality education. Quality education focuses on identification of the varieties of each individual student and nurturing such varieties for holistic development of the personality of each individual student.J.P Naik has pointed out that, equality, quality and quantity as an elusive triangle, hence maintaining equality and quality in Indian education is essential to promote quality school education where information communication technology(ICT) can play a significant role.

It was observed that the provision of computer facilities, essential infrastructure and trained, devoted and enthusiastic teachers has been highly unequal between the school and the schools affiliated to the state and central board. This has been the result of the fact that, some school authorities have placed relatively greater on these aspects as compared to the other schools. Different schools have taken varying decisions about the allocation of budgetary funds for investing an maintenance of computer facilities,

which reflects their views about the role of ICT in the schools curriculum, access to internet etc.It has been observed that 92.31% of the schools covered by the study, allocate less than 2 percent of the budgetary resources which is not desirable practice.(Table 6.1.17)

A common pool can be created amogst municipal schools to share the computer facility,expertise of teachers,internet usage,web based technology,books on computer literature.This will help to boost the moral of computer teachers as well as students in improving their computer awareness.

The role of a teacher in promoting computer awareness among the secondary students has been most critical but in practice, this aspect remains to be neglected by most of the schools in Pune city. Majority(64.10%) of the teachers were graduates without special training for achieving increasing participation of the students in using ICT in the process in their education. As teachers are key for successful computer integration in theclassroom. They need to be well trained so as to be quite confident in using technology not only to teach the subject math but also create interest among the students to use ICT with benefit. For this purpose, teachers need supportive environment, general guidance, individual incentives, clear policies, curricular, instructions and training along with peer support and interactive network. Teachers tend to use traditional method of teaching, which tends to be only one way communication making listening quite boaring.In order to enhance student's participation in the process of learning new and effective pedagogies of teaching ICT need to be evolved and used.

The teachers reported that they have to face number of problem for using ICT while teaching. These obstacle include lack of equipments,time,technical assistance, number of computers and their maintenance, internet connection sufficient time schedule for students using computers and lack of infrastructure especially power supply, lack of administrative support. The teachers were also finding it difficult to manage the crowded classes. Many students were not having computers at their home doing homework. Such problems need to be addressed.

A wide variety of software applications and tools, is required to promote ICT literacy and ICT enabled learning and teaching programmes.Graphics and animation, desktop publishing, web designing, database along with programming tools are necessary to

increase skills of using them. Similarly conceptual knowledge is also necessary for the teachers and students. Hence a suitable mix of software needs to be maintained by the schools. It has been observed that computer multimedia software packages and other developed packages have been found to be very effective in promoting computer literacy among the students.

Parents also have the responsibility to look after their children's progress in education of computer awareness. As they have to deal with rapid technological progress and survive and grow under ever increasing competition, they need to develop necessary technical skills right from their younger age.

7.5 SCOPE FOR FUTURE STUDY

For the purpose of present study, the students from secondary classes of the selected schools have been covered. Such studies should be conducted to cover primary and higher level of education, so as to get complete picture of the ICT awareness among the students in Pune city.

Secondly similar studies should be conducted for other cities in India.

Thirdly the problem of computer awareness is more acute in rural areas in rural areas in India, hence such surveys need to be conducted for the students, studying at various levels such as primary, secondary and higher educational institutes in semi urban and rural areas.

CHAPTER VIII

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ANNEXURES

Annexure No.	List of Annexure
1.	Questionnaire for School
2.	Questionnaire for Parents
3.	Questionnaire for Students
4.	Map of Location of schools in Pune city
5.	List of schools for study

Annexure -1

Questionnaire for School Management/Principal/Computer Teacher

Pl. tick (√) wherever applicable

Name of your school: _____

Address of your school: _____

Recognition/Affiliation of school is : ( ) Aided/Granted ( ) Central Board
( ) Private

Composition of school: ( ) Pre – Primary ( ) Primary ( ) Secondary
( ) Higher Secondary

Respondent's title: ( ) Computer teacher ( ) Lab instructor

Educational qualification of the respondents: ( ) Graduate ( ) Post-Graduate
( ) Others

Professional Qualification: ( ) MCSE ( ) MCSD ( ) MSC-IT
( ) Other please specify –

Age of respondent: ( ) Up to 30 years ( ) More than 30 years

Years of service of respondent: yrs

10 Year your school started Computer education:

11 From which class student start learning computer education in your school –

Infrastructure at your school

12 Number of computer lab in school :

13 Number of computer in school for students :

14 Number of computers connected to internet :

15 Do you feel that your school has sufficient computer resources? Yes/No/Maybe

16 Sources of getting software for school

1. ( ) Purchased market product
2. ( ) Created by a teacher
3. ( ) Contract Basis

17 Authorities designing Computer curriculum

1. ( ) Concerned Board
2. ( ) Designed by school teacher itself

[The following questions refer to computers both in the lab and regular classroom]

18 Total number of computer teacher in school :

19 Nature of appointment of computer teacher in school :

20 Frequency of computer periods per week :

21 Following areas affect the affect teachers' familiarity with computer technologies

Sr.No.	**Area**	**Yes**	**No**
1.	Gender		
2.	Area		
3.	Years of teaching		
4.	School status		

22 Percentage of the budget allocated for computer department : ( ) less than 2%

( ) More than 2%

23 Students of which grades use computers in the classroom/lab-

KG, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

24 Subject learned by students up to 10th class

(Multiple Choice):

1. ( ) keyboard operation
2. ( ) mouse operation
3. ( ) MS- Word
4. ( ) e-mail exchange
5. ( ) Web surfing
6. ( ) drawing
7. ( ) MS-Excel
8. ( ) setting up sites
9. ( ) programming (ex. C, C++)
10. ( ) algorithms
11. ( ) making presentation by Power Point
12. ( ) There are no defined specific skills or topics to be acquired by children.
13. Other: _____

25 Do you attend seminars or other events related to computers?

Sr. No.	**Training Programme**	**Number of teachers**
1	Workshop on computer	
2	Seminar	
3	Orientation Program in computers	
4	Training Program	
5	Not attended	

26 Do you visit computer stores and exhibitions-

1. ( ) visiting stores
2. ( ) visiting exhibitions

27 Teaching Methodologies used

Teaching Methodologies	**YES**	**No**
CD presentations in Class Room through monitor		
Internet usage while teaching in class-room		
Using LCD in class-room		
Preparing through CD or DVD		
Preparing through internet		
By reading computer magazines		
By reading Internet magazines		

Annexure -2

Questionnaire for Parents

Pl. tick (√) wherever applicable

1. Name : _____

2. Child Name : _____

3. Age : 25-35 ☐ 35-45 ☐ 45-55 ☐

4. Educational Qualification: _____

5. Your Annual Income : a) 1 Lac to 2 Lac ☐

b) 2 Lac to 3 Lac ☐ c) 3 Lac to 5 Lac ☐

d) 5 Lac to 10 Lac ☐ e) More than 10 Lac ☐

6. Occupation:_____

7. Pl. tick (√) the following

Sr.no	Use of computer	Yes	No
1.	Do you use computer for personal/professional purpose		
2.	Is computer education must for your children		
3.	You have Computer at home for children		
4.	If No, are you thinking to buy for children		
5.	Do you buy latest software and hardware for your child to upgrade his/her technical skills		
6.	Having computer would lead to better utilization of children's time		
7.	Whether school is teaching computer as per the practical needs considering the interest of children		
8.	Do you help your child in gaining knowledge about computer		
9.	Does computer education has positive effect on students academic achievement from elementary school to college		
10.	Do you visit computer stores and exhibitions with your children		
11.	Does your child use computer more to play games than to gain knowledge		
12.	Is your child using computer to download movies ,games ,		

	songs		
13.	Are your children aware of latest updates in hardware and software		

9. What expectations do you have toward computer education?
[Multiple Choice)]:

( ) To help children to pursue their future career
( ) To increase children's social interest
( ) To enhance children's knowledge
( ) To enhance students with their communication ability
( ) To help children to survive in modern society
( ) To nurture children's attitude and their power to think
( ) To help them better understand truth, good, and beauty
( ) To complete the different projects.
( ) I. Q Test

10. Whether your child learns more about computer through their –
(Who is more effective?) **Rank accordingly**

Parents ☐ Teachers ☐ Friends ☐ Relatives ☐ Books ☐

11. Your suggestion about the computer education in school? _____

Thank you! Your participation in this survey is much appreciated

.

Annexure -3

Questionnaire for School Students

Pl. tick (√) wherever applicable

School Students

1. Name : _____
2. Age : (yrs)
3. Nameof your school: _____
4. Board of your school: ( ) CBSE ( )SSC ( ) ICSE
5. I use a computer at - ( ) Home ( ) School ( ) Cyber Café ()Friends ( ) Other Place

6. In case of difficulty in using computers – who helps you most **(Rank accordingly)**

1. ☐ Parents 2. ☐ Teachers 3. ☐ Friends
4. ☐ Relatives 5. ☐ Books 6. ☐ Others

7. If you use the **computer**, please indicate the frequency and type of use:

Purpose(Other than Internet usage)	(1) Do Not use	(2) 1 hour per week or less	(3) 2-5 hours per week	(4) More than 5hours per week
a)Do Homework and other school assignments/projects				
b)Play computer games				
c) Databases				
d) Spreadsheets				
e) Word processors				
f) Downloading S/W				

g) Browsing				
h) Playing online games, chatting etc				

8**.** Please indicate whether you use the **Internet**:

Purpose	**(1) Do Not use**	**(2) 1 hour per week or less**	**(3) 2-5 hours per week**	**(4) More than 5 hours per week**
a) I use the Internet at **Home**				
b) At **Friends House**				
c) At **School**				
d) At **Cyber-Cafe**				
e) I **do not** use the Internet				

9. Please indicate your viewon the **usefulness** of the computer (includingInternet Access) at the following locations:

Usefulness of the computer	**(1) Not needed**	**(2) Of Limited Value**	**(3) Essential**	**(4) Very Essential**

a) In a Computer Lab at School				
b) In Classrooms at the School				
c) At Students Home				
d)Community Libraries				

10. From your experience**,** please indicate the usefulness of the computer and Computer applications:

	(1) Not needed	**(2) Of Limited Value**	**(3) Occasionally**	**(4) Always**
a) Information retrieved onthe Internet for schoolwork				
b) Information accessed on CD/DVD				
c Classroom presentations byteachers(PowerPoint/CDs/DVDs)				
d) Online Interaction with other students for homework/school work				
e)FrontPage				
f) MS-Office				
g) Any Other (Please state)				

11. Please indicate **the subject for which you** use the computer

Specify Subject: _____

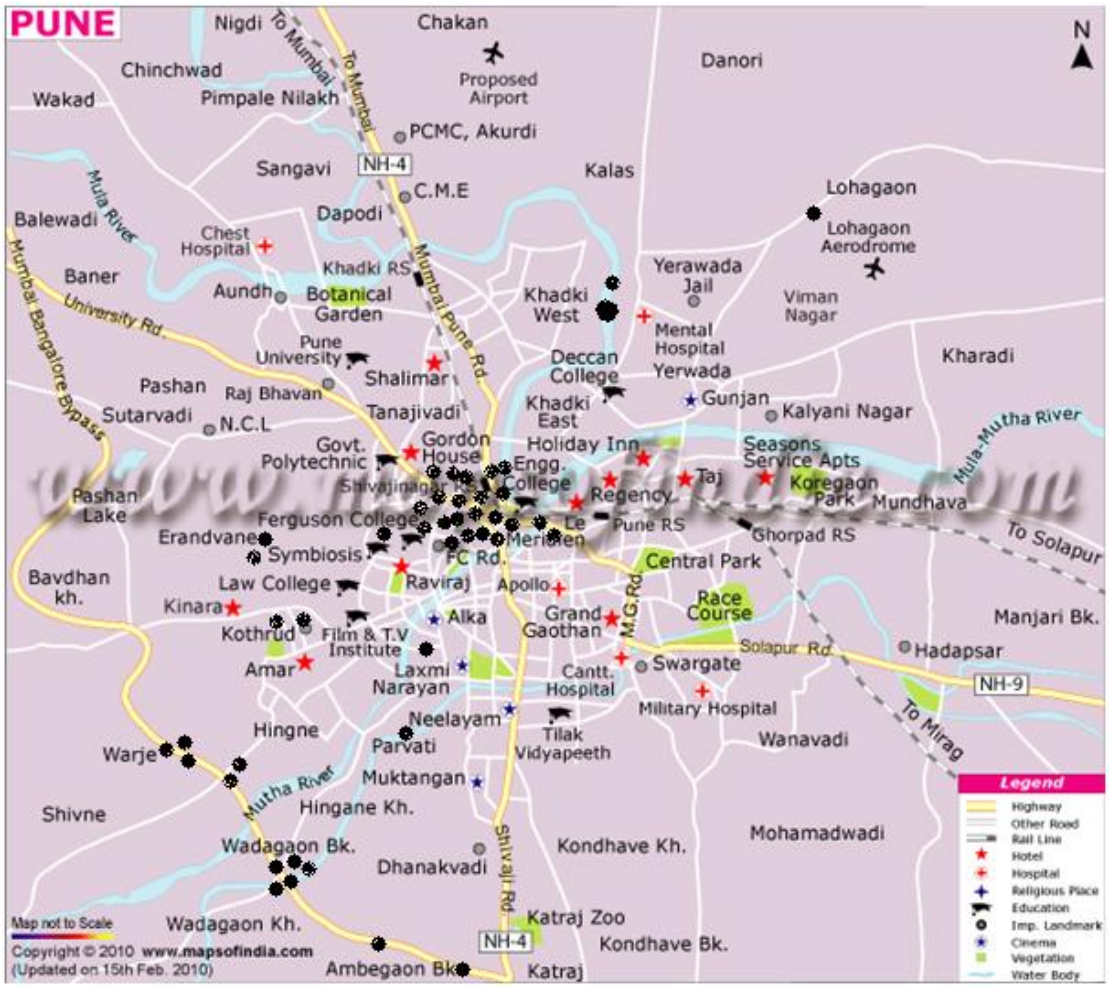
	(1) Not needed	**(2) Occasionally required**	**(3) Frequently required**	**(4) Essentially required**
MS - Word				

MS –Excel				
MS-Access				
MS-PowerPoint				
References from the Internet				
Submit assignments via email				
Online discussion with teacher				

Thank you! Your participation in this survey is much appreciated.

Annexure -4

Location of schools in Pune considered for survey as a part of primary data collection



Source :-http://www.mapsofindia.com/maps/maharashtra/pune.htm

Map 2: Pune city map with location of schools

Note –The • represents the location of the schools

Annexure -5

List of schools in Pune considered for survey as a part of primary data collection

1) GYANDA PRASHALA,NEAR TOO SABHAGRAH,ERANDWANE,PUNE
2) ABHINAV VIDYALAYA HIGH SCHOOL, KARVE ROAD PUNE - 04 PHONE : 25431018
3) ADARSHA SCHOOL 1367 SHUKRAWAR PETH PUNE - 02
4) AHILYADEVI HIGH SCHOOL FOR GIRLS 393 SHANIWAR PETH PUNE - 30 PHONE : 24450690
5) ROSERY INTERNATIONAL SCHOOL,NEAR MUMBAI-BANGLORE HIGHWAY,WARJE
6) VIMAL VIDYA KUNJ,WARJE NAKA,PUNE -52
7) SHRIMATI SHANTA BAI MAHAVIDYALAYA SRI DANGAT-PATIL VIDYALAYA ,WARJE _MALWADI ,PUNE
8) DNYAN PRABHODINI CHATRA PRABHODINI 510 SADASHIV PETH PUNE – 30
9) JOG SCHOOL , MAYUR COLONY,KOTHRUD PUNE - 29
10) KALMADI SHARMARAO HIGH SCHOOL 55/57, DR KETKAR RD, ERANDWANE PUNE - 04
11) ALL SAINTS HIGH SCHOOL PHONE : 5813969CHURCH ROAD,KHADKI, PUNE - 03
12) BAPUSAHEB PAWAR PRARTHAMIK SHALA 380 D BHAWANI PETH PUNE. PHONE : 6434413
13) BHARTIYA MARATHI VIDYALAYA166 SHUKRAWAR PETH PUNE. PHONE : 4453625
14) DIGHE KAMAL MADHUBAN S'NAG PUNE. PHONE :5539703
15) GURU NANAK HIGH SCHOOL 192/93 GANESH PETH PUNE – 02
16) MODERN V SCHOOL 503 SHANIWAR PETH TILAK RD PUNE - 30
17) MAHERSHI STRI SKISHAN SANSTHA KARVENAGAR , PUNE
18) NANDADEEP VIDYALAY 272 PARVATI PUNE.PHONE : 4442309
19) NAVIN MARATHI SHALA 342 SHANIWAR PETH PUNE - 30
20) NAV MAHARASHTRA SHIKSHAN SANS,16 NEAR HILL TOP SOC PUNE. PHONE : 4375850
21) NEW ENGLISH SCHOOL,TILAK RD PUNE - 30 PHONE : 4336029
22) NEW ENGLISH SCHOOL,PHURSUNGI TILAK RD PUNE - 30 PHONE : 6980214

23) PRATHMIK SHIKSHAN MANDAL SHIKSHAN SANS 351 RASTA PETH PUNE-11 PHONE :6121580
24) PRATHMIK SHIKSHAN SANGH ,48/A ERANDAWANA PUNE. PHONE : 5443007
25) KARAMVEER BHAURAO PATIL VIDYAMANDIR DHANKAWADI PUNE - 43
26) KARMAVEER BHAURAO PATIL VIDYALAYA,597 BUDHWAR PETH PUNE - 02
27) KARMAVEER BHAUSAHED HIRAY HIGH SCH,LAXMI NAGAR PUNE - 09
28) BISHOP'S SCHOOL 5A BHAGAT ROAD PHONE : 6360437,6361233
29) DR VIKHE PATIL MEMORIAL SCHOOL S-B ROAD PUNE - 16
30) HUTCHINGS HIGH SCHOOL 7 PHYARE RD PUNE - 01.PHONE : 6352764
31) KARAMVEER BHAURAO PATIL VIDYAMANDIR DHANKAWADI PUNE - 43
32) KARMAVEER BHAURAO PATIL VIDYALAYA 597 BUDHWAR PETH PUNE - 02
33) KARMAVEER BHAUSAHED HIRAY HIGH SCH LAXMI NAGAR PUNE - 09
34) KARNATAKA HIGH SCHOOL OFF KETKAR ROAD ERANDWANA PUNE - 04
35) KARVE INSTT OF SOCIAL SVC HILL SIDE KARVE NAGAR PUNE - 52
36) KENDRIYA VIDYALAYA CME PUNE.PHONE : 7145838
37) MILLENNIUM NATIONAL SCHOOL 18, HILL SIDE, KARVENAGAR, PUNE – 411052
38) ROSARY HIGH SCHOOL 15-16 AMBEDKAR ROAD PUNE PHONE : 6134668
39) SHANU PATEL HIGH SCHOOL SCH 62 GIRISH SOC VARJE PUNE. PHONE : 5230675
40) SINHAGAD SPRING DALE PUBLIC SCHOOL 44/1 VADGAON Budruk PH : 4341573,4359373
41) SINHAGAD SPRING DALE RESIDENTAIL SCHOOL,44/1 VADGAON Budruk PH :
42) KENDRIYA VIDYALAYA PHONE : 7011697 NO 12 9 BRD AIR FORCE STATION PUNE - 32
43) KENDRIYA VIDYALAYA,RANGE HILL PUNE - 28
44) KENDRIYA VIDYALAYA KIRKEE,RANGE HILL PUNE – 28