Dr. Deepa Vijay Abhonkar

ICT and Management Education

ICT and Management Education

ICT and Management Education

Dr. Deepa Vijay Abhonkar
Assistant Professor
MGV's Institute of Management & Research, Nahsik

Dedicated to

Dedicated to My Dad
Adv. Ashok Mahadu Deore

Acknowledgements

Table of Contents

CHAPTER – I

INTRODUCTION

1.1 Introduction

India has the third largest system of education in the world, next only to USA and China, with more than 500 universities and around 30000 colleges.

Now we have about 611 universities and university-level institutions and 31,324 colleges as of August 2011.India is one of fast developing countries in the world economically and technically especially in the field of IT. Indian IT professionals have conquered the world with their knowledge and technique which could not have been achieved without the support of ICT. So, spreading ICT to the gross root level would fulfill the Bottom Of the Pyramid philosophy to manage and master sustainable growth for our country.

In the recent years higher education especially management education has been in demand for most of the students in India. Even though, management education provided by Universities in India has failed to produce managers that are suitable for the industry. So, under Human Resource Management Department, AICTE has tried to improve the system of education in professional colleges by inculcating Information and Communication Technology in every University and affiliated colleges.

Education is the backbone of a nation. Education plays a major role in development of modern economies. Understanding how education system work and how it evolve over time has been one of the most important research agendas in recent years. The education system of any economy performs following main tasks: first, it handles the basic and higher education; second, it provides better opportunities of income; third it enhances the living standard and helps in social development. Information, Knowledge, and Communication Technology plays vital role in imparting education in modern scenario. At the height of the Internet boom of the 1990's a fashionable saying was "The Internet changes everything."

The ICT changed the way of imparting education in modern era. Considering the higher education in India has seen the massive growth in post-independence era. At the time of independence 17 universities and about 400 colleges was there in India and today 520 universities, nearly 22,000colleges, over 10 million students, 0.45 million teachers and one of largest higher education system in the world. Our education system focuses on at creation of high quality and well trained human resources to fulfill the need of ever growing Indian economy, but on other hand it face challenges at operational level.

Educational governing bodies like UGC, AICTE, ICMR, ICAR, all possess difficulties to maintain proper coordination, administration, monitoring and evaluation for improving the quality of education and also imparting the education. The role of Information and Communication Technology (ICT) is to strengthen the three traditional branches that make up the mission of higher education. i.e. teaching, research and service to the society. ICT changed the style of functioning of the educational system and its governance with the help of digital data, its storage, retrieval, manipulation and transmission. ICT works in three ways: -

(i)   Communication and decision implementation,

(ii) Automating tedious task, and

(iii) Supporting new and existing tasks and processes.

Use of ICTs can process information, create knowledgebase and make them available wherever and whenever necessary. Information and Communication Technologies (ICTs) in most cases have tremendous success in providing services at reduced costs to the people's door steps. ICTs have the same to do for making the higher education available.

1.2 Trends in Growth of Higher Education in India

Though higher education is very old in India, modern higher education in India began with the establishment of Hindu College in Calcutta in 1817. By 1855, there were 281 High Schools and 28 Colleges. To regulate them, three universities; Bombay, Calcutta and Madras were established in 1857 by then British Indian Government. The growth continued un-impeded and by 1947, there were 19 universities, 496 colleges with 2,40,000 students. University Education Commission, 1948-49 (popularly known as Radhakrishnan Commission) emphasized the need for setting up an apex body to coordinate the growth and development of education at the tertiary level and maintenance of standards in education. Thus, the University Grants

Commission (UGC) came into existence by an Act of Parliament in 1956. In the last five half decades, the growth of higher education presents a very impressive picture. There has been commendable quantitative expansion in terms of students' enrolment, number of teachers, colleges, universities and research degrees. Enrolment in higher education has registered a steep hike in the last sixty years. During the academic year 2009-10, there had been 146.25 lakhs (provisional) students enrolled in various courses at all levels in universities / colleges and other institutions of higher education as compared to 136.42 lakhs in the previous year, registering an increase of 7.2 percent. Out of 146.25 lakhs, 60.80 lakh had been women students, constituting 41.6 percent. This rapid expansion of higher education, however, hides the story of the severe disparities that prevails in access to higher education across the states. Different states are at different stages of development. There are states wherein the access ratio to higher education is much lower than the national average of about 20%. As against this, there are 14 states wherein the access ratio is higher than the national average.

It is evident from the available statistics that of the total enrolment in higher education, 86% students are enrolled in undergraduate programs, 12% in postgraduate programs, 1% in diploma / certificate programs and 1% are enrolled in research programs. It shows a highly skewed picture of higher education. The size of the post graduate education as also that of research is a matter of great concern. The situations of diploma and certificate level programs, which constitute only 1% of the higher education, leave much to be desired.

1.3   ICT enabled Education: an Overview

The Information and Communication Technology (ICT) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer, and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. When such technologies are used for educational purposes, namely to support and improve the learning of students and to develop learning environments, ICT can be considered as a subfield of Educational Technology. ICTs in higher education are being used for developing course material; delivering content and sharing content; communication between learners, teachers and the outside world; creation and delivery of presentation and lectures; academic research; administrative support, student enrolment etc.

In the current information society, people have to access knowledge via ICT to keep pace with the latest developments. In such a scenario, education, which always plays a critical role in any economic and social growth of a country, becomes even more important. Education not only increases the productive skills of the individual but also his/her earning power. It gives them a sense of well being as well as capacity to absorb new ideas, increases their social interaction, gives access to improved health and provides several more intangible benefits. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, audiocassettes and CD ROMs have been used in education for different purposes (Bhattacharya and Sharma, 2007).

1.4   Advancing Knowledge and Knowledge Economy: Prospects of E-learning

The emergence of ICTs represents high promises for the tertiary education sector and, more broadly, the post-secondary education sector if one takes into account their impact on non-formal education. ICTs could indeed play a role on three fundamental aspects of education policy: access, quality, and cost. ICTs could possibly advance knowledge by expanding and widening access to education, by improving the quality of education, and reducing its cost. All this would build more capacity for the advancement of knowledge economies. This section summarises the main arguments backing these possibilities.

E-learning is a promising tool for expanding and widening access to tertiary education. Because they relax space and time constraints, ICTs can allow new people to participate in open distance learning (ODL) by increasing the flexibility of participation compared to the traditional face-to-face model. In this way working students and adults, people living in remote rural areas, non-mobile students, and even students outside the country could now more easily participate in education. Thanks to ICT, learners can indeed study where and/or when they have time to do so, rather than where and/or when classes are planned. While traditional correspondence-based distance learning has long played this role, ICTs have enhanced traditional distance

education by enabling the rise of a continuum of practices between fully campus-based education and fully distance education.

More specifically, fully online learning can allow large numbers of students to access education. The constraints of the face-to-face learning experience, that is, the size of the rooms and buildings and the student/teacher ratios, represents another form of relaxation of space constraints. ICTs indeed allow a very cheap cost of reproduction and communication of a lesson, via different means like the digital recording and its (ulterior or simultaneous) diffusion on TV, radio or the Internet. The learning process or content can also be codified, and at least some parts be standardised in learning objects, for example a multimedia software, that can in principle be used by millions of learners, either in a synchronous or asynchronous way. Although both forms might induce some loss in terms of teacher-learner interactivity compared to face-to-face teaching, they can reach a scale of participation that would be unfeasible via face-to-face learning.

1.5   The Promises of ICT in the Education Sector

When the needs are huge, fully online learning can be crucial and possibly the only realistic means to increase and rapidly widen access to tertiary education. Some developing countries have huge cohorts of young people and shortages in their academic workforce that result in unmet demands for education. Given that training new teachers would take too much time, notwithstanding resources, e-learning therefore might represent for many potential students the only chance to study, so it is not merely an alternative to full face-to-face learning (World Bank, 2003).

E-learning may also be viewed as a promising way for improving the quality of tertiary education and the effectiveness of open distance learning. These promises can be derived from different characteristics of ICTs, including: the increased flexibility of the learning experience it can give to students; the enhanced access to information resources for more students; the potential to drive innovative and effective ways of learning and/or teaching, including learning tools; easier use of multimedia or simulation tools; and the possibility to diffuse these innovations at low marginal cost among teachers and learners.

Distance E-learning has not only the virtue to be inclusive for students that cannot participate in tertiary education because of time, space, or capacity constraints, as was shown above. It can also offer to students more personalised ways of learning than collective face-to-face learning. It can be helpful even in small groups. Although learning is often personalised to some extent in higher education through the modularity of paths, ICTs allow institutions to give students a wider variety of learning paths from which to choose. This is not usually the case in non-ICT supplemented institutions because of the administrative burden this represents in large institutions. This means that students can experiment with learning paths that best suit them. Moreover, e-learning can potentially allow students to take courses from several institutions, i.e. some campus-based and others fully online. This potential flexibility of individual curricula may be seen as an improvement of the overall student experience, regardless of pedagogical changes. In brief, e-learning could render education more learner-centred compared to the traditional model.

Finally, as far as prospects and promises are concerned e-learning may be seen as a promising way to reduce the cost of tertiary education, which is critical for expanding and widening its access worldwide. It might thus represent new opportunities for students having difficulties with traditional education formats. Although initial ICT investments are expensive, they can then generally be used at near-zero marginal cost. Where does this cost-efficiency come from? It comes from the replacement of expensive brick and mortar campuses by smaller virtual campus centres; the digitization of library materials that save the cost of keeping huge paper collections; the improvement of efficiency of institutional management; and the automation of some of the traditional on-campus activities, including some teaching.

Higher education systems have grown more rapidly than expected in the last five decades to meet the demands of quality education for all. In order to increase the access to higher education and improving its reach to the remotest parts of the country contribution of open and distance learning facilities is on increase. In addition, it is catering to lifelong learning aspirations and that too at affordable cost.ICT in Indian higher education is taking place at a fast pace. It is not new to us that audio visual aids, radio, TV are used as props to support education and spread out information for national development.

In 1975-76 government thought of education through satellite, and that system started as Satellite Instructional Television Experiment (SITE). Establishment of CIET-SIET studios for production and transmission of school oriented programs took place. That initiated the country-wide classroom of the UGC with CEC as the nodal agency for creating educational programmes, they are, Education Media Resource Centers (EMRCs) and Audio-Visual Resource Centers (AVRCs) in several universities. At present Gyandarshan - II of the IGNOU, Open School and NCERT broadcast channel programmes are still continuing. Without the support of ICT India cannot function as economically developing country.

Table No. 1.1 The four main rationales for introducing ICT in education:

Rational	Basis
Social	Perceived role that technology now plays in society and the need for familiarizing students with technology.
Vocational	Preparing students for jobs that require skills in technology.
Catalytic	Utility of technology to improve performance and effectiveness in teaching, management and many other social activities.
Pedagogical	To utilize technology in enhancing learning, flexibility and efficiency in curriculum delivery

(Source: Cross and Adam (2007).)

Due to the impact of rapidly growing technological interference unexpected changes have taken place in the society. It is necessary to improve the mobility in the society and social justice and to erect and fix for equity, acceptability of ICT tools is important. Many people who wish to pursue higher education, barriers of socio-economic, cultural, time and geographical occur (Bhattacharya and Sharma, 2007). Innovative use of Information and Communication Technology can potentially solve the problem.

Demand for skilled and competent labor is at all the time increasing in the contemporary globalized society. The ICT enabled education that imparts knowledge through multi-media, networking and internet is necessary for this large society. ICT skills and state-of-the-art infrastructure along with networking and internet connectivity via Virtual Private Network (VPN) / broadband connectivity for disseminating the content and affordable access devices should be made to reach the doorsteps of the remotest of the village's learners.

1.6   Concept of ICT

Information, Communication Technology is understood and derived by different associations, technocrats and professionals in different views as per the applications they have utilized under the concept of ICT.

So, let us now understand the different concepts o know d to define "What is ICT?"

According to Dr. Medha Gupte , concept of ICT is

ICTs stand for Information and Communication technologies and are defined as a diverse set of tools and resources which are used for the purpose of communication as well as for the purpose of creation, dissemination, storage and management of information. It is inclusive of computers, the internet, broadcasting technologies (radio and Television) and telephony. ICT can be referred to as collection of technological gear and resources which are largely used for the purpose of communication. One can divide ICT as:

a) Telecommunications systems and network: This consists of cellular, broadcast, cable, satellite, postal.

b) The networks that utilize them: This involves the hardware and software of information collection, storage, processing and presentation. Educational technology has become an important part of today's technology. It includes various types of media that deliver text, audio, video, images, animation, streaming videos and is inclusive of technical applications and processes such as audio or video tape, satellite TV, CD-ROM and computer based learning. In short, it can be said to be referring to physical hardware as well as educational theoretics. E technology is used, for the tools that technologically or electronically support teaching and learning.

Information technology (IT) is the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a micro-electronics - based combination of computing and telecommunication. The term in its modern sense first appeared in a 1958 article published in the Harvard Business Review, in which authors Leavitt and Whisler commented that —the new technology does not yet have a single established name. We shall call it information technology. It spans a wide variety of areas that include but are not limited to things such as processes, computer software, computer hardware, Programming Languages and data constructs. In short, anything that renders data, information or perceived knowledge in any visual format whatsoever, via any multimedia distribution mechanism, is considered part of the domains space known as Information Technology.

It depends on the local culture and the particular ICT available and how it is configured and managed. The understanding, management and configuration of the available technology might vary the concept of ICT from a collection of tools and devices used for particular tasks, eg, publishing, course delivery, transaction processing... an organized set of equipment (like a 'workshop') for working on information and communication components of integrated arrangements of devices, tools, services and practices that enable information to be collected, processed, stored and shared with others components in a comprehensive system of people, information and devices that enables learning, problem solving and higher order collaborative thinking, that is, ICT as key elements underpinning a (sharable) workspace.

There are some of the key concepts of Information and Communication Technology (ICT), such as those relating to networks and security:

- Understand what hardware is, know about factors that affect computer performance and know about the peripheral devices.---

- Understand what software is and give examples of common applications software and operating system software.----

- Understand what Information and Communication Technology (ICT) is and give examples of its practical applications in everyday life.-

- Understand health and safety and environmental issues in relation to using computers.

- Recognize the important security issues associated with using computers.

- Recognize the important legal issues in relation to copyright and data protection associated with using computers.

From the above concepts it is very clear that Information and Communication Technology is nothing but a technique which utilizes the sources of information to transform this information and communicate effectively with the society at the easiest, cheapest and easily accessible methods for improving the social standards of human beings.

IT defines as **Information Technology**, consists of study, design, advance development, accomplishment, support or administration of computer foundation information system, mostly software application and computer hardware. Information technology works with the use of electronic computers and computer software to renovate, defend, development, and broadcast and other information. Information technology has overstuffed to cover many features of computing and technology, and this word is more familiar than ever before. Information technology subject can be quite large, encompassing many fields. IT professionals perform different types of responsibilities that range from installing applications to designing complex computer networks.

IT professional's responsibilities are data management, networking, database, software design, computer hardware, management and administration of whole system. IT (Information Technology) is combined word of computer and communications or "InfoTech". Information Technology illustrates any technology which helps to manufacture, manipulate, accumulate, communicate or broadcast information.

Recently it has become popular to broaden the term to explicitly include the field of electronic communication so that people tend to use the abbreviation **ICT** (**Information and Communications Technology**).

1.7   History & Evolution of ICT

The history of ICT originates from humble beginnings, which include the abacus. The abacus is thought to have been originally invented 3000 years before the birth of Christ. Revisions to its use/design continued for many years e.g. 500 BC a bead and wire version is developed in Egypt. Early versions of the calculator were gradually replacing this primitive method of mathematics. In 1624 Wilhelm Schickard built the first four-function calculator-clock at the University of Heidelberg, thus heralding a new era.

Mechanical versions of the calculator followed in the years to come. Calculators as we know them couldn't have existed until 1780, when Benjamin Franklin discovered (through experimentation) electricity. The 1st general purpose computer was designed by Charles Babbage around the year of 1833. In 1855 George and EdvardScheutz built a practical model based on Babbage's original designs. The 1st electronic calculator (named the Z1) is built by KonradZuse in 1931. In the year of 1940 at Bell Labs, the Complex Number Calculator is tested and then demonstrated. This is thought to have been the first digital (pulse wave rather than analogue wave run) computer.

Quickly approaching the computers that we use today, 1971 was the year that the Intel Corporation released the 1st microprocessor (the Intel 4004.) Macian E. Hoff was thought to have been the leader of the project. The PC as we know it today was created by IBM and released during 1981. Apple introduces it's PC alternative, the Macintosh, during 1984. It features a GUI (Graphical User Interface) which gave the IBM PC's DOS (text-based) run system stiff competition due to it's usability and professional software .

The World Wide Web is developed by Tim Lee in 1991, and CERN also creates the 1st Web Server. The Pentium chip is included in PCs for the first time in 1993 signalling the end for the 486. There is officially World Internet Connectivity as of 6/15/95.

Fig-1
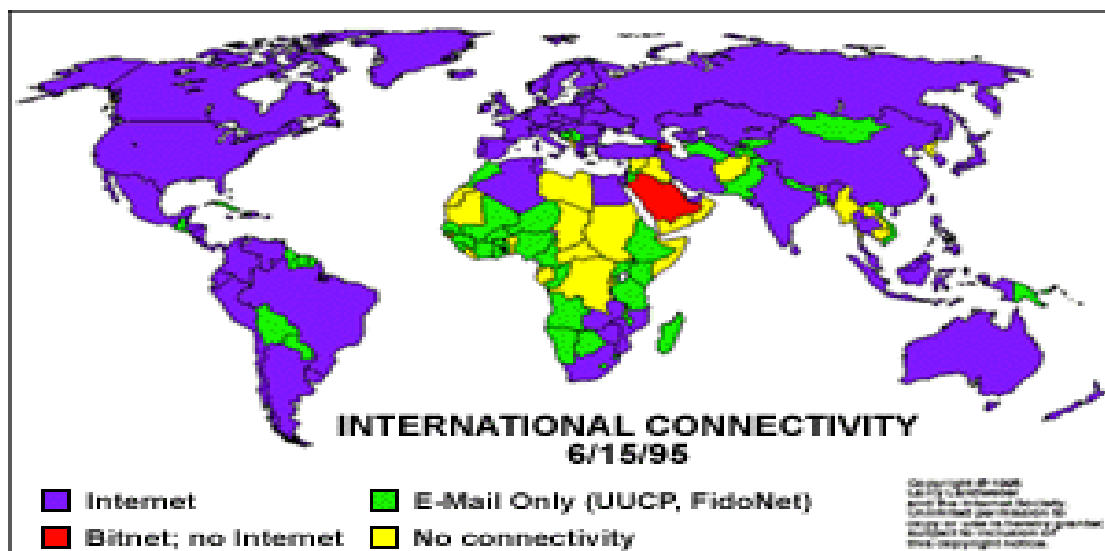
Source: Wikipedia

The development of the World Wide Web has given commercial enterprises a new business avenue to go down. The whole area of commerce involving the Internet is termed E-commerce and has been used (not always successfully) since the arrival of the Internet during the mid-nineties. Early e-companies suffered from offering the same product (as actual physical stores) with no Internet specific benefits to attract new or existing customers. A large percentage of early companies boomed and then went bust, due to heavy investment followed by heavy withdrawal of funds. Huge amounts of funds were invested in companies who had no product to sell and no experience of how to sell it (the nothing to sell that is.)

The value of shares and the combined PLC (Public Limited Company) value of some of these companies were higher than the value of established profit making businesses. Once shareholders cleared the mud from their eyes and paid attention it was too late to turn these situations around. Thus the method of selling and running made allegedly unstoppable companies go bust over night. A domino effect filled the air and soon people were wondering just what had happened to their dream investments.

Fortunately the market for e-commerce is stabilizing as companies learn from their mistakes and offer products/services, which can only be accessed through the Internet e.g. E-bay. The interactivity and relative speed of computers/the Internet are being used in ways, which could not be achieved using regular business practices.

The Internet is a development in the history of ICT which is now (in 2005) greatly affecting the development of industry and commerce. The idea of e-commerce didn't exist until the invention of the Internet and from reading this document I hope the reader has understood as I have, how the development of e-commerce has pushed forward industry and commerce into new lines of business. E-mail is another specific example, which has speeded up industries and given commerce a boost.

The term "information technology" evolved in the 1970s. Its basic concept, however, can be traced to the World War II alliance of the military and industry in the development of electronics, computers, and information theory. After the 1940s, the military remained the major source of research and development funding for the expansion of automation to replace manpower with machine power. Since the 1950s, four generations of computers have evolved. Each generation reflected a change to hardware of decreased size but increased capabilities to control computer operations. The first generation used vacuum tubes, the second used transistors, the third used integrated circuits, and the fourth used integrated circuits on a single computer chip. Advances in artificial intelligence that will minimize the need for complex programming characterize the fifth generation of computers, still in the experimental stage.

The term in its modern sense first appeared in a 1958 article published in the Harvard Business Review, in which authors Leavitt and whisler commented that —the new technology does not yet have a single established name. We shall call it information technology. The first commercial computer was the UNIVAC I, developed by John Eckert and John W. Mauchly in 1951. It was used by the Census Bureau to predict the outcome of the 1952 presidential election. For the next twenty-five years, mainframe computers were used in large corporations to do calculations and manipulate large amounts of information stored in databases. Supercomputers were used in science and engineering, for designing aircraft and nuclear reactors, and for predicting worldwide weather patterns. Minicomputers came on to the scene in the early 1980s in small businesses, manufacturing plants, and factories.

In 1975, the Massachusetts Institute of Technology developed microcomputers. In 1976, Tandy Corporation's first Radio Shack microcomputer followed; the Apple microcomputer was introduced in 1977. The market for microcomputers increased dramatically when IBM introduced the first personal computer in the fall of 1981. Because of dramatic improvements in computer components and manufacturing, personal computers today do more than the largest computers of the mid-1960s at about a thousandth of the cost. Computers today are divided into four categories by size, cost, and processing ability. They are supercomputer, mainframe, minicomputer, and microcomputer, more commonly known as a personal computer. Personal computer categories include desktop, network, laptop, and handheld.

Information and communication technology (ICT) is a force that has changed many aspects of human endeavors. The impact of ICT on various fields of human endeavor such as medicine, tourism, business, law, banking, engineering and architecture over two or three decades has been enormous. But when one looks at the field of education, there seems to have been an uncanny lack of influence of ICT and far less change than other fields have experienced. A number of scholars such as Soloway and Prior, 1996 have attempted to explore this lack of activity and influence of ICT on education and many others. In other words, though ICT has begun to have presence in education, its impact has not been as extensive as in other fields (Collis, 2002). Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers having high degrees of personal contact with learners. With the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important.

It has been suggested that information and communication technologies (ICTs) can and play a number of roles in education such as developing the kind of graduates and citizens required in an information society; improving educational outcomes and enhancing and improving the quality of teaching and learning (Wagner, 2001; McCormick and Scrimshaw, 2001; Flecknoe, 2002). Garrison and Anderson (2003) argue that the application of ICTs in the teaching-learning process can enhance the quality of education in several ways such as increasing learner motivation and engagement, facilitating the acquisition of basic skills, and enhancing teacher training. Since History is one of the major subjects being offered at both secondary and tertiary levels, its relevance and sustenance in the 21st century requires the adequate application of ICTs like video tapes, television and multimedia computer software that combine text, sound and colorful moving images which can be used to provide challenging and authentic content that will not only engage the student in the self-practice.

1.8 Current development
Now a days computers are used for different purposes. Computers are increasingly affordable; they continue to be more powerful as information-processing tools as well as easier to use.

1.8.1 Computers in Business
One of the first and largest applications of computers is keeping and managing business and financial records. Most large companies keep the employment records of all their workers in large databases that are managed by computer programs. Similar programs and databases are used in such business functions as billing customers; tracking payments received and payments to be made; and tracking supplies needed and items produced, stored, shipped, and sold. In fact, practically all the information companies need to do business involves the use of computers and information technology.

On a smaller scale, many businesses have replaced cash registers with point-of-sale (POS) terminals. These POS terminals not only print a sales receipt for the customer but also send information to a computer database when each item is sold to maintain an inventory of items on hand and items to be ordered. Computers have also become very important in modern factories. Computer-controlled robots now do tasks that are hot, heavy, or hazardous. Robots are also used to do routine, repetitive tasks in which boredom or fatigue can lead to poor quality work.

1.8.2 Computers in Medicine
Information technology plays an important role in medicine. For example, a scanner takes a series of pictures of the body by means of computerized axial tomography (CAT) or magnetic resonance imaging (MRI). A computer then combines the pictures to produce detailed three-dimensional images of the body's organs. In addition, the MRI produces images that show changes in body chemistry and blood flow.

1.8.3 Computers in Science and Engineering :
Using supercomputers, meteorologists predict future weather by using a combination of observations of weather conditions from many sources, a mathematical representation of the behavior of the atmosphere, and geographic data.

Computer-aided design and computer-aided manufacturing programs, often called CAD/CAM, have led to improved products in many fields, especially where designs tend to be very detailed. Computer programs make it possible for engineers to analyze designs of complex structures such as power plants and space stations.

1.8.4 Integrated Information Systems :
With today's sophisticated hardware, software, and communications technologies, it is often difficult to classify a system as belonging uniquely to one specific application program. Organizations increasingly are consolidating their information needs into a single, integrated information system. One example is SAP, a German software package that runs on mainframe computers and provides an enterprise-wide solution for information technologies. It is a powerful database that enables companies to organize all their data into a single database, then choose only the program modules or tables they want. The freestanding modules are customized to fit each customer's needs.

1.9   ICT Evolution

The world has undergone an evolution in terms of structural change and technological transformation. However, Africa is still lagging behind in this modern world whose development is largely determined and led by technological advances.   Increasingly, ICT plays an important role in determining levels of development and the quality and accessibility of services in our modern societies. It is in this context that governments and world leaders made a strong commitment towards building a people-centred, inclusive and development-oriented Information Society for all, where everyone can access, utilize and share information and knowledge (WSIS, 2003 and 2005).

1.10   Information Technology Era

Information technology (IT) is a term that encompasses all forms of technology used to create, store, exchange, and use information in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations, and other related forms) including the both telephony and computer technology that have been the driver of what has often been called "the information revolution. "Electronic calculating machine: In 1946, the first entirely electronic calculating machine ENIAC was made up of 30 separate units, weighing 30 tons, occupying 1,800 square feet with 17,468 vacuum tubes. The machine had a capacity for doing nearly 400 multiplications per second. Mainframes: Thereafter, the decades from the 1950s to 1970s are deemed as the ones for organizational mainframe and mini-computers.

In this mainframe era, an IBM computer that could perform 10 million instructions per second and it was costing a hefty $10 million in 1975.

Evolution of the Microprocessor: In 1969, Intel produced the first microprocessor i4004. This is the time when the computer's entire Central Processing Unit (CPU) was placed on a single silicon chip. The rapid development of microprocessor in 1980s, the microprocessor revolution, brought a major acceleration of downsizing: replacement of traditional mainframe and minicomputers with micro-based alternatives. This trend also drives users to low-cost solutions based on PCs, LANs, network servers, and multiple microprocessor-based systems. Evolution of ICT Applications Data Processing: They are characterized as being transaction-based, cyclically processed, usually batch-oriented, and usually operating in a current time frame. Information Management: Management Information Systems (MIS) facilitate and control the day-today business in organization with Decision Support Systems (DSS) providing support to decision makers in making fast, effectiveness and strategic decisions. Knowledge Management: Knowledge management refers to the state of affairs whereby organizations comprehensively gather, organize, share, and analyze knowledge in terms of resources, documents, and human skills. The challenge is to select or build software that fits the context of the overall plan and promote information sharing.

1.11   Evolution of Government Information Systems

It is mainly characterized by the development of internal government information systems for Data Processing Systems, Management Information Systems, and Decision   Support Systems. Evolution of Goals Pursued: Transaction-based, cyclically processed, usually batch-oriented, and usually operating in a current time frame. In general, the goals of computerization are to make government business more effective, more efficient, and more productive without touching upon the organizational structure of government. 2.4 Evolution of Gaps and Inequalities in Access The "digital divide" refers to the separation between those who can access digital technology, thus benefiting from the digital age, and those who cannot. Thus great divide between rich and poor countries and between rich and poor sections of societies within countries has developed which is reinforcing the long observed inequalities in economic wealth and social conditions.

According to the Orbicom CIDA Project, 2002 some statistics as related to the digital divide show that about 201 million people in the world are online out of which 95% of the world's Internet users are in Europe and North America. Sub-Sahara has about 10 percent of the world's population (626 million), but only 0.2 percent of the world's 1.0 billion telephone lines. The encouraging development is that ICT in Africa is growing faster than the world average (as shown in Table 1 below) albeit from a very low initial level.

1.12   ICT sector statistics in India – Current Status

Information and Communication Technology can be broadly viewed under two sectors, Information Technology and Communication. In India, the growth of both these sectors is very significant in the past two

decades. Indian IT industry has built up an enormous confidence for itself in the global markets. IT industry in India comprises of software industry and information technology enabled services (ITES), which also includes business process outsourcing (BPO) industry. India is considered as a pioneer in software development and a favourite destination for IT-enabled services. The Indian software and services exports including IT's-BPO exports is estimated at US $ 49.7 billion in 2009-10, as compared to US $ 47.1 billion in 2008-09, an increase of 5.5 per cent. The IT services exports is estimated to be US $ 27.3 billion in 2009-10 as compared to US $ 25.8 billion in 2008-09, showing a growth of 5.8 per cent. ITS-BPO exports is estimated to grow from US $ 11.7 billion in 2008-09 to US $ 12.4 billion in 2009-10, a year -on-year (Y-o-Y) growth of 6 per cent.

On the Other hand, the growth of Telecommunications is also alarming. In recent times, country has emerged as one of the fastest growing telecom markets in the world. Indian telecom has become the second largest wireless network in the world after China. The future progress of telecom in our country is very encouraging. The current addition of about15 million connections per month puts the telecom sector on strong footing. The target of 500million connections by 2010 has been achieved in September 2009 itself.

Measuring the impact of ICT is critical to better understanding the role of ICT for economic and social development. With the rapid growth of the ICT sector in India, there is an important demand from the research community and policy makers for better data to ensure that research findings are representative for the entire country or the state in order to inform policy makers about ICT developments and its impact and have meaningful interpretations of policies. In particular, there is a real need to measure the digital divide in the country, including the urban-rural and gender divides, and the use of community Internet access centers and mobile phone applications by low -income users.

In India, much work on measuring the impact of the IT industry on economic growth and employment has been carried out. The Government of India has been making sustained efforts to improve the availability of ICT data for policy making and research. Certain data in particular data on the telecommunication sector, the IT industry and business process outsourcing (BPO), data on the information society at large, are produced on a regular basis, A significant amount of data exists on the ICT service industry, collected by National Association of Software and Services Companies (NASSCOM), reflecting their members' data. Similarly, data on ICT manufacturing is captured by another private body, the Communication and Manufacturing Association of India (CMAI).

However, there is a clear need to collect more ICT data in India in a comprehensive and comparable fashion, particularly on the use of ICT by individuals, households and businesses. While some of these data are produced through surveys in a limited manner, official statistics representing the entire sector in a regular manner are still limited. The current proposed paper attempts to identify the existing data system / data present in the field of ICT statistics in India, particularly with reference to the Basic Core Indicators (Annex) identified and recognized at international level under the four categories viz.(a) Infrastructure and Access (b) Access to and use of ICT by households & Individuals (c) Use of ICT by businesses (d) ICT sector and Trade in ICT goods.

1.12.1 Core indicators on ICT infrastructure and access

The first three indicators A1, A2 and A3 viz Fixed telephones per 100 inhabitants, Mobile telephones per 100 inhabitants'; and computers per 100 inhabitants, are regularly maintained month wise by the department of telecommunication under the ministry of information and communication technology. The latest information available till March, 2010 on these three indicators are depicted in the following charts.

Table-1.2: No. of telephones per 100 inhabitants year as on 31st march

Year	No. of telephones per 100 inhabitants	No. of mobile for 100 inhabitants
2006-07	3.66	9.27
2007-08	3.61	14.61
2008-09	3.44	22.78
2009-10	3.21	33.71
2010-11	3.14	49.60

In the year 2006-07, percentage of number of telephones per 100 inhabitants was recorded 3.66 and number of mobiles per 100 inhabitants was 9.27. This percentage decreased to 3.61 and number of mobile users increased to14.61 respectively in 2007-08.In 2008-09 telephone users' numbers again decreased to 3.44 percentage on the other hand mobile users percentage jumped to 22.78. In 2009-10 and 2010-11 the percentage of telephone users reduced and percentage of mobile users increased to 49.60. This shows advanced technology of ICT made the world to change so fast.

Graph 1.1 No. of telephones per 100 inhabitant's year as on 31stMarch
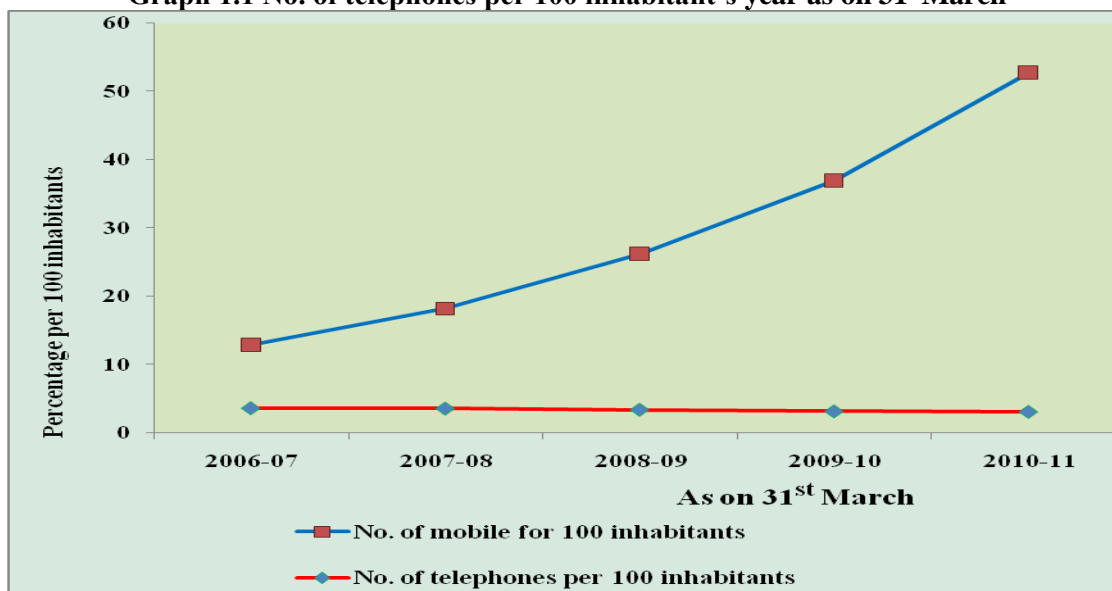
Table 1.3 No. of Internet connections per 100 inhabitant's year as on 31st march

Year	No. of Internet connections per 100 inhabitants	Broadband connections per 100 inhabitants
2006-07	0.12	0.61
2007-08	0.2	0.82
2008-09	0.33	0.96
2009-10	0.54	1.17
2010-11	0.74	1.29

Graph 1.2 No. of Internet connections per 100 inhabitants year as on 31st March
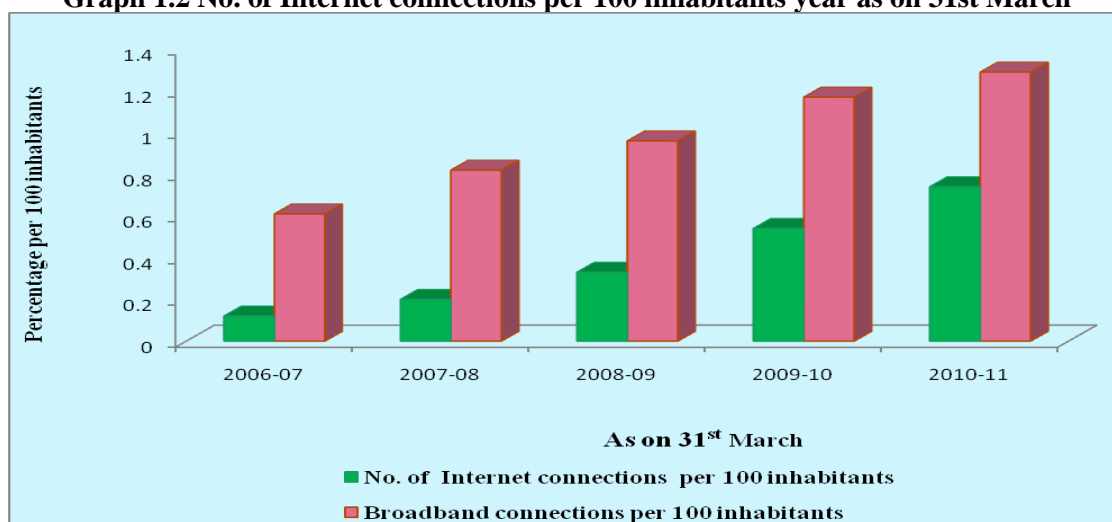
The data on certain indicators of this category like percentage of population covered by mobile cellular telephony (A7) are available in a very crude format. i.e. The number of localities in terms of villages in each state with the facility of mobile telephony are available, which can be converted to A7 by putting little more extra efforts by the state governments by adding the population of all these villages . Similarly the data on tariffs is available with the distributors of the internet connections under different packages offered. Thus the tariff rates are to be disaggregated under each package and per hpu rate is to be arrived at. In a nutshell, the data on the remaining indicators related to infrastructure and access indicators is yet to be maintained in a systematic fashion in India.

1.12.2 Core indicators on access to, and use of, ICT by households and individuals

National Sample Survey Office (NSSO) of the Ministry of Statistics and Programme Implementation conducts multi-subject integrated sample surveys all over the country in the form of successive rounds relating to various aspects of social, economic, demographic, industrial and agricultural statistics in successive rounds, each round covering subjects of current interest in a specific survey period. The subject coverage of Socio Economic (SE) inquiries for different rounds is decided on the basis of a 10 year time frame. In this cycle, 1 year is devoted to land and live stock holdings, debt and Investment; 1 year to social consumption (education and health care, etc.), 2 years to quinquennial surveys on household consumer expenditure, employment & un-employment situation and 4 years to nonagricultural enterprises, namely, manufacturing, trade and services in un-organized sector. The remaining two years are for open rounds in which subjects of current/special interest on the demand of Central Ministries, State Governments and research organizations are covered.

Each survey extends over a period of six months or a year which is termed a round. At present each NSS round covers, at the all India level, about 12,000 to 14,000 villages and urban blocks in the Central sample (covered by the Central government agency NSSO) and an independent sample of about 14,000 to 16,000 villages and blocks in the State sample(covered by the Governments of various states and union territories). The Socio-Economic Surveys cover the whole of the Indian Union except for a few inaccessible and difficult pockets.

The information related to the core indicators on access to and Use of ICT is available from the quinquennial surveys of Consumer Expenditure. The latest survey was conducted during the periods 2004-05. As per this survey the information of core indicators is depicted in the following table.

Table 1.4 Estimates of % of household in rural and urban India
(a) Possessing radio and (b) Possessing television

Year	% households possessing radio (HH1)		% households possessing television(HH2)	
2004-05	Rural	Urban	Rural	Urban
	26.3	66.1	25.6	66.1

The indicator HHR1, estimate of proportion of households using electricity as primary source of energy for lighting is available for 2004-05 to 20076-08. The estimates are asunder.

Table 1.5 Estimates of % of households using electricity for lighting

Year	% households using electricity for lighting*	
	Rural	**Urban**
2004-05	54.9	92.3
2005-06	56.3	92.0
2006-07	56.1	92.7
2007-08	60.2	93.8

As primary source of energy for lighting

Information on HH3 to hh13 is not available in India. However, the information on the number of household using computers (HH5) is being introduced in the next survey of NSSO.

1.12.3 Core indicators on use of ICT by businesses

The Annual Survey of Industries (ASI) is the principal source of industrial statistics in India. It provides statistical information to assess and evaluate, objectively and realistically, the changes in the growth, composition and structure of organized manufacturing sector comprising activities related to manufacturing processes, repair services, gas and water supply and cold storage. The data is collected through a comprehensive questionnaire, which includes a query related to the use of ICT whether the business is using the computer. The survey covers all factories registered under Factories Act, 1948 employing 10 or more workers using power; and those employing 20 or more workers without using power. Apart from these, certain servicing units and activities like water supply, cold storage, repairing of motor vehicles and other consumer durables like watches etc. are covered under the Survey Thus the core indicator B1 compiled from the Annual Survey of Industries for the last three are shown in the table below.

Table 1.6 ICT usage indicators (by no. of employees)

Year	Total estimated no. of factories / enterprises	% of enterprises using computer			% of enterprises using computer with no. of employees				
		Rural	Urban	Total	0-9	10-49	50-49	250+	Total
2005-06	140160	59.21	70.31	65.83	30.75	62.05	78.67	92.82	65.83
2006-07	144710	61.50	74.72	69.26	36.04	64.37	79.60	94.31	69.26
2007-08	146385	67.26	77.71	73.21	37.05	68.57	81.93	94.76	

The above table indicates that the usage of computers in rural areas has increased from 59% in 2005-06 to 67% in 2007-08 whereas in urban areas it has increased from 70% in 2005-06 to 78% in 2007-08. Also it may be seen that about 95% of large enterprises having above 250 employees are using computer. However, only 37% of businesses with less than 10 employees are using computers in 2007-08.

Moreover, the data in the survey is collected as per the National Industrial Classification that is comparable with International Standard Industrial Classification till four digit level. Thus the information on Value added and employment (by gender) related to the manufacturing industries of ICT (included in the definition of ICT sector, recognized by UN) are available through the Annual Survey of industries.

Apart from the Annual Survey of Industries described above, In India, large scale sample surveys on households and enterprises are carried out regularly to estimate the workforce, Gross value Added and various other related characteristics. These surveys are conducted by National Sample Survey Office (NSSO), an official agency of the Government of India under the Ministry of Statistics and Programme Implementation specializing in sample surveys. While household surveys are generally carried out every year, enterprise surveys are conducted with a gap of 4/5 years. Latest few enterprise surveys and their coverages were 63rd round (July 06 – June 07)-Service sector excluding trade 67th round (July 10 June11) - Manufacturing sector and Services sector.

1.12.4 Core indicators of the ICT sector and Trade in ICT goods

In India, the indicators ICT1 to ICT4 related to workforce, value added, imports &exports respectively are not strictly measured as per the International Standard Industrial Classification (ISIC). However, the information related to workforce & exports for this sector is maintained in National Association of Software and Services Companies (NASSCOM) for the IT-BPO sector.

NASSCOM is a premier trade body as well as the Chamber of Commerce of IT-BPO sector in India. It is a not-for-profit organization and has emerged as a authentic voice of this industry in India. It publishes an annual edition of its strategic review to disseminate the latest status of the industry based on the survey of large companies of this sector. As per the NASSCOM results, the estimated number of business sector workforce involved in the ICT sector - IT-BPO direct employment for the financial year 2009-10 is 2.3 million and the ICT goods exports as percentage of total exports- IT-BPO services as a percentage of total exports for the year 2009-10 is 27.3%.

Gross Domestic product related to Communication sector as a whole is available in the Ministry of Statistics and Programme implementation from their publication National Accounts Statistics. The figures for the last five as shown in chart below indicates that the GDP in this sector has increased from about 581 billions in 2004-05 to 1403.09 billions in 2008-09, which is slightly less than three times. The percentage GDP of this sector of total GDP has nearly doubled from 1.96 to 3.38. Production and exports for certain components of ICT sector is maintained by the Ministry of Information and Technology. The details of GDP for communication sector for the last few years are as below.

Table 1.7 Gross Domestic products from Communication sector

Year	Public Sector	Private Sector	Total
1	420.58	160.86	581.44
2	472.39	224.80	697.19
3	534.75	312.6	847.35
4	636.64	446.76	1083.4
5	777.38	626.31	1403.69

**Graph 1.3: Gross Domestic product from Communication sector**
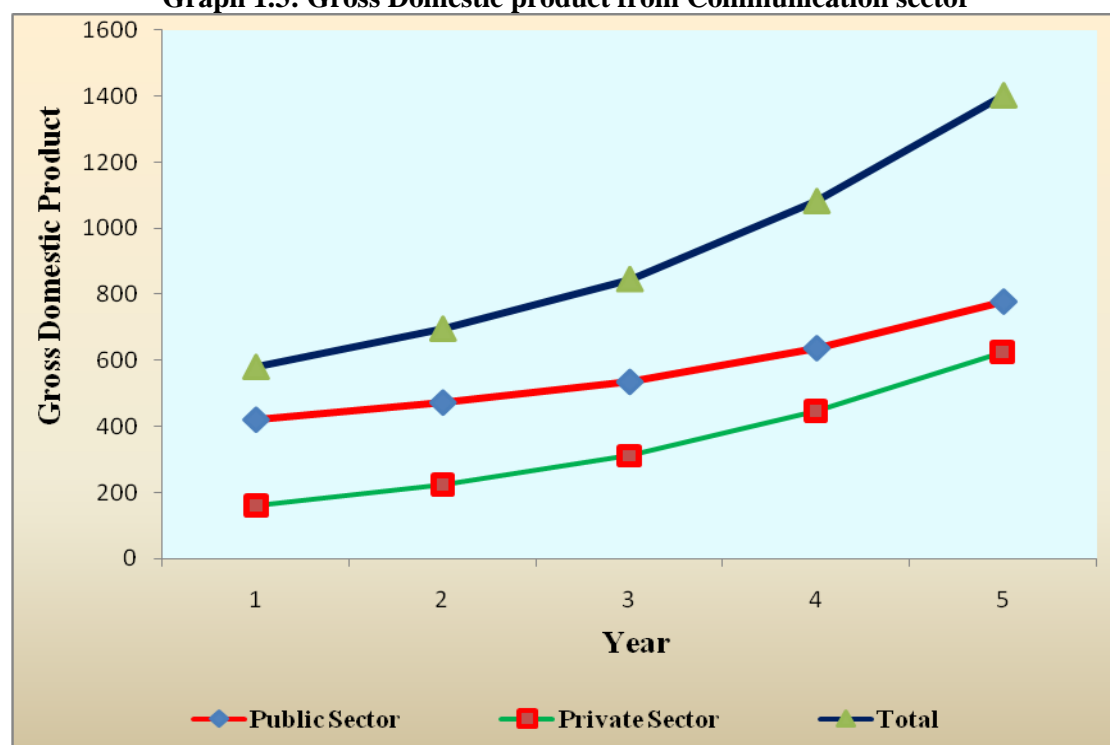
Public sector Private sector Total5.4 The data related to production, exports and imports of this sector is also maintained by the Ministry of Communication and Technology in terms of electronic hardware, computer software etc. The information of production, imports and exports are shown in table 4 and table 5 below.

Table No. 1.8 Trend in production and growth of the Hardware and Computer Software Sector

Year	Production (Rs. Billion)		Growth	
	Electronic Hardware	Computer software	Total	(% increase over previous year)
2003-04	438.0	744.9	1182.9	(21.9)
2004-05	505.0	1019.2	1524.2	(28.9)
2005-06	565.6	1337.0	1903.0	(24.9)
2006-07	660.0	1780.0	2440.0	(28.3)
2007-08	844.1	2114.1	2958.2	(21.2)
2008-09	946.9	2735.3	3682.2	(24.5)

Source: Department of IT, Ministry of Communication and IT

Graph No. 1.4 Trend in production and growth of the Hardware and Computer Software Sector
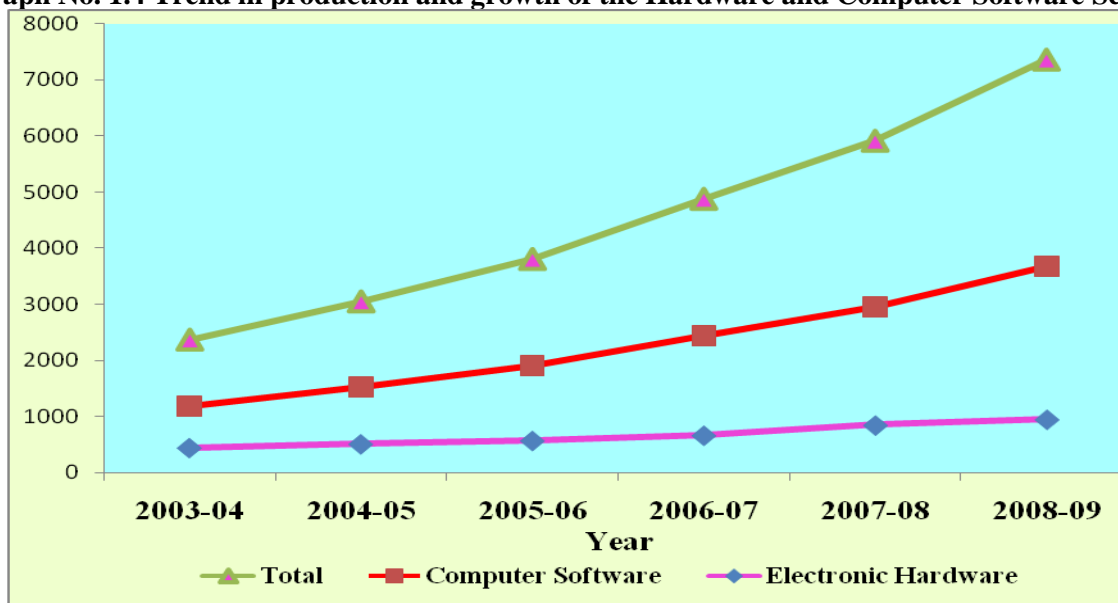
Table No. 1.9 Growth of Exports in IT-ITES/BPO sector

Sr.No.	Year	Exports (in US$ billions)	Growth (%)
1	2004- 05	17.7	37.2
2	2005- 06	23.6	33.3
3	2006-07	31.1	31.8
4	2007-08	40.4	29.9
5	2008-09	46.3	14.6
6	2009-10	32.5	-14.2
7	2010-11	41.5	9
8	2011-12	46.8	5.3
9	2012-13	58.6	11.8
10	2013-14	72.9	14.3

Source: The Ministry of Communication and Information Technology

Graph No. 1.5 Growth of Exports in IT-ITES/BPO sector
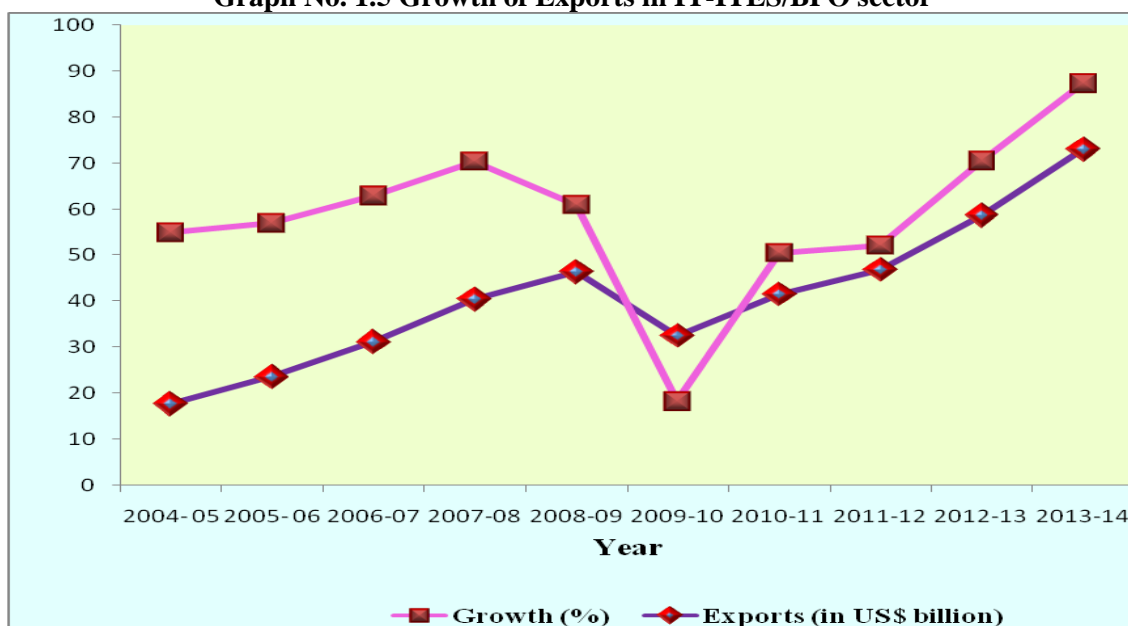
The Ministry of Commerce & Industry maintains the Imports/exports data of transportable goods as per the Indian Trade Classification ITC(HS) Classification which is an 8-digited classification, the first six digits are comparable in to with the HS Classification. The imports/exports details for the ICT Manufacturing industries are as below:

Table No. 1.10 shows Percentage of exports / imports of ICT manufacturing goods to total manufacturing exports / imports

Year	Exports	Imports
2004-05	1.05	4.01
2005-06	0.96	3.77
2006-07	0.87	3.63
2007-08	0.80	2.90
2008-09	2.84	7.85
2009-10	2.45	8.10
2010-11	3.2	8.6
2011-12	3.8	10.2
2012-13	5.3	9.8
2013-14	4.8	10.15

Source: Ministry of Commerce & Industry

1.13 Recent Developments in India

Recently Govt. of India, Ministry of Statistics and programme Implementation(MOSPI) has signed an MOU to participate in the project on "Statistical Compilation of ICT Sector and Policy Analysis" undertaken by Orbicom, the network of UNESCO Chairs in Communication. In this project an attempt has been made to compile data on the contribution of ICT sector to the Gross Domestic Product (GDP) and employment to the Indian economy following internationally accepted and harmonized definitions and concepts emerging from the OECD and United Nations. The value added has been compiled from the existing data holdings of the MOSPI.

Since the ICT sector spreads over both organized and unorganized segments of manufacturing and services sectors, the value added has been compiled from the Annual Survey of Industries for organized manufacturing sector. For the unorganized manufacturing sector it was found that the contribution was negligible. For the services sector as a whole the value added has been estimated at two digit level of NIC from the National Accounts Statistics of India, the official publication released by Central Statistics Office of the Ministry of Statistics and Programme Implementation. The definition of ICT sector / sub-sectors as defined under ISIC Version 4.0 and the corresponding derived National Industrial Classification 2008 (NIC-2008) has been used for compilation of the data. The high lights of the report are:

- Estimated GDP (at 2-digit level of NIC) for total ICT has increased from Rs. 656 billion in 2000-01 to Rs. 2530 billion in 2007-08 with Compound Annual Growth Rate (CAGR)of 21.3%.

- Estimated share (at 2-digit level of NIC) of ICT services to total ICT GDP is about 90%and that of ICT manufacturing sector to total ICT GDP is about 10%.

- Estimated share (at 2-digit level of NIC) of ICT services GDP to Service sector GDP has increased from 6% in 2000-01 to 10% in 2007-08.

- Estimated share of ICT services to total GDP has increased from 3% in 2000-01 to 6% in2007-08

1.13.1 Index of Telecommunication sector as a part of Services Sector Index

In view of the growing importance of the service sector in the Indian economy, in terms of its contribution to Gross Domestic Product (GDP) about 55% of total GDP as well as absence of short term indicators to measure the dynamics of this vital sector it was decided by the Govt. of India to compile service sector indices for the major source activities.

Telecom sector is one of the services sectors which need to be measured on urgent basis. The work is in progress in the development of methodology and identification of the variables. The variables under

consideration are fixed telephone services, mobile telephone services and provision of internet access. In India, the data pertaining to access indicators are maintained at different sources indifferent formats for the purpose of internal policy decisions and investment purposes. A standalone survey of enterprises or households will be of great help for business indicators and household indicators. Given the vastness of the country both in size and population, the collection of information on Gross value added, workforce imports and exports, for this sector according to ISIC definition, is very difficult and take s time to establish the mechanism fully for international comparability of data.

Table No. 1.11 shows Benefits of ICT in education to the main stakeholders

Stake holder	Benefits
Student	❖ Increased access, ❖ Flexibility of content and delivery, ❖ Combination of work and education, ❖ Learner-centred approach, ❖ Higher quality of education and new ways of interaction.
Employers	• High quality, cost effective professional development in the workplace, • Upgrading of employee skills, increased productivity, • Development of a new learning culture, • Sharing of costs and of training time with the employees, • Increased portability of training.
Governments	▪ Increase the capacity and cost effectiveness of education and training systems, ▪ To reach target groups with limited access to conventional education and training, ▪ To support and enhance the quality and relevance of existing educational structures, ▪ To ensure the connection of educational institutions and curricula to the emerging networks and information resources, ▪ To promote innovation and opportunities for lifelong learning.

Source: (UNESCO, 2002)

1.14   Importance of the subject

Since five decades Higher education systems have grown exponentially to meet the demands of quality education for all. Computing power continues to increase in speed while costs are being driven down, in this way allowing computer users to run more complex programs and graphic-rich applications.

Connectivity that only a few years ago regularly used dial-up-connections over hard-wired telephone lines have now been rapidly moving over to coaxial cable connections in industrialized countries and to 2G, 3G and 4G connections via cellular networks in both industrialized and developing countries. The expansion of multi-media centers, ICT kiosks and cyber cafés into rural areas created new possibilities for extension services and the application of university research. Higher education has also been instrumental in the development of community informatics. Emerging technologies like Second Life, Facebook, YouTube, Flicker, Blogger, Twitter and LinkedIn, etc. which at first seemed to be entertainment devices or toys, are proving useful in the relationships between the academic world and its community stakeholders. These developments have created the new role of knowledge 'infomediaries', who take advantage of ICTs to facilitate linkages between universities and communities.

In Pune University, there are total 260Management colleges among them 199 colleges in Pune zone, 27 colleges in Ahmednagar zone and 34 colleges in Nasik zone

Conclusion

The researcher after having discussed in detail the concepts of ICT and its definitions, meaning ,its applications and as well its evolution in this chapter, she will now review literature in her second chapter.

======+++======

CHAPTER – II

REVIEW OF LITERATUE

2.1 Introduction

Today's world is a world of information explosion. This information explosion is taking place in such a fast speed that even a literate person is feeling as if he or she is illiterate being not able to cope up with such an information explosion. Here the question arises how is one to cope up with it? The answer is information technology (IT) that can help in coping with the information explosion. So, we can say that ―Information Technology is nothing but coping up with explosion of Information.

Information communication technology [ICT] has become, within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy. UNESCO(2000) aims to ensure that all countries, both developed and developing, have access to the best educational facilities necessary to prepare young people to play full roles in modern society and to contribute to a knowledge nation. In fact, Information and communication technologies (ICTs) are a major factor in shaping the new global economy and producing rapid changes in society. ICT permeates the business environment, it underpins the success of modern corporations, and it provides governments with an efficient infrastructure. At the same time, ICT adds value to the processes of learning, and in the organization and management of learning institutions.

The researcher in this chapter will be reviewing all the research papers and the concepts related to ICT technology. The researcher will also discuss how the papers have been useful to her for compiling her research work.

2.2 Concept
According to Dr. Medha Gupte , concept of ICT is

ICTs stand for Information and Communication technologies and are defined as a diverse set of tools and resources which are used for the purpose of communication as well as for the purpose of creation, dissemination, storage and management of information. It is inclusive of computers, the internet, broadcasting technologies (radio and Television) and telephony. ICT can be referred to as collection of technological gear and resources which are largely used for the purpose of communication. One can divide ICT as: a) Telecommunications systems and network: This consists of cellular, broadcast, cable, satellite, postal. b) The networks that utilize them: This involves the hardware and software of information collection, storage, processing and presentation. Educational technology has become an important part of today's technology. It includes various types of media that deliver text, audio, video, images, animation, streaming videos and is inclusive of technical applications and processes such as audio or video tape, satellite TV, CD-ROM and computer based learning. In short, it can be said to be referring to physical hardware as well as educational theoretics. E technology is used, for the tools that technologically or electronically support teaching and learning.

Information technology (IT) is the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a micro-electronics - based combination of computing and tele-communication. The term in its modern sense first appeared in a 1958 article published in the Harvard Business Review, in which authors Leavitt and whistler commented that ―the new technology does not yet have a single established name. We shall call it information technology.It spans a wide variety of areas that include but are not limited to things such as processes, computer software, computer hardware, Programming Languages and data constructs. In short, anything that renders data, information or perceived knowledge in any visual format whatsoever, via any multimedia distribution mechanism, is considered part of the domains space known as Information Technology.

It depends on the local culture and the particular ICT available and how it is configured and managed. The understanding, management and configuration of the available technology might vary the concept of ICT from a collection of tools and devices used for particular tasks, eg. publishing, course delivery, transaction processing... an organized set of equipment (like a 'workshop') for working on information and communication components of integrated arrangements of devices, tools, services and practices that enable information to be collected, processed, stored and shared with others components in a comprehensive system of people, information and devices that enables learning, problem solving and higher order collaborative thinking, that is, ICT as key elements underpinning a (sharable) workspace.

There are some of the key concepts of Information and Communication Technology (ICT), such as those relating to networks and security:

– Understand what hardware is, know about factors that affect computer performance and know about the peripheral devices.---- ---- --------------

– Understand what software is and give examples of common applications software and operating system software.---- ---- ---- ---- ----------

– Understand what Information and Communication Technology (ICT) is and give examples of its practical applications in everyday life.---- ---- -----– Understand health and safety and environmental issues in relation to using computers.--

– Recognize the important security issues associated with using computers.

– Recognize the important legal issues in relation to copyright and data protection associated with using computers

2.3 Research Papers

2.3.1 ICT IN HIGHER EDUCATION: REVIEW OF LITERATURE FROM THE PERIOD 2004-2011,

By: UlkaToro (gulavani) and MillindJoshi

ABSTRACT

Information and Communication Technology (ICT) is a vehicle to enhance the quality of the education. As the world is moving rapidly into digital media and information, the role of ICT in education is becoming more important in the 21^{st}century. ICT helps to share availability of best practices and best course material in education. ICT based education causes changes in the educational objectives in the conception of the teaching and learning process. ICT allows the academic institutions to reach disadvantaged groups and new international educational markets. Within the past decade, the new ICT tools have fundamentally produced significant transformations in industry, agriculture, medicine, business, engineering and other fields. The new teaching methodologies involve the use of audiovisual, computer and telematic tools on the part of lecturers.

REVIEW

The above paper concentrates on the quality teaching and learning, how education has become students friendly through ICT, and its importance in the 21st century. Students are motivated towards self-studying through ICT. This paper also highlights the implementation of ICT policy in higher education and further tells the impact of ICT in teaching learning process in higher education in different countries and about benefits and challenges of ICT in higher education. The ICT Policy in higher education prepares youth to take creative participation in the establishment, and growth of a knowledge society leading to all round socio- economic development of the nation and global competitiveness. Introducing ICT at this level makes students efficient in using technologies in different fields.

The writers have reviewed various literatures from 2004 to 2011 in which notable reviews are :

(i) Article **Integration of ICT in Higher education Institutions: Challenges and best practice recommendations based on the experience of Makerere University and other organizations, by F.F.Tusbira, N Mulira [2004], of Africa** states that infrastructure of ICT in African Higher Education is poorly developed and unevenly distributed, that is because of their mindset, lack of awareness and lack of commitment for the progress by the top-level people in ICT integration. It needs systematic method of implementation, cost and efficient utilization of ICT. It is necessary to define well planned ICT policy for successful mobilization of funds to resolve such challenges. Despite such difficulties, a number of Higher Education Institutions in Africa have made significant progress in building an ICT infrastructure and developing computer science and other ICT disciplines.

(ii) **Jef Peeraer, Peter Van Petegem** [2005], in their paper **Factors Influencing Integration of ICT in Higher Education in Vietnam, of Vietnam** throws light on factors influencing Integration of ICT in

teaching practice in Teacher Education Institution in higher Education in Vietnam. The important factors for successful implementation of ICT in teaching-learning are ICT skills, confidence to use computer, infrastructure and availability in hardware and software. Jef Peeraer further mentioned barriers for the usage of ICT like lack of technical support, insufficient knowledge, gender and age of teacher and lack of motivation. Authors state that enthusiastic nature of teacher towards the usage of ICT, ICT policies, budget, educational management and skill training is necessary.

(iii) According to Markus Mostert usage of ICT in Teaching and Learning on Professional Development of academic Staff in South Africa, there is a need in professional development for lecturers to use ICT in teaching and learning. Since technology has revolutionized teaching and learning method and academic staff members face the challenge of introducing effective ways of engaging technology.

(iv) Another paper **Obstacles Towards the use of ICT Tools in Teaching and Learning of Information Systems in Malaysian Universities by Mee Chin Wee, Zaitum Abu Bakar [2006] of Malaysia**, states that the most significant obstacles in implementing ICT are the fast changes in ICT tools, extra time and effort needed to integrate ICT tools in teaching, poor network connectivity, improper evaluation in integration of ICT tools in teaching and etc. He further stated that to remove these obstacles it is necessary for successful implementation of ICT and its tools in the institutes for effective ICT applications in higher education. Carla Teixeira Lopes prepared a model to evaluate the e-learning in Porto's Allied Health Sciences Higher Education Institution which highlighted the importance of usage of ICT for medical students and faculties for teaching-learning purpose.

(v) A Review of ICT Status and Development Strategy Plan in Iran by AlirezaAbbasi, Abolghasem Sadeghi Niaraki, Behzad Mirzaeiandhko of Iran Review report states that Iran needs to base its national ICT technology strategy on a much greater consideration of local, cultural and social issues. The national IT strategy will need to address the issues of resistance to change due to cultural, personal and infrastructural factors. The government has a major role to play if the country wants to stand in the information arena like regulator, promoter and diffuser for successful implementation of ICT in higher education.

The writers have clearly defined the importance of ICT for educational purposes, especially for professional and management post-graduation level. This review paper is an important for this research to emphasize on effectiveness of ICT in management institutes.

Paper – 2

APPLICATION OF ICTS IN TEACHING AND LEARNING AT UNIVERSITYLEVEL: THE CASE OF SHAHID BEHESHTI UNIVERSITY

By: Kourosh Fathi VAJARGAH

Associate Professor of Curriculum Studies. Shahid Beheshti University. Tehran. Iran Sheida JAHANI, PhD Student of Educational Technologies.UniversitiSains Malaysia. Penang. Malaysia, Nahid AZADMANESH

ICT Specialist in Education.ShahidBeheshti University. Tehran. Iran

ABSTRACT

Information and communication technologies (ICTs) are a diverse set of technological tools and resources used for creating, storing, managing and communicating information. For educational purposes, ICTs can be used to support teaching and learning as well as research activities including collaborative learning and inquiring. One of the main applications of the ICTs in higher education is teaching and learning based on these new technologies. This research is concentrated on the obstacles, facilitators, and the risks of using these technologies in teaching and learning in higher education. The main purpose of this research is to answer the question: in which fields and to what extent there are obstacles, facilitators and the risks in using ICT in teaching and learning at university level? This research was conducted at the National University of Iran, the second largest university in the country. The research population consists of the university academics and students. A questionnaire has been administrated for collecting the data. The main results are reported based on the following:

1. The possible domains of using ICT in curriculum decision-making in higher education

2. Obstacles of using ICT in curriculum development at university level

3. Facilitating factors and essential supports needed for application of ICT in curriculum development of higher education

4. Advantages and disadvantages of using ICT for curricular activities at university level.

REVIEW

In his case study, the researcher has discussed about several challenges which Iran is facing to implement ICT application in Higher Education, and his suggestions to implement ICT successfully in Higher Education.

According to the researcher the challenges Iran is facing to implement ICT successfully are;

(1) **Lack of National Policy for using ICT in Higher Education**. The researcher says that higher education system of Iran is centralized and, all general decisions are made at central level, many governmental entities are responsible for developing policies and strategies in ICT application, the scope and the rate of using ICT in higher education institutions are determined by different bodies, which play major roles in this regard. This is one big hurdle for the root level people to take decision and implement.

(2) **Lack of adequate investments in implementing ICT**. The researcher has observed that the universities in Iran have to follow the policies of the government. So, universities have the limited authority in providing the financial and physical supports for ICT application. Universities have to wait for the permission of higher authority in implementing ICT at Higher Education.

(3) **Cultural obstacles**, the researcher says as we all know Iran is cultural and orthodox country, where global changes are not accepted easily. Even though ICT tools and resources are used for creating, storing, managing and communicating the information. Iron people think that ICT is developed in western country, Adopting changes from Western countries is not at all acceptable. This orthodox nature of Iran's policy makers is not letting ICT to progress in the country.

(4) Financial challenges, the researcher says when government's policy makers and top officials are the treasurers for the financial movements which limits the universities liberty to install and train the faculties of the colleges regarding any technologies like ICT.

1) **Lack of continuity in ICT use, and lack of systematic training and development programs,** the researcher has observed that low rate of participation of faculty members in ICT workshops and training and development events, this is due to lack of support from university people and lack of financial support.

Application of ICTs in teaching and learning at university level is not so easy in Iran, because of cultured and orthodox nature of government policy makers and people. Until policy makers and people broaden their views, ICT cannot be implemented and developed successfully.

Paper – 3

ICT IN HIGHER EDUCATION: OPPORTUNITIES AND CHALLENGES

By :AjitMondal, University of Kalyani, Kalyani, West Bengal

&

Dr. Jayanta Mete, University of Kalyani, Kalyani, West Bengal

ABSTRACT

Since time immemorial, education has been an important instrument for social and economic transformation. Presently higher education in India is experiencing a major transformation in terms of access, equity and quality. This transition is highly influenced by the swift developments in information and communication technologies (ICTs) all over the world. The introduction of ICTs in the higher education has profound implications for the whole education process especially in dealing with key issues of access, equity, management, efficiency, pedagogy and quality. At the same time the optimal utilization of opportunities arising due to diffusion of ICTs in higher education system presents a profound challenge for higher educational institutions. In this backdrop, the paper addresses the opportunities and challenges posed by integration of ICTs in various aspects of higher education in the present scenario.

REVIEW

The researchers have discussed about importance of ICT in Higher Education and about opportunities and challenges. They have discussed on many issues in short related to ICT. Regarding **"Trends in growth of higher education in India", researchers have discussed establishment of Colleges and Universities and other Institutions in India, increased enrolment of students, faculties and research people and especially, women folk increased in higher education, etc.** ICT is considered as a subfield of Educational Technology.   ICTs in higher education are being used to develop course material; to deliver content and to share content. It is communication between learners, teachers and the outside world; creation and delivery of presentation and lectures; academic research; administrative support, student enrolment etc. ICT education increases the productive skills, and gives sense of wellbeing, capacity to absorb new ideas, increases their social interaction, gives access to improved health and provides several more intangible benefits.

The researchers have further discussed different variety of learnings, like, E-learning, Blended Learning, Distance Learning, **Face to face Learning, Self-paced Learning, and Online Collaborative Learning**.

According to researchers, Rationale for introducing ICT are as follows;
1. To develop the understanding ability of ICT technology and familiarizing students and the society with technology.

2. Preparing students for jobs that require skills in technology.

3. Utility of technology to improve performance and effectiveness in teaching, management and many other social activities.

4. To utilize technology in enhancing learning, flexibility and efficiency in curriculum delivery.

Students, Employers, Governments, etc., all have benefited by **ICT education.**

India is putting great efforts to reach the people of remotest of the villages. That's why India is making use of powerful combination of ICTs such as open source software, satellite technology, local language interfaces, easy to use human-computer interfaces, digital libraries etc. with a long-term plan. Community service centers have been started to promote e-learning throughout the country. Some notable initiatives of use of ICT in education in India include radio, television and internet technologies, Eklavya initiative program to promote distance learning through television and internet and 'Brihaspati'(Virtual Class Room).The UGC has initiated different schemes called "ICT for teaching and learning process" to achieve quality and excellence in higher education. Other schemes are 'UGC INFONET', ERNET, INFLIBNET to improve effectiveness of learning and teaching process in colleges and universities. Network facilities with the help of ERNET, Ministry of Information and Technology, Government of India were installed at UGC office to promote a healthy work culture.

With all these plus points there are some drawbacks. Obviously ICT in education has some benefits but brings challenges also. These challenges are the high cost of acquiring, installing, operating, maintaining and replacing ICTs. The effective implementation of ICT into teaching is still a dream. Always make mistakes while implementing properly. They are as follows;

i) Installing learning technology without reviewing student needs and content availability;

ii) Imposing technological systems from the top down without involving faculty and students;

iii) Using inappropriate content from other regions of the world without customizing it appropriately;

iv) Producing low quality content that has poor instructional design and is not adapted to the technology in use (UNESCO, 2009).

The researchers have discussed regarding risks also. They are:

- It may create a digital divide within class as students who are more familiar with ICT will reap more benefits and learn faster than those who are not as technology savvy.

- It may shift the attention from the primary goal of the learning process to developing ICT skills, which is the secondary goal.

- It can affect the bonding process between the teacher and the student as ICT becomes a communication tool rather than face to face conversation and thus the transactional distance is increased.

- Also since not all teachers are experts with ICT they may be lax in updating the course content online which can slow down the learning among students.

- The potential of plagiarism is high as student can copy information rather than learning and developing their own skills.

- There is a need for training all stakeholders in ICT.

- The cost of hardware and software can be very high.

The researchers emphasize on increasing use of ICT that brings changes not only in education but in every field. The use of ICT in education improves classroom teaching - learning process, and provides the facility of e-learning. ICT enhances distance learning. The teaching community is able to reach remote areas. Learners are able to access qualitative learning environment from anywhere and at any time. Successful implementation of ICT will lead to a great change that influences and empowers teachers and supports them in engaging students to learn rather than acquiring computer skills and obtaining software and equipment. The teachers or trainers should be made to adopt this technology in their teaching styles to provide pedagogical and educational gains to the learners.

ICTs have emerged as powerful tools for diffusion of knowledge and information. The opportunities can be categorized as the aspects relating to role of ICT for access and equity in education, their role in pedagogy for quality learning and teaching at higher education level and in inducing innovations in approaches and programmes. Improved quality of teaching-learning is another most important aspect of higher education sector that is influenced by ICT integration.

By the researchers views it is observed that implementing ICT in management education will change the present scenario of the whole world. Our young generation in remote villages will get to better access and use of ICT to lead the world to new era.

Paper - 4

INFORMATION AND COMMUNICATION TECHNOLOGY IN HIGHER EDUCATION IN INDIA: CHALLENGES AND OPPORTUNITIES

By: Uttam Kr Pegu

Department of Mass Communication & Journalism, Tezpur University, Tezpur, Sonitpur, Assam

ABSTRACT

The focus of this paper is to examine the role of Information and Communication Technology (ICT) in higher education in India. The emergence of ICT has fundamentally changed the practices of not only business and governance but education as well. While the world is moving rapidly towards digital media, the role of ICT in education has become increasingly important. There has been an unprecedented growth in the use of ICTs in teaching, research and extension activities. The sudden boom in Information Technology has transformed the way how knowledge is disseminated today. One of the changes it has brought about is the way how teachers interact and communicate with the students and vice-versa. Given the fact that higher education in India is plagued by the challenges of inadequate technology access and inequity coupled with economic considerations and technological know-how, it remains to be seen how Information and Communication Technology can actually burgeon the students and how it can foster change in this aspect. Moreover, this paper explores the emancipatory and transformative potentials of ICT in higher education in India. Finally, this paper assesses how Information Technology has facilitated the growth in interactive learning and what has been its impact in the higher educational scenario in the country.

REVIEW

The researcher has discussed the role of Information and Communication Technology (ICT) in higher education in India. He has focused on how ICT has changed the practices of not only business, governance or education but almost every spheres of human endeavor. The demand for education in developing countries like India is still regarded as an important bridge for social, economic and political mobility. Even though India has innumerable challenges in terms of developing proper infrastructure, socio-economic, linguistic and physical barriers of people, there is a hope that ICT can transform the educational scenario in the country, as India has a high proportion of young people among 1.2billion population (Census, 2011).

According to the researcher the challenges are ;
1. Inadequate access to technology and inequity.

2. Lack of quality higher education in the country.

3. Some higher education institutions are extremely poor; according to a survey of accredited colleges by UGC in 2008 which reveals shortcomings in IT infrastructure.

4. The majority of Indians live in rural areas where there is very less access to internet, it is necessary that they are exposed and trained in basic computing skills and ICT utilization.

5. According the International Telecommunication Union ; The Internet and Mobile Association of India (IAMAI) report a majority of government institutions do not have sufficient IT systems

6. India's linguistic diversity, India has many languages which do not have script and standardized fonts. It is very difficult to compute local language. It is difficult but not impossible.

Regarding opportunities the researcher says that,
1. Even though ICT has brought tremendous changes in higher education still we are far away in achieving the desired level of IT adoption in higher education in the country.

2. ICT has become indispensable support system for higher education as it provides training to students to face challenges.

3. It can provide access to education regardless of time and geographical barriers.

4. Wider availability of course material in ICT education can promote better teaching and learning

5.   Technology can influence teaching and learning process

The researcher has concluded his paper with the hope that the changed role of teacher-student will benefit students in following ways, increased access, flexibility of content delivery, combination of work and education, learner centered approach and higher quality of education and new ways of interaction. The best and most favorable use of opportunities arising due to non -implementation of ICT and not concentrating on ICT in higher education system will present enormous challenges. He also hopes that ICT education will lead to the democratization of education.

Successful implementation of ICT in India is need of hour. India is rich by means of high proportion number of young people, number of Universities (651 as per survey on 2013). There are some difficulties to implement, linguistic barriers is one such difficulty. But it is not an impossible thing to do. Indians will overcome all these impossible to attain successful implementation and utilization of ICT.

Introducing ICT in higher education is not enough, it is necessary implementing in management education also. Our young people are in need of a technology that will make them winners by overcoming obstacles and solving problems successfully to achieve goals.

Paper –5

DOES INFORMATION AND COMMUNICATION TECHNOLOGY HAVE AN IMPORTANT ROLE TO PLAY IN INDIAN HIGHER EDUCATION

By: Dr. MedhaGupte I/C Principal and Associate Professor, Bhavan's Hazarimal College of Arts and Science and Jaya Ramdas Patel College of Commerce and Management Studies, Mumbai, India

ABSTRACT

The rapid development of Information and Communication Technology (ICT) has changed many aspects of human life. ICTs stand for Information and Communication technologies and are defined as a diverse set of tools and resources which are used for the purpose of communication as well as for the purpose of creation, dissemination, storage and management of information. ICT is playing an important role in today's world and education is no exception Use of ICT for promotion of education and development has always formed an integral part of the Indian policy and plan documents on education. The Indian Government has taken a number of measures at both the primary and higher education levels. The draft education policy of 1986, which was further, modified in1992 laid emphasis on the role of ICT in promoting economic development. Several schemes have accordingly been adopted. ICT can play an important part from the view point of three agencies: teachers, students and government. If implemented correctly ICT can help in the acquisition of 21st century skills. ICT in India has a number of challenges, in the form of infrastructural challenges, teacher related challenges, capacity building challenges, technology support challenges and language content challenges. India has a number of problems such as poverty, illiteracy, language and health issues. ICT is definitely an engine of growth. It has to be propelled properly and the impending problems solved. Otherwise the ICT Revolution will be more a dream rather than a reality.

REVIEW

The researcher has discussed the important role ICT in Indian Higher Education. She has tried to assess the role of ICT in the economic progress of a nation and present situation in India. What challenges and restrictions Indian economy is facing and what are the solutions to overcome these challenges. India is rich with a population of over 1 billion and has one of the largest young populations in the world. The demand for higher education has increased a lot more. There are number of challenges in terms of infrastructure, socio-economic and physical barriers.

If ICT reaches to common people, it will change the whole scenario of India. To promote ICT successfully in education and development has become an integral part of Indian policy and made many policies to implement ICT successfully in private educational institutions also. Indians are well known for their skills in ICT in software, satellite technology, local language interface, digital libraries etc. fields. ICT policies are made to improve quality and achieve goals of higher education. The goals are as follows; to create an environment for the development of ICT, to create an ICT literate community who can utilize the benefits from ICT, to create an environment of co-operation, collaboration and sharing for creating a demand for optimal utilization of ICT in schools and higher education, to promote accessibility, development, to promote the development of professional networks, to promote research, evaluation and experimentation in ICT tools and practices, etc.

The government launched many educational programmes in Doordarshan. The broadcast programs contributed by Indira Gandhi Open University (IGNOU) and IITs, like Gynan Darshan, GynanVani were launched to broadcast educational programs for school kids, university students and adults.

The researcher finds the role of ICT in this way, ICT allows part-time and distance learning schemes for students which can help to overcome obstacles such as cost, faculty crunch, poor quality of education, time and distance barriers etc., ICT can provide greater reliability validity and efficiency in the collection of data, the modern world is leaning more and more towards digital media, the role of ICT in education is gaining more importance than ever. ICT makes a big difference in the way of teaching-learning process but also help to absorb the skills like digital literacy, innovative thinking, creativity, sound reasoning and effective communication.ICT improves the quality of education through blended learning; ICT can help in the management and governance of educational institutions. It brings about a change between the students, as also between the students and the teachers. ICT benefits all.

According to the researcher, Challenges to the ICT Sector are as follows;

Infrastructure related Challenges: Teacher-related Challenges: Capacity building Challenges: Technology support related Challenges: Language and content related challenges.

The researcher thinks about Future of ICT in India as follows
Challenges of ICT are multi-faceted, a multi - pronged approach is required. The researcher emphasizes to bring reforms in teaching, curriculum, and assessment. It is necessary, to identify the situations where educational technology is appropriate, otherwise to find solutions and resolve these problems will be difficult. A healthy ICT environment it is essential that we develop collaborative networks together with a common centralized repository for e-journal, digitized PhD thesis, research papers, e-books etc. The Indian education system is showing enhanced interest in imparting ICT based teaching.

The researcher has concluded by saying ICT is a weapon for progress. It is essential that we combine our knowledge system with the ICT strategies. The future of e-education in India is bright. The process has begun. But there are plenty of challenges. There are many problems in India like poverty, illiteracy, language barriers and health issues. So, first of all is to overcome the problems in order to provide effective e-learning throughout the country. Otherwise, the ICT Revolution will only remain a dream, if efforts are not made to tackle the major constraints.

It is necessary to implement ICT in management education. So that, it will help to reduce problems to some extent India is facing today.

Paper – 6

ICT USAGE IN HIGHER EDUCATION:

A CASE STUDY ON PRESERVICE TEACHERS AND INSTRUCTORS

Assistant Prof. Dr. YaseminGulbahar, Başkent University – Faculty of Education, Ankara/Turkiye,

ABSTRACT

This study explored the level of usage of pre-service teachers' and instructors' utilization of information and communication technologies (ICT). Thus, the main purpose of this study was to examine factors that contribute to pre-service teachers' utilization of technology and suggest recommendations regarding to the effective utilization of technology. This case study used data from a school of education in a private university. Results of this study indicated that teacher education programs fail to provide appropriate instructional technologies and computer facilities for both in and out of class activities. Furthermore, three factors that appear to have a significant influence on the effective use of technology were found to be: (1) the quantity and quality of the lessons addressing technology in the curriculum, (2) incompetent teachers/lack of in-service training, and (3) insufficient technological infrastructure.

REVIEW

The researcher has discussed ICT usage in Higher Education and its failure in Turkey. The purpose of the study was to understand how effectively ICT technology can be utilized by the pre-service teachers at the level of Higher Education. He found that programs failed to give significant influence on the effective use of ICT technology due to lack of suitable instructional technologies and computer facilities. The teachers were not enough competent to adapt this new technology. During service training, insufficient technological infrastructure, lack of quantity and quality of the lessons introducing ICT technology in the curriculum for both in and out of class activities made the ICT technology ineffective.

This paper is useful in understanding the importance of training and education to the faculties of higher education, so that, the faculties can develop an effective teaching method through ICT.

Paper – 7

AN EFFECTIVE USE OF ICT FOR EDUCATION AND LEARNING BY DRAWING ON WORLDWIDE KNOWLEDGE, RESEARCH, AND EXPERIENCE: ICT AS A CHANGE AGENT FOR EDUCATION(A LITERATURE REVIEW)

By: Syed Noor-Ul-Amin Ph.D Research Scholar

Department Of Education, University Of Kashmir

ABSTRACT

Information and communication technologies (ICT) have become commonplace entities in all aspects of life. Across the past twenty years the use of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavor within business and governance. Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers having high degrees of personal contact with learners. The use of ICT in education lends itself to more student-centred learning settings. But with the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21st century. In this paper, a literature review regarding the use of ICTs in education was provided. Effective use of ICT for Education, along with ICT use in the teaching learning process; quality and accessibility of education; learning motivation, Learning environment. Besides, an overview of the ICT and scholastic performance has been discussed in this paper.

REVIEW

The researcher has discussed in his review, future growth and prosperity of ICT in this rapid moving world. ICT is becoming user friendly and most needed facility. Since twenty years ICT has changed the practices and procedures of almost all fields whether it is business, governance, or any other day today life's requirement. It has become one of the global requirements. Since past, education is thought as socially oriented activity and quality education is traditionally associated with strong teachers having high degrees of personal contact with learners. But now a day's education has become student centered by the use of ICT in education. The researcher has predicted that in this world of digital media and information, the role of ICT in education is becoming more important and it will continue to grow and develop through the centuries. The researcher also said that effective implementation of ICT education in schools need quality teaching, accessibility of education, learning environment, motivation to learn and so on.

Paper – 8

ADVANTAGES AND DISADVANTAGES OF USING ICT IN EDUCATION

By: Jozef BUSHATI, *PhD* **(1) EzmoldaBarolli,** *PhD* **(2) Prof. Ass. Dr. GezimDibra (3) ArbenHaveri, MBA (4)**

1. 3. 4. University of Shkodra "LuigjGurakuqi"

2. University of Tirana

ABSTRACT

The presence of technology in every aspect of our life in the XXI century faces up the people all around the world with new choices, opportunities and challenges that has parallel emerged and developed, have created a new global economy powered by ICT and driven by knowledge. While ICT has had a great impact on this "revolution" of the global economy, traditional teaching and learning paradigms have been shaken by the impact of ICT integration in education.

The paper is focused on addressing the advantages and disadvantages of use of ICT in education, mainly in institutions of higher education. This treatment is based on a theoretical and practical background, on the basis of reasoning interest groups and the benefits of each in this point of view. Argumentation of advantages and disadvantages is made through a variety of effective forms and opinions from the studies to observations; these in general view, but also according to the responses of the management staff, the lecturers and students. Comparative data of all Albanian public universities show their specifics, not visible advantages between them, but common ICT-related in these institutions of higher education.

REVIEW

The researchers have focused on the advantages and disadvantages of use of ICT in education institutions of higher education. In 21st century, due to technology life of every person has changed throughout the world. People have new choices, opportunities and challenges to achieve and develop. These feelings of people have created a new world of economy which is powered by ICT and which is driven by the knowledge. ICT has brought great revolution in global economy. Due to ICT, examples of traditional teaching and learning have also been affected. Actually the impacts of ICT have shaken the traditional education system.

On the theoretical and practical basis, from the responses of the management staff, the lecturers and students, the researchers found that there are no visible advantages between them. The researcher's observations say that every sample considers for responses in higher educational institutes give specific requirements based on the work environment of their institute. So, specific advantages cannot be clearly identified from this research work. The disadvantage may be the slowly vanishing traditional system of education where teacher and students relationships were binded.

Paper –9

INFORMATION AND COMMUNICATIONS TECHNOLOGIES (ICT) IN HIGHER EDUCATION TEACHING - A TALE OF GRADUALISM RATHER THAN REVOLUTION

By: Gill Kirkup and Adrian Kirkwood, The Open University

ABSTRACT

The widespread adoption of information and communications technologies (ICT) in Higher Education (HE) since the mid-1990s has failed to produce the radical changes in learning and teaching than many anticipated. Activity theory and Rogers' model of the adoption of innovations provide analytic frameworks that help develop our understanding of the actual impact of ICT upon teaching practices. This paper draws on a series of large-scale surveys carried out over a 10 year period with distance education tutors at the UK Open University to explore the changing role of ICT in the work of teachers. It investigates how the teachers in one large distance learning university have, over time, appropriated ICT applications as teaching tools, and the gradual rather than revolutionary changes that have resulted.

REVIEW

The research paper says that implementation of ICT technology in higher education, failed to bring new and revolutionary changes in learning and teaching as many expected. This is said by the researchers after the survey of 10 long years period with distance education tutors at UK Open University to learn about the changing role of ICT in the work of teachers. During this survey, they followed the Activity theory and Rogers' model of the adoption of innovations that help to develop understanding of the actual impact of ICT upon teaching practices. The researchers found that implementation of ICT application in Higher Education as teaching tools is more truly a gradual process and not a revolutionary change as many expected.

Paper – 10

TOWARDS IMPROVING THE QUALITY OF EDUCATION BY INTEGRATINGICT INTEACHEREDUCATION

By: RajuNarayanaSwamy I.A.S., Secretary to Government of Kerala

ABSTRACT

Information and Communication Technology (ICT) has become one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing, and numeracy. There is a widespread belief that ICTs have an important role to play in changing and modernizing educational systems and ways of learning. Inventive use of ICT is defined as the use of ICT applications that hold up the learning objectives based on the requirements of the modern information society. Hence, there is a need to bring out the facts on the impact of ICT on educational trainers. This article discusses the factors which stimulate or limit the innovative use of ICT by teacher educators in Kerala. Survey analysis was used to study the prospective influencing factors. The study indicated a limited involvement of the teacher training institutions towards the use of ICT within the curriculum.

REVIEW

The researchers discuss about improving the quality of ICT as one of the basic building blocks of modern society. Now, many countries have taken into account in understanding and mastering the basics of ICT and concepts of ICT as part of the core education, along with reading, writing, and numeracy. Many people believe that changing and modernizing of education requires prominent role of ICT. ICTs applications are used in objective based learning depending on the modern information society. For this reason, it is necessary to know how educational trainers are affected by the ICT applications.

The researchers have further discussed about the stimulations and limitations for the innovative use of ICT by teachers in Kerala. The survey and analysis showed that there is very much limited involvement of the teacher training institutions in using ICT as part of their curriculum.

From this paper the researcher helped herself in gaining knowledge about the limitations of implementing ICT for educational purposes. The researcher can help herself with suitable recommendations for the faculties in higher education for developing effective teaching methods in management institutes.

CONCLUSION

The researcher after having reviewed various papers and concepts of ICT and its importance in education has found various barrios and limitations. She now can analyze these barrios and bring about suitable recommendations from her research work to develop an effective implementation program for ICT in management institutes of Pune University.

The researcher will now go ahead with Research Methodology process in next chapter.

========+++=======

CHAPTER – III

RESEACH METHODOLOGY

3.1 INTRODUCTION

Research Methodology is an important tool for the researcher in any field of study. It is with this tool that the researcher analyses research problem and finds suitable solutions to the research problem by first formulating the hypothesis and then proving the hypothesis with the help of the data collected through primary and secondary means. The main concept of research, research methodology and their definitions along with various researches and their uses has been discussed in this chapter. Here the methodology used for the research study and the selection of samples and criteria applied for selecting the samples for this research work has also been discussed below.

3.2 Meaning of Research

Research is an academic activity and as such the term should be used in a technical sense. According to Clifford Woody research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis. D. Slesinger and M. Stephenson[1] in the Encyclopedia of social Sciences.

They define research as " the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art". Research is, thus, an original contribution to the existing stock of knowledge making for its advancement. It is the pursuit of truth with the help of study, observation, comparison and experiment. In short, the search for knowledge through objective and systematic method of finding solution to problem is research. The systematic approach concerning generalization and the formulation of a theory is also research. As such the term 'research' refers to the systematic method consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analyzing the facts and reaching certain conclusions either in the form of solutions (s) towards the concerned problem or in certain generalizations for some theoretical formulation.

Reference: 1- D. Slesinger and M. Stephenson "Encyclopedia of Social Sciences (1987)

3.3 Objectives of Research

The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:

1. To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as exploratory or formulative research studies);

2. To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as descriptive research studies);

3. To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies);

4. To test a hypothesis of a casual relationship between variables (such studies are known as hypothesis – testing research studies)

3.4 Motivation in Research

What makes people to undertake research? This is a question of fundamental importance. The possible motives for doing research may be either one or more of the following:

1. Desire to get a research degree along with its consequential benefits;

2. Desire to face the challenge is solving the unsolved problems, i.e., concern over practical problems initiates research;

3. Desire to get intellectual joy of doing some creative work;

4. Desire to be of service to society;

5. Desire to get respectability.

However, this is not an exhaustive list of factors motivating people to undertake research studies. Many more factors such as directives of government, employment conditions, curiosity about new things, desire to understand casual relationships, social thinking and awakening and the like may as well motivate (or at times compel) people to perform research operations.

3.5 Types of Research

The basic types of research are as follows :

(i) Directive v/s Analytical

Descriptive research includes surveys and fact-finding enquiries of different kinds. The major purpose of descriptive research is description of the state of affairs as it exists at present. In social science and business research we quite often use the term Ex post facto research for research studies. The main characteristic of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening. Most ex post facto research projects are used for descriptive studies in which the researcher seeks to measure such items as, for example, frequency of shopping, preferences of people, or similar data. Ex post factor studies also include attempts by researchers to discover causes even when they cannot control the variables. The methods of research utilized in descriptive research are survey methods of all kinds, including comparative and co-relational methods. In analytical research, on the other hand, the researcher has to use facts or information already available, and analyze these to make a critical evaluation of material.

(ii) Applied v/s Fundamental

Research can be either be applied (or action) research or fundamental (to basic or pure) research, Applied research aims at finding a solution for an immediate problem facing a society or an industrial/business organization, whereas fundamental research is mainly concerned with generalizations and with the formulation of a theory.

(iii) Quantitative v/s Qualitative

Quantitative research is based on the measurement of quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity. Qualitative research, on the other hand, is concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind. For instance, when we are interested in investigating the reasons for human behavior (i.e., why people think or do certain things), we quite often talk of 'Motivation Research', an important type of qualitative research, this type of research aims at discovering the underlying motives and desires, using in depth interviews for the purpose. Other techniques of such research are word association tests, sentence completion tests, story completion tests and similar other projective techniques. Attitude or opinion research i.e., research designed to find out how people feel or what they think about a particular subject or institution is also qualitative research. Qualitative research is especially important in the behavioral sciences where the aim is to discover the underlying motives of human behavior.

(iv) Conceptual v/s Empirical

Conceptual research is that related to some abstract idea(s) or theory. It is generally used by philosophers and thinkers to develop new concepts or to reinterpret existing ones. On the other hand, empirical research relies on experience or observation alone, often without due regard for system and theory. It is data – based research, coming up with conclusions which are capable of being verified by observation or experiment. We can also call it as experimental type of research. In such a research it is necessary to get at facts firsthand, at their source, and actively to go about doing certain things to stimulate the production of desired information. In such a research, the researcher must first provide himself with a working hypothesis or guess as to the probable results. He then works to get enough facts (data) to prove or disapprove his hypothesis. He then sets up experimental designs which he thinks will manipulate the persons or the materials concerned so as to bring forth the desired information. Such research is thus characterized by the experimenter's control over the variables under study and his deliberate manipulation of one of them to study its effects. Empirical research is appropriate when proof is sought that certain variables in some way. Evidence gathered through experiments or empirical studies is today considered to be the most powerful support possible for a given hypothesis.

(v) Some Other Types of Research

All the types of research are variations of one or more of the above stated approaches, based on either the purpose of research, or the time required to accomplish research, on the environment in which research is done, or on the basis of some other similar factor. From the point of view of time, we can think of research either as one-time research or longitudinal research. In the former case the research is carried on over several time-periods.

3.6 Research Approaches

The above description of the types of research brings to light the fact that there are two basic approaches to research, viz., quantitative approach and the qualitative approach. The former involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion. This approach can be further sub-classified into inferential, experimental and simulation approaches to research. The purpose of inferential approach to research is to form a data base from which to infer characteristics or relationships of populations. This usually means survey research where a sample of population is studied (questioned or observed) to determine its characteristics, and it is then inferred that the population has the same characteristics.

Experimental approach characterized by much greater control over the research environment and in this case some variables are manipulated to observe their effect on other variables.

Stimulation approach involves the construction of an artificial environment within which relevant information and data can be generated. This permits an observation of the dynamic behavior of a system (or its sub-system) under controlled conditions. The term 'simulation' in the context of business and social sciences applications refers to "the operation of numerical model that represents the structure of a dynamic process. Given the values of initial conditions, parameters and exogenous variables, a simulation is run to represent the behavior of the process over time". Simulation approach can also be useful in building models for understanding future conditions.

3.7 Research Methodology

Research Methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. It is necessary for the researcher to know not only the research methods/techniques but also the methodology. Researchers not only need to know how to develop certain indices or tests, how to calculate mean, the mode, the median or the standard deviation or chi-square, how to apply particular research techniques, but they also need to know which of these methods or techniques, are relevant and which are not relevant and what would they mean and indicate and why. Researchers also need to understand the assumptions underlying various techniques and they need to know the criteria by which they can decide that certain techniques and procedures will be applicable to certain problems and others will not. This entire means that it is necessary for the researcher to design his methodology designs a building, has to consciously evaluate the basis of his decisions, i.e., he has to evaluate why and on what basis he selects particular size, number and location of doors, windows and ventilators, uses particular materials and not others and the like. Similarly, in research the scientist has to expose the research decisions to evaluation before they are implemented. He has to specify very clearly and precisely what decisions he selects and why he selects them so that they can be evaluated by others also.

From what has been stated above, we can say that research methodology has many dimensions and research methods do constitute a part of the research methodology. The scope of research methodology is wider than that of research methods. Thus, when we talk of research methodology we not only talk of the research methods but also consider the logic behind the methods we use in the context of our research study and explain why we are using a particular method or technique and why we are not using others so that research results are capable of being evaluated either by the researcher himself or by others. Why a research study has been defined, in what way and why the hypothesis has been formulated, what data have been collected and what particular method has been adopted, why particular technique of analyzing data has been used and a host of similar other questions are usually answered when we talk of research methodology concerning a research problem or study.

3.8 Research and Scientific Method

For a clear perception of the term research, one should know the meaning of scientific method. The two terms, research and scientific method, are closely related. Research, as well we have already stated can be termed as a "and inquiry into the nature of, the reasons for, and the consequences of any particular set of circumstances, whether these circumstances experimentally controlled or recorded just as they occur. Future, research implies the researcher is interested in more than particular results; he is interested in the repeatability of the results and their extension to more complicated and general situation". On the other hand, the philosophy common to all research methods and techniques although they may vary considerably from one science to another, is usually given the name of scientific method. In the context, Karl Pearson writes, "The scientific method is one and same in the branches (of science) and that method is the method of all logically trained minds … the unity of all sciences consist alone in its methods not its materials; the man who classifies facts of any kind whatever who sees their mutual relation and describes their sequence, is applying Scientific Method and is a man of science". Scientific Method is the pursuit of truth as determined by logical considerations. The ideal of science is to achieve a systematic interrelation of facts. Scientific method attempts to achieve "this deal by experimentation, observation, logical arguments from accepted postulates, and a combination of these three in varying proportions". In scientific method, logic aids in formulating propositions explicitly and accurately so that their possible alternatives become clear. Further, logic develops the consequences of such alternatives, and when these are compared with observable phenomena, it becomes possible for the researcher or the scientist to state which alternative is most in harmony with the observed facts. All this is done through experimentation and survey investigations which constitute the integral parts of scientific method.

Experimentation is done to test hypotheses and to discover new relationships. If any, among variables, but the conclusions drawn on the basis of experimental data are generally criticized for either faulty assumptions, poorly designed experiments, badly executed experiments or faulty interpretations. As such the researcher must pay all possible attention while developing the experimental design and must state only probable inferences. The purpose of survey investigations may also be to provide scientifically gathered information to work as a basis for the researchers for their conclusions.

The scientific method is, thus based on certain basic postulates which can be stated as under:

a. It relies on empirical evidence;

b. It utilizes concepts;

c. It is committed to only objective considerations;

d. It presupposes ethical neutrality, i.e., it aims at nothing but making only adequate and correct statements about population objects;

e. It results into probabilistic predications;

f. Its methodology is made known to all concerned for critical scrutiny are for use in testing the conclusions through replication;

g. It aims at formulating most general axioms or what can be termed as scientific theories.

Thus, "the scientific method encourages a rigorous, impersonal mode of procedure dictated by the demands of logic and objective procedure." Accordingly, scientific method implies an objective, logical and systematic method, i.e., a method free from personal bias or prejudice, a method to ascertain demonstrable qualities of a phenomenon capable of being verified, a method wherein the researcher is guided by the rules of logical reasoning, a method wherein the investigation proceeds in an orderly manner and a method that implies internal consistency.

3.9 Research Process

Before embarking on the details of research methodology and techniques, it seems appropriate to present a brief overview of the research process. Research process consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps.

The points given below, indicates that the research process consists of a number of closely related activities. But such activities overlap continuously rather than following a strictly prescribed sequence. At times, the first step determines the nature of the last step to be undertaken. If subsequent procedures have not been taken into account in the early stages, serious difficulties may arise which may even prevent the completion of the study. One should remember that the various steps involved in a research process are not mutually exclusive; nor are they separate and distinct. They do not necessarily follow each other in any specific order and the researcher has to be constantly anticipating at each step in the research process the requirements of the subsequent steps. However, the following order concerning various steps provides a useful procedural guideline regarding the research process :

1. Formulating the research problem;

2. Extensive literature survey;

3. Developing the hypothesis;

4. Preparing the research design;

5. Determining sample design;

6. Collecting the data;

7. Execution of the project;

8. Analysis of data;

9. Hypothesis testing;

10. Generalizations and interpretation   and

Preparation of the report or presentation of the results, i.e., formal write up of conclusions reached.

3.10 Title : "A Study on Effectiveness of Information and Communication Technology(ICT) and its use in Management Institutes of University of Pune "

3.11 Objectives of the study:
1.   To analyze the effectiveness of ICT in management institutes.

2.   To understand the advantages of ICT to the management institutes.

3.   To understand the advantages of ICT to improve the educational standards in management institutes.

4.   To analyze the benefits of ICT to the students of management institutes.

5.   To understand the use of ICT in management institutes.

3.12 Hypothesis of the study:
1.   **H0**-There is vast improvement in administrative performances of   the management institutes.

H1- There is least improvement in administrative performances of the management institutes.

2.   **H0**-Educational standards in management institutes is highly upgraded by ICT.

H1- Educational standards in management institutes is poorly upgraded by ICT.

3.   **H0**- ICT enables the students to understand and analyze the subjects easily in management institutes.

H1- ICT enables the students to understand and analyze the subjects with diffculty in management institutes

3.13. **Research Methodology**
Research methodology is the process or method of research undertaken by the researcher. In analytical studies like this case data collected is mainly based on two methods

1. Primary data

2. Secondary data

1. **Primary data :** It is the data collected from direct sources such as people, observation and sight visits, here the primary data is collected through questionnaires supplied to various people such as select students and select administrative people of management institutes.

2. **Secondary data :** It is the data collected through secondary measures such as literature, observation on electronic media etc. there the data is collected from annual reports of –management institutes, literature of ICT, news papers, bulletins etc**.**

The researcher has used the tools like tables and graphs for analyzing the data and other statistical tools to test the hypothesis if and where found necessary.

3.14 Criteria of selection of samples

The questionnaires prepared for various categories are divided into two categories namely

Category A – Administrative and faculty of management   Institutes.

Category B – Students of management Institutes.

As there are 204 management institutes in Pune district, 27 institutes in Ahmednagar district and 34 management institutes in Nasik district, making a total of 265 management institutes affiliated to Pune University. Taking 30% of the total sample size in Pune district, the researcher has selected 60 institutes in Pune district and 15 institutes in Ahmednagar making 55 % and in Nasik districts 15 institutes making 44% . So, there are a total of 90 institutes selected for the study.

The researcher has selected 5 students [3 boys and 2girls] from each selected institutes making up a total of 450 samples. The student samples were selected on the basis of regularity to the classes and maximum utilization of library of the college.

The faculty samples were based on number of years of teaching experience and also on the basis of university approval. So the researcher has selected 180 faculties as her samples.

The administrative staff was also selected on the basis of number of years working in the institution. So the researcher has selected 180 staff for her research work.

The following table shows list of management institutes selected for study and also the number of different sample categories selected for study.

Table 3.1 shows the sample categorization of all the collages selected for the study

LIST OF MANAGEMENT INSTITUTE OF THE UNIVERSITY

Name of the University – University of Pune

Ganeshkhind, Pune – 411 007

Pune District

Sr. No.	Name of the College	Year of Establish-ment	Intake Capacity	No. of Students selected	No. of Faculties	No. of Administrative staff
1	Indian Institute of Cost& Management Studies & Research	1981	M.P.M.-120 M.M.M.-60 M.C.M-120	5	2	2
2	Audyogik Shikshan Mandal's, Institute of Business Management & Research	1984	M.B.A.-240 M.P.M.-120 M.M.M-120 M.C.M.-120 M.M.S. – 60	5	2	2
3	Maharashtra Jain Sanskritik Mandal's (Akluj)Institute of	1984	M.P.M.-60 M.M.S.-60 M.C.M.-60	5	2	2

	Management , Social Science & Research					
4	Dr. Vikhe – Patil Foundation's ,Center for Management Research & Development	1984	M.B.A. -120	5	2	2
5	Institute of Science's Institute of Business Management & Research	1984	M.B.A.-90 M.P.M.-60 M.C.M.-60	5	2	2
6	PUMBA	1981	M.B.A.-180	5	2	2
7	Institute of Management & Career Courses (IMCC)	1986	M.P.M.- 60 M..C.M.- 60 M.C.A - 120	5	2	2
8	Data System Research Foundation, Kharadi	1986	M.C.M.-120 D.B.M.- 40 D.C.M.- 40	5	2	2
9	S.P. Mandal's Prin. N.G. Naralkar Institute of Career Development & Research	1986	M.M.S.- 60 M.C.M-120 M.M.M.-60 M.P.M. -120	5	2	2
10	M.I.T School of Management	1990	M.B.A. -90	5	2	2
11	Modern Education Society's Neville Wadia Institute of Management Studies & Career Development	1991	M.B.A.-60 M.P.M.-120 M.C.M.-60	5	2	2
12	Progressive Education Society's Institute of Management Studies & Career Development	1991	M.B.A.-60 , M.C.M-90. M.P.M.40	5	2	2
13	Sinhagad Technical Education Society's Sinhagad Institute of Management	1994	M.B.A- 300 M.C.M.-120 M.C.A.- 180 M.P.M -60 M.M.M.-60	5	2	2
14	Marathwada Mitra Mandal's Institute of Management Education Research & Training	1994	M.B.A-60	5	2	2
15	Dr. D.Y. Patil Institute of Management &	1994	M.B.A. -120 M.C.M.-90 M.P.M.-60	5	2	2

	Research		M.M.S.-30 M.C.A.-60 M.M.M.-60			
16	Chankya Education Society's Indira Institute of Management	1994	M.B.A. -180 M.C.A.- 60 M.P.M.-60 M.C.M.-120 M.M.M-180	5	2	2
17	Shivnagar Education Society's Institute of Management	1994	M.B.A.-60	5	2	2
18	Maharashtra Cosmopolitan Education Society's Allana Institute of Management Science	1998	M.B.A. -60 M.C.M. -60 M.C.A. -120	5	2	2
19	S.P.M.'s Manikchand Dhariwal Institute of Rural Management & Tenchnology	1988	D.B.M. -30 D.C.M.-30 M.P.M.-30 M.C.A.-60	5	2	2
20	Anjuman Khairul Islam Poona Institute of Management , Science & Entrepreneurship Poona College Campus	1990	M.P.M.-60 M.C.M. -60 M.M.S.-30	5	2	2
21	Pune Zilha Shikshan Mandal's Mahatma Phule Institute of Computer Management Studies & Research	1990	M.B.A.-60	5	2	2
22	Maharshi Karve Stree Shikshan Sanstha's Shrimati Hiraben Nanavati Institute and Management of Research	1996	M.B.A.-120	5	2	2
23	Raja Shivrai Pratisthan's Institute of Management & Computer studies	1998	M.C.M.-120 M.M.M.-60 D.B.M.-60 M.P.M.-60	5	2	2
24	Jai Shivarai Pratishthan 's Chhatrapati Shivaji Institute of Business Management & Research	1999	M.C.M.-30 M.P.M.-30 D.B.M.-30	5	2	2
25	Vivekanada Institute of Technology & School of Computer	2000	M.C.M.-30 P.G.D.B.M.- 60 ,	5	2	2

			Studies & Research		M.M.M.-60			
26	GMSP Mandal's, Sharadchandra Pawar Research Institute of Technology Computer & Management	2001	M.C.M.-60 M.M.M.-60	5	2	2
27	Saraswati Mandir Sanstha's L.K. Phatak Institute of Tenchnology & Management	2001	M.C.M. -60 M.M.S. -30 P.G.D.B.M-60	5	2	2
28	Bansilal Ramnath Agarwal Charitable Trust's Vishwakarma Institute of Management	2002	M.B.A.- 180 M.C.M.- 60 M.P.M.- 60 M.M.M.-60	5	2	2
29	J.S.P.M. Jaywant Institute of Management Studies		M.B.A. -120	5	2	2
30	Suryadatta Education Foundation's Suryadatta Institute of Management & Information Research	2001	M.C.M.-120 M.P.M.-120 D.B.M. -60 M.M.M-180 M.M.S. -60	5	2	2
31	Shri Shivaji Maratha Society's Institute of Management & Research	2001	M.B.A-60	5	2	2
32	Vidya Pratishthan 's Institute of Information Technology, Vidyanagari	2001	M.C.A. -60 M.C.M. -60	5	2	2
33	Camp Education Society's Institute of Management, Nigdi	2001	M.C.M. - 40 M.B.A. - 60	5	2	2
34	All India Shri Shivaji Memorial Society's Institute of Management	2002	M.B.A.-120 M.M.M.-30	5	2	2
35	Sinhagad Technical Education Society's Sinhgad Institute of Management and Computer Application	2004	M.C.A.-180 M.B.A.-180 M.M.M. -60	5	2	2
36	Sinhgad Technical Education Society's Sinhgad Institute of Business Administration and Research	2004	M.C.A.-240 M.B.A.-180 M.M.M.-60 M.P.M.-60	5	2	2

37	Sinhagad Technical Education Society's Sinhagad Institute of Management, Business Administration and Computer Application	2004	M.C.A. -180 M.B.A. -180 M.M.M. -60	5	2	2
38	Padmashri Dr. D.Y. Patil Institute of Management studies	2004	M.B.A.-120	5	2	2
39	Prestige College of Management & Technology	2004	M.M.M.-30 M.P.M -60	5	2	2
40	Shree Sai Education Society's, Sai Sinhgad Business School	2006	M.B.A.- 120 M.C.M.-60 M.M.M.-60 M.P.M.-60	5	2	2
41	Sinhagad Technical Education Society's, Sinhagad Business School,	2007	M.M.M-120 M.P.M.-120 M.C.M.-60 M.B.A.-240	5	2	2
42	G.H. Raisoni Institute of Management and Research	2007	M.B.A. - 60	5	2	2
43	Jaywant Shikshan Prasarak Mandal's, Kautilya Institute of Management & Research	2007	M.C.A. - 60 M.B.A.-120	5	2	2
44	Rajmata Jijau Shikshan Prasarak Mandal's Institute of Computer & Management Research	2007	M.B.A.- 120	5	2	2
45	Mula Education Society's Sahayadri Institute of Management Studies	2007	M.B.A.- 120	5	2	2
46	Zeel Education Society's Gyanganga Institute of Career Environment and Research	2007	M.B.A.- 120	5	2	2
47	Audogik Shikshan mandal's Institute of computer Studies	2008	M.C.A.- 60 M.B.A.- 180	5	2	2
48	Navsahyadri Charitable Trust	2008	M.B.A.-120	5	2	2

	Insitute of Business Management & Research					
49	Kamala Education Society Pratibha Institute of Business Management	2008	M.B.A.-60 M.M.M.- 60 M.P.M.- 60	5	2	2
50	Shrinath Shikshan Prasarak Mandal's, Sinhgad Management School,	2008	M.B.A.-180 M.P.M.-60 M.M.M.-60 M.C.M.-60	5	2	2
51	Rajgad Gnyanpeet's Rajgad Institute of Management Research Development	2008	M.B.A.-180	5	2	2
52	Yashaswi Education Society's International Institute of Management Science	2008	M.M.M.-60 M.P.M.-60 M.B.A.-60	5	2	2
53	Institute Apex of Management & Research	2008	M.B.A.-120	5	2	2
54	Pimpri Chinchwqd Education Trust's S.B. Patil Institute of Management	2009	M.B.A.-180	5	2	2
55	Sukhdev & Kamal Sharma Education Trust's Lexicon Institute of Management Education	2009	M.B.A.- 180	5	2	2
56	Akemi Education Society's, Akemi Business School	2011-12	M.B.A.- 120	5	2	2
57	Suryadatta Education Foundation's, Suryadatta Institute of Business Management and Technology (MIBMT),	2011-12	M.B.A.- 120	5	2	2
58	P. K. Foundation's, P. K. Technical Campus	2011-12	M.B.A.-60 M.C.A. -120	5	2	2
59	Anekant Education Society, Anekant Institute of Management Studies	2011-12	M.B.A.-120	5	2	2

| 60 | Sinhgad Technical Education Society, Sinhgad School of Business Studies | 2010-11 | M.B.A.-180, M.M.M., M.P.M. | 5 | 2 | 2 |

LIST OF MANAGEMENT INSTITUTE OF THE UNIVERSITY

Name of the University – University of Pune

Ahmednagar District

Sr. No.	Name of the College	Year of Establishment	Intake capacity	No. of Students selected	No. of Faculties	No. of Administrative staff
1	Dr. Vithalrao Vikhe Patil Foundation's, Institute of Business Management and Rural Development (MBA) Centre	1986	M.P.M.- 30 M.C.M.- 60 M.B.A.- 150	5	2	2
2	B.P. Hivale Education Society's Institute of Management Studies & Career Development & Research	1990	M.P.M. - 60 M.B.A. - 60 M.M.S. - 30 M.C.M. - 90	5	2	2
3	Pravara Institute of Research and Education in Natural and Social Sciences (Pirens)	1993	M.B.A. -120 M.P.M. - 30 M.C.M.- 60	5	2	2
4	Babanrao Pachapute Vichardhara Trust's, Group of Institutions College of Management	2009	M.B.A.-60	5	2	2
5	S. G. R. Education Foundation's, G. H. Raisoni Institute of Management & Research	2009-10	M.B.A.- 180	5	2	2
6	Dnyanvardhini Shikshan Sanstha's, Global Institute of Management	2010-11	M.B.A.- 120	5	2	2
7	Akole Taluka Education Sanstha's, Global Institute of Management, Society, Technical Campus	2011-12	M.B.A.- 120 M.C.A.- 120	5	2	2
8	Sakeshwar Gramin Vikas Seva Sanstha, Adsul's, Technical Campus, Faculty of	2011-12	M.B.A.- 120	5	2	2

			MBA			
9	Shri Dattakrupa Shaikshnik & Krushi Gramvikas Prathithan's, Saikrupa Institute of Management Science	2009-10	M.B.A.-60	5	2	2
10	Amrutvahini Institute of Management and Business Administration	1994	M.B.A.-60	5	2	2
11	Abhinav Education Society's, Institute of Management & Business Administration	2009	M.B.A.-60	5	2	2
12	Babanrao Pachapute Vichardhara Trust's, Group of Institutions College of Management	2009	M.B.A.-60	5	2	2
13	Sulochana Belhekar Samajik & Bahu Udddieshiya, Shikshan Sanstha's Sant Dnyaneshwar Institute of Management & Business Administration	2010-11	M.B.A.-60	5	2	2
14	A.J.M.V.P. Hutatma Karveer Chhatrapati Chouthe Shivaji Maharaj Institute of Management	1986	M.C.M.- 60 M.P.M. - 30	5	2	2
15	Rayat Shikshan Sanstha's Institute of Management and Research for Rural Development	1986	M.P.M.-30	5	2	2

LIST OF MANAGEMENT INSTITUTE OF THE UNIVERSITY

Name of the University – University of Pune

Nashik District

Sr. No.	Name of the College	Year of Establishment	Intake Capacity	No. of Students selected	No. of Faculties	No. of Administrative staff
1	N.D.M.V.P.S.'s Institute of Management Research and Technology	1987	M.B.A. - 60 M.P.M.- 60 M.C.M. - 60	5	2	2

2	G. E. Society's J.D.C. Bytco Institute of Management Studies and Research	1991	M.P.M. - 60 M.C.M. - 60 M.M.S. - 60	5	2	2
3	M.G.Vidya Mandir's Institute of Management and Research	1994	M.B.A.-120 M.P.M.-60	5	2	2
4	Navjeevan Education Society's Institute of Management	1994	M.B.A-60 M.P.M.-40 P.G.D.B.M.-40	5	2	2
5	Dr. Moonje Institute of Management & Computer Studies	2002	M.C.M.-60 M.P.M -60 M.B.A.-120 M.C.A. - 60	5	2	2
6	M.E.T.'s Institute of Management Bhujbal Knowledge city MET League of Colleges	2006	M.B.A. - 60 P.G.D.F.T.-60	5	2	2
7	Matoshri Education Society's Matoshri College of Management & Research Center	2008	M.B.A.-120	5	2	2
8	Kalyani Charitable Trust's K.R. Sapkal College of Management & Studies	2008	M.B.A. - 60	5	2	2
9	Swargeeya Sanjibhai Rupbjibhai Memorial Trust's S.S.R. Institute of Management Research	2008	M.B.A. - 60	5	2	2
10	Gurudatta Shikshan Sanstha's Shri Dhondu Baliram Pawar College Of Management	2009	M.B.A.- 60	5	2	2
11	Nashik Gramin Shikshan Prasarak Mandal's, Bramha Valley Institute of Management	2008	M.B.A.-120	5	2	2
12	Dr.B. V. Hiray College of Management and Research Centre	2011-12	M.B.A.-120 M.C.A.- 60	5	2	2
13	Ozar Vikas Sansths Viswasattya College Of MBA	2009	M.B.A.-60	5	2	2
14	Pune Vidyarthi Ghruha's Institute of management	2009	M.B.A.- 60	5	2	2

15	Matoshri Education Society's, Matoshri College of Management & Research Center	2008	M.B.A.-120	5	2	2

3.15 Statistical tools for hypothesis

In this research the researcher has tested her hypothesis with help of **Two- Tail T-Test** method .Here the researcher has calculated Mean, Standard Deviation and t-value from the data available from questionnaire supplied to respondents namely students, faculties and administrative staff of management institutes of Pune University. The t-value was then compared with critical value available from Binary Normal Distribution Curve Table shown in the Areas of Standard Normal Distribution page-669. BRM by R Cooper, for Critical Values of 't' in the Wilcoxon Matched Pairs Test.

3.16 Scope of the study

1. The study focuses on the importance of ICT for the management institutes of Pune University.

2. The study highlights the scope for higher educational efficiency in management institutions.

3. The study focuses on the ease of administrative process of management institutes with help of ICT and its tools.

4. The study limits its program in upgrading the learning systems in management institutes with help of ICT and its tools.

5. The boundaries of the study are limited to application of ICT and its tools in management institutes of Pune University.

3.17 Limitations of the study :

1. The study is limited to management institutes affiliated to Pune University only.

2. The study is limited to applications of ICT only.

3. The study is limited to educational and administrative systems only.

3.18 Period of Study

The study is for a period of ten years from 2002 – 03 to 2011 – 12.

3.19 Chapter Scheme

Chapter I – Introduction

In this chapter the researcher has briefly given introduction to her topic, the problems on hand, importance of the subject and scope of the subject.

Chapter II – Review of Literature

In this chapter the researcher has elaborately discussed the role, importance, concepts and usage of ICT in school education, higher education and especially in professional education systems. The researcher has reviewed various literature related to the topic.

Chapter III – Research Methodology

In this chapter the researcher has discussed the concepts of research, methods of research, data collection, criteria for selection of samples in this chapter.

Chapter IV– Profile of Pune and Management Institutes in Pune

In this chapter the researcher has discussed the profile of select Management Institutes affiliated to Pune University. In the profile the performance of management institutes over a period of study that has been selected for the study.

Chapter V– Data collection and Analysis

In this chapter the researcher has analyzed the data by tabulating and analyzing through tables and graphs and then the results will be interpreted in this chapter.

Chapter VI – Results and Discussions
A] Findings
B] Observations
C] Recommendations
In this chapter the researcher has analyzed the data and brought out conclusions in the form of observations, results and has discussed the observations.

Chapter VII – Contribution To The Body Of Knowledge
In this chapter the researcher has briefly discussed the contributions to the society from her research.

Chapter VIII – Further Scope For the Research
In this chapter the researcher has briefly discussed the further scope for research in the field of ICT applications in higher education.

3.20 Conclusions
The researcher has clearly mentioned her research methodology in this chapter. In this chapter she has also discussed the concept of research, types of research and the criteria for selecting her samples for study. Now she will go to next chapter for bringing the profile of Pune district and also the beginning of management studies in Pune University.

========+++========

CHAPTER – IV

PROFILE OF PUNE AND MANAGEMENT INSTITUTES IN PUNE

4.1 Introduction

Pune is considered the cultural capital of Maharashtra.[1] Since the 1950s and 1960s, Pune has a traditional old-economic base . Most of the old industries continue to grow. The city is also known for its manufacturing and automobiles industries, as well as for research institutes of information technology(IT), education, management and training, which attract migrants, students, and professionals from India, South East Asia, the Middle East, and Africa. Pune is also one of the fastest growing cities in the Asia-Pacific region. The 'Mercer 2015 Quality of Living rankings' evaluated local living conditions in more than 440 cities around the world where Pune ranked at 145, second in India after Hyderabad(138).[2] It also highlights Pune among evolving business centers and emerging 9 cities around the world with citation "Hosts IT and automotive companies"[3]

4.2 HISTORY

Copper plates dated 858 AD and 868 AD show that by the 8th century an agricultural settlement known as *Punnaka* existed where Pune is today. The plates indicate that this region was ruled by the Rashtrakuta dynasty. The Pataleshwar rock-cut temple complex was built during this era.

1: "Pune". Maharashtratourism.gov.in. Retrieved 14 May **2014.**

2: "Hyderabad, Pune top Mumbai and Delhi in quality of life". The Hindu. Retrieved4 March **2015**

3: "Quality of Living City Rankings". Mercer Information Solutions business. Retrieved3 March **2015**

Pune was part of the territory ruled by Seuna Yadavas of Devagiri from the 9th century to 1327. In 1595, Maloji Raje Bhosale was appointed the jagirdar of Pune by the Mughal Empire.[1] Pune was ruled by the Ahmadnagar Sultanate until it was annexed by the Mughals in the 17th century.

4.3 Maratha era

Pune was part of the Jagir (Fiefdom) granted to Maloji Bhosale in 1599 for his services to the Nizamshahi of Ahmadnagar. His grandson,Shivaji, the founder of Maratha Empire, was born in Shivneri fort not far from Pune. Shivaji was brought up by his mother in Pune. Pune changed hands a few times between the Mughals and the Marathas in the period between 1660 AD to 1705 AD. When Chhatrapati Shahu succeeded to the Maratha throne in 1707, he wanted to declare Satara the capital but his chief administrators, the Peshwa who were the real power behind the throne, decided Pune was to be their headquarters.

4.4 Bhosale Administration

In 1626 AD, Shahaji Raje Bhosale (father of *Chhatrapati Shivaji Maharaj*) appointed Rango Bapuji Dhadphale as the administrator of Pune. He was one of the first main developers of the town, overseeing the construction of some markets and residential areas like Kasba Peth, Somwar Peth, Raviwar Peth and Shaniwar Peth. After the destruction of the town in raids by the Adil Shahi dynasty in 1630 AD and again between 1636 AD and 1647 AD, Dadoji Konddeo, the successor to Dhadphale, oversaw the reconstruction of the town.

1: *"Some Important Years in the History of Pune". Retrieved 4 April 2008.* **Pune's Timeline**

He stabilised the revenue collection and administrative systems of areas around Pune and in neighbouring area of the Maval region.

In addition, he developed effective methods to manage disputes and to enforce law and order.[1] Construction on the Lal Mahal began in 1631 AD. The Lal Mahal was completed in 1640 AD.[2]Jijabai is said to have commissioned the building of the Kasba Ganapati temple. The Ganesha idol consecrated at this temple has been regarded as the presiding deity (*gramadevata*) of the city.[3]

Despite bitter opposition from some Maratha Jagirdars, Shivaji was crowned Chhatrapati in 1674 AD, thus founding the Maratha Empire. He oversaw further development in Pune, including the construction of Guruwar Peth, Somwar Peth, Ganesh Peth and Ghorpade Peth. Shivaji encouraged the development of dams in Parvati and Kondhwa regions of Pune for agricultural purposes. Pune and its surrounding villages were the major recruitment areas for Shivaji's army between 1645 AD and 1680 AD. Between 1660 AD and 1670 AD the town was captured by Mughal General Shahista Khan, but was recaptured by the Marathas in 1670 AD after the Battle of Sinhagad. Shivaji often used Pune as his transit base during his major campaigns

such as Varhad-Karanja (1673), AhemadaNagar District (1675), Karnataka (1677) and Jalna (1679). During the27-year-long conflict between the Marathas and the Mughals, the town was occupied by Aurangzeb from 1703 to 1705; during this time, the name of the town was changed to "Muhiyabad".

1: "Pune History – Origin & History of Pune – History of Puna India – History of Pune City". Pune.org.uk. Retrieved 16 July **2010.**

2: Government, of Bombay. Gazetteer of the Bombay Presidency: Poona (2 pts.). p. 321

3: "Monuments in Pune". Pune district administration. Archived from the original on 25 March 2008. Retrieved 4 April **2008.**

Peshwa rule
An equestrian statue of **Baji Rao-I** outside the Shaniwar Wada, who is credited with successful expansion of Maratha power in North India (circa 1730 CE)[1][2] A memorial commemorating **The Great Peshwa Shrimant Madhavrao I**, who (with assistance from Maharaja Mahadaji Scindia) resurrected Maratha power in North India (circa 1770 CE)[2].

Chhatrapati Shahu, grandson of Shivaji, realised the importance of Pune and asked most of the Maratha army to be stationed in Pune because of its central location. Various regions such as Konkan, Khandesh, Marathwada, South Maharashtra, North Karnataka can be reached from Pune in just 3 to 4 days. He also asked his army to report to the Peshwa at Pune location for fast expeditions, finances rather than relying on Satara, the seat of the Chhatrapati. In 1720, Baji Rao I was appointed Peshwa (Prime Minister) of the Maratha Empire by Shahu.[3] He moved his base from Saswad to Pune in 1728 and in the process laid the foundation for turning what was Kasabah into a large city.[4] Bajirao also started construction of Shaniwar Wada on the right bank of the Mutha River The construction was completed in 1730, ushering in the era of Peshwa control of the city.

1: *History Modern India – S. N. Sen – Google Books. Books.google.co.in. Retrieved*7 August *2014*

2: *"Shrimant Bajirao Peshwa : Great warrior and protector of Hindu Dharma | Hindu Janajagruti Samiti". Hindujagruti.org. Retrieved* 7 August *2014.*

3: *The Great Maratha Mahadaji Scindia – N. G. Rathod – Google Books. Books.google.co.in. Retrieved* 7 August *2014.*

4: *Kosambi, Meera (1989). "Glory of Peshwa Pune". Economic and Political Weekly 24(5): 247.*

The patronage of the Maratha Peshwas resulted great expansion of Pune with the construction of many temples and bridges in the city, including the Lakdi Pul and the temples onParvati Hill. Bajirao Peshwa also constructed an underground aqueduct to bring water from Katraj Lake to Shaniwar Wada. The aqueduct is still operational. Pune prospered as a city during the reign of Nanasaheb Peshwa. He developed Saras Baug, Heera Baug, Parvati Hill and new commercial, trading, and residential localities. Sadashiv Peth, Narayan Peth, Rasta Pethand Nana Peth were developed in this era. The Peshwa's influence in India declined after the defeat of Maratha forces in the Battle of Panipat but Pune remained the seat of power until their final defeat by the British East India Company. In 1802, Pune was captured by Yashwantrao Holkar in the Battle of Pune, directly precipitating the Second Anglo-Maratha War of 1803–1805. During this period, Sardar Apajiram Sahastrabuddhe was the Kotwal of the city (further adopted Kotwal as surname)[1]

4.5 British rule
Government House of the British authority to Gunesh Khind at Poona in India, seen from the east, around 1875.Leiden University Library, Royal Netherlands Institute of Southeast Asian and Caribbean Studies. Fergusson College, founded in 1885 during the British Raj, the first privately governed college in India.[2] The Third Anglo-Maratha War broke out between the Marathas and the British in 1817.

1: *"Shaniwarwada was centre of Indian politics: Ninad Bedekar – Mumbai – DNA". Dnaindia.com. Retrieved* 17 October *2013*

2 : History of Foundation Archived 12 July 2015 at the Wayback Machine

The Peshwas were defeated at the Battle of Khadki(then spelt *Kirkee*) on 5 November near Pune and the city was seized by the British. It was placed under the administration of the Bombay Presidency and the British built a large military cantonment to the east of the city (now used by the Indian Army). The Pune Municipality was established in 1858. Navi Peth, Ganj Peth (now renamed Mahatma Phule Peth) were developed during the British Raj.

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, Mahatma Jyotirao Phule and Dr. Raghunath Karve. Vinayak Damodar Savarkar resided in Pune when he enrolled in Fergusson College in 1902.

In late 1896, Pune was hit by bubonic plague. By the end of February 1897, the epidemic was raging with a mortality rate twice the norm and half the city's population fled. A Special Plague Committee was formed under the chairmanship of W.C. Rand, an Indian Civil Services officer. He brought troops to deal with the emergency. Although these measures were unpopular, the epidemic was under control by May. On 22 June 1897, during the Diamond Jubilee celebration of the coronation of Queen Victoria, Rand and his military escort were killed by the Chapekar brothers. A memorial to the Chapekar brothers exists at the spot on Ganeshkhind Road (University Road) between the Reserve Bank and the Agricultural College.

Pune was prominently associated with the struggle for Indian independence. In the period between 1875 and 1910, the city was a major centre of agitation led by Gopal Krishna Gokhale and Bal Gangadhar Tilak. The city was also a centre for social reform led by Mahatma Jyotirao Phule, feminist Tarabai Shinde, Dhondo.

Keshav Karve and Pandita Ramabai. They demanded the abolition of caste prejudice, equal rights for women, harmony between the Hindu and Muslim communities, and better schools for the poor.[1] Mohandas Gandhi was imprisoned at Yerwada Central Jail several times and placed under house arrest at the Aga Khan Palace in 1942–44, where both his wife and aide Mahadev Desai died.

4.6 Pune since Indian Independence
After Indian independence in 1947 from Britain, Pune saw a lot of development, such as the establishment of the National Defence Academy at Khadakwasla and the National Chemical Laboratory at Pashan. Pune serves as the headquarters of the Southern Command of the Indian Army.[2] Industrial development started in the 1950s and '60s inHadapsar, Bhosari, Pimpri and Parvati.[3] Telco (now Tata Motors) started operations in 1961, which gave a huge boost to the automobile sector.

In July 1961, the Panshet and Khadakwasla dams broke and their waters flooded the city, destroying large sections of the old city, particularly along the river bank. The disaster led to the introduction of modern town planning concepts and the development of parts of Pune. The economy of the city witnessed a boom in the construction and manufacturing sectors. By 1966, the city had expanded in all directions.[4]

1: Ramachandra Guha, "The Other Liberal Light," *New Republic* **22 June 2012**

2: *"Southern Command in India"*

3: *"Historical Events in Pune". http://pune.gov.in. NIC – District-Pune. Archived from the original on 13 June 2008. Retrieved* 29 October *2009.*

4: *"The Mumbai-Pune expressway". The Financial Express. Retrieved* 29 October *2009*

In 1990, Pune began to attract foreign capital, particularly in the information technology and engineering industries; new businesses like floriculture and food processing, wineries started to take root in and around the city. In 1998, work on the six-lane Mumbai-Pune expressway began, the expressway being completed in 2001.[1] IT Parks were established in Aundh, Hinjawadi and on Nagar Road. In 2008, the Commonwealth Youth Games took place in Pune, which encouraged additional development in the northwest region of the city.[2]

In July 2009, India's first death due to H1 N1 occurred in Pune. Later the city became an epicentre of swine flu due to the large number of H1 N1 cases.[3]

On 13 February 2010, a bomb exploded at the German Bakery in the upmarket Koregaon Park neighbourhood on the east side of Pune, killing 17 and injuring 60.[4] The explosion is now suspected to be an improvised explosive device using an ammonium nitrate fuel oil mix.[5] The blast was a first in what was until then the relatively safe environment of Pune. During the first week of June 2013, heavy rainfall caused casualties, landslide near Katraj Ghat very near to city limit believed to be "Modern South Gate" of the city. This unfortunate incident highlighted the need for preservation of hills and prevention of encroachment on natural water resources .

1: *"Latest News: Swine Flu in India". news.rediff.com. Retrieved 2 May 2010.*

2: *"Pune to get piped compressed natural gas before CYG". The Punekar. Archived from the original on 4 October 2008. Retrieved 29 October 2009.*

3: *"Latest News: Swine Flu in India". news.rediff.com. Retrieved 2 May 2010.*

4: *Harmeet Singh (13 February 2010). "Eight killed in India restaurant blast". CNN. Retrieved 14 February 2010*

5: *PTI (13 February 2010). "9 killed, 40 injured in Pune bomb blast". The Hindu(Chennai, India). Retrieved 14 February 2010.*

4.7 GEOGRAPHY

Pune is located 560 m (1,840 ft) above sea level on the western margin of the Deccan plateau. It is situated on the leeward side of theSahyadri mountain range, which forms a barrier from the Arabian Sea. It is a hilly city, with its highest hill, Vetal Hill, rising to 800 m (2,600 ft) above sea level. Just outside the city, the Sinhagad fort is located at an altitude of 1,300 m. It lies between 18° 32"North latitude and 73° 51"East longitude.

Central Pune is located at the confluence of the Mula and Mutha Rivers. The Pavana and Indrayani Rivers, tributaries of the Bhima River, traverse the northwestern outskirts of metropolitan Pune.

4.8 Demographics

The population of the Pune urban agglomeration had been around 4,485,000 in 2005.[1] The migrating population rose from 43,900 in 2001 to 88,200 in 2005.[2] According to the Pune Municipal Corporation, 40% of the population lived in slums in 2001.[3] The sharp increase in censorial decade of 1991–2001 can be attributed to the absorption of 38 fringe villages into the city.[4] The average literacy rate of Pune was 86.15 in 2011 compared to 80.45 in 2001. [5][6]

1: "Demographics of Pune". *Punepages.com*. **Retrieved** 16 July **2010.**

2: "Pune's GDP at Rs 46,000 is 50 pc higher than India's". *The Indian Express. 28 July 2006.* **Retrieved** 24 March **2007**

3: "Annexure I" *(PDF). Fire Hazards Response and Mitigation Plan. Pune Municipal Corporation. 2001. p. 10.* **Retrieved** 29 June **2012.**

4: "Revised Action Plan for Control of Air Pollution in Pune" *(PDF). Census of India, Government of India (2001). Maharashtra Pollution Control Board.* **Retrieved**29 December **2008.**

5: "Pune to become 7th metro city in India: Assocham – Economy and Politics". *livemint.com. 30 October 2008.* **Retrieved** 26 March **2011**

6: "Pune District Population Census 2011, Maharashtra literacy sex ratio and density". *Census2011.co.in*. **Retrieved** 14 May **2014**

Marathi is the official and most widely spoken language, while English and Hindi are understood and spoken. Pune has a great Marathi influence as it was the bastion of the Maratha Empire.

4.9 Religion

Hinduism is the dominant religion in Pune. Many Churches, Mosque, Gurudwaras, Buddhist Viharas, Jewish synagogues, Jain temples and other religious buildings are found throughout the city.[1] Major communities by religion include Hindus, Muslims, Jains, Sikhs, Buddhist and Christians. The most prominent Hindu

temple in Pune is the Parvati Temple, located on Parvati hill and visible from most of the inner suburbs. The most visited temple is likely the Chaturshringi Temple, located on the slopes of a hill in the northwest of the city. DuringNavratri, there is a large fair at the temple and worshippers gather from around the country to pray here. The presiding Deity of the city is the Kasba Ganapati, whose temple is located in Kasba Peth in central Pune. Sarasbaug Ganpati is also a prominent landmark in Pune.

The Rock-cut Pataleshwar Temple is believed to be one of the oldest temples in the city.

Since 1894, Pune has celebrated Ganeshotsav as an eleven-day-long festival, in which most neighbourhoods put up a *Pandal* (a temporary tent like structure) with an idol of Ganesha, often amidst a religious setting, complete with decorative lights and festive music. This festival culminates with a parade of Ganesh idols from across the city carried to the local rivers to be immersed (*Ganesh visarjan*). The Kasba Ganapati, as the presiding deity of the city, is the first in this parade.

1: *"Pune Religions". Retrieved 14 November 2010*
The idea of a public celebration was initiated by Lokmanya Tilak in Pune, and has since spread to other places in Maharashtra and beyond.

The Samadhi shrinesof Bhakti Saints, Dnyaneshwar and Tukaram Maharaj are near Pune at Alandi and Dehu respectively. The Palkhis carrying the sandals of both saints stop in Pune on their annual journey to Pandharpur in the Hindu month of Jyeshtha (June to early July).

Islam is the second largest religion in Pune.[1] Pune has a large number of Mosques, the most prominent of which are Chand Tara Masjid, Jaama Masjid, and Azam Campus Masjid. Chand Tara Masjid, located in Nana Peth, is one of the biggest and most important mosques in Pune as it is the city headquarters (*markaz*) for the Tablighi Jamaat. The Eid-gah Maidan located near Golibar Maidan on Shankar Sheth Road witnesses a large gathering of people for Eid namaz on Eid al-Fitr and Eid al-Adha.

There are a significant number of Christians residing in Pune. The Roman Catholic Diocese of Poona (Latin: Poonen (sis)) is located here. It is a part of the Ecclesiastical province of Mumbai established in 1854 as the Apostolic Vicariate of Pune from the Apostolic Vicariate of Bombay. On 1 September 1886, it was promoted to the Diocese of Pune. Protestantism arrived in the 19th century when the British took over from the Maratha Empire.

American missionaries were the first to start evangelizing local people, building many churches and schools in Pune. Pune's Christians are also called Marathi Christians because of their use of the Marathi language. The *Vineyard Workers' Church* is a popular place of Christian worship in Dapodi, a village near Pune.

1: *"Socio - Economic Survey Of Pune City" (PDF). p. 273. Retrieved 6 November 2014.*
Pune is known for its Marathi-speaking Jews. The Ohel David Synagogue

(popularly known as *Lal Deval* in Marathi or *Red Temple*) built by Baghdadi Jewish businessman and philanthropist, David Sassoon is renowned. David Sassoon died in the city in 1864.

The Shrutisagar Ashram, located at Phulgaon off the Nagar road, houses the Vedanta Research Centre and a unique temple of Dakshinamurthy, located near the confluence of the Bhima, Bhama and Indrayani rivers. It was established in 1989 by Swami Swaroopanand Saraswati. Here one can find detailed explanations of *śruti* and *smriti* (including theVedas, Bhagavad Gita, Upanishads and Puranas) in Marathi and English.

Religions in Pune City[1]

S.No.	Religion	Percent
1	Sanātanī(Hinduism)	79.43%
2	Islam	11.03%
3	Sikh	0.43%
4	Christian	2.17%
5	Jains	2.45%
6	Buddhism	3.94%

4.10 Savitribai Phule Pune University

Savitribai Phule Pune University (Marathi: सावित्रीबाई फुले पुणे विद्यापीठ); formerly the **University of Pune** Marathi: पुणे विद्यापीठ), is a university in western India, in the city of Pune which was founded in 1948. Spread over a 411 acres (1.66 km²) campus the university is home to 46 academic departments. It has been given the highest "A" rating by the National Assessment and Accreditation Council (NAAC) for its overall performance. The university is named after Savitribai Phule, an Indian social reformer who is known for her contribution towards empowerment and emancipation of women through education. The university has now been ranked 3rd in India The university has affiliated colleges, departments, and research institutes, which are primarily in Pune.

4.10. a History

Savitribai Phule Pune University was established under the Pune University Act, passed by the Bombay legislature on 10 February 1948. In the same year, Dr. M. R. Jayakar became its first Vice-Chancellor. B. G. Kher, Chief Minister and Education Minister of the government of Bombay, helped ensure the university received a large allocation of land for their campus. In early 1950, the university was allocated over 411 acres (1.7 km²).

The University of Pune (earlier name) was renamed as Savitribai Phule Pune University on 9 November 2014[11] in the honor of Savitribai Phule who was an Indian social reformer who played an important role in improving women's rights in India during British rule. She founded the first women's school at Pune in 1848.

"The University stands for humanism and tolerance, for reason, for adventure of ideas and for the search of truth. It stands for the forward march of the human race towards even higher objectives. If the universities discharge their duties adequately then it is well with the nation and the people." —Jawaharlal Nehru (first prime minister of India)

Its location has historical significance. Some incidents of the Battle of Khadki, during the Third Anglo-Maratha War, took place where the present-day university is located. The present-day main building was built in 1864 and was known as the Governor's House. The university is home to IUCAA, an institute for astronomy.

4.10. b Jurisdiction

Initially the university had a jurisdiction extending over 12 districts of western Maharashtra. With the establishment of Shivaji University in Kolhapur in 1962, the jurisdiction was restricted to five districts: Pune, Ahmednagar, Nashik, Dhule and Jalgaon. Out of these, two districts—Dhule and Jalgaon—are attached to the North Maharashtra University established in August 1990.

4.10. c Affiliations

In 1949, there were 18 affiliated colleges (including colleges such as the Fergusson College, and College of Engineering, Pune) with an enrolment of over 8000. Thereafter, the number of colleges increased. In 2010, the university had 41 graduate departments, 433 affiliated colleges and 232 recognised research institutions, with an enrolment of 496,531 students for undergraduate and graduate courses.

Vidyavani is a community radio operated by the university. Programs are focused on departments of Pune University, student welfare schemes, information about exams, and results and activities of the university. Edutainment programmes which cater to the problems of youth are also broadcast.

4.10. d Research

More than 70 research institutions have been recognised by the Savitribai Phule Pune University for research. These include institutions of national importance like the Inter-University Centre for Astronomy and Astrophysics (IUCAA), National Chemical Laboratory (NCL), National Centre For Cell Science (NCCS), National Institute of Virology (NIV), Gokhale Institute of Politics and Economics (GIPE), Documentation Research and Training Centre (DRTC) of the Indian Statistical Institute (ISI) among others.

Other research organizations which are associated with the university are :

- National Centre for Radio Astrophysics (runs the Giant Metrewave Radio Telescope)

- Centre for Development of Advanced Computing (home to the PARAM range of supercomputers)

- Institute of Bioinformatics and Biotechnology (IBB)

- Shreemati Nathibai Damodar Thackersey Women's University (SNDT Women's University)

4.10. e. Departments

Savitribai Phule Pune University has departments and centres, offering courses in science, social science, management, law, etc.

- Department of Anthropology.

- The Department of Law was established in 1965 under the stewardship of Professor Dr. S.K.Agrawala a legal scholar. The initiative and efforts undertaken by Agrawala led the department to be rated as the fifth best in the Commonwealth of Nations in the field of legal education of the commonwealth universities.

- The Department of Zoology was one of the first to be established. It offers a postgraduate programme (M.Sc., M. Phil and Ph.D.) in Zoology.

- The Department of Communication Studies was established in 1990. It runs a two-year full-time Masters course in Communication Studies (MSc. CS.).The Department of Geography was established in 1950. Every year the department admits students for its M.A/MSc., M.Phil and Ph.D courses. The department also offers students a course in Remote Sensing and Geospatial Information Systems(GIS and RS).

- Department of Geo-science.

- The Institute of Bioinformatics and Biotechnology is an autonomous institute with an affiliation to the Savitribai Phule Pune University. It was established with a view to promote research and development activities in bioinformatics and biotechnology.

- The Department of Chemistry was one of the earliest established by the university. It has received the CAS status (Centre for Advanced Studies in Chemistry). Its research programs cover areas like computational chemistry, organic chemistry and inorganic chemistry and biochemistry. The department has a collaboration with the National Chemical Laboratory (NCL), a research institute in India. It has a separate central computing facility: a computer laboratory for students.

- The Department of Microbiology is an autonomous department and offers a credit based course in Microbiology which covers topics in Immunology, Medical Microbiology, Molecular Biology, Industrial Microbiology and Biochemistry.

- The Department of Materials Science.

- The Department of Management Sciences (PUMBA) is a business school run by the university. It was formed in 1971 and has about 360 students. In 2007–08, it started an MBA++ course. It also offers an MBA with a biotechnology specialisation.

- Department of Biotechnology: In 1985, the National Board of Biotechnology selected the Savitribai Phule Pune University as one of its five centres for imparting training in M.Sc. Biotechnology.

- The Department of Environmental Science was established as an interdisciplinary school in 1978. As a first step, Environmental Science was introduced as an optional course in all the science departments. In view of its popularity, a one-year course, B.Sc. (Applied) was started in 1986, which was subsequently converted into a two-year full-time M. Sc. course.

- Department of Education.

- Computer Science Department (PUCSD): In 1980, a one-year programme was started towards the B.Sc.(Applied) degree in Computer Science. The M.C.A. programme was launched in 1983, the M.Tech. degree programme in 1985, and the one-year B.Sc.(Applied) programme was upgraded to a two-year M.Sc. in Computer Science in 1986.

- Department of Psychology.

- The Department of Physics started in 1952. Its research programmes cover areas like Materials Science, Solid State Physics, Condensed Matter Physics, Nonlinear Dynamics, Scanning Tunneling Microscopy, Cloud Physics, Thin/Thick Films, Diamond Coatings, Nuclear and Accelerator Physics, Lasers, Plasma Physics, Field Electron/Ion Microscopy, Biophysics etc. The department has received funds from DST / government of India under the FIST program.

- Atmospheric and Space Sciences.

- The Department of Electronic Science started in 1984. Its labs and research programmes include System Design, Cyber lab for Electronics, Sensors, Materials, MEMS, Embedded systems, Optoelectronics, Virtual Instrumentation. Every year 30 students are taken in for post graduation studies through an entrance exam.

- Department of Ecotechnology.

- The Department of Instrumentation Science (USIC) A spin-off from the university workshop, the department was conceived as an extension of the physics department to build and maintain instruments used by the Physics department and served as a prototyping laboratory for building and testing new instruments. Initially the department started running an M.Sc. program for Applied Electronics autonomously, funded in large part by student fees and research projects. To provide a broader focus, the M.Sc. Applied Electronics course gradually metamorphosed into the M.Sc. Instrumentation Science Course with additional focus on sensors and transducers, as well as product design. In addition to the M.Sc. course, the department features a sensor lab which continues to collaborate with the Physics and Electronics departments providing PhD candidates an inter-disciplinary environment to pursue independent research work.

- The Centre for Modeling and Simulation (CMS) is an autonomous centre at the university. It was established in 2003 to promote mathematical modeling and simulation methodologies, to encourage interdisciplinary problem-centric approaches to basic and applied research, and to nurture computing expertise on the university campus. The centre runs a two-year full-time MTech programme in Modeling and Simulation.

- Interdisciplinary School of Scientific Computing (ISSC):

- Department of Linguistics.

- The Department of Statistics was established in 1953. The department was in the main building of the university. Prof. V. S. Huzurbazar was its first head. In 1962 the department was shifted to its new elegant building later named as 'Wrangler Paranjapye Ganit ani Sankhyashastra Bhavan'. The Department of Statistics was separated in 1976. Now the department is recognised as the 'Centre for Advanced Studies in Statistics'.

- Department of Sociology.

- Department of Mathematics.

- Department of Politics and Public Administration.

- The Department of Economics offers a Master's programme in Economics and a doctoral programme. The department has a post-graduate diploma in Foreign Trade.

- Department of Architecture.

- Department of Defence & Strategic Studies.

- Department of Urban Studies & Planning.

- The Department of Foreign Languages was started in Ranade institute building in 1949. It offers courses for German, French, Russian, Japanese and Spanish languages from elementary level to post graduation courses. Batches are conducted in morning as well as in evening. Over 1500 students are enrolled every year.[14]

- The Department of Technology provides a research platform for solving industry relevant research problems. It runs industry-university sponsored M.Tech-Ph.D. integrated programs. Four technology boards have been established under the umbrella of 'Faculty of Technology'.

4.11 History of PUMBA

The Department of Management Sciences (PUMBA)**,** University of Pune, one of the first Management Institutes in India, is a pioneer by itself in the field of Management Studies.

Founded in the year 1971, PUMBA has since then come a long way. Being the official department for the MBA course in the Savitribai Phule Pune University has been an image booster for PUMBA. It has also helped add tremendously to PUMBA's contribution in the field of management. Situated in the midst of 414 acres of lush green surroundings of the Savitribai Phule Pune University, PUMBA provides just the right atmosphere to develop a perfect manager out of an individual.

Department of Management Sciences (PUMBA), Savitribai Phule Pune University has since been a centre of learning and development. It has been constantly metamorphosing itself to be at the forefront of the evolutionary academic entity on one side and a skilled human resource provider to the corporate world on the other.

The Department of Management Sciences (PUMBA), Savitribai Phule Pune University , one of the first Management Institutes in India, is a pioneer by itself in the field of Management Studies.

Recently the University was granted the highest rating by the National Council of Assessment and Accreditation (Bangalore). The institutional grade 'A' with Five Stars was granted to the Institution making it one of the very few Universities in the country to have been so recognized. The University is also recognized by the University Grants Commission (UGC) as University of Potential Excellence. The Department, being one of the foremost departments of the University, was also subjected to the rigorous investigation carried out for the accreditation and is very glad to have come out successful. With the able and visionary leadership of the Vice-Chancellor of the University, Prof. (Dr.) W. N. Gade, we are certain of maintaining and exceeding the present standards.

Rankings & Awards

1. Ranked India's #41 best B-School. (Source-THE WEEK magazine's Hansa National Survey 2013)

2. Ranked 26th amongst top B-schools in the country. (Source-OUTLOOK September, 2009 issue)

3. Rated AAAA in the ratings of Best B-schools across India by careers360.

4. Ranked 16th amongst the top B-schools in the west zone by THE WEEK in 2013.

5. Ranked 18th top government B-school by THE WEEK in 2013.

6. 19th position amongst the Best public B-Schools of India Rankings 2013 by careers360.

7. Granted the highest rating by the National Council of Assessment and Accreditation(NAAC).

Conclusion

The researcher has discussed in detail the history of Pune city and also brief history of Savitri bai Phule Pune University and evolution of management studies in Pune University.

Now the researcher will go ahead with data analysis in her next chapter.

----------------------xxx-----------------------

CHAPTER – V

DATA ANALYSIS AND INTERPRETATION

5.1 Introduction

In this chapter data collected through the questionnaire has been analyzed with help of tables and graphs. The data available through rating questions and the total scores of all samples has been condensed in appendix of which mean and standard deviation was calculated and the same is used for hypothesis testing.

For hypothesis testing the co-relation was established between students, faculties and administrative officers wherever necessary.

5.2.1 How frequently do you visit college computer laboratory?

Table No. 5.1 shows the frequency of students visiting the college computer laboratory.

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Very frequently	95	21
2	Occasionally	150	33
3	Rarely	125	28
4	As and when required only	80	18
	Total	**450**	**100**

Graph No. 5.1 shows the frequency of students visiting the college computer laboratory

Graph shows opinion of the students in percentage
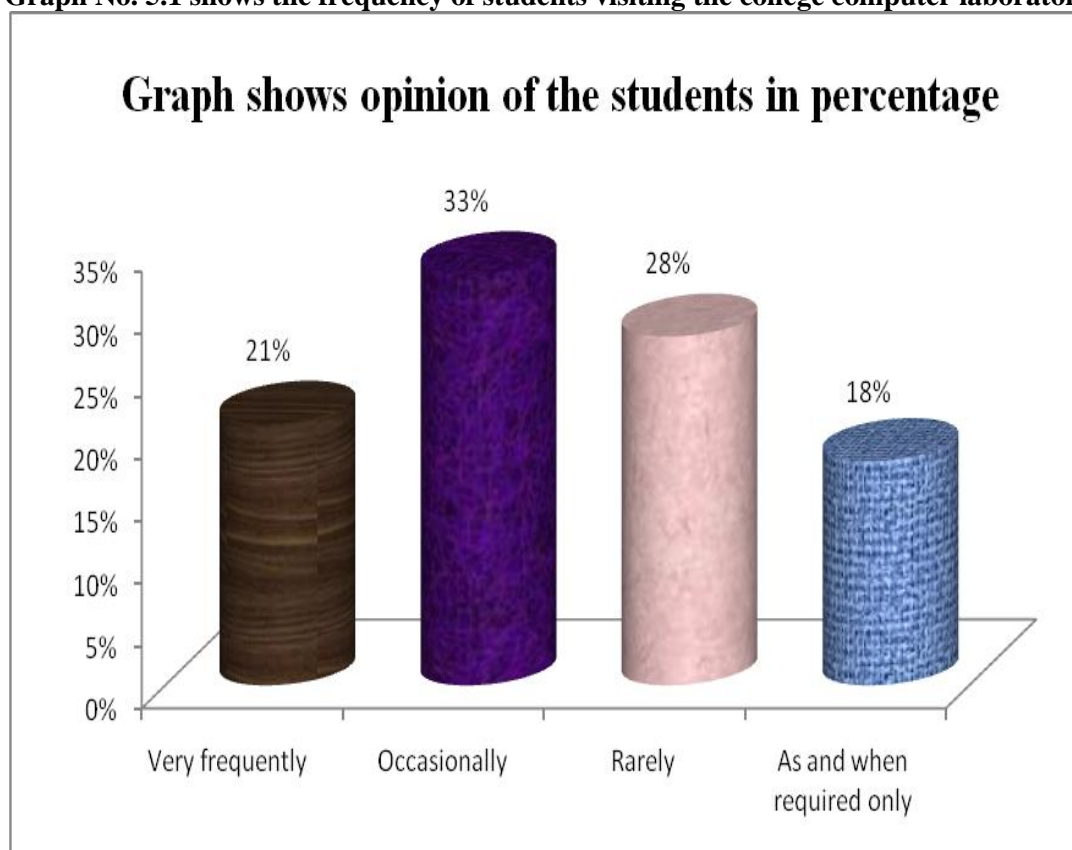
The above graph shows that 21% of the students visit the computer laboratory very frequently. 33% of the students visit the computer laboratory occasionally. 28% students said they rarely visit the computer laboratory. While 18% of the students visit the computer laboratory as and when required.

5.2 2 Is there Wi-Fi facility installed in your college?

Table No. 5.2 shows the number of colleges with wi-fi connectivity

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	375	83
2	No	75	17
	Total	**450**	**100**

Graph No. 5.2 shows the number of colleges with wi-fi connectivity

Graph shows opinion of the students in percentage

83%

17%
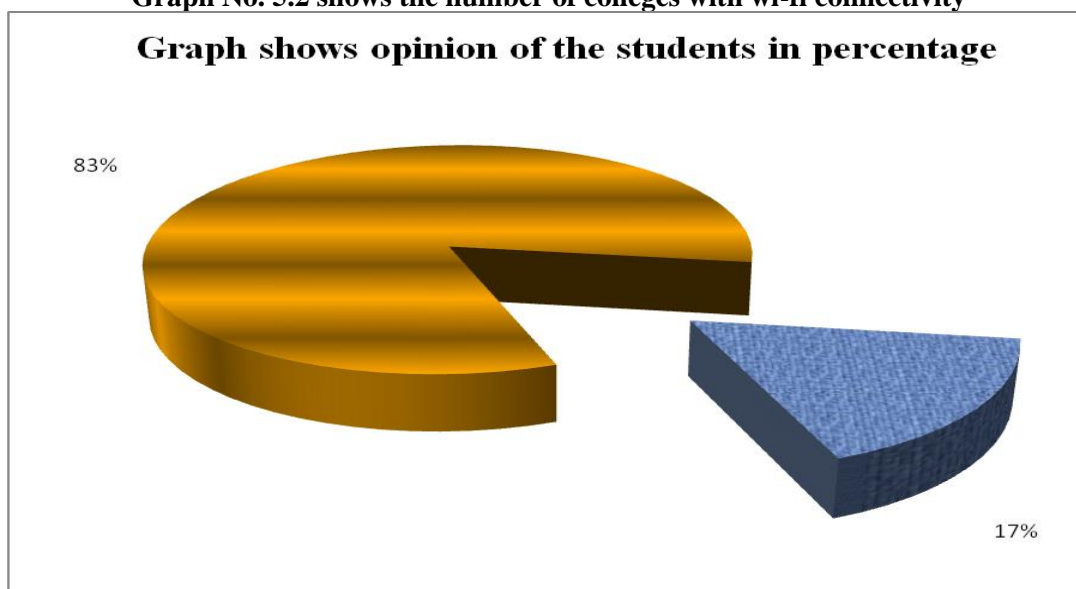
The above graph shows that 83% of the students said Wi-Fi facility is installed in their college. While 17% said there is no Wi-Fi facility installed in their college

5.2.3 How frequently does your faculty use Power Point Presentation [PPT] during lectures?

Table No. 5.3 shows the frequency of PPT lectures by the faculties

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Twice in a week	125	28
2	Once in a week	100	22
3	Occasionally	150	33
4	Not at all	75	17
	Total	**450**	**100**

Graph No. 5.3 shows the frequency of PPT lectures by the faculties

Graph shows opinion of the students in percentage
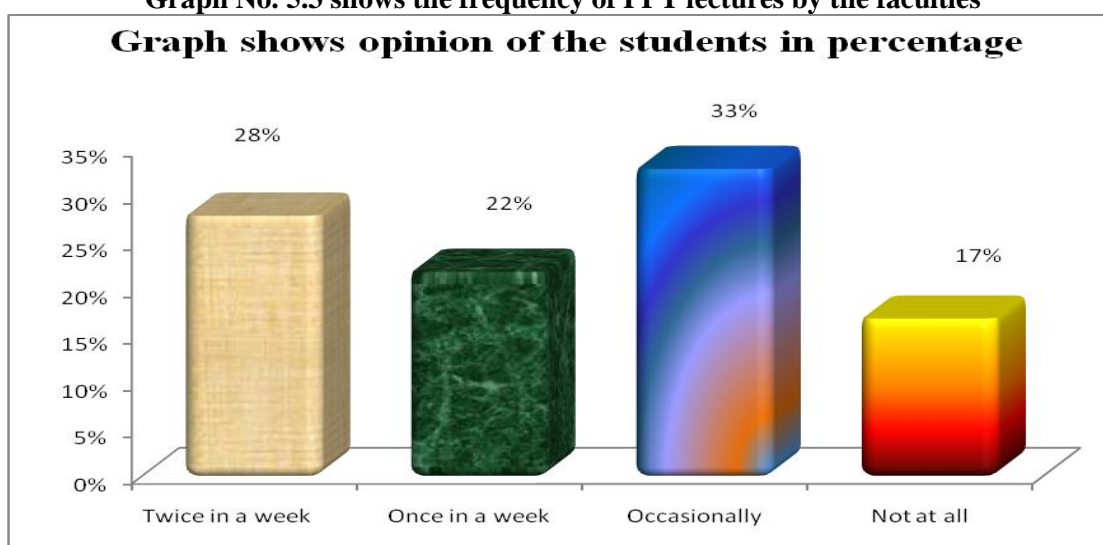
The above graph shows that 28% of the students said that their faculties use Power Point Presentation twice in a week during lectures. 22% of the students said that their faculties use Power Point Presentation once in a week during lectures. 33% students said occasionally their faculties use Power Point Presentation during lectures. While 17% of the students their faculties never use Power Point Presentation during lectures

5.2.4 Does your college library have E-Journals subscription and internet facility provided in computers?

Table No. 5.4 shows the opinions of students on E-journal facility

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	400	89
2	No	50	11
	Total	450	100

Graph No. 5.4 shows the opinions of students on E-journal facility
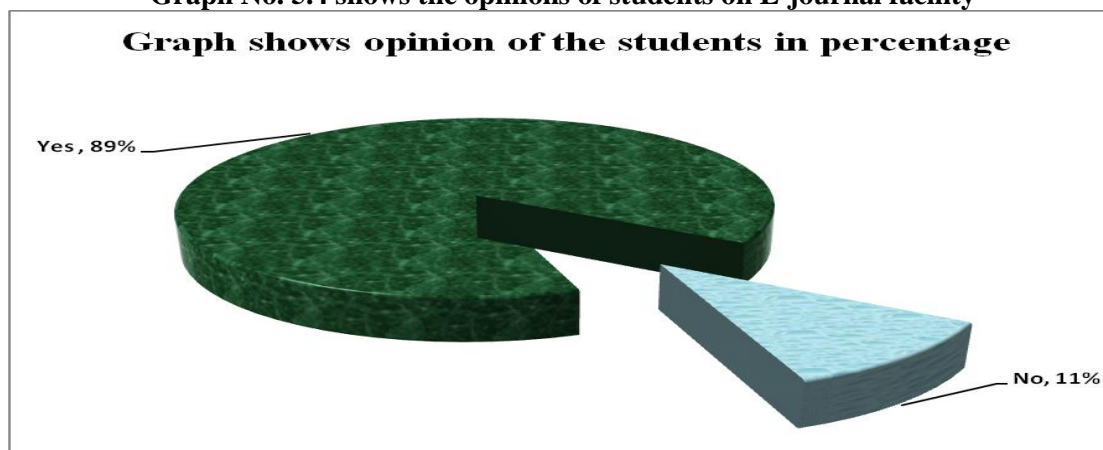
The above graph shows that 89% of the students said their college library has E-Journals subscription and internet facility provided in computers. While 11% said their college library has no E-Journals subscription and internet facility provided in computers.

5.2.5 How do you rate the faculty performance with computer and its applications?

Table No. 5.5 shows the opinions of students on the performance of faculties with computers.

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Very good	125	28
2	Good	100	22
3	Average	50	11
4	Poor	100	22
5	Very poor	75	17
	Total	450	100

Graph No. 5.5 shows the opinions of students on the performance of faculties with computers.
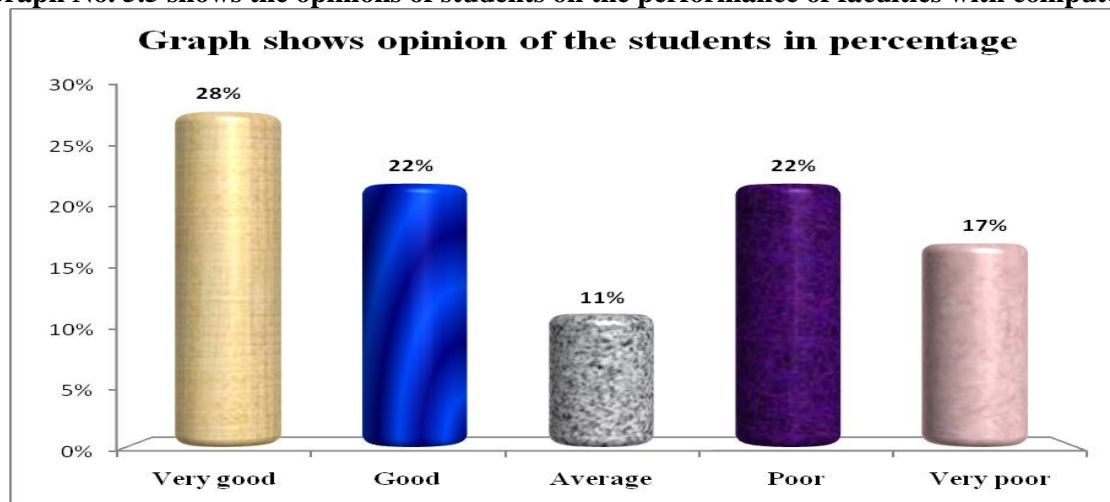
The above graph shows that 28% of the students said that their faculties' performance with computer and its applications is very good. 22% of the students said that their faculties' performance with computer and its applications is good. 11% of the students said that their faculties' performance with computer and its applications is average. 22% of the students said that their faculties' performance with computer and its applications is poor, and 17% of the students said that their faculties' performance with computer and its applications is very poor.

5.2.6   Do you go online for subject tuitions from your faculties?

Table No. 5.6 shows the opinion of students on online subject tuitions

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	75	17
2	No	375	83
	Total	**450**	**100**

Graph No. 5.6 shows the opinion of students on online subject tuitions
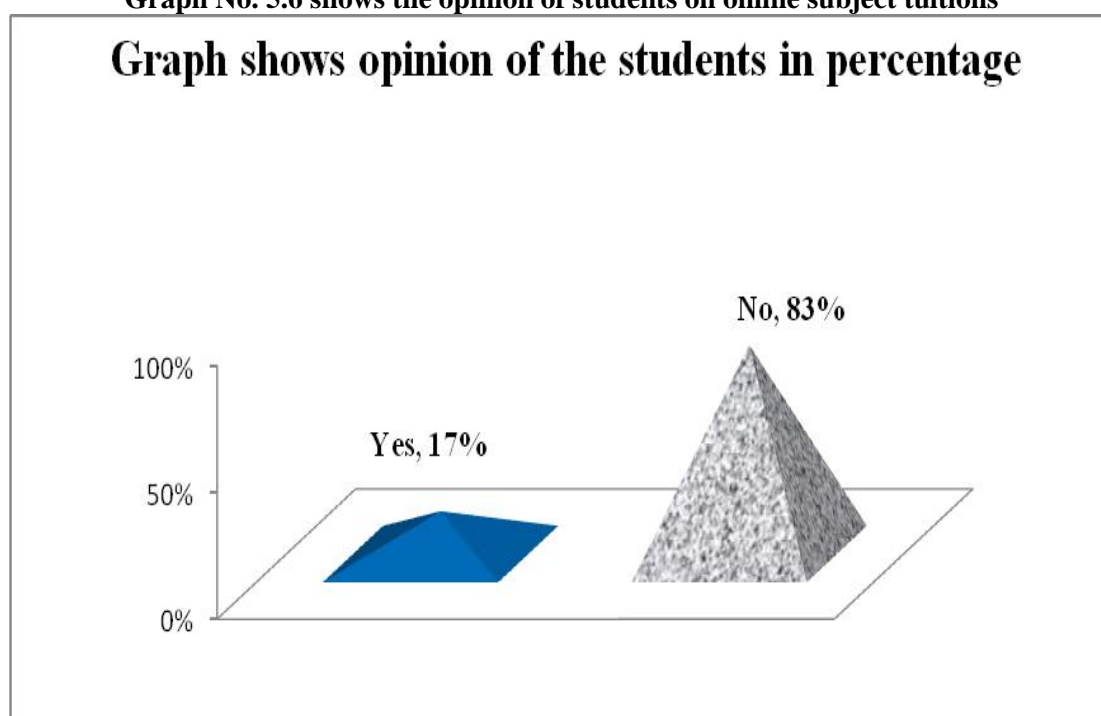
The above graph shows that 17% of the students agreed that they go for online tuitions for subject tuitions from their faculties. But 83% of the students said that they do not go for online tuitions for subject tuitions from their faculties.

5.2.7   How much time do you spend on internet for educational data surfing in a day?

Table No. 5.7 shows the opinion of students the time they spend on internet

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	3 to 4 hrs	50	11
2	2hrs	25	5
3	1 hrs	125	28
4	More than 4 hrs	75	17
5	Less than 1 hrs	175	39
	Total	450	100

Graph No 5.7 shows the opinion of students the time they spend on internet
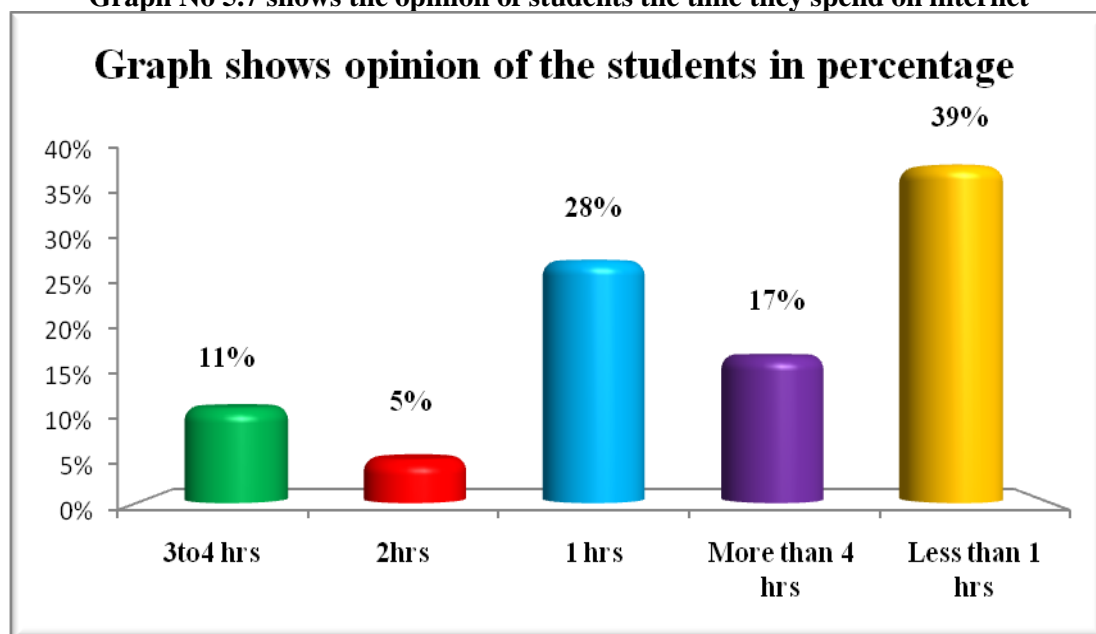
Graph shows opinion of the students in percentage

- 3to4 hrs: 11%
- 2hrs: 5%
- 1 hrs: 28%
- More than 4 hrs: 17%
- Less than 1 hrs: 39%

The above graph shows that 11% of the students said that they spend 3 to 4 hours on internet for educational data surfing in a day. 5% of the students said that they spend 2hours on internet for educational data surfing in a day. 28% of the students said that they spend 1hour on internet for educational data surfing in a day. 17% of the students said that they spend more than 4hours on internet for educational data surfing in a day. While 39% of the students said that they spend less than 1hour on internet for educational data surfing in a day.

5.2.8   Do you work online for university administrative purposes like exam forms, online exams, online payments and other works?

Table No. 5.8 shows the opinion of students working online for administrative works

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	275	61
2	No	175	39
	Total	**450**	**100**

Graph No. 5.8 shows the opinion of students working online for administrative works

Graph shows opinion of the students in percentage

- Yes, 61%
- No, 39%
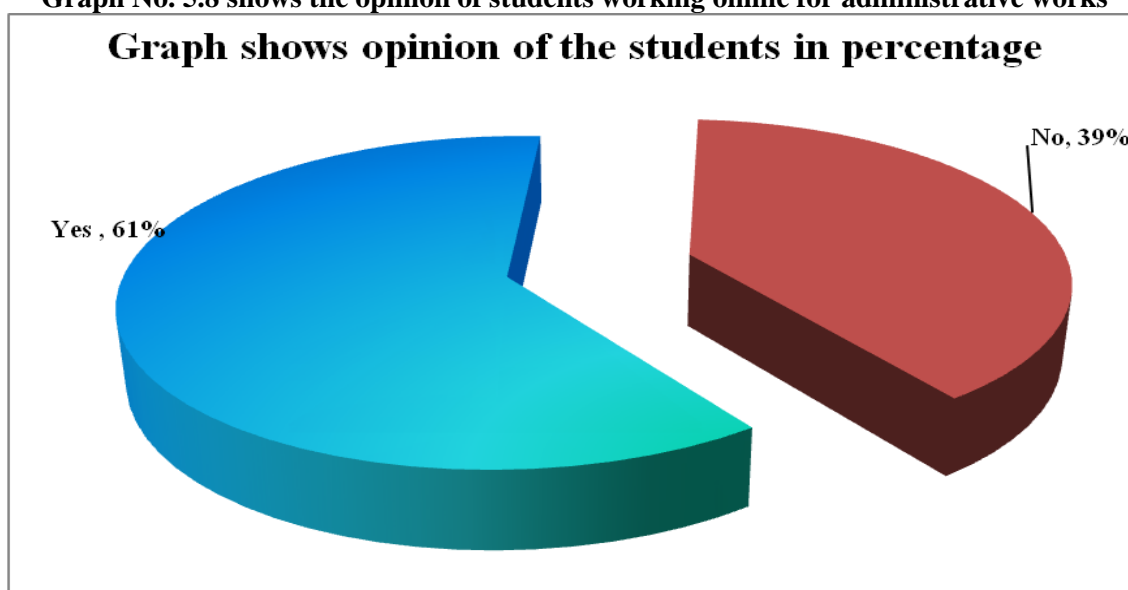
The above graph shows that 61% of the students said that they work online for university administrative purposes like exam forms, online exams, online payments and other works. While 39% of the students said that they do not work online for university administrative purposes like exam forms, online exams, online payments and other works.

5.2.9 Have you ever tried to write research papers and submit them to conference organizers or national//international journals through online process?

Table No. 5.9 shows the opinion of students writing research papers through online process

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	25	6
2	No	425	94
	Total	**450**	**100**

Graph No. 5.9 shows the opinion of students writing research papers through online process
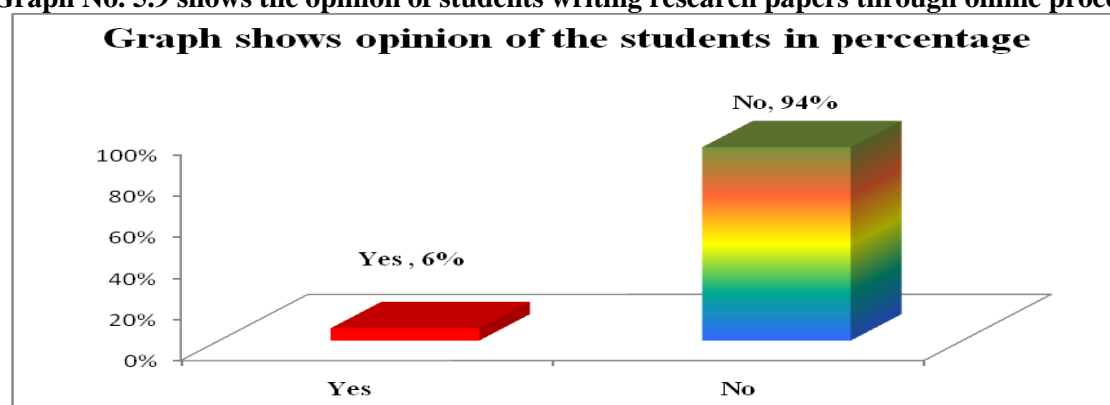
The above graph shows that 6% students said that they have written research papers and submitted them to conference organizers for national / International journals through online process, but 94% of the students said they have not tried to write any paper for the conference/ for any national or international paper.

6 How do you rate the performance of internet facilities of your college?

Table No. 5.10 shows the opinion of students about their college's internet facilities and performance

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Very good	125	28
2	Good	150	33
3	Average	75	17
4	Poor	75	17
5	Very poor	25	6
	Total	**450**	**100**

Graph No. 5.10 shows the opinion of students about their college's internet facilities and performance

The above graph shows that 28% of the students said that internet facilities in their college are very good. 33% of the students said that their college provides good internet facilities for them. 17% of the students said that their college's internet facilities are average. 17% of the students said that internet facilities in their college are poor, another 6% of the students said that internet facilities in their college are very poor.

5.2.11   Has every class room of your institute been facilitated with projector and screen for PPT and slide exhibitions to the students?

Table No. 5.11 shows the opinion of students about institute's facilitation with projector and screen for PPT

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	50	11
2	No	400	89
	Total	**450**	**100**

Graph No. 5.11 shows the opinion of students about institute's facilitation with projector and screen for PPT

Graph shows opinion of the students in percentage
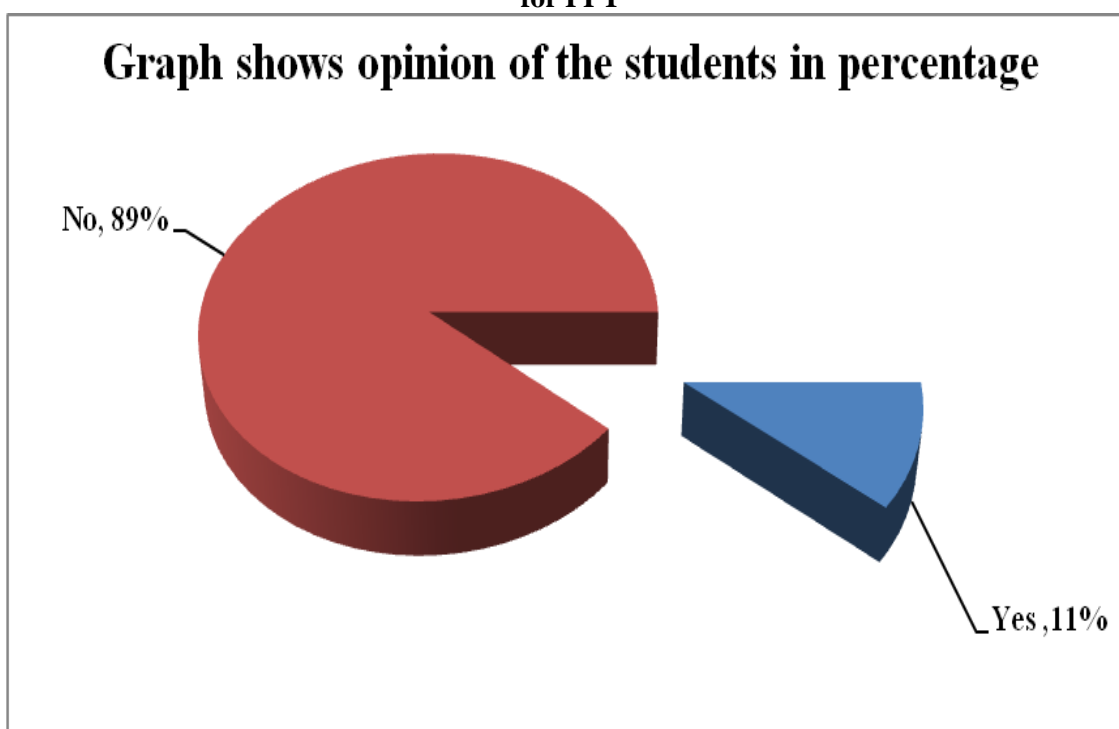
The above graph shows that 11% of the students said that every class room of their institute been facilitated with projector and screen for PPT and slide exhibitions to the students, but 89% of the students said their class rooms have no projector or screen.

5.2.12   How do you rate the effectiveness of ICT and its tools in your institute?

Table No. 5.12 shows the opinion of students about the effectiveness of ICT and its tools in their institute

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Very good	75	17
2	Good	80	18
3	Average	150	33
4	Poor	125	28
5	Very poor	20	4
	Total	**450**	**100**

Graph No. 5.12 shows the opinion of students about the effectiveness of ICT and its tools in their institute
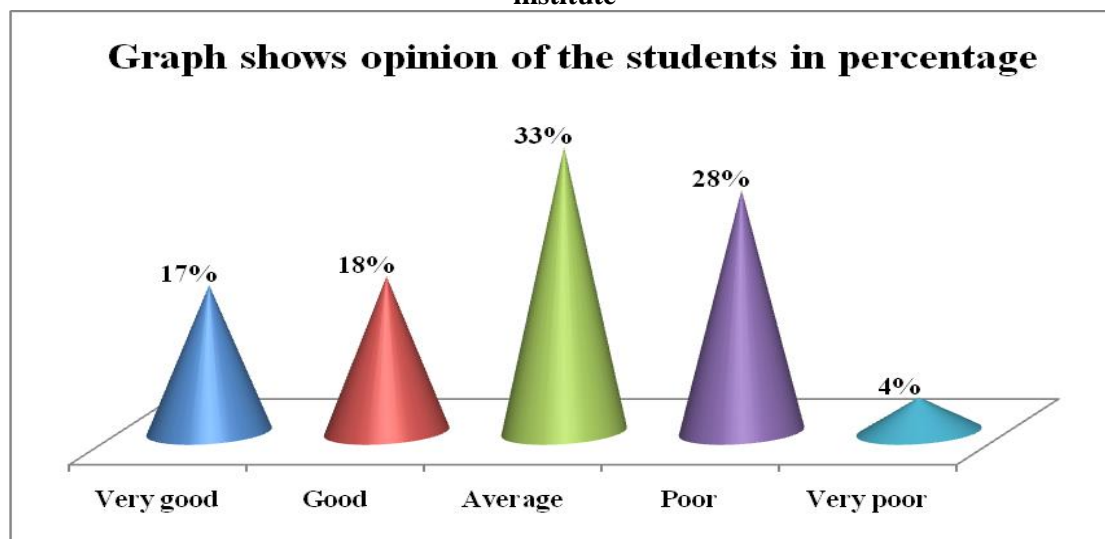
The above graph shows that the students opinion regarding the effectiveness of ICT and its tools in their institute. 17% of the total students opine that the effectiveness of ICT and its tools in their institute are very good. 18% of the total students said that the ICT and its tools in their institute are good. 33% of the total students said that the ICT and its tools in their institute are average. While 28% students said the ICT and its tools in their institute are poor. Another 4% students said the ICT and its tools in their institute are very poor.

5.2.13 Do you think ICT has given relief to the burden of stationary expenditure to the institute administration?

Table no 5.13 shows the opinion of students about the relief to the institute administration from the burden stationary expenditure

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	275	61
2	No	175	39
	Total	**450**	**100**

Graph No. 5.13 shows the opinion of students about the relief to the institute administration from the burden stationary expenditure
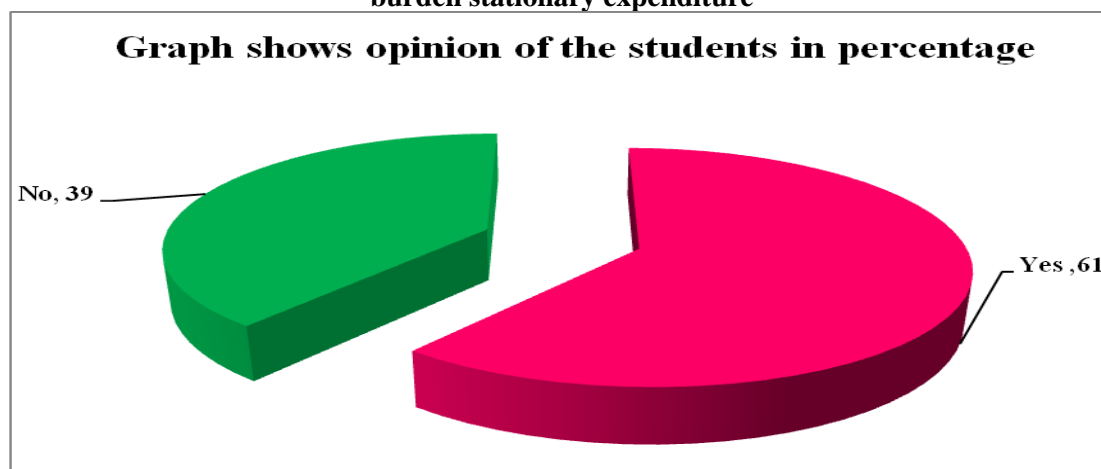
The above graph shows that 61% of the total students think that really ICT has given relief to the burden of stationary expenditure to the institute administration. But 39% of the total students think that ICT has not given any type of relief to the burden of stationary expenditure to the institute administration.

5.2.14 How do you rate your agreement that ICT has generated new and fast methods of communication systems in this world?

Table No. 5.14 shows the opinion of students about the new and fast methods of communication systems in this world due to ICT

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Completely agree	96	21
2	Agree	144	32
3	Cant say	110	24
4	Disagree	75	17
5	Completely disagree	25	6
	Total	450	100

Graph No. 5.14 shows the opinion of students about the new and fast methods of communication systems in this world due to ICT
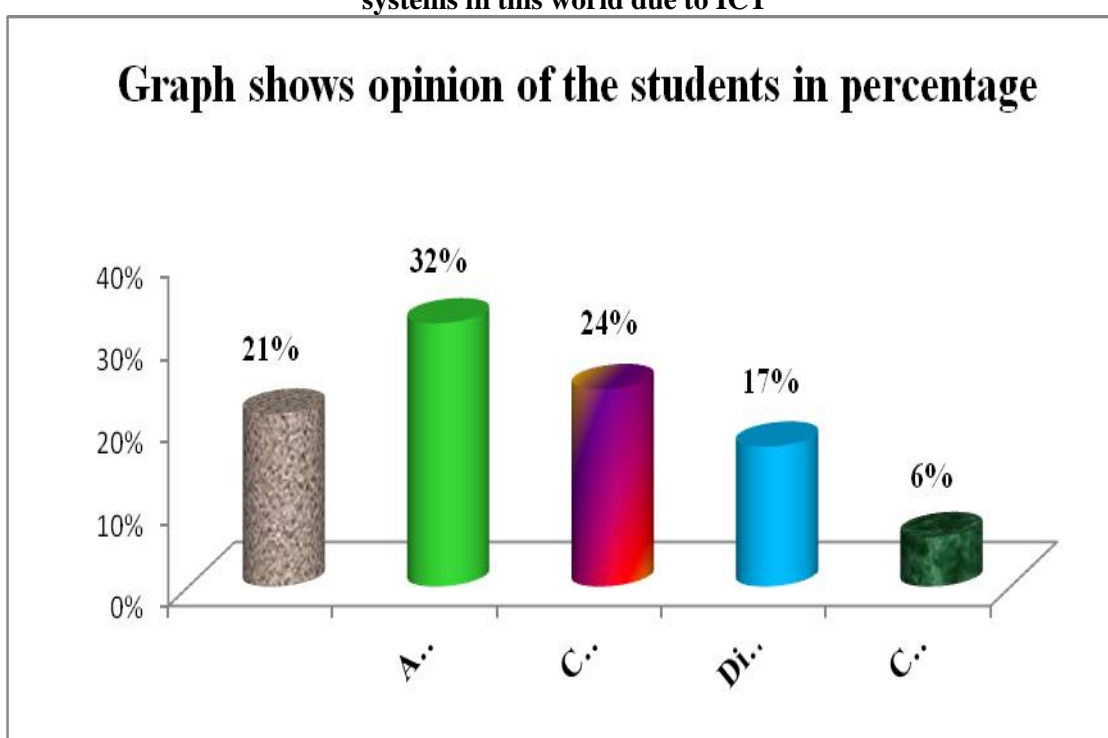
The above graph shows that 21% of the total students completely agree that ICT has generated new and fast methods of communication systems in this world. 32% of the total students agree that ICT has generated fast and new methods of communication systems in this world. 24% of the total students said that they can't say anything about the ICT and its fast and new communication systems in this world. 17% of the total students disagree that ICT has generated fast and new methods of communication systems in this world. 6% of the total students completely disagree that ICT has generated new and fast methods of communication systems in this world.

5.2.15 Which method of knowledge imparting methods do you feel are most effective?

Table No. 5.15 shows the opinion of students about the effective methods of knowledge imparting

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	PPT Methods	125	28
2	Online tutors	75	17
3	Chalk and Talk Methods	150	33
4	Other Methods	100	22
	Total	450	100

Graph No. 5.15 shows the opinion of students about the effective methods of knowledge imparting

Graph shows opinion of the students in percentage
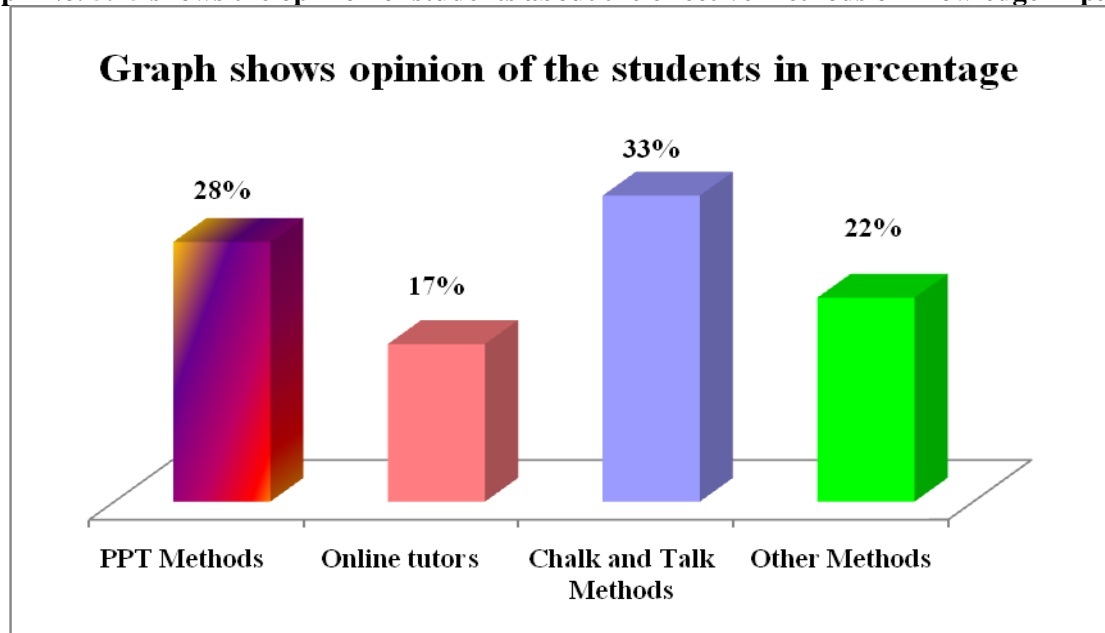
The above graph shows students opinion about the effective method of knowledge imparting methods. 28% of the students feel that PPT method is the best method to impart knowledge effectively. 17% of the students feel that online tutors can impart knowledge effectively. But 33% students feel that chalk and talk method is the best method to impart knowledge. While 22% students opine that there are other methods to impart knowledge.

Hypothesis testing No. -1

Step1- Hypothesis writing

H0- ICT enables the students to understand and analyze the subjects easily in management institutes.

H1- ICT enables the students to understand and analyze the subjects with difficulty in management institutes

Step 2 : Statistical test

Statistical test the "t-test" is chosen because the data or ratio measurements assuming the population to be normal and having randomly selected the sample from the given population we consider the third step.

Step 3 : Significance level.

Let $\alpha = 0.05$ with n1 and n2 pairing being 450 and 180 respectively.

Step 4 : Degree of freedom and "t" value

Here in our case

n1 - Number of student samples - 450

n2 - Number of faculty samples - 180

X1 - Mean of student samples - 60.89

X2 - Mean of faculty samples - 61.50

S1 - Standard Deviation - 6.5

S2 - Standard Deviation - 6.18

$$d.f. = \frac{(s_1^2/n_1 + s_2^2/n_2)^2}{(s_1^2/n_1)^2/(n_1 - 1) + (s_2^2/n_2)^2/(n_2 - 1)}.$$

73

Degree of freedom (d.f.) =

$[(6.5)^2 / 450 + (6.18)^2 / 180]^2$

$[(6.5)^2 / 450]^2 / (450 -1) + [(6.18)^2 / 180]^2 / (180 – 1)]$

d.f. = 0.0000196/0.000256

=0.076

$$t = \frac{\overline{X}_1 - \overline{X}_2}{s_{\overline{X}_1 - \overline{X}_2}}$$

where

$$s_{\overline{X}_1 - \overline{X}_2} = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}.$$

t= 60.89-61.50/√0.306

= -0.61/05532

=-1.102

Step 5 : Critical test value
Critical test value – from the tables of critical values of "t" for given probability levels drawn from **"Table – 3"** of **"Fisher& Yates" (Exibit C – 2, page. No 670 "Business Research Methods"** by **"Donald R Cooper"** 9th edition The McGraw Hill Publications) with 0.076 degree of freedom and level of significance value of 0.05 we get the critical values of about - 0.056

Step 6 : Interpretation
Now in our case the calculated value of "t" is greater than the critical value therefore we accept the null hypothesis that ICT enables the students to understand and analyze the subjects easily in management institutes.

Table No. 5.16 Shows Use of ICT Tools

Sr.No.	ICT Tool	No of Respondents	Percentage (%)
1	Computer	400	89
2	E-Mail	375	83
3	Internet	400	89
4	Mobile Phones	425	94
5	Printers	90	20
6	Scanners	80	18
7	Fax	25	6

The above table shows that nearly all the students use computer and internet services (89%) and mobile phones 94% and E-Mail services (83%) The use of mobile phones is highly significant because it is fast and easy to communicate and improve their knowledge.

Table No. 5.17 Shows Barriers in use of ICT by students and faculties.

Sr.No.	Barriers	No. of respondents	Percentage
1	Wi-Fi Connections	125	28
2	Digital Boards	90	20
3	Obsolete equipments	100	22
4	Interconnectivity problem	75	17
5	Basic knowledge application	60	13

The above table shows the various problems faced by the faculties and students in utilizing the ICT effectively in their colleges. It is found that nearly 28% of the respondents say that there is no Wi-Fi connection provided by the college authorities. Secondly 20% of the respondents saying that the equipments installed in the colleges are of inferior quality which are big barrier in effective use of ICT. Another 22% of the respondents complain that there exists interconnectivity problem when using internet services. 17% of the faculties say that there is no digital board provided by the college authority for effective use of ICT in teaching the students effectively.13% of respondents complain of no basic knowledge of technology applications to use the equipments effectively for developing knowledge.

Table No. 5.18 shows Purpose of use of ICT tools by respondents.

Sr.No.	Purpose of use of ICT tools	No of respondents	Percentage
1	Research	60	13
2	Education	175	39
3	Entertainment	110	24
4	Communication	105	24

Graph No. 5.16 shows the No. of respondents using ICT for various purposes

Graph shows the no. 5.16 of respondents using ICT for various purposes
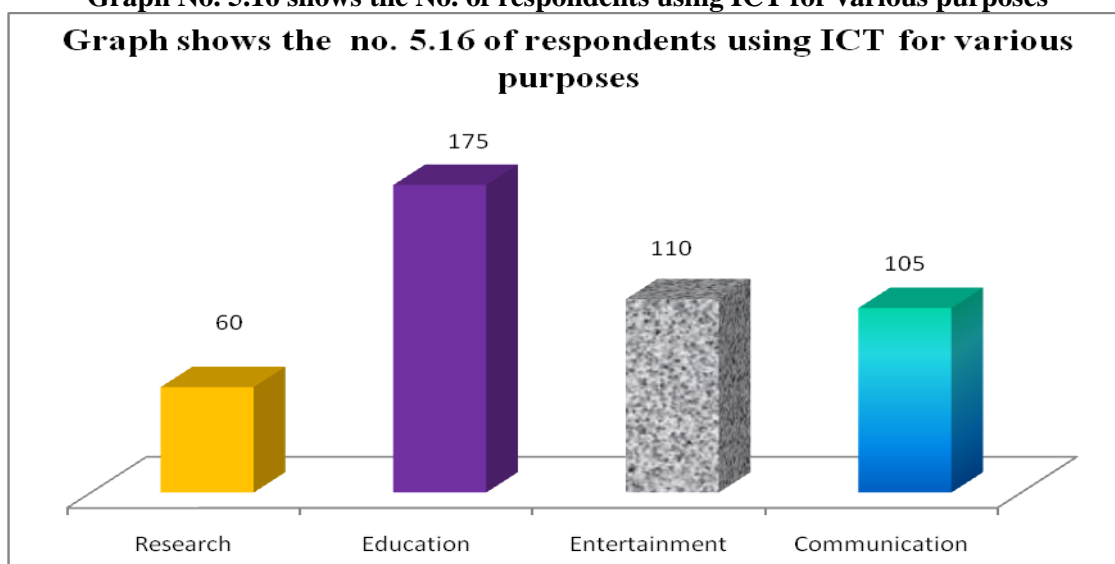
The above table and graph show the various purposes of use of ICT tools by the respondents. Most of the respondents use ICT tools for gaining knowledge. Here 13% of the respondents use ICT tools FOR educational purpose.39% of the respondents' use ICT tools for entertainment purpos whereas 24%of the respondents use for the purpose of communication and 24% of the respondents use ICT tools for the purpose of research works.

Response on Influence of ICT on academic efficiency

A] Use of conventional documents has decreased ---20%

B] Dependency on ICT tools has increased   ---98%

C] expedited the research process   ---54%

D] Improved professional competency   ---75%

Satisfaction with ICT tools

A] Completely satisfied   45%

B] Partially satisfied   25%

C] Least satisfied   20%

D] No comments   10%

5.2.17 Which method of teaching do you adopt most? (Faculty)

Table No. 5.19 shows the opinion of faculties about the adoption of effective teaching methods

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Chalk& Talk	65	36
2	PPT Slides	68	38
3	Pictorial	25	14
4	Online tutor	22	12
	Total	**180**	**100**

Graph No. 5.17 shows the opinion of faculties about the adoption of effective teaching methods
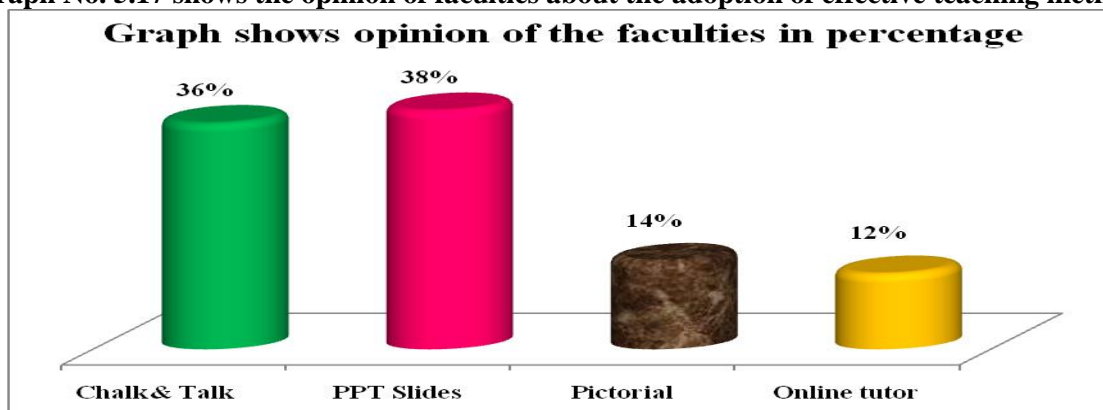
The above graph shows 38% of faculties said that they prefer to adopt PPT slides method for teaching most effectively. According to 36% of faculties chalk and talk method of teaching is most effective. While 14% faculties opine that pictorial method is the most effective method of teaching. But another 12% of the total faculties feel online teaching is the best method to teach effectively.

5.2.18 How do you rate the response of the students for chalk &talk lectures? (Faculty)

Table No. 5.20 shows the opinion of faculties about the response of students for chalk &talk lectures

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Very good	62	34
2	Good	24	13
3	Average	37	21
4	Poor	27	15
5	Very poor	30	17
	Total	**180**	**100**

Graph No. 5.18 shows the opinion of faculties about the response of students for chalk &talk lectures
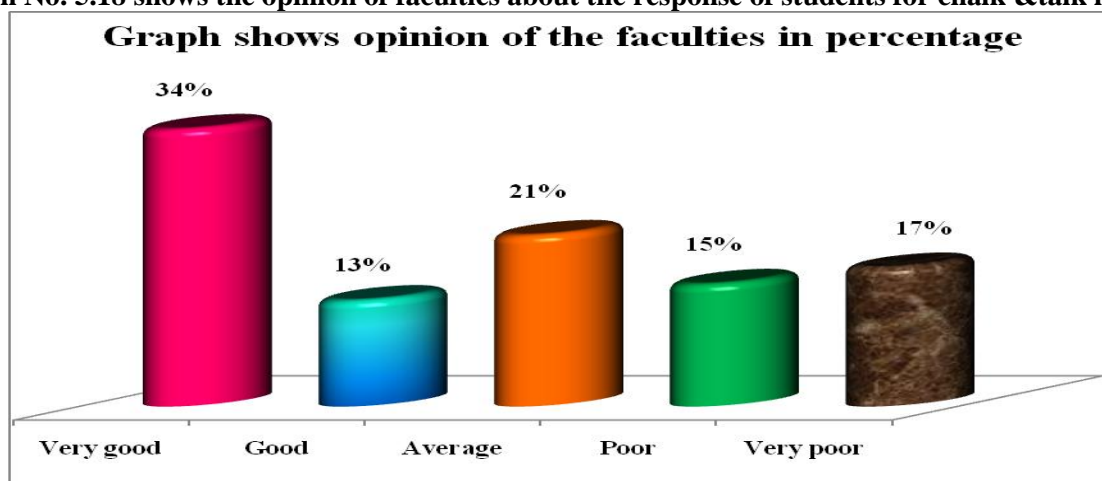
The above graph shows faculties views regarding response of the students for chalk &talk lectures. 34% of the total faculties expressed that the response of the students for chalk and talk form of the lectures is very good. While 13% of the total faculties said that students show good response for chalk and talk form of the lectures. 21% faculties told response of the students for chalk and talk form of the lectures is average effective. Another 15% of the total faculties said that students show poor response for chalk and talk form of the lectures. And 17% of the total faculties said that response of the students for chalk and talk form of the lectures is very poor.

5.2.18 How do you rate the response of the students for PPT Slides lectures? (Faculty)

Table no 5.21 shows the opinion of faculties about the response of the students for PPT Slides lectures

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Very good	50	28
2	Good	65	36
3	Average	36	20
4	Poor	24	13
5	Very poor	5	3
	Total	180	100

Graph No. 5.19 shows the opinion of faculties about the response of the students for PPT Slides lectures
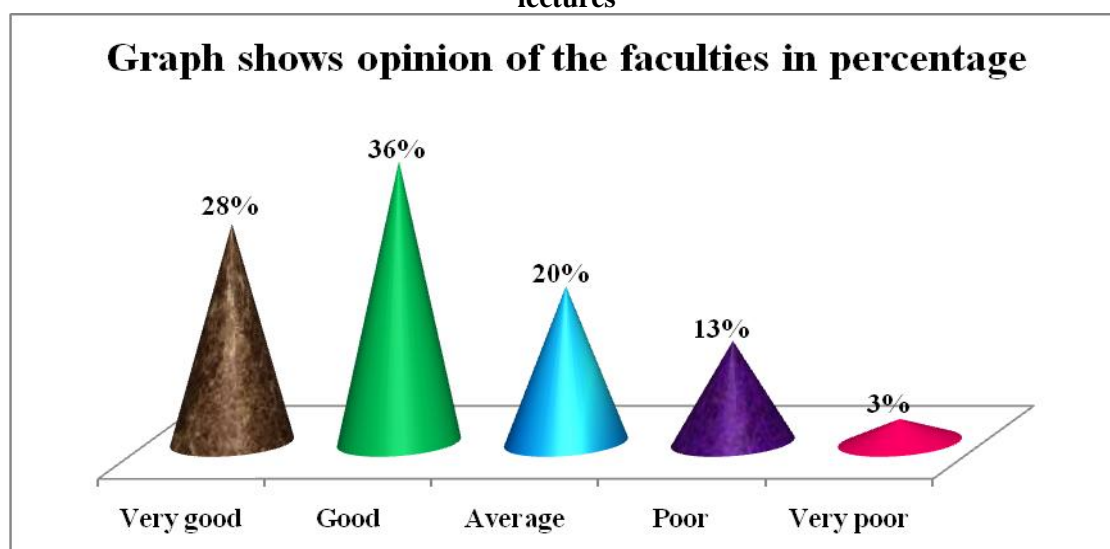
The above graph shows faculties views regarding the response of students for PPT Slides lectures. 28% of the total faculties expressed that students response for PPT slides lectures is very good. While 36% of the faculties said that students response is good for PPT slides lectures. 20% faculties said that students show average response for PPT slides lectures. Another 13% of the faculties said that students response is poor for the PPT slides lectures and only 3% of the faculties expressed that the students response is very poor for the PPT slides lectures.

5.2.19 How do you rate the response of the students for online tutors? (Faculty)

Table No. 5.22 shows the opinion of faculties about the response of the students for online tutors

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Very good	15	8
2	Good	10	6
3	Average	22	12
4	Poor	58	32
5	Very poor	75	42
	Total	180	100

Graph No. 5.20 shows the opinion of faculties about the response of the students for online tutors

Graph shows opinion of the faculties in percentage

Average, 12%

Poor, 32%

Good, 6%

Very good, 8%

Very poor, 42%
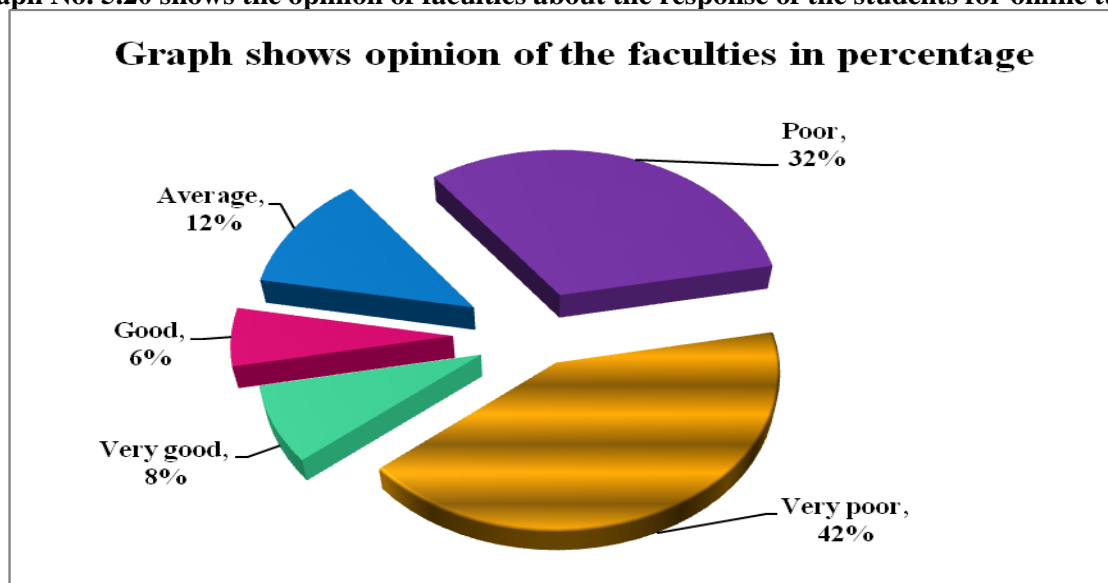
The above graph shows faculties views regarding the response of students for online tutors. 8% of the total faculties expressed that students response for online tutors is very good. 6% of the total faculties told students show good response for online tutor. While 12% of the faculties said that students response for online tutors is average. 32% of the total faculties said that students show poor response for online tutors. But 42% of the total faculties said that students response for online tutors is very poor.

5.2.20 The student's response to the classes has improved after implementation of digital teaching

Table No. 5.23 shows the opinion of faculties about the response of the students to the classes after implementing digital teaching

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Completely agree	90	50
2	Agree	40	22
3	No change	10	6
4	Disagree	15	8
5	Completely disagree	25	14
	Total	**180**	**100**

Graph No. 5.21shows the opinion of faculties about the response of the students to the classes after implementing digital teaching

Graph shows opinion of the faculties in percentage

Completely agree 50%

Agree 22%

No change 6%

Disagree 8%

Completely disagree 14%
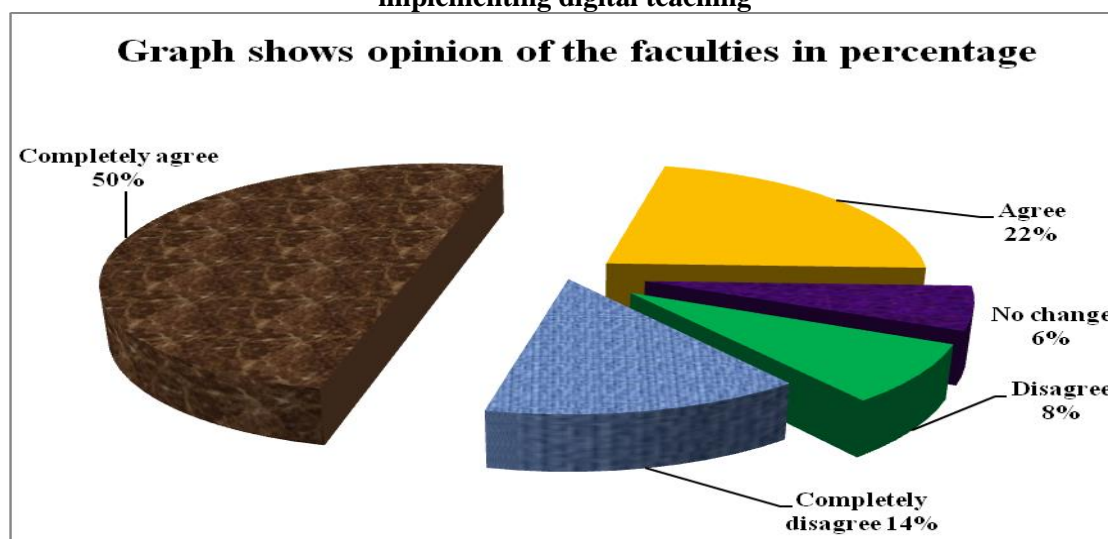
The above graph shows faculties' views regarding the response of students to the classes that has improved after implementation of digital teaching. According to 50% faculties said they completely agree that students turn up to the classes have improved after the digitization of class rooms. 22% faculties agreed that students turn up to the classes have improved after implementation of digital teaching. 6% faculties said that students turn up to the classes have not changed after implementation of digital teaching. 8% faculties said they disagree that students response to the classes has improved after implementation of digital teaching. 14% faculties completely disagree that students response to the classes has improved after implementation of digital teaching.

5.2.21 Do you think the students are able to understand better with ICT technology? (Faculty)

Table No. 5.24 shows the opinion of faculties about the students ability to understand ICT technology better

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	105	58
2	No	75	42
	Total	**180**	**100**

Graph No. 5.22 shows the opinion of faculties about the students ability to understand ICT technology better

Graph shows opinion of the faculties in percentage

No 42%

Yes 58%
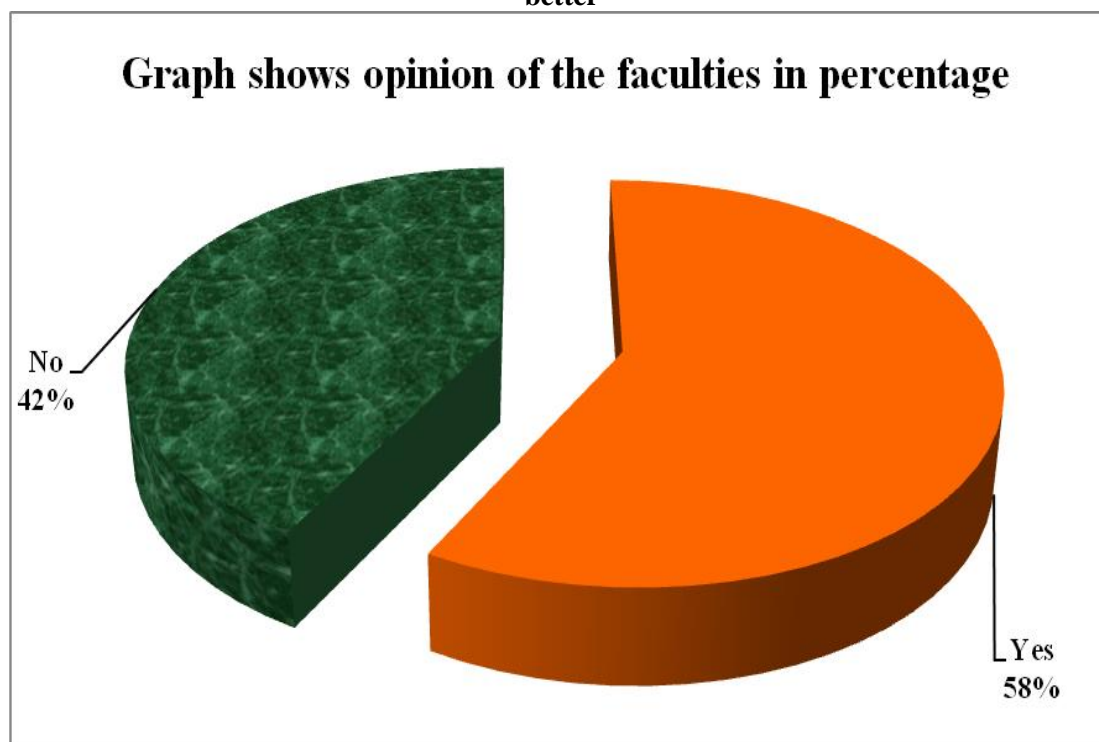
The above graph shows faculties views regarding students ability to understand ICT technology better. 58% of the faculties opine that students are able to understand ICT technology better. Another 42% of the faculties expressed that students are not able to understand ICT technology better

5.2.22 Does your institute encourage you to teach with help of ICT tools? (Faculty)

Table No. 5.25 shows the opinion of faculties about the encouragement from the institute for their teaching with the help of ICT tools

Sr.no.	Particulars	No. of opinions	Percentage of opinion
1	Yes	155	86
2	No	25	14
	Total	**180**	**100**

Graph no 5.23 shows the opinion of faculties about the encouragement from the institute for their teaching with the help of ICT tools
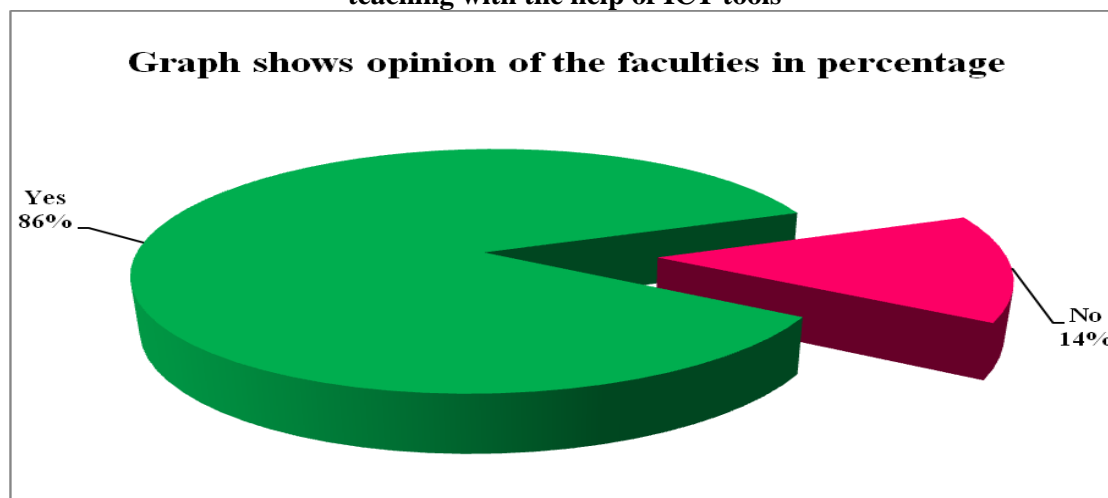
The above graph shows faculties views regarding encouragement they get by the institute to teach with help of ICT tools. 86% of the faculties agreed that they get encouragement by the institute to teach with help of ICT tools. 14% of the faculties told they do not get any type of encouragement by the institute to teach with help of ICT tools

5.2.23 Do you feel the library of your institute is well equipped with internet services for online surfing and E-journal access and reading? (Faculty)

Table No. 5.26 shows the opinion of faculties about the libraries with internet services for different study purposes

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Completely agree	65	36
2	Agree	55	31
3	No comment	20	11
4	Disagree	25	14
5	Completely disagree	15	8
	Total	**180**	**100**

Graph No. 5.24 shows the opinion of faculties about the libraries with internet services for different study purposes
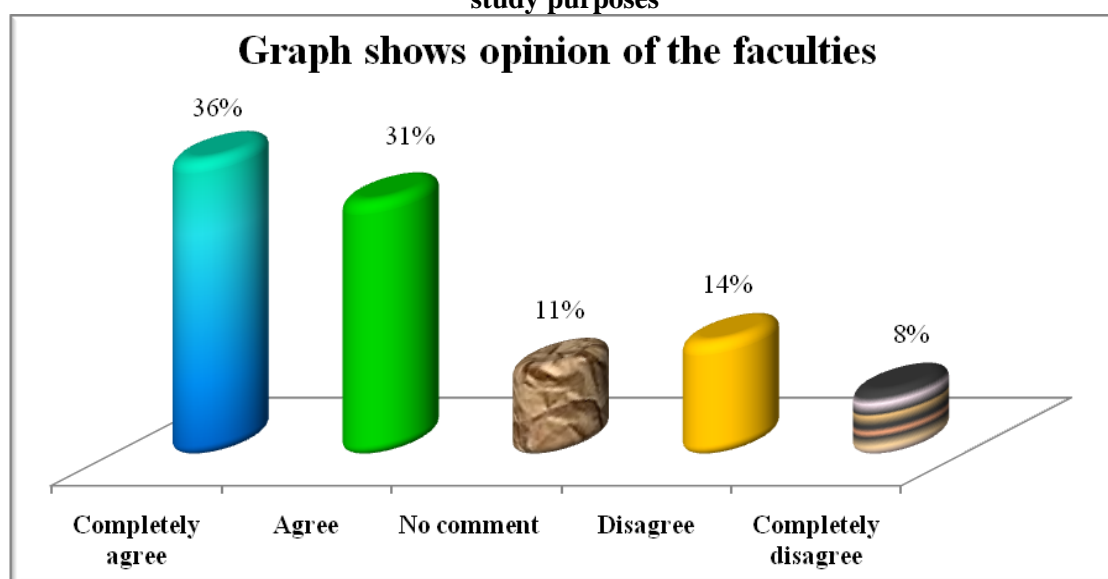
The above graph shows faculties views regarding the library of their institutes with its well equipped internet services for online surfing and E-journal access and reading. 36% of the faculties said that they completely agree the library of their institutes with its well equipped internet services for online surfing and E-journal access and reading. While 31% of the faculties said that they agree the library of their institutes with its well equipped internet services for online surfing and E-journal access and reading. Another 11% of the faculties said that they do not want to comment regarding the library of their institutes with its well equipped internet services for online surfing and E-journal access and reading. But 14% of the faculties said that they disagree that the library of their institutes have well equipped with internet services for online surfing and E-journal access and reading. 8% of the faculties said that they completely disagree that the library of their institutes have well equipped with internet services for online surfing and E-journal access and reading

5.2.24 Inter-college activities of Pune University have become easily accessible to the students with help of ICT technology? (Faculty)

Table No.5.27 shows the opinion of faculties about the ICT technology that helped students to get information of Inter-college activities of Pune University

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Completely agree	90	50
2	Agree	45	25
3	No comment	15	8
4	Disagree	10	6
5	Completely disagree	20	11
	Total	180	100

Graph No.5.25 shows the opinion of faculties about the ICT technology that helped students to get information of Inter-college activities of Pune University
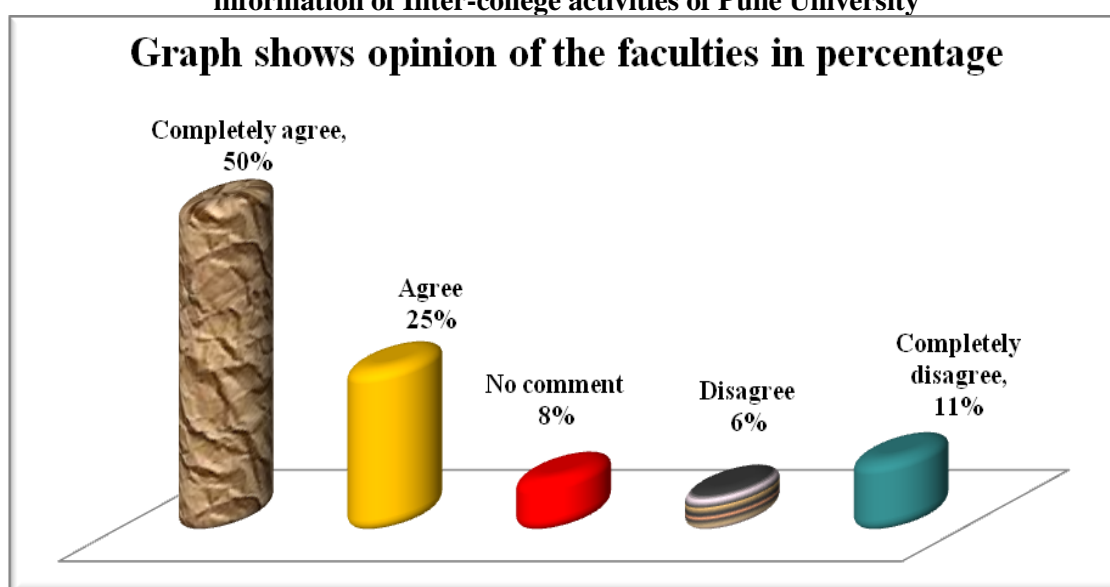
The above graph shows the faculties views regarding easy accessibility of Inter-college activities of Pune University to the students with help of ICT technology. 50% of the faculties said that they completely agree that the accessibility of Inter-college activities of Pune University to the students has become easy with the help of ICT technology. While 25% of the faculties said that they agree that the accessibility of Inter-college activities of Pune University to the students has become easy with the help of ICT technology. Another 8% of the faculties said that they have no comments regarding the easy accessibility of Inter-college activities of Pune University to the students y with the help of ICT technology. 6% of the faculties said that they disagree that the accessibility of Inter-college activities of Pune University has become easy to the students with the help of ICT technology. But 11% of the faculties said that they completely disagree that with the help of ICT technology students can access and know about the activities of Pune University easily.

5.2.25   Do you think that investment on ICT Tools by the management of the institute is justified? (Faculty)

Table No. 5.28 shows the opinion of faculties about the justification of investment on ICT tools

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	95	53
2	No	85	47
	Total	180	100

Graph No. 5.26 shows the opinion of faculties about the justification of investment on ICT tools

Graph shows opinion of the faculties in percentage

No 47%

Yes 53%
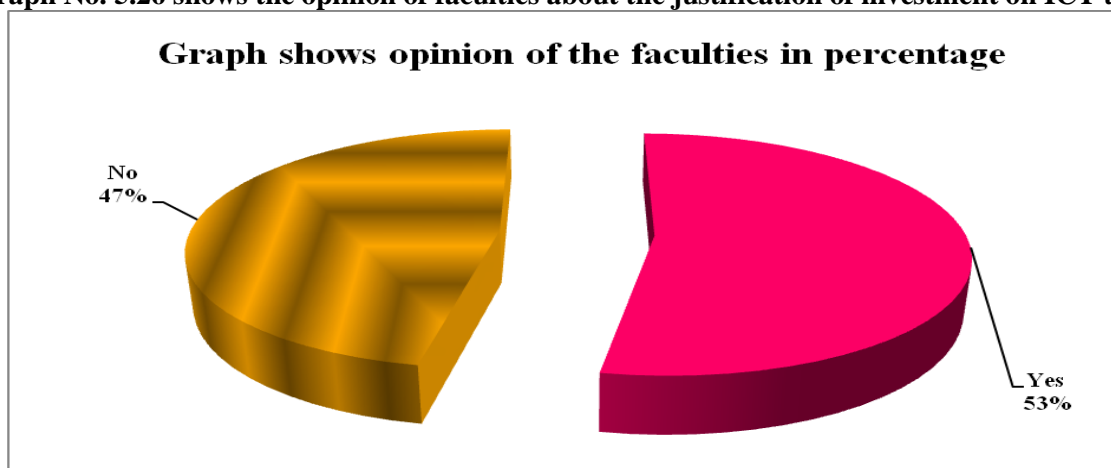
The above graph shows the faculties view regarding the investment on ICT Tools by the management of the institute is justified or not. 47% of the faculties said that the investment on ICT Tools by the management of the institute is not at all justified. But 53% of the faculties said that the investment on ICT Tools by the management of the institute is justified.

5.2.26   Do you think that E-Mail services are effective enough to teach the subject matter to the students successfully? (Faculty)

Table No. 5.29 shows the faculties views regarding effectiveness of E-Mail services to teach the subject matter to the students successfully

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	60	33
2	No	120	67
	Total	180	100

Graph No.5. 27 shows the faculties views regarding effectiveness of E-Mail services to teach the subject matter to the students successfully

Graph shows opinion of the faculties in percentage

No 67%

Yes 33%
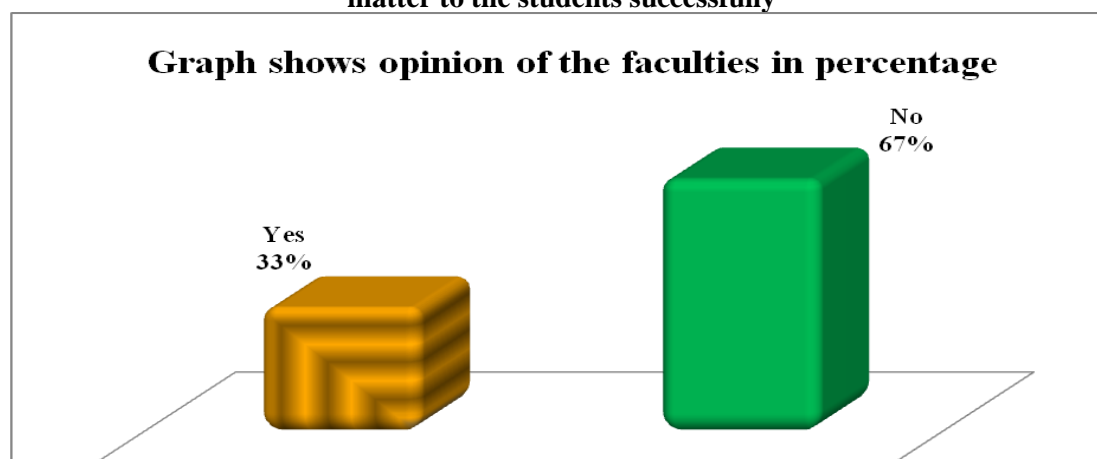
The above graph shows the faculties views regarding effectiveness of E-Mail services to teach the subject matter to the students successfully. 33% of the faculties said that the E-Mail services are effective enough to teach the subject matter to the students successfully. But 67% of the faculties said that the E-Mail services are not so effective to teach the subject matter to the students successfully.

5.2.27 What is the percentage of students who effectively adopt ICT as a tool to improve their knowledge? (Faculty)

Table No. 5.30 shows the faculties views regarding effectiveness of ICT tool to improve students knowledge

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	More than 60%	40	22
2	50%	30	17
3	45%-40%	25	14
4	Less than 30%	85	47
	Total	**180**	**100**

Graph No.5. 28 shows the faculties views regarding effectiveness of ICT tool to improve students knowledge
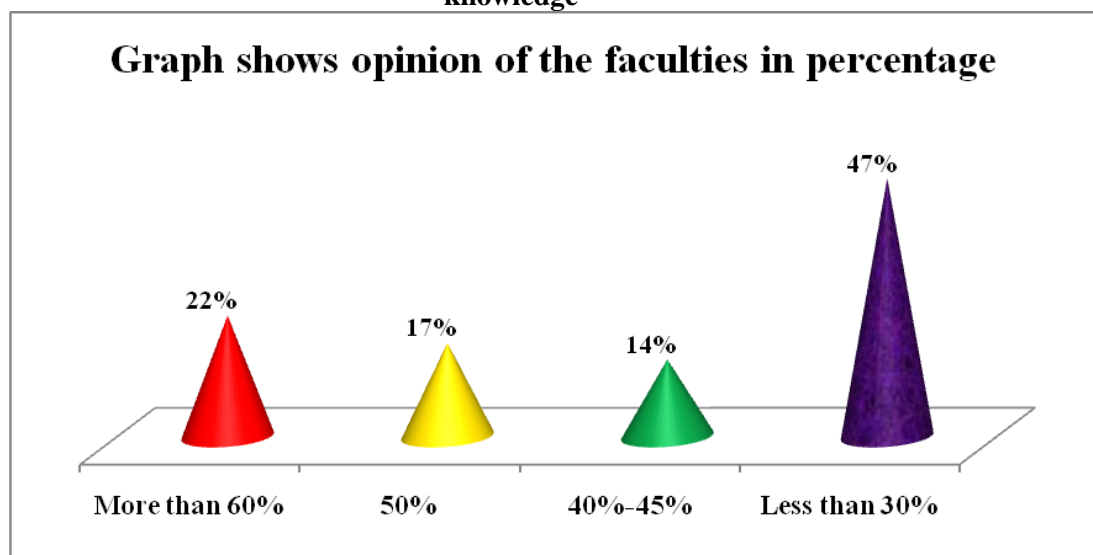
The above graph shows the faculties views regarding the percentage of students who effectively adopt ICT as a tool to improve their knowledge. According to 22% of the faculties more than 60% students have effectively adopted ICT tool to improve their knowledge. While 17% of the faculties said that 50% students effectively adopt ICT tool to improve their knowledge. 14% of the faculties said that 40%-45% students have effectively adopted ICT tool to improve their knowledge. And 47% of the faculties said that less than 30% students effectively adopt ICT tool to improve their knowledge

5.2.28 Today what's App has been effectively used by the students to send messages and also gather information, so how do you rate the performance of this software in mobiles? (Faculty)

Table No. 5.31 shows the faculties views regarding effectiveness of What's App's performance to gather information

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Very good	80	44
2	Good	70	39
3	Average	05	3
4	Poor	10	6
5	Very poor	15	8
	Total	**180**	**100**

Graph No. 5.29 shows the faculties views regarding effectiveness of What's App's performance to gather information
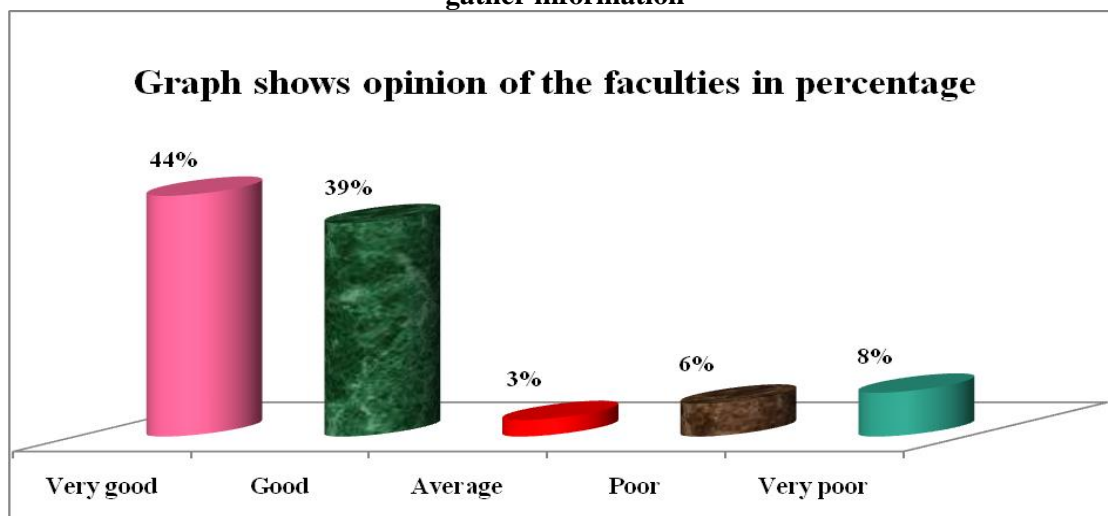
The above graph shows the faculties views regarding the performance of what's App software in students mobiles which is used to send messages and also gather information. According to 44% of the faculties, the performance of what's App software is very good to send messages and also gather information. Another 39% of the faculties, opine it is good to students to use What's App software which is used to send messages and also gather information. 3% of the faculties said that the performance of What's App software in mobiles is average which is used to send messages and also gather information. While 6% of the faculties, said that the performance of What's App software in mobiles is poor which is used to send messages and also gather information. And another 8% of the faculties, said that the performance of What's App software in mobiles is very poor which is used to send messages and also gather information.

5.2.29 Do you think that digital and online systems have damaged the good binding between the teacher and student? (Faculty)

Table No.5.32 shows the faculties views regarding the damaged good binding between the teacher and student due to digital and online systems

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	140	78
2	No	40	22
	Total	**180**	**100**

Graph No. 5.30 shows the faculties views regarding the damaged good binding between the teacher and student due to digital and online systems
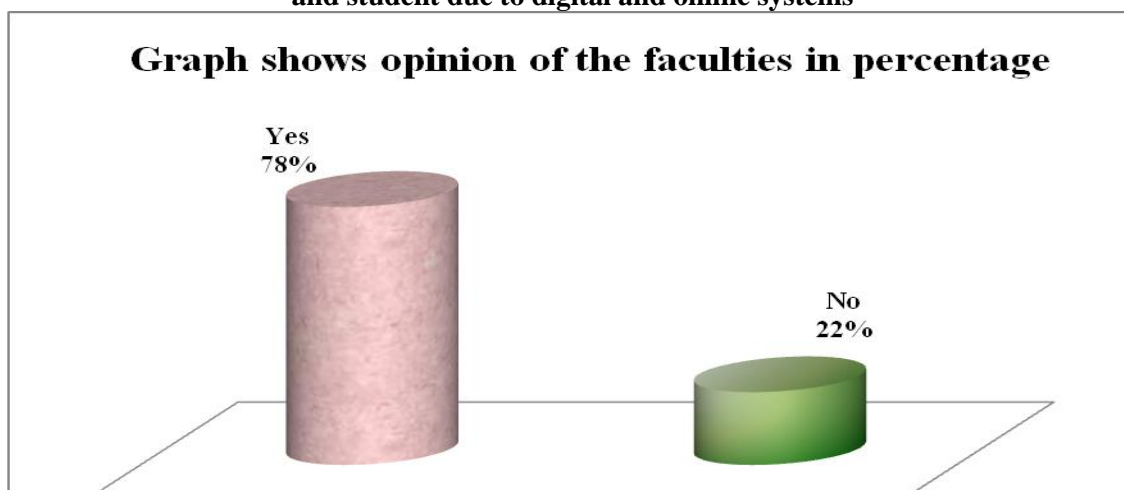
The above graph shows the faculties views regarding the damaged good binding between the teacher and students due to the digital and online systems. According to 22% of the faculties the binding between the teacher and students has not damaged due to the digital and online systems. But 78% of the faculties expressed that the good binding between the teacher and students has damaged due to the digital and online systems.

Hypothesis Testing -2

Step 1 : Hypothesis Writing

H0 - Educational standards in management institutes is highly upgraded by ICT.

H1- Educational standards in management institutes is poorly upgraded by ICT.

Step 2 : Statistical test

Statistical test the "t" test is chosen because the data or ratio measurements assuming the population to be normal and having randomly selected the sample from the given population we consider the third step.

Step 3 : Significance level.

Let $\alpha = 0.05$ with n1 and n2 pairing being 180 and 450 respectively.

Step 4 : Degree of freedom and "t" value

Here in our case

n1- Number of faculty samples-180

n2- Number of student samples- 450

X1- Mean of faculty samples - 61.50

X2- Mean of student samples - 60.89

S1- Standard Deviation- 6.18

S2-Standard Deviation- 6.5

$$\text{d.f.} = \frac{(s_1^2/n_1 + s_2^2/n_2)^2}{(s_1^2/n_1)^2/(n_1 - 1) + (s_2^2/n_2)^2/(n_2 - 1)}.$$

Degree of freedom (d.f.) =

$[(6.18)^2 / 180 + (6.5)^2 / 450]^2$

_____

$[(6.18)^2 / 180]^2 / (180 - 1) + [(6.5)^2 / 450]^2 / (450 - 1)]$

d.f. = 0.020

$$t = \frac{\overline{X}_1 - \overline{X}_2}{s_{\overline{X}_1 - \overline{X}_2}}$$

$$s_{\overline{X}_1 - \overline{X}_2} = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}.$$

Where

t = 61.50-60.89/√0.306

= 0.61/0.553

= 1.103

Step 5 : Critical test value

Critical test value – from the tables of critical values of "t" for given probability levels drawn from "**Table – 3**" of "**Fisher& Yates**" (**Exibit C – 2, page. No 670 "Business Research Methods"** by "**Donald R Cooper"** 9th edition The McGraw Hill Publications) with 0.020 degree of freedom and level of significance value of 0.05 we get the critical values of about 0.059

Step 6 : Interpretation

Now in our case the calculated value of "t" is greater than the critical value therefore we accept the null hypothesis that Educational standards in management institutes is highly upgraded by ICT.

5.2.30 Do you think ICT has improved the administrative efficiency of your institute in information and communication procedures? (Administrators)

Table No. 5.33 shows the faculties views regarding the improved the administrative efficiency in information and communication procedures due to ICT

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	55	31
2	No	125	69
	Total	**180**	**100**

Graph No. 5.31 shows the faculties views regarding the improved the administrative efficiency in information and communication procedures due to ICT

Graph shows opinion of Administrators in percentage

No, 69%

Yes , 31%
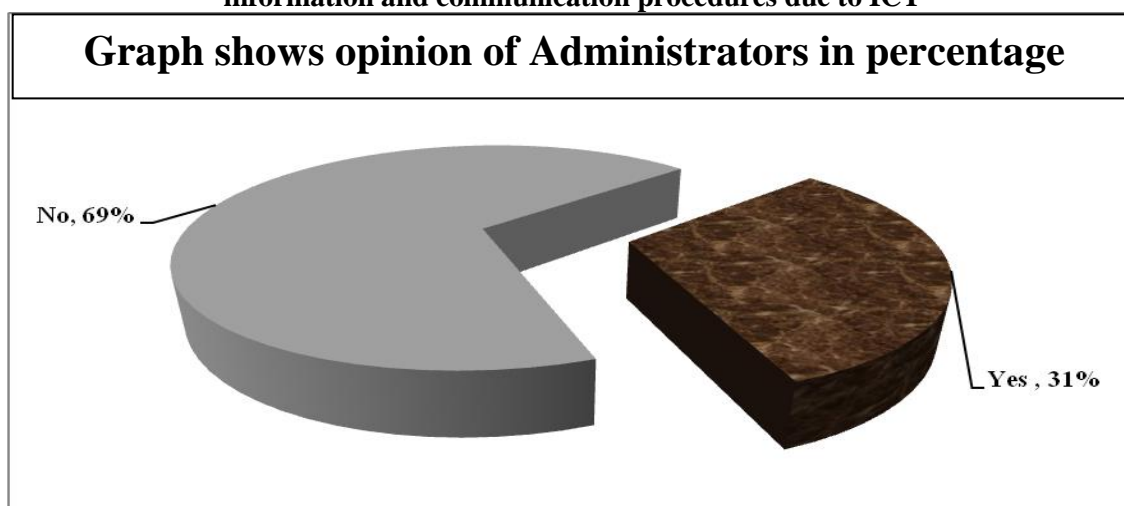
The above graph shows the Administrators views regarding improved administrative efficiency of their institute in information and communication procedures due to ICT. According to 31% of Administrators agreed that administrative efficiency of their institute in information and communication procedures have improved due to ICT. 69% of Administrators did not agree that administrative efficiency of their institute in information and communication procedures have improved due to ICT.

5.2.31 How do you rate the benefits of ICT for the students in the learning and communication process? (Administrators)

Table No. 5.34 shows the administrators views regarding the benefits of ICT for the students in the learning and communication process

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Very good	75	42
2	Good	55	31
3	Average	20	11
4	Poor	18	10
5	Very poor	12	6
	Total	**180**	**100**

Graph No. 5.32 shows the administrators views regarding the benefits of ICT for the students in the learning and communication process
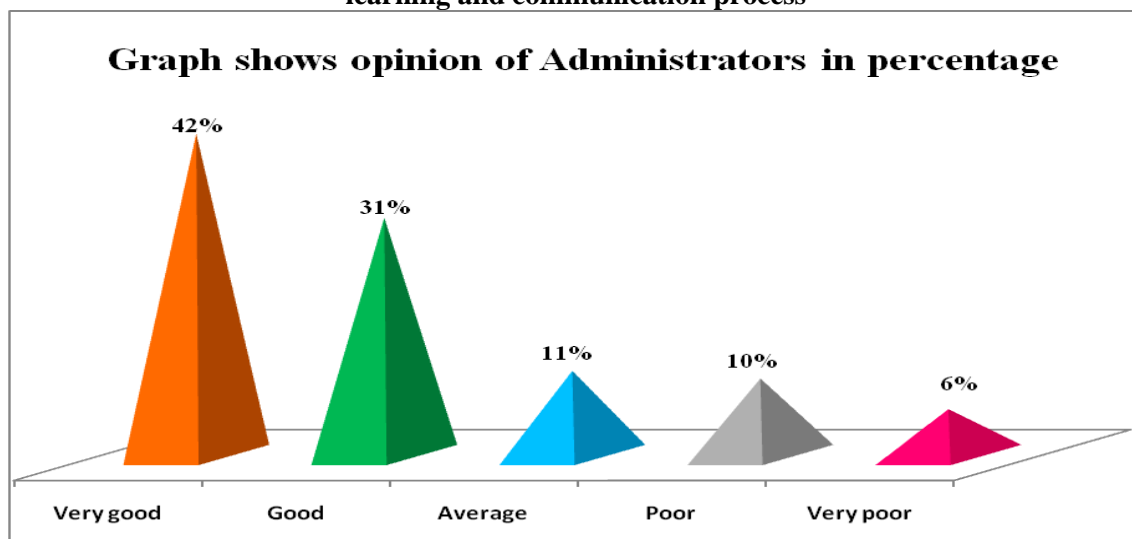
The above graph shows the Administrators views regarding the benefits of ICT for the students in the learning and communication process. According to 42% of the administrators the benefits of ICT for the students in the learning and communication process are very good. While 31% of the administrators said that students are getting good benefits by ICT for the learning and communication process. 11% of the administrators opine that students are getting average benefits for the learning and communication process by ICT. Another 10% of the administrators told students are getting poor benefits by ICT for the learning and communication process. And 6% of the administrators expressed that the benefits of ICT for the students in the learning and communication process are very poor.

5.2.32 Are the administrative and faculties of your institute well trained to effectively use and teach the students with help of new technology? (Administrators)

Table No. 5.35 shows the administrators views regarding the effective use of new technology by well trained teachers in teaching

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	95	53
2	No	85	47
	Total	**180**	**100**

Graph No. 5.33 shows the administrators views regarding the effective use of new technology by well trained teachers in teaching
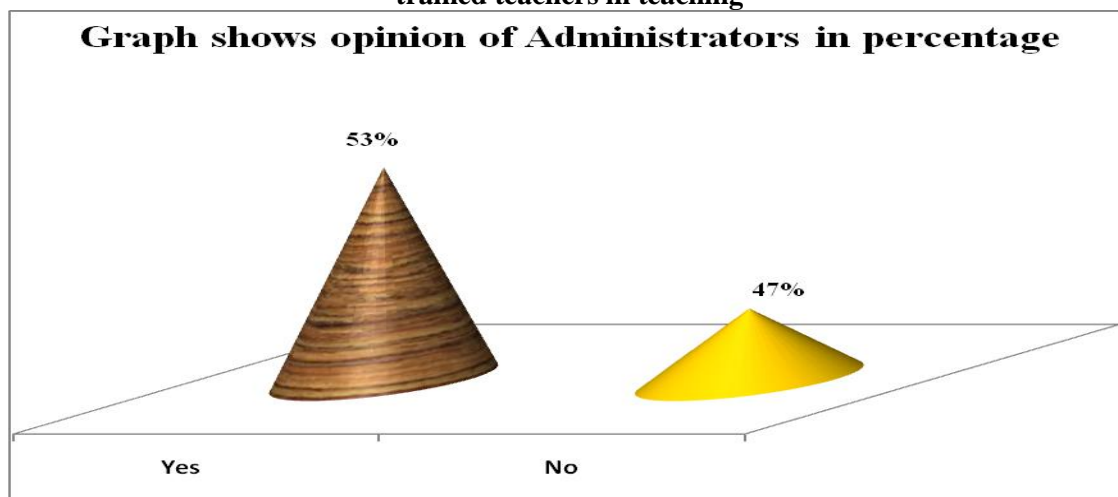
The above graph shows the Administrators views regarding the effective use of new technology in teaching and other administrative works by their institutes well trained administrative and faculties. According to 53% administrators, with help of new technology, their trained faculties are teaching effectively and administrators use technology effectively. While 47% administrators said that, with help of new technology, their trained faculties' teaching is not so effective and administrators do not use technology effectively.

5.2.33 How do you rate the effectiveness of ICT in fulfilling your institute's information and communication procedures with regulatory bodies like University, AICTE or DTE and other external affiliated bodies? (Administrators)

Table No. 5.36 shows the administrators views regarding the effectiveness of ICT in fulfilling their institute's information and communication procedures with regulatory bodies.

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Very high	62	34
2	High	58	32
3	Average	25	14
4	Low	15	8
5	Very low	20	11
	Total	**180**	**100**

Graph No. 5.34 shows the administrators views regarding the effectiveness of ICT in fulfilling their institute's information and communication procedures with regulatory bodies
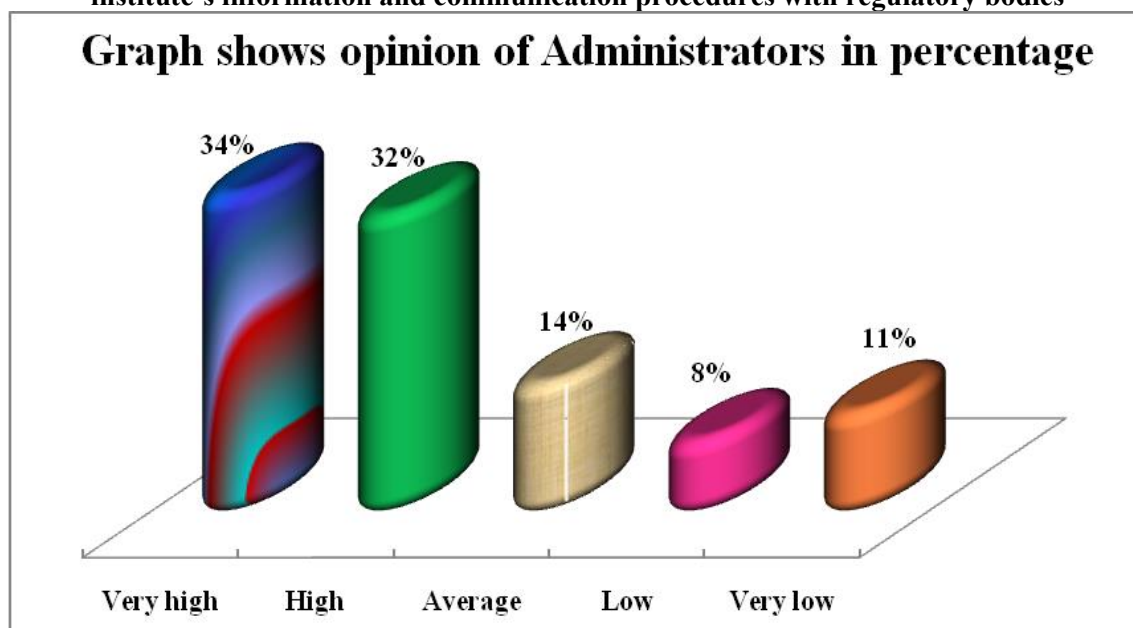
The above graph shows the Administrators views regarding the effectiveness of ICT in fulfilling their institute's information and communication procedures with regulatory bodies like University, AICTE or DTE and other external affiliated bodies. According to 34% administrators, usage of ICT is very high in their institutes to fulfill their institute's information and communication procedures with regulatory bodies like University, AICTE or DTE and other external affiliated bodies effectively. While 32% administrators said that usage of ICT is high in their institutes to fulfill their institute's information and communication procedures with regulatory bodies like University, AICTE or DTE and other external affiliated bodies effectively. Another 14% administrators told usage of ICT is average in their institutes to fulfill their institute's information and communication procedures with regulatory bodies. 8% administrators said that the usage of ICT is low in their institutes to fulfill their institute's information and communication procedures with regulatory bodies. And another 11% administrators accepted that usage of ICT is high in their institutes to fulfill their institute's information and communication procedures with regulatory bodies like University, AICTE or DTE and other external affiliated bodies effectively.

5.2.34 Has the institute installed all the required ICT tools in the library to facilitate the students to get all the benefits of online education and E-Journal accessibility? (Administrators)

Table No. 5.37 shows the administrators views regarding the installation of required ICT tools in the library to benefit students

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	80	44
2	No	100	56
	Total	180	100

Graph No. 5.35 shows the administrators views regarding the installation of required ICT tools in the library to benefit students

Graph shows opinion of Administrators in percentage

No, 56%

Yes ,44%
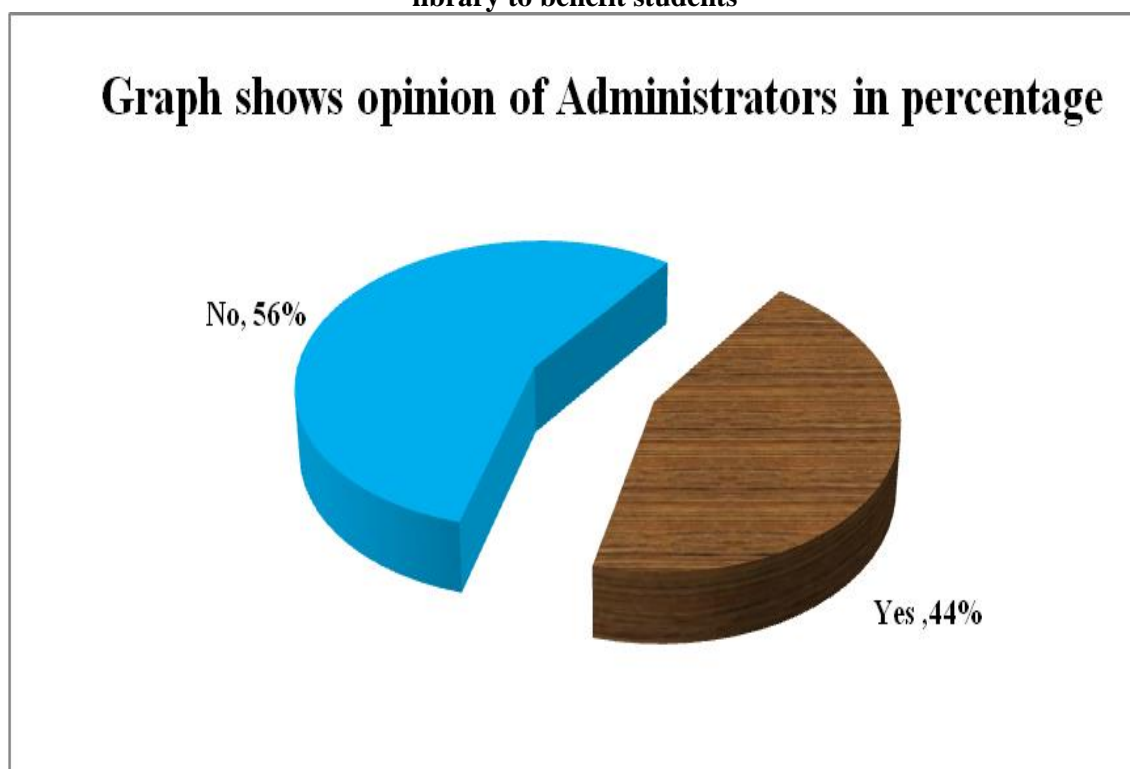
The above graph shows the Administrators views regarding the installation of all the required ICT tools in the library to facilitate the students to get all the benefits of online education and E-Journal accessibility. According to 56% administrators their institute has not installed all the required ICT tools in the library to facilitate the students to get all the benefits of online education and E-Journal accessibility. But 44% administrators said that their institute has installed all the required ICT tools in the library to facilitate the students to get all the benefits of online education and E-Journal accessibility.

5.2.35 Do you think the installation of ICT tools is a burden on the institution's finances?

Table No.5. 38 shows the administrators views regarding the burden on the institution's finances for installing ICT tools

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	40	22
2	No	140	78
	Total	180	100

Graph no. 36 shows the administrators views regarding the burden on the institution's finances for installing ICT tools
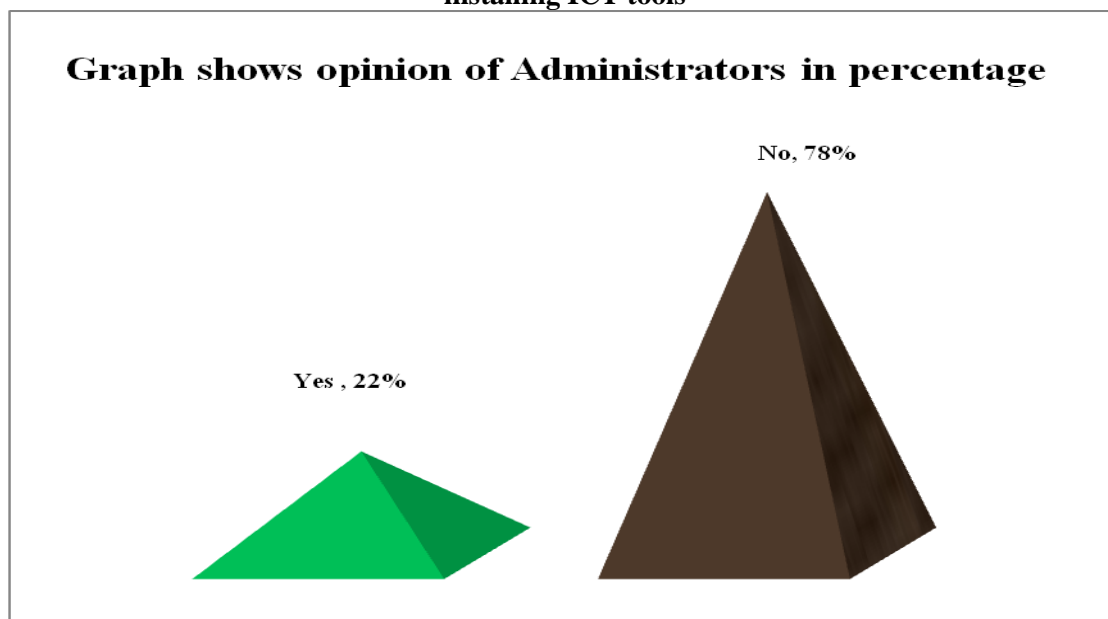
The above graph shows the Administrators views regarding the institution's financial burden by installing ICT tools. According to 22% administrators, installing ICT tools is a financial burden to the institutes. But 78% administrators, installing ICT tools is not at all a financial burden to the institutes.

5.2.36 What percentage of institutions expenses is occurred for the maintenance of ICT tools? (Administrators)

Table No. 5.39 shows the administrators views regarding the expenses occurred for the maintenance of ICT tools

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	<1%	140	78
2	1%	25	14
3	1% - 1.5%	10	6
4	>1.5%	5	2
	Total	**180**	**100**

Graph No. 5.37 shows the administrators views regarding the expenses occurred for the maintenance of ICT tools
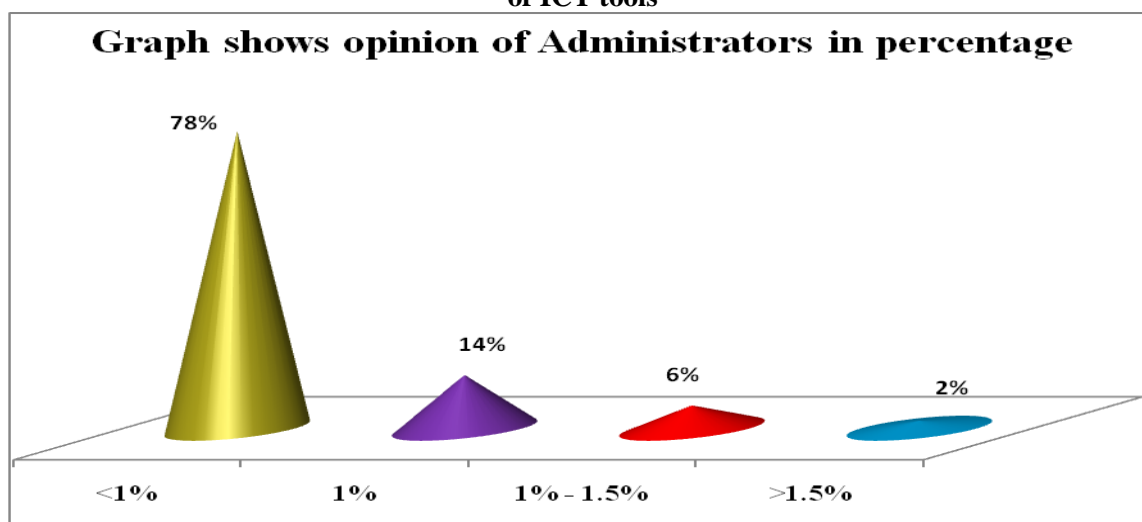
The above graph shows the Administrators views regarding the percentage of expenses occurred for the maintenance of ICT tools of their institutions. According to 78% administrators expenses occurred for the maintenance of ICT tools of their institutions is lesser than 1%. While 14% administrators said that expenses occurred for the maintenance of ICT tools of their institutions is 1%. Another 6% administrator said that expenses occurred for the maintenance of ICT tools of their institutions is just 1% to 1.5%. And only 2% administrators told expenses occurred for the maintenance of ICT tools of their institutions is greater than 1.5%

5.2.37 What is the maintenance schedule for ICT tools conducted in your institute? (Administrators)

Table No. 5.40 shows the administrators views regarding the maintenance schedule for ICT tools conducted in their institute

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Weekly	15	8
2	Fortnightly	35	19
3	Monthly	85	47
4	Half yearly	45	25
	Total	**180**	**100**

Graph No. 5.38 shows the administrators views regarding the maintenance schedule for ICT tools conducted in their institute
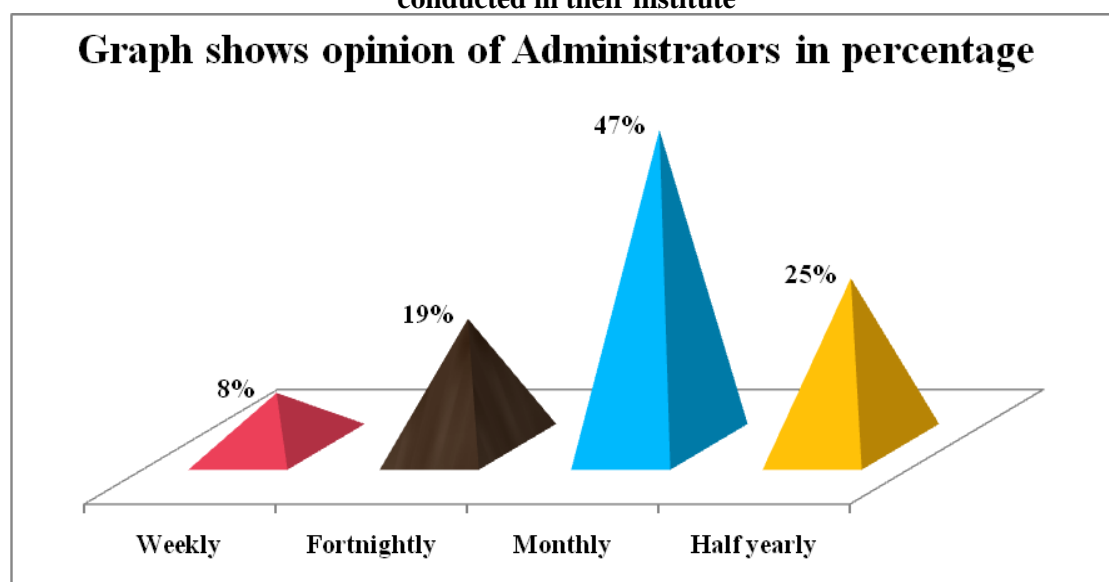
The above graph shows the Administrators views regarding the maintenance schedule of ICT tools conducted in their institute. 47% administrators prefer monthly maintenance schedule for ICT tools conducted in their institutes. 25% administrators said that they prefer half yearly maintenance schedule for ICT tools conducted in their institutes. While 19% administrators said that they prefer every fortnight maintenance schedule for ICT tools conducted in their institutes. And 8% administrators said that they prefer weekly maintenance schedule for ICT tools conducted in their institutes.

5.2.38 Has ICT enabled your institute better accessibility of information of other institutes affiliated to SPP University?

Table No. 5.41 shows the administrators views regarding the better accessibility of information of other institutes affiliated to SPP University

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	140	78
2	No	40	22
	Total	**180**	**100**

Graph No. 5.39 shows the administrators views regarding the better accessibility of information of other institutes affiliated to SPP University
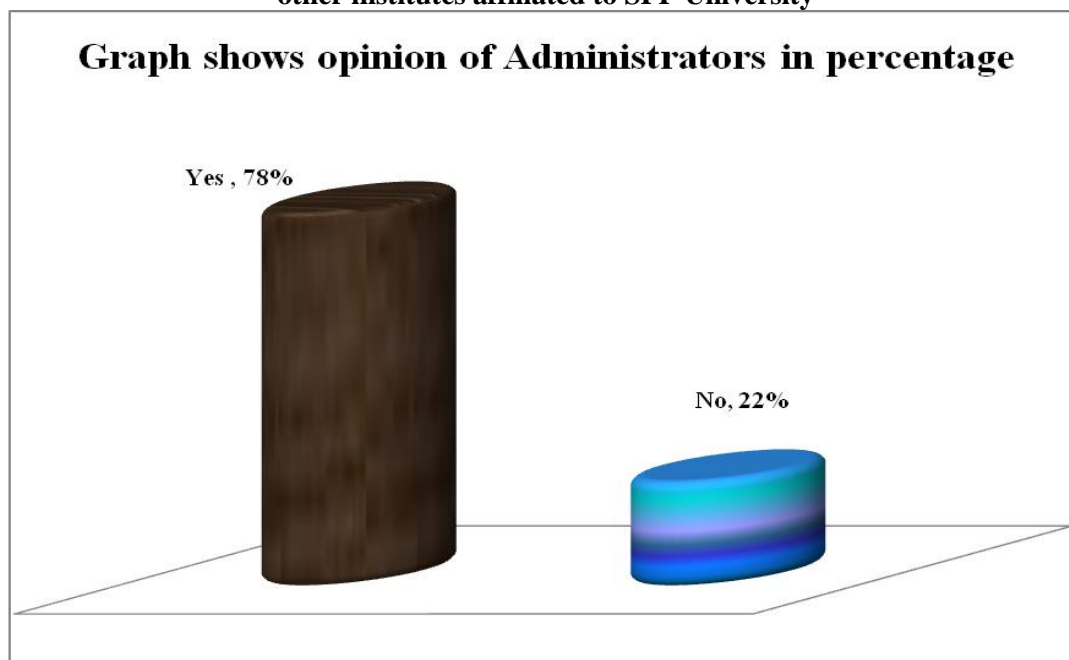
The above graph shows the Administrators views regarding ICTs usages have enabled their institutes better accessibility of information of other institutes affiliated to SPP University. 22% of the administrators said that there is no better accessibility of information of other institutes affiliated to SPP University after implementing ICT. But 78% administrators agreed that there is very much good accessibility of information of other institutes affiliated to SPP University after implementing ICT.

5.2.39 Has ICT been successful in reducing the stationary expenses of your institute? (Administrators)

Table No. 5.42 shows the administrators views regarding the reduction of their institute's stationary expenses due to ICT

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Yes	60	33
2	No	120	67
	Total	**180**	**100**

Graph No. 5.40 shows the administrators views regarding the reduction of their institute's stationary expenses due to ICT
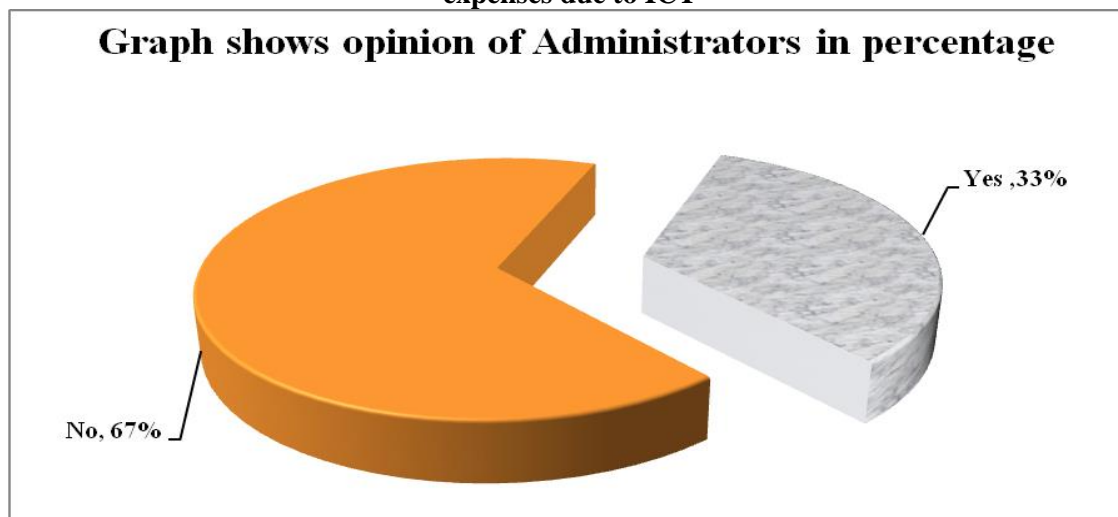
The above graph shows the Administrators views regarding the reduced stationary expenses of their institutes after implementing ICT. 33% administrators agreed that stationary expenses of their institutes have reduced after implementing ICT successfully. But 67% administrators said that stationary expenses of their institutes have not reduced after implementing ICT.

5.2.40. How do you rate the success of reducing man power in the administrative section of the institute? (Administrators)

Table No. 5.43 shows the administrators views regarding the reduction of man power in the administrative section of the institute

Sr.No.	Particulars	No. of opinions	Percentage of opinion
1	Very successful	45	25
2	Successful	55	31
3	No change	32	18
4	Unsuccessful	28	16
5	Very unsuccessful	20	11
	Total	**180**	**100**

Graph No. 5.41 shows the administrators views regarding the reduction of man power in the administrative section of the institute
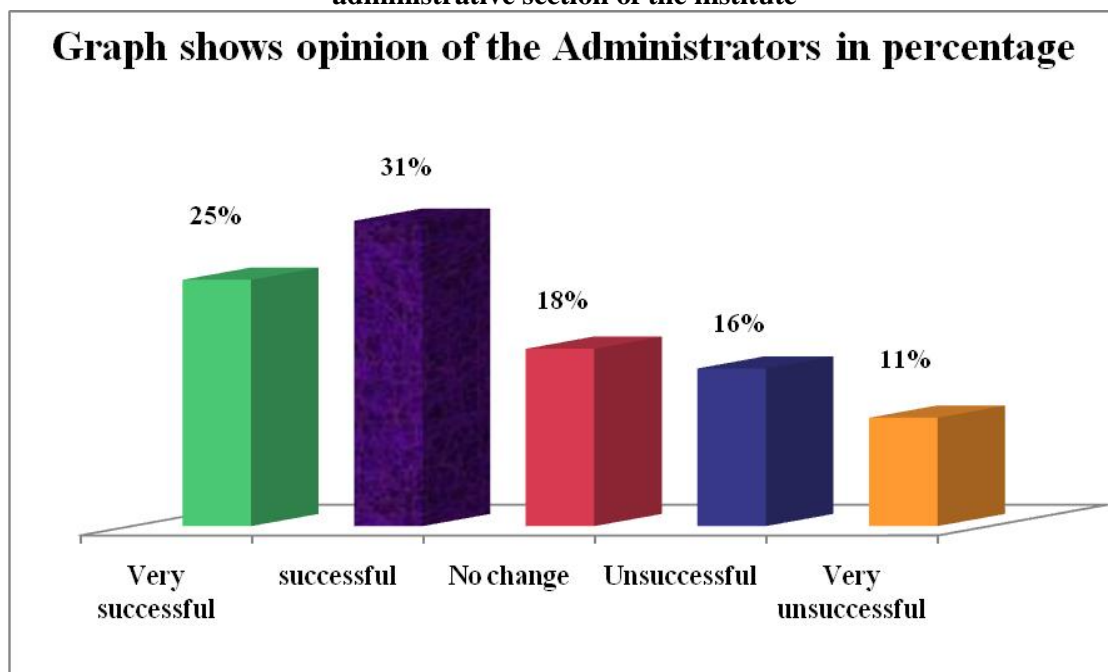
The above graph shows the Administrators views regarding the success of reducing man power in the administrative section of the institute. According to 25% administrators said that they reduced man power very successfully in the administrative section of the institute. 31% administrators said that they reduced man power successfully in the administrative section of the institute. 18% administrators said that there is no change in man power in the administrative section of the institute. While 16% administrators said that it is unsuccessful in reducing man power in the administrative section of the institute. And another 11% administrators said that it is very unsuccessful in reducing man power in the administrative section of the institute.

Hypothesis testing - 3

Step 1 Hypothesis Writing

1. H0 - There is vast improvement in administrative performances of the management institutes.

H1- There is least improvement in administrative performances of the management institutes.

Step 2 : Statistical test

Statistical test the "t" test is chosen because the data or ratio measurements assuming the population to be normal and having randomly selected the sample from the given population we consider the third step.

Step 3 : Significance level.

Let α = 0.05 with n1 and n2 pairing being 180 and 180 respectively.

Step 4 : Degree of freedom and "t" value

Here in our case

n1- Number of administrative officer samples-180

n2- Number of faculty samples- 180

X1- Mean of administrative officer samples - 62.27

X2- Mean of faculty samples - 61.50

S1- Standard Deviation-   6.33

S2-Standard Deviation-   6.18

$$\text{d.f.} = \frac{(s_1^2/n_1 + s_2^2/n_2)^2}{(s_1^2/n_1)^2/(n_1-1) + (s_2^2/n_2)^2/(n_2-1)}.$$

Degree of freedom (d.f.) =

$[(6.33)^2 / 180 + (6.18)^2 / 180]^2$

$[(6.33)^2 / 180]^2 / (180 -1) + [(6.18)^2 / 180]^2 / (180 - 1)]$

df = 0.0823

$$t = \frac{\overline{X}_1 - \overline{X}_2}{s_{\overline{X}_1 - \overline{X}_2}}$$

Where $\quad s_{\overline{X}_1 - \overline{X}_2} = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}.$

t =   62.27-61.50/√0.435

=   0.77/0.66

=   1.17

Step 5 : Critical test value

Critical test value – from the tables of critical values of "t" for given probability levels drawn from **"Table – 3"** of **"Fisher & Yates" (Exibit C – 2, page. No 670 "Business Research Methods"** by **"Donald R Cooper"** 9th edition The McGraw Hill Publications) with 0.0823 degree of freedom and level of significance value of 0.05 we get the critical values of about 7.223

Step 6 : Interpretation

Now in our case the calculated value of "t" is less than the critical value therefore we reject the null hypothesis that there is vast improvement in administrative performances of the management institutes and accept the alternate hypothesis that there is least improvement in administrative performances of the management institutes.

Conclusions

In this chapter the data is tested for hypothesis and the results are predicted on the available data. The hypothesis was tested with the help of 'T' test, where the correlation was established between students and faculties for the first hypothesis, between students and administrators for second hypothesis and faculties and administrator officers for third hypothesis. The data available from questionnaires is purely response of students and faculties. The question of bias responses is not the researcher. The responses and the data analyzed in this chapter are purely original and straight from the heart of the respondents.

The researcher after having analyzed the available data in the form of tables and in graphs she has interpreted them in detail to give idea of her data, now she will go to next chapter to discuss her findings and give her conclusions in the next chapter.

CHAPTER – VI

RESULTS & DISCUSSIONS

6.1 Results

6.1. a. Findings

1. 21% of the students visit the computer laboratory very frequently. 33% of the students visit the computer laboratory occasionally. 28% students said they rarely visit the computer laboratory. While 18% of the students visit the computer laboratory as and when required. **(Refer : Table no. 5.1)**

2. 83% of the students said Wi-Fi facility is installed in their college. While 17% said there is no Wi-Fi facility installed in their college. **(Refer : Table no. 5.2)**

3. 28% of the students said that their faculties use Power Point Presentation twice in a week during lectures. 22% of the students said that their faculties use Power Point Presentation once in a week during lectures. 33% students said occasionally their faculties use Power Point Presentation during lectures. While 17% of the students their faculties never use Power Point Presentation during lectures. **(Refer : Table no. 5.3)**

4. 89% of the students said their college library has E-Journals subscription and internet facility provided in computers. While 11% said their college library has no E-Journals subscription and internet facility provided in computers. **(Refer : Table no. 5.4)**

5. 28% of the students said that their faculties' performance with computer and its applications is very good. 22% of the students said that their faculties' performance with computer and its applications is good. 11% of the students said that their faculties' performance with computer and its applications is average. 22% of the students said that their faculties' performance with computer and its applications is poor, and 17% of the students said that their faculties' performance with computer and its applications is very poor. **(Refer : Table no. 5.5)**

6. 17% of the students agreed that they go for online tuitions for subject tuitions from their faculties. But 83% of the students said that they do not go for online tuitions for subject tuitions from their faculties. **(Refer : Table no. 5.6)**

7. 11% of the students said that they spend 3 to 4 hours on internet for educational data surfing in a day. 5% of the students said that they spend 2hours on internet for educational data surfing in a day. 28% of the students said that they spend 1hour on internet for educational data surfing in a day. 17% of the students said that they spend more than 4hours on internet for educational data surfing in a day. While 39% of the students said that they spend less than 1hour on internet for educational data surfing in a day. **(Refer : Table no. 5.7)**

8. 61% of the students said that they work online for university administrative purposes like exam forms, online exams, online payments and other works. While 39% of the students said that they do not work online for university administrative purposes like exam forms, online exams, online payments and other works. **(Refer : Table no. 5.8)**

9. 6% students said that they have written research papers and submitted them to conference organizers for national/international journals through online process, but 94% of the students said they have not tried to write any paper for the conference / for any national or international paper. **(Refer : Table no. 5.9)**

10. 28% of the students said that internet facilities in their college are very good. 33% of the students said that their college provides good internet facilities for them. 17% of the students said that their college's internet facilities are average. 17% of the students said that internet facilities in their college are poor, another 6% of the students said that internet facilities in their college are very poor. **(Refer : Table no. 5.10)**

11. 11% of the students said that every class room of their institute been facilitated with projector and screen for PPT and slide exhibitions to the students, but 89% of the students said their class rooms have no projector or screen. **(Refer : Table no. 5.11)**

12. 17% of the total students opine that the effectiveness of ICT and its tools in their institute are very good. 18% of the total students said that the ICT and its tools in their institute are good. 33% of the total students said that the ICT and its tools in their institute are average. While 28% students said the ICT and its tools in their institute are poor. Another 4% students said the ICT and its tools in their institute are very poor. **(Refer : Table no. 5.12)**

13. 61% of the total students think that really ICT has given relief to the burden of stationary expenditure to the institute administration. But 39% of the total students think that ICT has not given any type of relief to the burden of stationary expenditure to the institute administration. **(Refer : Table no. 5.13)**

14. 21% of the total students completely agree that ICT has generated new and fast methods of communication systems in this world. 32% of the total students agree that ICT has generated fast and new methods of communication systems in this world. 24% of the total students said that they can't say anything about the ICT and its fast and new communication systems in this world. 17% of the total students disagree that ICT has generated fast and new methods of communication systems in this world. 6% of the total students completely disagree that ICT has generated new and fast methods of communication systems in this world. **(Refer : Table no. 5.14)**

15. 28% of the students feel that PPT method is the best method to impart Knowledge effectively. 17% of the students feel that online tutors can impart knowledge effectively. But 33% students feel that chalk and talk method is the best method to impart knowledge. While 22% students opine that there are other methods to impart knowledge. **(Refer : Table no. 5.15)**

16. It is found that nearly all the students use computer and internet services(89%)and mobile phones 94% and E-Mail services(83%) The use of mobile phones is highly significant because it is fast and easy to communicate and improve their knowledge. **(Refer : Table no. 5.16)**

17. It is found that nearly 28% of the respondents say that there is no Wi-Fi connection provided by the college authorities. Secondly 20% of the respondents saying that the equipments installed in the colleges are of inferior quality which are big barrier in effective use of ICT. Another 22% of the respondents complain that there exists interconnectivity problem when using internet services. 17% of the faculties say that there is no digital board provided by the college authority for effective use of ICT in teaching the students effectively.13% of respondents complain of no basic knowledge of technology applications to use the equipments effectively for developing knowledge.   **(Refer : Table no. 5.17)**

18. It is found that 13% of the respondents use ICT tools FOR educational purpose.39% of the respondents' use ICT tools for entertainment purpose whereas 24%of the respondents use for the purpose of communication and 24% of the respondents use ICT tools for the purpose of research works. **(Refer : Table no. 5.18)**

19. When the hypothesis, ICT enables the students to understand and analyze the subjects easily in management institutes, was tested, it was found that the null hypothesis stating ICT enables the students to understand and analyze the subject easily is proved.

20. 38% of faculties said that they prefer to adopt PPT slides method for teaching most effectively. According to 36% of faculties chalk and talk method of teaching is most effective. While 14% faculties opine that pictorial method is the most effective method of teaching. But another 12% of the total faculties feel online teaching is the best method to teach effectively. **(Refer : Table no. 5.19)**

21. 34% of the total faculties expressed that the response of the students for chalk   and talk form of the lectures is very good. While 13% of the total faculties said that students show good response for chalk and talk form of the lectures. 21% faculties told response of the students for chalk and talk form of the lectures is average effective. Another 15% of the total faculties said that students show poor response for chalk and talk form of the lectures. And 17% of the total faculties said that response of the students for chalk and talk form of the lectures is very poor. **(Refer : Table no. 5.20)**

22. 28% of the total faculties expressed that students response for PPT slides lectures is very good. While 36% of the faculties said that students response is good for PPT slides lectures. 20% faculties said that

students show average response for PPT slides lectures. Another 13% of the faculties said that students response is poor for the PPT slides lectures and only 3% of the faculties expressed that the students response is very poor for the PPT slides lectures. **(Refer : Table no. 5.21)**

23. 8% of the total faculties expressed that students response for online tutors is very good. 6% of the total faculties told students show good response for online tutor. While 12% of the faculties said that students response for online tutors is average. 32% of the total faculties said that students show poor response for online tutors. But 42% of the total faculties said that students response for online tutors is very poor. **(Refer : Table no. 5.22)**

24. 50% faculties said they completely agree that students turn up to the classes have improved after the digitization of class rooms. 22% faculties agreed that students turn up to the classes have improved after implementation of digital teaching. 6% faculties said that students turn up to the classes have not changed after implementation of digital teaching. 8% faculties said they disagree that students response to the classes has improved after implementation of digital teaching. 14% faculties completely disagree that students response to the classes has improved after implementation of digital teaching. **(Refer : Table no. 5.23)**

25. 58% of the faculties opine that students are able to understand ICT technology better. Another 42% of the faculties expressed that students are not able to understand ICT technology better. **(Refer : Table no. 5.24)**

26. 86% of the faculties agreed that they get encouragement by the institute to teach with help of ICT tools. 14% of the faculties told they do not get any type of encouragement by the institute to teach with help of ICT tools. **(Refer : Table no. 5.25)**

27. 31% of the faculties said that they agree the library of their institutes with its well equipped internet services for online surfing and E-journal access and reading. Another 11% of the faculties said that they do not want to comment regarding the library of their institutes with its well equipped internet services for online surfing and E-journal access and reading. But 14% of the faculties said that they disagree that the library of their institutes have well equipped with internet services for online surfing and E-journal access and reading. 8% of the faculties said that they completely disagree that the library of their institutes have well equipped with internet services for online surfing and E-journal access and reading. **(Refer : Table no. 5.26)**

28. 50% of the faculties said that they completely agree that the accessibility of Inter-college activities of Pune University to the students has become easy with the help of ICT technology. While 25% of the faculties said that they agree that the accessibility of Inter-college activities of Pune University to the students has become easy with the help of ICT technology. Another 8% of the faculties said that they have no comments regarding the easy accessibility of Inter-college activities of Pune University to the students y with the help of ICT technology. 6% of the faculties said that they disagree that the accessibility of Inter-college activities of Pune University has become easy to the students with the help of ICT technology. But 11% of the faculties said that they completely disagree that with the help of ICT technology students can access and know about the activities of Pune University easily. **(Refer : Table no. 5.27)**

29. 47% of the faculties said that the investment on ICT Tools by the management of the institute is not at all justified. But 53% of the faculties said that the investment on ICT Tools by the management of the institute is justified. **(Refer : Table no. 5.28)**

30. 33% of the faculties said that the E-Mail services are effective enough to teach the subject matter to the students successfully. But 67% of the faculties said that the E-Mail services are not so effective to teach the subject matter to the students successfully. **(Refer : Table no. 5.29)**

31. 22% of the faculties more than 60% students have effectively adopted ICT tool to improve their knowledge. While 17% of the faculties said that 50% students effectively adopt ICT tool to improve their knowledge. 14% of the faculties said that 40%-45% students have effectively adopted ICT tool to

improve their knowledge. And 47% of the faculties said that less than 30% students effectively adopt ICT tool to improve their knowledge. **(Refer : Table no. 5.30)**

32. 44% of the faculties, the performance of what's App software is very good to send messages and also gather information. Another 39% of the faculties, opine it is good to students to use What's App software which is used to send messages and also gather information. 3% of the faculties said that the performance of What's App software in mobiles is average which is used to send messages and also gather information. While 6% of the faculties, said that the performance of What's App software in mobiles is poor which is used to send messages and also gather information. And another 8% of the faculties, said that the performance of What's App software in mobiles is very poor which is used to send messages and also gather information. **(Refer : Table no. 5.31)**

33. 22% of the faculties the binding between the teacher and students has not damaged due to the digital and online systems. But 78% of the faculties expressed that the good binding between the teacher and students has damaged due to the digital and online systems. **(Refer : Table no. 5.32)**

34. The second hypothesis stating educational standards in management institutes is highly upgraded by ICT was proved positively.

35. 31% of Administrators agreed that administrative efficiency of their institute in information and communication procedures have improved due to ICT. 69% of administrators did not agree that administrative efficiency of their institute in information and communication procedures have improved due to ICT. **(Refer : Table no. 5.33)**

36. 42% of the administrators the benefits of ICT for the students in the learning and communication process are very good. While 31% of the administrators said that students are getting good benefits by ICT for the learning and communication process. 11% of the administrators opine that students are getting average benefits for the learning and communication process by ICT. Another 10% of the administrators told students are getting poor benefits by ICT for the learning and communication process. And 6% of the administrators expressed that the benefits of ICT for the students in the learning and communication process are very poor. **(Refer : Table no. 5.34)**

37. 53% administrators, with help of new technology, their trained faculties are teaching effectively and administrators use technology effectively. While 47% administrators said that, with help of new technology, their trained faculties' teaching is not so effective and administrators do not use technology effectively. **(Refer : Table no. 5.35)**

38. 34% administrators, usage of ICT is very high in their institutes to fulfill their institute's information and communication procedures with regulatory bodies like University, AICTE or DTE and other external affiliated bodies effectively. While 32% administrators said that usage of ICT is high in their institutes to fulfill their institute's information and communication procedures with regulatory bodies like University, AICTE or DTE and other external affiliated bodies effectively. Another 14% administrators told usage of ICT is average in their institutes to fulfill their institute's information and communication procedures with regulatory bodies. 8% administrators said that the usage of ICT is low in their institutes to fulfill their institute's information and communication procedures with regulatory bodies. And another 11% administrators accepted that usage of ICT is high in their institutes to fulfill their institute's information and communication procedures with regulatory bodies like University, AICTE or DTE and other external affiliated bodies effectively. **(Refer : Table no. 5.36)**

39. 56% administrators their institute has not installed all the required ICT tools in the library to facilitate the students to get all the benefits of online education and E-Journal accessibility. But 44% administrators said that their institute has installed all the required ICT tools in the library to facilitate the students to get all the benefits of online education and E-Journal accessibility. **(Refer : Table no. 5.37)**

40. 22% administrators, installing ICT tools is a financial burden to the institutes. But 78% administrators, installing ICT tools is not at all a financial burden to the institutes. **(Refer : Table no. 5.38)**

41. 78% administrators expenses occurred for the maintenance of ICT tools of their institutions is lesser than 1%. While 14% administrators said that expenses occurred for the maintenance of ICT tools of their institutions is 1%. Another 6% administrator said that expenses occurred for the maintenance of ICT tools of their institutions is just 1% to 1.5%. And only 2% administrators told expenses occurred for the maintenance of ICT tools of their institutions is greater than 1.5%. **(Refer : Table no. 5.39)**

42. 47% administrators prefer monthly maintenance schedule for ICT tools conducted in their institutes. 25% administrators said that they prefer half yearly maintenance schedule for ICT tools conducted in their institutes. While 19% administrators said that they prefer every fortnight maintenance schedule for ICT tools conducted in their institutes. And 8% administrators said that they prefer weekly maintenance schedule for ICT tools conducted in their institutes. **(Refer : Table no. 5.40)**

43. 22% of the administrators said that there is no better accessibility of information of other institutes affiliated to SPP University after implementing ICT. But 78% administrators agreed that there is very much good accessibility of information of other institutes affiliated to SPP University after implementing ICT. **(Refer : Table no. 5.41)**

44. 33% administrators agreed that stationary expenses of their institutes have reduced after implementing ICT successfully. But 67% administrators said that stationary expenses of their institutes have not reduced after implementing ICT. **(Refer : Table no. 5.42)**

45. 25% administrators said that they reduced man power very successfully in the administrative section of the institute. 31% administrators said that they reduced man power successfully in the administrative section of the institute. 18% administrators said that there is no change in man power in the administrative section of the institute. While 16% administrators said that it is unsuccessful in reducing man power in the administrative section of the institute. And another 11% administrators said that it is very unsuccessful in reducing man power in the administrative section of the institute. **(Refer : Table no. 5.43)**

46. The third hypothesis stating there is vast improvement in administrative performances of the management institutes was found negative so, the alternative hypothesis that there is least improvement in administrative performances of the management institutes.

6.2 DISCUSSIONS

6.2.1 Observations

1] It is observed that 90% of the management institutes in Pune university have established Wi-Fi facility in the campus but is not allowed for accessibility to the students, the reason better known to the institute management.

2] As mobile handset industry is undergoing very fast innovative environment and day by day new and new soft ware developed and facilities increased, the young generation is moving towards singular world rather than socially staying together.

3] Online education transformation of knowledge is still to pick up to reach the students; online tutors are making good use of student requests for essential study material transformation through internet services.

4] Libraries of management institutes are facilitated with internet services to provide online journal accessibility for extra knowledge, but students do not find time to sit and subscribe for membership to get accessibility to international journals for latest developments in the field of communication technology or management and industry sectors.

5] The number of students visiting libraries for accessibility of research knowledge through international journals or magazines or reference books is observed to be very poor and students do not show eagerness or enthusiasm to get the benefit of free accessibility to new knowledge world.

6] The binding between the faculties and the students has been very weak due to the absence of face to face interaction and also physical lectures in the class rooms are insignificant and are rarely conducted.

7] For the management of management institutes there is insignificant benefit from ICT Tools and their facilities as they bring any kind of relief in stationary expenditures or in reducing considerable manpower in the institute.

8] Inter-college activities of all management institutes of Pune university have increased due to inter connectivity through internet services as seen from the success of Nasik Management institutes festival which organized all kinds of activities in different colleges in urban and rural at the same time.

9] The effectiveness and utility of Information and Communication Technology can be brought about by more and more interaction among the participants involved in the system like students, faculties and administrators of any institute or all members of any organization. But this interaction is found to be missing in management institutes of Pune University.

10] It was observed that the computer laboratories of management institutes are ill equipped and broadband connectivity for internet services is very weak due to lack of regular maintenance programs of the institutes. So the students are found to utilize or depend on the mobile services and other mode of information tool.

11] As 95% of the management institutes of Pune University are not getting any kind of financial grants from the government, the management body of these institutes find it hard to divert any kind of funds for the maintenance or up gradation of laboratory equipments. This is one of the reason why the ICT tools in the institutes are in poor state.

12]. Despite the increase in access to technology in the educational institutions the integration of ICT into the educational curriculum is lacking. Lack of trained teaching manpower and lack of motivation among teachers to adopt and integrate ICT as teaching tools are other challenging factors to realization of potential benefits of technologies.

13] Chalk and talk system of teaching and learning still exists in management institutes, while adaptation of digital or PPT system of teaching and learning is observed to be very poor.

14] Mobile handsets have undergone vast changes in the recent times. There are many facilities incorporated for the users that use of laptop or even smart phones have been outdated.

15] ICT'S applications are increasing and new technology has enabled India to launch Digital India program to connect the country digitally and transfer required data to every corner of the country.

6.2.2 Conclusions

1] The utility of ICT in higher education has become mandatory in the sense that without which higher education will fail to deliver the required quality education to the aspirant and desiring students.

2] Management institutes of Pune University show only 45% of applications of ICT in their institutes which reflects on their adaptability to new technology developed in learning and teaching methods.

3] Even though there is increase in access to technology in the educational institutions the integration of ICT into the educational curriculum is lacking. Lack of trained teaching manpower and lack of motivation among teachers to adopt and integrate ICT as teaching tools are other challenging factors to realization of potential benefits of technologies.

4] As most of the management institutes of Pune University are deprived of grants from the government these institutes find it difficult to maintain high technical infrastructure and adopt new technical changes to help the students.

5] As management institutes are considered as professional institutes, their role in developing qualified and talented professionals suitable and who can fulfill the requirement of the industry is the need of the hour.

6] The effectiveness and utility of Information and Communication Technology can be brought about by more and more interaction among the participants involved in the system like students, faculties and administrators of any institute or all members of any organization. So it is mandatory for the students and faculties to develop highly productive and professional interaction among them in the institute.

7] ICT technology may not have saved significant stationary expenditures but it has definitely helped the institutes in developing quick and very fast communications with regulatory bodies like AICTE,DTE or University for all regulatory works and most importantly the news of any regulatory changes made by these bodies.

8] For distant education ICT technology is very useful and very effective because it reaches any remote point where it is to be accessed and communicated for educational information. Distant education deprives direct contact or interaction of students with the faculties so the students have to adapt ICT as the only tool to access or send any information related to their study.

9] The wi-fi environment in the institutes is usable for limited members of the institutes, if this has to be enjoyed by all the students, faculties and administrative officers of the institute then its application would be enjoyed and the student turnout to the college premises will be high.

10] Government of India has launched a dream project 'Make in India' and Digitization of India where all parts of India are to be connected with internet services, telecommunication services, electricity and other infrastructural requirements to digitize India. This is a big boost for the successful and effective use of ICT for all population.

6.2.3. Recommendations

1] Important aspect is development and availability of learning modules/ and content material. The development of e-content for encouraging and supporting independent learning has to be based on processes of constructing knowledge as promoted by constructivist theories. For this ICT applications would help the faculties to develop subject content for delivering to the students.

2] Apart from enhancing student's learning experience, role of ICTs in capacity building/ training of educational personnel has very large potential. National level institutes can provide leadership role in enhancing technical and managerial manpower in different disciplines through ICT networks and collaborations. Technology facilitated learning would result in preparation of staff regarding innovative pedagogic methods, new ways of learning and interacting, easy sharing of new practices among teaching community and result in widening the opportunities for their participation. The capabilities of competent and trained teachers/ academic experts should be made available to larger audiences/ students through flexible and virtual settings.

3] ICT has the potential to drive innovative and effective ways of teaching learning and research. The inclusion of learning tools, easier use of multimedia or simulation tools, easy and almost instant access to data and information in a digital form which allows for computations and data processing generates possibilities which were otherwise not feasible. The possibility to diffuse these innovations and complement the learning content to improve quality in higher education through innovative pedagogic methods is high. The focus on ICTs to back quality research through utilization of rigorous research methodology and in-depth analysis is the call of the hour.

4] Investment in ICT for higher education is a matter of critical concern. Keeping in view the decreasing trend of budgetary allocations over the past decades and increasing demand for higher education seats educationists, policymakers and decision makers are facing many dilemmas. Over the years technologies introduced in the institutions for enhancing the quality of education need to be updated yet it is very difficult to write off / discard the same in favor to the new technologies. This also calls for massive investment. In addition the investment requirements don't end here. The costs of developing the necessary infrastructure, acquisition and maintenance of new technologies, costs of staff training and systemic changes that characterize introduction of ICT would require a mechanism for massive budgetary allocations and/ or resource mobilization. The challenge lies in development of a realistic model of investment as during planning of interventions a University or an institution and even government encounters difficult choices and competing priorities. In order to ensure that the investments are cost efficient, e-learning activities may substitute some of the routine administrative activities and teaching activities. Sharing of infrastructural resources and innovations, learning materials can reduce development costs.

5] The establishment of ICT infrastructures and technologies alone is not sufficient to achieve the goals of ICT integration in the education system holistically; development of innovative and effective e-content is a fundamental necessity. Important aspect is development and availability of learning modules/ and content material. The development of e-content for encouraging and supporting independent learning has to be based on processes of constructing knowledge as promoted by constructivist theories. For this ICT applications would help the faculties to develop subject content for delivering to the students.

6] As compared to traditional teaching activities adoption of ICTs in teaching activities require teachers to change/ enhance their organizing capabilities, deal with a whole new range of professionals for developing their teaching learning material. Building an atmosphere of teamwork and promotion of networking among faculty from multiple disciplines, web designers, instructional and cognitive e-scientists, academicians, project managers etc is essential to develop e-learning modules and content. Thus introduction of ICTs has implications for organizational innovations, knowledge management practices in order to limit conflicting situations.

7] The integration of ICTs would not only help in promoting personal growth but also in developing "knowledge societies". The call of the hour is the need to provide education for everyone, anywhere, and anytime. Lifelong learning has become the driving force to sustain in the contemporary competitive environment. Therefore to strengthen and/or advance this knowledge-driven growth, new technologies, skills and capabilities are needed. For this development of infrastructures, content ware and trained personnel is very necessary. Adoption of ICTs in education requires establishment of infrastructural facilities, acquisition of technologies and their periodic updating, management and professional support services.

8] Every college or institute should develop its own website because, Websites of the institutions developed would help in information dissemination and e-management (Acts and Statutes, Ordinances, Regulations, Right to Information, notices & tenders, advertisements for admissions and vacant positions, forms and Performa's, Press releases, archives), provide research related information (abstracts of PhD theses, their full text, research activities in the departments/centres, research by individual faculty members etc.), information of academic interest (academic events such as seminars, conferences, workshops, symposia, open research archive, outreach programmes), information or students (admission related information, courses of study, fee structure, hostel facility, scholarship, examinations, academic calendar, games and sports, extracurricular activities, placement)

9] Contribution of ICTs in developing Management Information System for the Universities/ colleges is vital to ensure collection of information, its analysis for identifying trends, keeping track of resources/funding and their monitoring. Establishment of online MIS system provides good predictive management information, for instance ICAR is covering all agricultural universities, and UGC is in the process of developing. Availability of data and information for research and other academic analyses is either limited or is constrained due to gaps in information. Most of the universities/institution compiles and provides the data manually. Development of MIS would result in efficiency and transparency, accurate and timely information, would provide support for decision making, easy access to information, would help in enforcement of standards, results in reduced data redundancy and call for associated efforts. MIS for universities may include student information system, examinations system, alumni information system, placement information, faculty and staff information system, stores management system, documents management system, legal and estate management system, Finance & accounting information system and other need specific modules.

10] For effective utilization and for more practical results the college managements should upgrade their ICT tools, wi-fi connectivity and other information gathering tools every year and maintain them in good condition.

CHAPTER – VII

CONTRIBUTIONS TO THE BODY OF KNOWLEDGE

This research work has been of great importance under the circumstances that India today talks of digitization and inter- connectivity with Information and Communication tools to all over the country. Higher education in the country is experiencing a major transformation in terms of access, equity and quality. This Transition is highly influenced by the swift developments in information and communication technologies (ICTs) all over the world. The optimal utilization of opportunities arising due to diffusion of ICTs in higher education system presents a profound challenge for higher education institutions. At the same time the introduction of ICTs in the higher education has profound implications for the whole education process ranging from investment to use of technologies in dealing with key issues of access, equity, management, efficiency, pedagogy and quality.

Higher education systems have grown exponentially in the last five decades to meet the demands of quality education for all. This aspect has further gained momentum due to swift advancements in Information and Communication Technology (ICT). Demand for skilled and competent labour is ever increasing in the contemporary globalised society. Competition in every sector ranging from access to quality in higher education has emerged as determining factor of economic growth and development. In order to increase the access to higher education and improving its reach to the remotest parts of the country contribution of open and distance learning facilities is on increase. In addition, it is catering to lifelong learning aspirations and that too at affordable cost. The last two decades have witnessed the inclusion of developments in ICTs in higher education systems around the world. Even then the challenge to develop a higher education system that is flexible and dynamic so as to holistically integrate the technology in the management and delivery of learning programmes is daunting.   So the topic is today very important and is very essential for the higher education institutes. This research work contributes to help the students, faculties and the administrative officers understand the utility and advantages of this technology for better and quick services. This work will also guide the institute managements to encourage their faculties and students to undertake research programs in the institute and improve the learning and teaching methods.

CHAPTER – VIII

FURTHER SCOPE FOR RESEARCH

This research work has opened flood gates for many research in this field, especially ICT related to the benefits to higher education. The research titled "A Study on Effectiveness of Information and Communication Technology (ICT) and its use in Management Institutes of University of Pune " was very essential in this environment where Indian government had just launched the dream project named "Digital India" "Make in India" programs. In this environment, the utilization of ICT and its tools. This research work gives further scope for research in the field of ICT and its applications, its utilization in industry and research works in ICT applications and its privacy. The third said field of privacy and industry will be a challenging research work which can give our corporate a big relief in utilizing and securing their datas without getting hacked by unknown identity.

This research work not only gives room for research work in the field of education, industry, social welfare schemes and also in the medicine fields, it enables the researchers to think more on innovations in the field of Information and Communication Technology. As ICT is undergoing revolutionary changes with the aid of innovations and research works bringing in new and new technologies in mobile, hand set industries and as well as technologies related to access to information in any mode of ICT.

So, there is lot of future scope for further research in the field of ICT.

CHAPTER – VIII

BIBLIOGRAPHY

S. no.	Name of the writer and book / journals/ articles

1   Richey, R.C. (2008). Reflections on the 2008 AECT Definitions of the Field. TechTrends. 52(1) 24-25

2   *"About Pune Municipal Corporation". Pune Municipal Corporation. Retrieved 4 June2015*

3   "Cities with population of 1 Lakh and Above" *(PDF). censusindia.gov.in. Retrieved30 January 2014*

4   Urban agglomerations/cities having population 1 million and above" *(PDF).Provisional population totals, census of India 2011. Registrar General & Census Commissioner, India. 2011. Retrieved 26 January 2012.*

5   D. Randy Garrison and Terry Anderson; Definitions and Terminology Committee (2003). *E-Learning in the 21st Century: A Framework for Research and Practice*. Routledge. ISBN 0-415-26346-8

6   "Definition of Poona". *The Free Dictionary. Retrieved 9 December 2013*

7   Selwyn, N. (2011) Education and Technology: Key Issues and Debates. London: Continuum International Publishing Group

8   Moore, J. L., Dickson-Deane, C., &Galyen, K. (2011). e-Learning, online learning, and distance learning environments: Are they the same? The Internet and Higher Education, 14(2), 129-135

9   *Nalawade, S.B. "Geography of Pune Urban Area". Ranwa. Archived from the original on 22 December 2007. Retrieved 4 April 2008*

10   *"Shaniwarwada was centre of Indian politics: Ninad Bedekar". Daily News and Analysis. 29 November 2011. Retrieved 19 April 2012*

11   Tavangarian D., Leypold M., Nölting K., Röser M.,(2004). Is e-learning the Solution for Individual Learning? Journal of e-learning, 2004

12   EC (2000). Communication from the Commission: E-Learning – Designing "Tejas at Niit" tomorrow's education. Brussels: European Commission

13   *"Quality of Living City Rankings". Mercer Information Solutions business. Retrieved3 March 2015*

14   Lowenthal P. R., & Wilson, B. G. (2010). Labels do matter! A critique of AECT's redefinition of the field. *TechTrends, 54*(1), 38-46. doi:10.1007/s11528-009-0362-y

15   *"Pune History – Origin & History of Pune – History of Puna India – History of Pune City". Pune.org.uk. Retrieved 16 July 2010*

16   *Government, of Bombay. Gazetteer of the Bombay Presidency: Poona (2 pts.). p. 321*

17   *"Monuments in Pune". Pune district administration. Archived from the original on 25 March 2008. Retrieved 4 April 2008*

18   "Computer-managed instruction: an alternative teaching strategy.". US National Library of Medicine National Institutes of Health

19   *History Modern India – S. N. Sen – Google Books. Books.google.co.in. Retrieved7*

August 2014

20 *"Shrimant Bajirao Peshwa : Great warrior and protector of Hindu Dharma | Hindu Janajagruti Samiti". Hindujagruti.org. Retrieved 7 August 2014*

21 *The Great Maratha Mahadaji Scindia – N. G. Rathod – Google Books. Books.google.co.in. Retrieved 7 August 2014*

22 *Kosambi, Meera (1989). "Glory of Peshwa Pune". Economic and Political Weekly **24**(5): 247*

23 *"Shaniwarwada was centre of Indian politics: Ninad Bedekar – Mumbai – DNA". Dnaindia.com. Retrieved 17 October 2013*

24 Kurbel, Karl: Virtuality on the Students' and on the Teachers' sides: A Multimedia and Internet based International Master Program; ICEF Berlin GmbH (Eds.), Proceedings on the 7th International Conference on Technology Supported Learning and Training – Online Educa; Berlin, Germany; November 2001, pp. 133–136

25 Molenda, M. (2008). Historical foundations. In M. J. Spector, M. D. Merrill, J. Merrienboer, & M. P. Driscoll (Eds.), Handbook of Research on Educational Communications and Technology (Third., pp. 3–20). New York, NY: Lawrence Earlbaum Associates

26 Nye, D. (2007). Technology Matters: Questions to Live With. Cambridge MA: MIT Press

27 *"Historical Events in Pune". http://pune.gov.in. NIC – District-Pune. Archived from the original on 13 June 2008. Retrieved 29 October 2009*

28 Saettler, P. (1990). The evolution of American educational technology. Englewood, CO: Libraries Unlimited

29 Nagy, A. (2005). The Impact of E-Learning, in: Bruck, P.A.; Buchholz, A.; Karssen, Z.; Zerfass, A. (Eds). E-Content: Technologies and Perspectives for the European Market. Berlin: Springer-Verlag, pp. 79–96

30 Hiltz, S. (1990) 'Evaluating the Virtual Classroom', in Harasim, L. (ed.) Online Education: Perspectives on a New Environment New York: Praeger, pp. 133–1

31 *Harmeet Singh (13 February 2010). "Eight killed in India restaurant blast". CNN. Retrieved 14 February 2010*

32 Mason. R. and Kaye, A. (1989) Mindweave: Communication, Computers and Distance Education Oxford, UK: Pergamon Press

33 Crow, W. B. & Din, H. (2009). Unbound By Place or Time: Museums and Online Learning, Washington, DC: American Association of Museums, pp. 9-10

34 Bates, A. (2005) Technology, e-Learning and Distance Education London: Routledge

35 "Dialogue and the construction of knowledge in e-learning: Exploring students' perceptions of their learning while using Blackboard's asynchronous discussion board". Eurodl.org. ISSN 1027-5207. Retrieved 2013-10-22

36 *Stocks Unplugged. (19 October 2012). "28 new villages into the Pune Municipal Corporation's limits". Globalstockmakers.blogspot.in. Retrieved 17 October 2013*

37 Shurville, S., Browne, T., & Whitaker, M. (2009). Accommodating the newfound strategic importance of educational technologists within higher education: A critical literature review. Campus-Wide Information Systems, 26 (3), 201-231

38	Harasim, L., Hiltz, S., Teles, L. and Turoff, M. (1995) Learning Networks: A Field Guide to Teaching and Learning Online Cambridge, MA: MIT Press
39	Robinson, T. (2006). Schools Kill Creativity. TED Talks. [Video]. Retrieved on October 25, 2012 from http://www.ted.com/talks/lang/en/ken_robinson_says_schools_kill_creativity.html
40	"Ken Robinson: How schools kill creativity | Talk Video". TED. Retrieved 2014-03-22
41	AleksanderAristovnik. The impact of ICT on educational performance and its efficiency in selected EU and OECD countries: a non-parametric analysis. MPRA Paper No. 39805, posted 3. July 2012 [8]
42	*"Demographics of Pune". Punepages.com. Retrieved 16 July 2010*
43	Whyte, Cassandra Bolyard (1989) Student Affairs-The Future.Journal of College Student Development.30.86-89
44	Postman, N. (1992). Technopoly: the surrender of culture to technology. New York, NY: Vintage Books
45	*"Revised Action Plan for Control of Air Pollution in Pune" (PDF). Census of India, Government of India (2001). Maharashtra Pollution Control Board. Retrieved29 December 2008*
46	Cuban, L. (2001). "Oversold and underused: Computers in the classroom.". *Harvard University Press*
47	*"Pune District Population Census 2011, Maharashtra literacy sex ratio and density". Census2011.co.in. Retrieved 14 May 2014*
48	1997.Building Asynchronous and Synchronous Teaching-Learning Environments: Exploring a Course/Classroom Management System Solution
49	*"Socio - Economic Survey Of Pune City" (PDF). p. 273. Retrieved 6 November 2014*
50	*Office of the Registrar General and Census Commissioner, Indiahttp://www.census2011.co.in/data/town/802814-pune-maharashtra.html. Retrieved2015-11-29*
51	"The History of Online Education?." Career FAQs". CareerFAQs.com.au. 15 August 2013. Retrieved 2014-08-29
52	"Recommendation 1836 (2008)". *Realising the full potential of e-learning for education and training*. Council of Europe. Retrieved 7 May 2013
53	*Top universities of Largest metropolitan economy -Pune , January –31, 2015, AICTE David*
54	Geer, R., & Sweeney, T. (2012). Students' voices about learning with technology. Journal of social sciences, 8 (2). 294-303
55	*"The boom is over in Detroit. But now India has its own motor city". The Independent(London). 20 April 2008. Retrieved 22 April 2008*
56	Trucano, M. (2013, December 11). More about MOOCs and developing countries. EduTech: A World Bank Blog on ICT use in Education
57	Skinner, B.F. The science of learning and the art of teaching. Harvard Educational Review, 1954, 24, 86-97., Teaching machines. *Science*, 1958, 128, 969-77

58	*"Hinjawadi IT park". The MegaPolis. Archived from the original on 18 March 2009. Retrieved 13 November 2009*

59   Wolf, L. (2001). "College Students with ADHD and Other Hidden Disabilities: Outcomes and Interventions". *Annals of the New York Academy of Sciences*

60   Skinner, B.F. (1968). *The technology of teaching*. New York: Appleton-Century-Crofts. Library of Congress Card Number 68-12340 E 81290

61   deJong, T. (2010). "Cognitive Load Theory, Educational Research, and Instructional Design: Some Food for Thought". *Instructional Science: An International Journal of the Learning Sciences*: 38

62   Bates, A. and Poole, G. Effective Teaching with Technology in Higher Education San Francisco: Jossey-Bass/John Wiley, 2003

63   OECD (2005) E-Learning in Tertiary Education: Where Do We Stand? Paris: OECD

64   "What is Blended Learning?". *CareerFAQs state*. CareerFAQs state. Retrieved31 March 2013

65   Grabinger, R. S; Aplin, C; Ponnappa-Brenner, G (2008). "Supporting learners with cognitive impairments in online environments". *TechTrends* **52** (1): 63–69.doi:10.1007/s11528-008-0114-4

66   Strauss, Valerie (2012-09-22). "Three fears about blended learning". *The Washington post*. Retrieved 31 March 2013

67   Loutchko, Iouri; Kurbel, Karl; Pakhomov, Alexei: Production and Delivery of Multimedia Courses for Internet Based Virtual Education; The World Congress "Networked Learning in a Global Environment: Challenges and Solutions for Virtual Education", Berlin, Germany, May 1 – 4, 2002

68   Trentin G. (2010). Networked Collaborative Learning: social interaction and active learning, Woodhead/Chandos Publishing Limited, Cambridge, UK, ISBN 978-1-84334-501-5

69   *Nair, Ajesh. "Annual Survey of India's City-Systems" (PDF).http://janaagraha.org/asics/. Janaagraha Centre for Citizenship and Democracy. Retrieved 7 March 2015*

70   Crane,Beverly E. "Using Web 2.0 Tools in the K-12 Classroom". Neal-Schuman Publishers, Inc., 2009

71   Sendall, P; Ceccucci, W.; Peslak, A. (December 2008). "Web 2.0 Matters: An Analysis of Implementing Web 2.0 in the Classroom". *Information Systems Education Journal* **6** (64). Retrieved 04/12/12Whyte, Cassandra B. and Lauridsen, Kurt (editor)(1980). An Integrated Learning Assistance Center.New Directions Sourcebook, Jossey-Bass, Inc.

72   *"Kirkee Cantonment Board: A Brief Profile". Archived from the original on 6 January 2009. Retrieved 22 August 2008*

73   "Curriculum and Pedagogy in Technology Assisted Learning". Sero.co.uk. Retrieved2013-10-22

74   *"Just hold on, PMRDA not far off". The Indian Express. 5 January 2008. Retrieved3 September 2008*

75   "Review of Learning 2.0 Practices: Study on the Impact of Web 2.0 Innovations on Education and Training in Europe". *JRC Scientific and technical report.* (EUR 23664 EN – 2009)

76   "Using Online Forums in Language Learning and Education". StudentPulse.com. Retrieved 2012-08-22

77	*Lyla Bavadam (13 March 1999). "The evolution of the NDA". Khadakwasla: The Frontline. Archived from the original on 6 October 2008. Retrieved 2 March 2010*
78	Forehand, M. (2010). Bloom's Taxonomy. From Emerging Perspectives on Learning, Teaching and Technology. Retrieved October 25, 2012,
79	*Kaul, Sanat (May 2006). "Higher Education in India: Seizing the Opportunity (working paper)" (PDF). Indian Council for Research on International Economic Relations, New Delhi, India. Retrieved 4 April 2008*
80	Reeves, Thomas C. (February 12, 1998). "The Impact of Media and Technology in Schools". Retrieved 9 October 2013
81	"Educating the Mobile Generation – using personal cell phones as audience response systems in post-secondary science teaching. Journal of Computers in Mathematics and Science Teaching, 2010, 29(2), 217-227. Chesapeake, VA: AACE.". Retrieved 2010-11-05
82	Kester, Liesbeth; Kirschner (May 2007). "Designing support to facilitate learning in powerful electronic learning environments". *Computers in Human Behavior* **23** (3): 1047.doi:10.1016/j.chb.2006.10.001. Retrieved 21 January 2014
83	Iiyoshi, T., & Kumar, M. S. (2008). Opening up education: the collective advancement of education through open technology, open content, and open knowledge. Cambridge, Mass.: MIT Press
84	"Social Networking in Education". *International Journal of Innovation in the Digital Economy* **4** (1): 15.doi:10.4018/jide.2013010101
85	Courts, B., & Tucker, J. (2012). Using Technology To Create A Dynamic Classroom Experience. Journal of College Teaching & Learning (TLC), 9(2), 121-128
86	Shiao, Dennis. "Why Virtual Classrooms Are Excellent Learning Venues". INXPO. Retrieved 18 May 2013
87	*"ILS Law College Best Law Colleges 2014 India Today Survey". Indiatoday.intoday.in. Retrieved 2015-05-30*
88	"Screencasting	Teaching and Learning Innovation Park". Ipark.hud.ac.uk. Retrieved2013-10-22
89	*Devayani Shahane (17 June 2003). "Performing arts degree slowly taking centre stage". Times of India. Retrieved 12 February 2010*
90	*The Great Maratha Mahadaji Scindia – N. G. Rathod – Google Books. Books.google.co.in. Retrieved 7 August 2014*
91	"Crowd Learn: Crowd sourcing the Creation of Highly-structured E-Learning Content". *5th International Conference on Computer Supported Education CSEDU 2013*
92	Raybould, B. (1991). An EPSS Case Study: Prime Computer. Handout given at the Electronic Performance Support Conference, Atlanta, GA, 1992
93	Gery, Gloria J. Electronic Performance Support Systems: How and why to remake the workplace through the strategic application of technology. Tolland, MA: Gery Associates, 1991. ISBN 978-0961796815
94	Cho, V., &Wayman, J. C. (2009, April). *Knowledge management and educational data use*. Paper presented at the 2009 Annual Meeting of the American Educational Research Association, San Diego, CA
95	*Pordié, Laurent; Lalitha, N. (24 May 2006). "Research Update: Transversal Themes of Indian Society and Medicines" (PDF). Department of Social Sciences, The French Institute of*

Pondicherry

96   Rankin, J. (2013, March 28). How data Systems & reports can either fight or propagate the data analysis error epidemic, and how educator leaders can help. *Presentation conducted from Technology Information Center for Administrative Leadership (TICAL) School Leadership Summit*

97   *Abhijit Atre (19 June 1998). "City's largest open-air theatre gets a roof". The Indian Express. Retrieved 8 February 2010*

98   *TNN (25 November 2008). "Sawai Gandharva music fest to start from Dec 11 – Pune – City – The Times of India". The Times of India. Retrieved 16 July 2010*

99   *Prachi Bari. "Diwali Pahat puts Pune in the mood". Indiatimes. Archived from the original on 19 May 2006. Retrieved 12 February 2010*

100   Pune Warriors India – The Team Archived 22 July 2015 at the Wayback Machine

101   Clark, R. C., Mayer, R. E. (2007). eLearning and the Science of Instruction. San Francisco: Pfeiffer

102   Warren Buckleitner (2008-06-12). "So Young, and So Gadgeted". *The New York Times*. Retrieved 2013-10-22

103   *"Skateboarding enthusiasts cheer civic body for opening a park in city". Retrieved29 April 2015*

104   *Singh, Ramendra (11 January 2011). "Wrong 'un on e way". Pune Mirror. Retrieved11 January 2011*

105   Cavanaugh, C. (2009, July/August). Effectiveness of cyber charter schools: A review of research on learnings. TechTrends, 53(4), 28-31. Retrieved from Education Research Complete

106   Allen, I. E. and Seaman, J. (2008) Staying the Course: Online Education in the United States, 2008 Needham MA: Sloan Consortium

107   Rideout, V., Vanderwater, E. &Wartella, E. Zero to six: Electronic media in the lives of infants, toddlers, and preschoolers. Menlo Park, CA: The Henry J. Kaiser Family Foundation. (2003)

108   Allen, I.E. and Seaman, J. (2003) Sizing the Opportunity: The Quality and Extent of Online Education in the United States, 2002 and 2003 Wellesley, MA: The Sloan Consortium

109   Ambient Insight Research (2009) US Self-paced e-Learning Market Monroe WA: Ambient Insight Research

110   Repetto, M., &Trentin, G. (Eds) (2011). Faculty Training for Web-Enhanced Learning. Nova Science Publishers Inc., Hauppauge, NY, ISBN 978-1-61209-335-2

111   Kolowich, Steve (May 15, 2014). "Conventional Online Higher Education Will Absorb MOOCs, 2 Reports Say". *The Chronicle of Higher Education*. Retrieved May 15, 2014

112   Youngberg, David (August 13, 2012). "Why Online Education Won't Replace College-- Yet". *The Chronicle of Higher Education*

113   *"Three routes for metro rail in city identified". The Times of India. 27 September 2007. Retrieved 24 April 2008*

114   *Manish Umbrajkar (5 March 2009). "2 years on, country's first BRTS remains incomplete". Times of India*

115   Iris Mansour, "Degreed wants to make online courses count", Fortune, August 15, 2013. (Retrieved August 15, 2013)

116   Warner, D, Procaccino, JD (2004). "Toward wellness: Women seeking health information". *Journal of the American Society for Information Science and Technology***55**. doi:10.1002/asi.20016

117   Madaus, J. W., McKeown, K., Gelbar, N., & Banerjee, M. (2012). "The Online and Blended Learning Experience: Differences for Students With and Without Learning Disabilities and Attention Deficit/Hyperactivity Disorder.". *International Journal for Research in Learning Disabilities*

118   Simpson, CW, Prusak, L (1995). "Troubles with information overload—Moving from quantity to quality in information provision". *International Journal of Information Management* **15** (6)

119   Parker, D. P., & Banerjee, M. (2007). "Leveling the digital playing field: Assessing the learning technology needs of college-bound students with LD and/or ADHD.".*Assessment for Effective Intervention*

120   Sajadi, S. S., & Khan, T. M. (2011). "An evaluation of constructivism for learners with ADHD: Development of a constructivist pedagogy for special needs."

121   Keengwe, J., Onchwari, G., &Onchwari, J. (2009). "Technology and Student Learning: Toward a Learner-Centered Teaching Model,". *AACE Journal*

122   Crain, William (2010). *Theories of Development: Concepts and Applications (6th Edition)*. Upper Saddle River, NJ: Prentice Hall: Pearson. ISBN 0205810462

123   Fichten, C. S., Ferraro, V., Asuncion, J. V., Chwojka, C., Barile, M., Nguyen, M. N., Klomp, R., &Wolforth, J. (2009). "Disabilities and e-Learning Problems and Solutions: An Exploratory Study". *Technology & Society*

124   D, Butucea (March 2013). "Personalized e-learning software systems. Extending the solution to assist visually impaired users". Academy of Economic Studies Bucharest, Romania-Database Systems Journal

125   E-learning accessibility for blind students. (2005). Italian National Research Council. Retrieved from http://www.researchgate.net/publication/228613727_E-learning_accessibility_for_blind_students%7Caccess date=11-2014

126   Ahmad, Zameer (November 16, 2010). "Virtual Education System (Current Myth & Future Reality in Pakistan)". Ssrn.com. Retrieved 2013-10-22

127   Dalsgaard, Christian. "Social software: E-learning beyond learning management systems". *eurodl.org*. University of Aarhus. Retrieved 31 March 2013

128   "Technology Impact on Learning". Nsba.org. 2011-12-09. Retrieved 2014-03-22

129   "Technology's Impact". Electronic-school.com. 2011-12-09. Retrieved 2014-03-22

130   Guo, Z., Li, Y., & Stevens, K. (2012). Analyzing Students' Technology Use Motivations: An Interpretive Structural Modeling Approach. Communications of the Association for Information Systems, 30(14), 199-224

131   Gu, X., Zhu, Y. &Guo, X (2013). Meeting the "Digital Natives": Understanding the Acceptance of Technology in Classrooms. Educational Technology & Society, 16 (1), 392–402

132   Warschauer, M., &Matuchniak, T. (2010). New technology and digital worlds: analyzing evidence of equity in access, use and outcomes. Review of Research in Education, 34, 179-225

133   "Technology Uses in Education". Nsba.org. 2011-12-09. Retrieved 2014-03-2

134   Ross, S., Morrison, G., &Lowther, D. (2010). Educational technology research past and present: balancing rigor and relevance to impact learning. Contemporary Educational Technology, 1(1)

135   Hicks, S.D. (2011). Technology in today's classroom: Are you a tech-savvy teacher? The Clearing House, 84, 188-191

136   An, Y. J., &Reigeluth, C. (2011). Creating Technology-Enhanced, Learner-Centered Classrooms: K–12 Teachers' Beliefs, Perceptions, Barriers, and Support Needs. Journal of Digital Learning in Teacher Education, 28(2), 54-62

137   Hiring Practices and Attitudes: Traditional vs. Online Degree Credentials SHRM Poll . (n.d.). Retrieved December19,2014, from http://www.shrm.org/research/surveyfindings/articles/pages/hiringpracticesandattitudes.aspx

138   Boser, U. (2013). "Are Schools Getting a Big Enough Bang for Their Education Technology Buck?".www. americanprogress. org. pp. 1–12. Retrieved 2014-05-15

139   Culp, K.M.; Honey, M.&Mandinach, E. "A retrospective on twenty years of education technology policy.". *A retrospective on twenty years of education technology policy.*: 279–307

140   Lai, K.W. (2008). *ICT supporting the learning process: The premise, reality, and promise. In International handbook of information technology in primary and secondary education*. Springer US. pp. 215–230

141   Postman, N. (1992). *Technopoly: the surrender of culture to technology. New York*. New York, NY: Vintage Books

142   Bransford, J., Brown, A., & Cocking, R. R. (Eds.). (2000). Technology to support learning. In J. Bransford, A. Brown, & R. R. Cocking (Eds.), How people learn: Brain, mind, experience (pp. 206-230). Washington, DC: National Academies P

143   Cuban, L. (1998). High-Tech Schools and Low-Tech Teaching. Journal of Computing in Teacher Education. 14(2), 6–7

144   Ritchel, Matt. Growing up Digital, Wired for Distraction. The New York Times. 21 Nov. 2010

145   Ho, A. D., Reich, J., Nesterko, S., Seaton, D. T., Mullaney, T., Waldo, J., & Chuang, I. (2014). HarvardX and MITx: The first year of open online courses (HarvardX and MITx Working Paper No. 1) . Available at SSRN: http://ssrn.com/abstract=2381263 orhttp://dx.doi.org/10.2139/ssrn.2381263

146   Lai, K.W. (2008). *Technopoly: the surrender of culture to technology. New York*. Springer US. pp. 215–230

147   Small, G.; Vorgan, G. (2008). "Meet Your iBrain.". *Scientific American Mind* **5** (19): 42–49. doi:10.1038/scientificamericanmind1008-42

148   Ritchel, M. "Growing up Digital, Wired for Distraction". *The New York Times*

149   Technology: The Emergence of a Hazardous Concept. Technology and Culture, 51(3), 561–577. doi:10.1353/tech.2010.0009

150   Wei, L. and Hindman, D. (2011). Does the Digital Divide Matter More? Comparing the Effects of New Media and Old Media Use on the Education-Based Knowledge Gap."*Mass Communication and Society*, 14 (1), 216–235

151   Jenkins, H. (2009). *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*. Cambridge, MA: The MIT Press

152   Oliver, A., Osa, J. O., & Walker, T. M. (2012). Using instructional technologies to enhance teaching and learning for the 21st century pre K-12 students: The case of a professional education programs unit. *International Journal of Instructional Media*, 39(4), 283–295

153   De Castell, S. (2011). Ludic Epistemology: What Game-Based Learning Can Teach Curriculum Studies. Journal of the Canadian Association for Curriculum Studies, 8 (2), 19-27

154   Harris, J., Mishra, P., & Koehler, M. (2009). Teachers' Technological Pedagogical Integration Reframed. Journal of Research on Technology in Education, 41 (4), 393–416

155   Prensky, M. (2001). Digital natives, digital immigrants. On the Horizon, 9(5), 1–6

156   Eisenberg, M. (2008). Information Literacy: Essential Skills for the Information Age.*Journal of Library & Information Technology*, 28 (2), 39–47

157   Fletcher, S. (2013). Machine Learning. Scientific American, 309(2), 62–28

158   McCue, TJ. "Online Learning Industry Poised for $107 Billion In 2015". *Forbes.com*. Forbes. Retrieved 1 December 2014

159   "E-Learning Market Trends & Forecast 2014 - 2016 Report".*www.docebo.com*. Docebo. Retrieved 2 December 2014

List of Tables

List of Graphs

ABOUT THE AUTHOR

Dr. Deepa Vijay Abhonkar is Assistant Professor at MGV's Institute of Management & Research, Nahsik. She has completed her Graduation in Computer Science (BCS), Masters in Business Management (MBA-HR) and Computer Management (MCM) from University of Pune and Doctorate in Philosophy from Rashtrasant Tukdoji Maharaj Nagpur University, Maharashtra.

She has published several papers in reputed journals on various subjects such as Computer, Management and Social Sciences. She has participated and presented many research papers with impact factors at various state, national and International seminars and Conferences.

ABOUT THE BOOK

In the recent years higher education especially management education has been in demand for most of the students in India. Under Human Resource Management Department, AICTE has tried to improve the system of education in professional colleges by inculcating Information and Communication Technology in every University and affiliated colleges. This book attempts to enlighten the concept of Information and Technology and the role of ICT, to strengthen the three traditional branches that make up the mission of higher education. i.e. teaching, research and service to the society. With this book we try to reach the outcome, how ICT has changed the way of imparting education in modern era and with the advancement in knowledge and knowledge economy,ICT has improving the quality of education, and reducing its cost. Three elements taken into consideration in this study i.e. Students,Faculties and Administrative staff from various institutes.