CHAPTER – I
INTRODUCTION

1.0 OVERVIEW

The present study followed a Survey Research Design aimed to measure the Influence of Teaching Attitude and Anxiety towards Utilization of Information and Communication Technologies in Classroom Instruction among Teacher-Educators at Colleges of Education. This Chapter deals with the Conceptual Framework of the Study. It starts from Meaning of Education, Technology in Education, Role of Technology in Fostering a Student-Centric Learning Environment. Further this chapter emphasis the importance of the Information and Communication Technology in field of Education under the caption Information and Communication Technology (ICT) in Education, Varieties of Information Communication Technological Tools, Benefits of ICT in Classroom Instruction and Integrate ICT in Classroom Instruction.

This Chapter also explains Approaches to ICT Integration in Teacher Education, Capacity Building in Teachers with Help of ICT, Future Scenario of ICT in Teacher Education, Role of Teacher in the Utilization of ICT in Teaching, Impact of ICT on Teacher-Educators and Student Teachers and ICT Training Inputs for Teachers and Teacher-Educators. Finally this chapter explains the Features of E-Learning, Teaching Attitude and Anxiety, Rationale for the Study, Scope of the Study and ends with Chapterisation.
1.1 MEANING OF EDUCATION

The root meaning of education is given as bringing up or leading out or making manifest the inherent potentialities in a pupil. Education refers to any act or experience that has a formative effect on the personality of an individual.

In a technical sense, however, education refers to the process by which society, through its different instructions, deliberately transmits its cultural heritage to its young its accumulated values, knowledge and skills from one generation to another.

Education in broad terms means, “The life-long process of acquiring new knowledge and skills through both formal and informal exposure to information, ideas and experiences”. Education in narrow terms means, “Systematic planned instruction that takes place in school”. Education has a very important role to play in the present set up of world. Investment in the education of its youth is considered as most vital by all modern nations. Such an investment understands acquires top priority in developing countries. Along with the knowledge exposing that is found in developed countries, we see another factor, namely population explosion, particularly in developing countries that is trying to change the pattern of life. Most countries in the world are faced in same form or another, with these problems and what is needed today is an “Information Explosion”. Curing illiteracy is the immediate problem in developing countries. To obliterate this
problem, we need more teachers and yet, this cannot be a complete solution for the
ever-increasing problem of illiteracy.

1.2 TECHNOLOGY IN EDUCATION

With the emergence of new technology, many traditional schools have
employed Modern Techniques to assist with student learning. Early developments
referred to the role of technology in education, which signify the use of audio-
visual equipments like Tele Media, Recording Media, Computer etc., Thus,
Educational Technology is sometimes narrowly thought of as confined to so-called
Hardware, emphasizing on the art of employing new Media and Technological
system for instructional purpose. Soon it was realized that a systematic way of
applying Techniques to achieve an objective is an important as the use of
Technical Equipment for the same. This gave way to the importance to the
software aspect of educational technology i.e., Application of teaching- learning,
Principles and Methodologies to the direct and deliberate shaping of behaviour or
in other words, application of behavioral science to the problems of learning and
motivation. But, the most widely recognized meaning of educational technology
today is much more than the hardware or the software approaches of it.

Now, it is being defined as the application of procedures and techniques for
the systematic design of a learning experience. In this broader context, the
emphasis is taken away from the use of individual media and now it focuses more
on a problem oriented approach to the design of learning experience in which
media are selected on the basis of their appropriateness for the achievement of educational objectives specified for the course. Thus, hardware materials, systems of organizations and new roles for teachers and administrators are all a part of educational technology.

Educational Technology is a broad term, an all-pervasive concept including both teaching and instructional technologies, emphasizing the systematic problem solving aspects of the field. It has been defined as a systematic way of designing, carrying out and evaluating the total process of learning and teaching in terms of specific objectives based on research in human learning and communication and employing a combination of human and non-human resources to bring about effective instruction. Its primary role is to increase the efficiency and effectiveness of the entire teaching-learning process through a system approach putting to use modern communication technologies and the media.

Educational Technology is in fact a growing, dynamic and vitally significant engineering in the field of pedagogy, as it seeks to Analyze, Reform, Remodel and even build-in new and various Paradigms of Learning and Teaching processes by judiciously applying the established Laws, Principles, Theories and Empirically derived findings of modern Psychology, Sociology, Engineering Management, Mathematics and other basic disciplines. Educational Technology, thus, implies more than the total of all the Media, Methods, Materials and Techniques used for better Teaching and Learning. Educational Technology has
enabled us to integrate the process of Instructional Design and the development of Instructional Media. Advances in Educational Science on the one hand and in Optical and Electronic Technologies on the other have provided an excellent scenario for a new range of developments in order to make the Teaching Learning process more efficient. Educational Technology has stimulated teachers to innovate in the area of School Organization, Curriculum Construction and Teaching Methods resulting in a variety of newer concepts such as “Modular Scheduling”, “Team teaching” and “Self study procedures”.

1.3 ROLE OF TECHNOLOGY IN FOSTERING A STUDENT-CENTRIC LEARNING ENVIRONMENT

With the adoption of 21st century technology, there is a major paradigm shift in instructional methods to reflect the challenges present in today’s society. The role of the teacher and student has changed dramatically over the years. The teacher was responsible for disseminating information to students. The students’ primary responsibility was to consume and retain as many of the facts and figures as they could. In student-centric classroom, the role of the teacher changes to that of facilitator and resource person often acting as a catalyst, the teacher help the student to promote his or her individual learning. With the use of technology, the teacher can extend his or her role beyond the classroom.

Technology provides students with the opportunity via E-mails or discussion forums to ask questions and also collaborate with other students in the
understanding of the course content. This use of technology virtually gives the students access to the teacher at all times where they can ask and receive answers to their questions without having to speak in front of large group. It also makes possible for the students to access lectures, demonstrations or discussions when required, rather than being laid down to a fixed schedule. These resource materials are stored and available in digital format (CD-ROM or DVD) and can even be delivered on demand via the Internet. Each technology is likely to play a different role in students learning, e.g., word processing and e-mail promote communication skills, database and spreadsheet programs promote organization skills and modelling software promotes the understanding of science and mathematical concepts. There are numerous multimedia programs designed to meet the special needs of diverse learning, e.g., a student learning English language would benefit from a computer program where they could learn the language at their own pace. They could spend as much time as needed on the computer, without feeling pressured to keep up with other students.

One cannot expect all teachers to teach in this fashion but a computer program or multimedia application may have the capabilities of doing so without taking additional time away from other students. By utilizing such programs a single teacher can employ many more resources and methods within one class room, rather than teaching the information in one manner to all students.
In technology rich Student-Centered classrooms, there are many observable changes:-

i. There is shift from whole class to small group instruction.

ii. Coaching occurs rather than lecture and recitation.

iii. Teachers work with weaker students more often rather than focusing attention on brighter students.

iv. Students are more actively engaged.

v. Students become more cooperative and less competitive.

vi. There is an integration of both visual and verbal thinking instead of the privacy of verbal thinking.

By integrating technology with constructive methods, such as problem-based learning and project-based learning, teachers are more responsible for and active in the learning process (Grant, 2002).

1.4 INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN EDUCATION

The quality of Education depends to a great extent on the quality of teachers. It is the known fact that quality teachers opt for an innovation in their teaching aspect through integrating technology in the Classroom Instruction to give the best to student-teachers. Since Technology is a powerful tool for problem-solving, conceptual development and critical thinking help to make the learning process much easier for the student-teachers. To be effective in the classroom
Instruction, Teacher-educators should acquire the knowledge and skills to use the new challenges in promoting innovative teaching strategies that are student-centered collaborative, engaging, authentic, self-directed and based on the development of higher order thinking skills with respect to handling classes for student-teachers which aims to achieve high academic standards.

Globally, educational systems are under great pressure to adopt innovative methodologies and to integrate New Information and Communication Technologies (NICTs) in the teaching and learning process, to prepare students with the knowledge and skills they need in the 21st century. Apparently, teaching profession is evolving from an emphasis on teacher-centered, lecture-based instructions to student-centered interactive learning environments.

ICT can be used as a tool in the process of education in the following ways.

- **Informative tool:** It provides vast amount of data in various formats such as Audio, Video, documents.
- **Situation tool:** It creates situations, which the student experiences in real life. Thus, simulation and virtual reality is possible.
- **Constructive tool:** To manipulate the data and generate analysis.
- **Communicative tool:** It can be used to remove communication barriers such as that of space and time.

Use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real world problems. It improves the
perception and understanding of the world of the student. Thus, ICT can be used to prepare the workforce for the information society and the new global economy. Institutions must promote ‘learning to learn’, i.e., the acquisition of knowledge and skills that make possible continuous learning over the life time. ‘The illiterate of the 21st century’, according to futurist Alvin Toffler, ‘will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn’.

Henceforth, the training is imparted on knowledge and utilization of Information and Communication Technology (ICT), which has the potential to adopt to the student’s instructional needs in the classroom situation. This new learning environment created by ICT is called Interactive Learning Environment. ICT integration in institutions is being perceived as a necessity and is growing exponentially. The pervasive use of technology in all spheres of life, the knowledge economy and the paradigm shift together, generate demands on the institutions to adopt ways that help inculcate 21st century skills amongst students.

1.5 VARIETIES OF INFORMATION COMMUNICATION TECHNOLOGICAL TOOLS

The following are some of the ICTs tools that can be used effectively in the Classroom Instruction like e-Learning, m-Learning, Computer Assisted Instruction (CAI), Virtual Learning Environment (VLE), On-line Learning, Blogs, Podcasting, Videoconferencing, etc.
(i) e-Learning

e-Learning which refers to the electronic learning promotes innovative strategy in teaching methods with information of diversified learning environment. It has more variety of information resources in learning experience with the use of Multimedia and non-verbal presentation by teaching material that encourages more and more self-learners to continue life-long learning without limitation of space, time and profession. It is a single point of access that serves as a gateway to variety of e-resources.

(ii) m-Learning

Mobile Learning is termed as m-Learning which is enabled by the use of portable computing devices such as PDA’s, Palmtops, Smart Phones, and Tablet PC’s communicating over wireless networks. The use of computing in teaching and learning is being extended to spaces beyond the traditional classroom and within the classroom; the teachers and learners are gaining more flexibility. It provides new opportunities for interaction with each other through Short Messaging Service (SMS), downloading the course-content where lessons are provided in bit-sized format, a fact that is appealing to busy students through Bluetooth connectivity easily without Internet connectivity.
(iii) Computer Assisted Instruction (CAI)

It is a development of systematic programmed learning and teaching machine. It is a self-instructional device with the principle of automization. CAI is “Computer applications applied to traditional teaching methods such as drill, tutorial, demonstration, simulation and instructional games”. It is an effective medium and an indispensable aid in the teaching-learning process. It is perhaps the best in classroom instruction, because it offers

- Individualised Instruction
- Effective interaction with the Learner and
- Immediate feedback
- Engage students as active learners
- Promote student self-assessment and self-reflection

Thus, there are so many advantages for an individual to enrich his learning to the great extent as one likes. The learner may feel that a best teacher is with him whenever one learns through Computer Assisted Instruction.

(iv) Virtual Learning Environment (VLE)

VLE is a set of teaching and learning tools designed to enhance a students’ learning experience by including computers and Internet in the learning process. The principal components of VLE package include Curriculum Mapping, Student Tracking, On-line support for both Teachers and students.
(v) On-Line Learning

It is synonymous with Web-based learning where learning is fostered via World Wide Web (www) only with Internet connectivity. It is pedagogy of On-line teaching and learning. The various strategies of Instruction was followed through On-line learning such as Conversing, Discussing, Mentoring, Questioning, Debating, Sharing data which is the necessary components for the teaching-learning process in the Classroom Instruction. The other important features of On-line learning are Analysing, Seeking, Collecting, Organising and Synthesing, On-line information of knowledge resources towards the evolutionary growth of open, flexible, anytime and anywhere in learning.

(vi) Blogs

The term ‘Blog’ is a blend of the term, ‘web’ and ‘log’ leading to ‘web log’, which finally becomes “Blog”. Blog as an educational tool can be integrated in multifaceted manner to accommodate all learners. As they are easy to create and update efficiently they can be used to inform students of classroom requirements, post handouts, notices, home work and assignments or act as a question and answer board. It provides conversation between the batch-mates in larger classes. A teacher can create and manage a blog to his/her professional interest and disseminate academic information and give instruction to their students on-line. The information or instruction through Blogs can be accessed by the students through the Internet connectivity everywhere even after the classroom hours.
1.6 BENEFITS OF ICT IN CLASSROOM INSTRUCTION

There are enormous benefits from the usage of Technology in Classroom Instruction. The benefits of this technological feature in Classroom Instruction are summarized below.

- Improves efficiency both in teaching and learning
- Increases motivation
- Paves way for Personality Development
- Active Participation of students
- Self-paced Learning
- Very flexible and rich medium for students to access the information
- Better learning, Retention and Students’ performance
- Multisensory Learning experience

The enormous benefits of ICT have been well documented by various authorities and researchers such as Becta (2004), Akudolu (2002), Sharp and Potter (2002) and Olibie (2003). Thus, ICT has enormous potentiality to deliver many numbers of benefits to the learners. Unless we use ICT one cannot obtain up-to-date information to face the competitive world. Using Information Communication technology is the need of the hour and essential part of the life of every individual who wish to enrich ones life.
1.7 INTEGRATE ICT IN CLASSROOM INSTRUCTION

Teachers are encouraged to experiment and adopt a variety of innovative Learner-Centred, Pedagogical Teaching and Learning Approaches, in order to evolve alternatives to the traditional methods of Lecture. The effective and efficient use of technology depends on technically competent educators/teachers. They should be able to appreciate the potentiality of these technologies and have positive attitude. To implement Technology based learning in the Teacher Education Programme so as the student-teachers while they become teachers in school would be able to utilize Technological tools in Classroom Instruction in promoting Flexible Learning Environment to meet individual learning objectives of the subject matter content. The Four phases are there to integrate ICT in classroom instruction as given below.

i. Developing Information and Communication Technology (ICT) literacy

ii. Effective and Efficient use of Hardware and Software for teaching learning activities

iii. Technology based environment, on-line support, networking and management and

iv. Adopt best innovative practices in the use of technological approach

Technology has great potential for knowledge dissemination, effective learning and efficient educative services yet. Of the educational policies are not
well thought out and if the prerequisites condition for using the technology are not met concurrently, the potential will not be realized. If an Institution or individual follows the above phases to integrate ICT, definitely one can acquire the maximum benefits in learning. If a teacher integrates the technology in teaching, it will help the teacher to discharge the duty effectively. Training of teacher should be based on practical demonstrative on the uses of Information and Communication Technology in teaching and learning and the application of ICT in the classroom.

1.8 APPROACHES TO ICT INTEGRATION IN TEACHER EDUCATION

Use of ICT within Teacher-Training programs around the world is being approached in a number of ways with varying degrees of success. These approaches were subsequently described, refined and merged into four primary approaches as follows.

(i) ICT skills Development Approach

Here importance is given to providing training in use of ICT in general. Student-teachers are expected to be skilled users of ICT in their day-to-day activities. Knowledge about various features of Software, Hardware and their use in educational process is provided.
(ii) ICT Pedagogy Approach

This approach emphasizes on integrating ICT skills in respective subjects, drawing on the principle of constructivism, pre-service teachers design lessons and activities that centre on the use of ICT tools that will foster the attainment of learning outcomes. This approach is useful to the extent that the skills enhance ICT literacy skills and the pedagogy allows student to further develop and maintain these skills in the context of designing classroom-based resources. Students who have undergone this type of training have reported significant changes in their understandings associated with effective implementation strategies, as well as their self-efficacy as to their ICT competencies.

(iii) Subject-Specified Approach

Here ICT is embedded into one’s own subject area. By this method teachers not only expose students to new and innovative ways of learning, but also provide them with a practical understanding of what learning and teaching with ICT looks and feels like. In this way, ICT is not an ‘add on’, but an integral tool that is accessed by teachers and students across a wide range of the curricula.

(iv) Practice-Driven Approach

Here the emphasis is on providing exposure to use of ICT in practical aspects of Teacher-Training also. Emphasizing on developing lessons, assignments etc. using ICT and implementing these in their practical work experience at various levels, the students are provided with an opportunity to
assess the facilities available at workplace and effectively use their own skills to manipulate these facilities. Based on the concept that the pre-service teacher is a learner, manager, designer and researcher and expected to research their practicum school’s ICT facilities, design ICT activities with their tutor-teacher, manage those activities in the classroom, and evaluate their effectiveness in terms of student learning. Ideally, an integrated approach is to be followed for developing ICT skills in teaching. Whatever may be the approach followed in the institutions to develop knowledge about ICT, it has its own limitations and coupled with other reasons, they are not making student-teachers fully confident of using ICT in their day-to-day classrooms and other situations. In the opinion, all the four approaches are required to develop awareness of expert level skills in Student-Teachers.

1.9 CAPACITY BUILDING IN TEACHERS WITH HELP OF ICT

Training in professional development of teachers in the effective use of ICTs for improved teaching and learning, focuses on the capacity building of teachers in using ICTs to help them develop the necessary knowledge and skills of related pedagogies to enhance the teaching learning process.

The competencies of the teachers have to be improved though both pre-service education and in-service training in integrating ICTs as pedagogical tools and educational resources to facilitate active student learning. Locally specific ICT pedagogical models of ICT use in different learning environments have to be identified and disseminated. Teachers as well as teacher educators must have the
knowledge and skills needed to integrate ICT effectively into the learning environment. If not students will not be exposed to the wealth of Information resources available and will be prevented from learning to use ICT effectively.

Teacher educators have responded to this ever changing environment and have focused on two broader areas. The first relates “learning to use” technology and the second relates to “using to learn” technology. Firstly, educators taught the necessary skills to use ICT across a variety of personal and professional levels. Secondly, educators are taught on how ICT can be integrated into the total teaching learning process and how effectively basic knowledge and skills can be learned by using ICT.

Integration of ICT into various strategies for teaching and learning not only presents a new set of challenges but also holds great opportunities that are intrinsic to the nature of the newer ICT. The rapid movement towards a knowledge society places new demands on the knowledge, skills and competencies of teachers. The most important criteria for effective professional development is to tailor it to the learning needs and skill levels of individual teaching staff.

There are three major components of capacity building:

i. Improvement of teachers’ knowledge base, their skills and attitudes in ICT integration.
ii. Motivation of teachers to apply innovative pedagogical approaches and models in the classroom.

iii. Making teachers competent in online / offline learning resources.

*(Anderson, et. al, 2003)*

**Fig 1.0 Objectives of Capacity Building**

*NOTE: (‘KSA’) denotes Knowledge, Skills and Attitudes*

Capacity building is the sustained, continuing and lifelong process. It is not a onetime activity. Teachers need to update their knowledge and skills as the curriculum and technology change. Capacity building should be based on learning needs and skills of individuals. In order to create successful programme for capacity building and for teachers to become pioneers, inventors and shapers of new culture of learning, professional development programmes should have the following elements.
- Inspire teachers to invent.
- Focus on experiential learning.
- Conduct need based assessments.
- Provide greater opportunities for feedback and reflections.
- Improve teacher competence in ICT integration. (Tuviera Lecaroz, 2002)

1.10 FUTURE SCENARIO OF ICT IN TEACHER EDUCATION

ICT will be the medium of education in the near future and will change many aspects of education system known in the last century. There is an urgent need to shift the paradigm from “ICT based systems and strategies” to “ICT enabled systems and strategies” to develop capabilities in a very large number of institutions and more so in the huge population of teachers for using the new methodologies, effectively integrating them with the education. The reform in education was started with the introduction of IT and now the ICT is moving fast into education especially after the spread of internet.

The following strategy is suggested by SITE for effective integration of ICT in education to meet the future needs.

(i) Technology should be infused into the teacher education programmes from introductory and foundation courses to their student teaching or professional development experiences.
(ii) Technology should be infused in all contexts during pre-service and in-service training.

(iii) Student-teachers should experience all innovative technology supported learning environments such as power points, multimedia etc throughout their teacher education programmes.

(iv) Positive models of technology developed by experts should be popularised among teacher educators.

(v) The educational institutions which are found to be leaders in technology integration should be encouraged to serve as models for other institutions.

(vi) Different centres of excellence should be identified for different technologies and they should be encouraged to further innovate new processes for improvement of the identified technologies.

(vii) The teachers in schools with better performance have to be identified and allowed to interact with other teachers.

(viii) Pre-service teachers should be given ample opportunity to observe the performance of mentor teachers in addition to develop new technologies.

(ix) Adequate provision of funds is essential to adopt all relevant technologies for integration of ICT in education especially teacher education.

1.11 ROLE OF TEACHER IN THE UTILIZATION OF ICT IN TEACHING

Teaching is one of the most complex human endeavors imaginable. Teachers arrange content information around an organizing idea, determine
appropriateness of available resources, and make judgment about the people involved. Generally, the teacher serves as decision maker regarding what to teach, when to teach and how to teach it. The teacher is often the primary information of source. The teacher has to play a pivotal role for the success of the ICT. The teaching aids either modern or traditional only supplement the efforts of the instructor to enhance the learning process. They cannot be a substitute the teacher. The technologies assist the teacher to do their work in an efficient manner to achieve the educational objectives.

Each Technology has its advantages and limitations and no single technology is useful for all types of learning. While selecting the media, the criteria to be kept in mind are Availability, Accessibility, Acceptability, Cost and Validity of the media. The fear about technology among the teachers is that it will replace the teacher and will create unemployment. No technology can produce new things because output depends on the nature of input. The input aspect is more important and it depends on the teacher. The instructional material cannot be prepared by educational technology. Therefore, ICT will not replace the human teacher but will help them in improving teaching-learning process.

The use of ICT is very important for providing opportunities to students to learn in an informational and technological world. There are some barriers in integrating ICT in teacher education like lake of confidence, lake of time, lack of accessibility, lack of technical support etc. To overcome these obstacles teacher
must be aware of how to use technology in classrooms, should acquire ICT skills, knowledge and positive attitude regarding the effective use of technology to support learning by their students, to effectively harness the power of the new ICT to improve learning, the following essential conditions must be met. They are summarized below.

- Student-teachers and Teacher-educators must have sufficient access to digital technologies and the internet in their classrooms, schools and teacher education institutions.
- High quality, meaningful and cultural responsive digital content must be available for Teachers and Learners.
- Teacher-educators must have the knowledge and skills to use the new digital tools and resources to help all students achieve high academic standards.

These insights are useful for establishing the ICT learning environment to excel in the Teacher education. ICT have no doubt transformed the manner in which we consume knowledge, the sheer breadth of the resources at our disposal. The role of ICT in education is significant, as we access and absorb information more quickly that before. Today the 1.7 billion people are online almost a third of the humanity. ICT in education guarantee a long and exciting journey ahead to brush up the level of education in colleges and universities all over the world.
Bottino and Sharma (2003) mention that the use of ICT can improve performance, teaching, administration and develop relevant skills in the disadvantaged communities. It also improve the quality of education by facilitating learning by doing, real time conversation, directed instruction, self-learning, problem solving, information seeking and analysis, and critical thinking, as well as the ability to communicate, collaborate and learn.

1.12 IMPACT OF ICT ON TEACHER-EDUCATORS AND STUDENT-TEACHERS

The following points discussed below are regarded as the impact of ICT on Teacher-Educators and Student Teachers.

i. It acts as the gateway to world of information and enables Teacher-educators to be updated.

ii. For professional development and awareness of innovative trends in instructional methodologies, evaluation mechanism etc.

iii. For effective implementation of certain student-centric methodologies such as project -based learning which puts the students in the role of active researches and technology becomes the appropriate tool.

iv. It is an effective tool for information acquiring so that Student-teachers are encouraged to look for information from multiple sources and they are now more informed then before.
v. It has enabled better and swifter communications, presentation of ideas are more effective and relevant.

vi. The dissemination of ideas to a larger mass now seems possible due to technology.

vii. Student-teachers are transformed into self learners.

viii. ICT creates awareness of recent methodologies and thus teacher educators feel empowered.

The above points are most benefited for the Teacher-educators and Student-teachers to develop their skills in the teaching profession and to face the challenges in the near future.

1.13 ICT TRAINING INPUTS FOR TEACHER-TRAINEES AND TEACHER-EDUCATORS

For the successful implementation of ICT, Teacher-Trainees and Teacher-Educators need to be trained in the following dimensions. The commercially available training programs are designed to provide exposure only to system software, some of the application software and the basics of internet.

(i) Awareness Phase

The input should be to make the teachers aware of the importance and possibilities of ICT-the current trends and future projections.
(ii) Learning Theories and Technology Integration

In learning Retention is more among the students, shift from Teacher-centred to Learner Centred and Teacher become facilitator to the students.

(iii) Basic Hardware Skills

Hands on experiences in operating a) the PC and Laptops-switching on, shutting down, and networking, b) Storage Devices- using Floppy Drive, CD-ROM/ DVD-ROM drive, Flash Drive, and burning CD-ROM/DVD-ROM, c) Output Devices- using Printers and Speakers, d) Input Devices- using Keyboard (Including shortcuts), Mouse, Modem, Scanners, Web Cam, Digital Camera, Camcorders, and d) Display Devices- LCD projectors, and Interactive White Boards.

(iv) Understanding System Software

One have to acquire the features of Desktop, starting an Application, Resizing Windows, Organizing Files (Creating, Editing, Saving and Renaming), switching between Programs, Copying etc.

(v) Using Application / Productivity Software

Word-processing, Spreadsheet, Database, Presentation, Publishing, Creation of Portable Document Format (PDF) files, Data Logging, Image Processing etc. to be well-versed.
(vi) Using Multimedia

Exposure to multimedia CD/DVD ROMs in different subject, installing programs, evaluating CD/DVD ROMs, approaches to using CD/DVD ROMs, creating Multimedia presentations.

(vii) Using Internet

e-mail, Social Networking sites such as Facebook, Twitter, Forums, Blogging, wikis are to be known. Subscription to mailing lists, e-mail and Internet projects, Web searching strategies (navigating, searching, selecting, and saving information) Videoconferencing, designing Web pages, freeware and shareware, evaluating website resources, virtual fieldtrips and Java applets.

(viii) Pedagogical Application of ICT Tools

Specific use of application software in different subject, appropriate ICT tools and pedagogy, unit plan integrating ICT tools, approaches to managing ICT-based learning groups, assessment of learning, electronic portfolio and creating teacher and student support materials, supporting students with special needs.

(ix) Social, Legal, Ethical and Health Issues

Advantages and limitations of computer use, privacy violations, copyright infringement, plagiarism, computer security (hacking, virus, misuse, abuse and staying safe) and in terms of healthy use (seating, light, sound, radiation, exercise)
(xi) ICT for Professional and Personal Productivity

ICT for administration, record keeping, reporting and transfer of information, attendance, research, careers in computers and professional development opportunities.

As an advanced training website development, installation and use of server based applications, training in course management system, e learning course content development using various authoring tools, audio/video/image editing, animation etc. can be introduced. In addition to the hands on experiences every training program could include an ICT awareness/familiarity quiz, exhibitions of ICT books and multimedia CD/DVD ROMs by commercial agencies, Poster session on success stories, Case-Study presentations and analysis, ICT based demonstration lesson in the schools (whole class, small group, Internet based, etc) exhibitions and presentations by commercial agencies on emerging technologies.

1.14 FEATURES OF E -LEARNING

The information explosion and rapid expansion of worldwide Webs have made e-learning an inevitable educational facility. The term e-learning in general refers to all the learning facilities supported by ICT through the use of computers, internet etc. World Wide Web provides access to a wide range of digital resources including online libraries, journals and databases. e-learning today allows students to get fully involved, to be more interactive and collaborative in learning to get more out of learning than ever before (Webster, 2005)
A Virtual Learning Environment (VLE) is a web based online environment that integrates tools for content delivery, communication, amusement and student management is one of the features of e-Learning. By integrating various e-learning tools, a rich virtual learning environment can be created. It allows a student centred learning environment which can be tailored to suit the needs of individual learners. It gives the opportunity for the learners to learn at own pace and place. With its inherent ability to cover distance any time in an unimaginable speed, e-learning will definitely help the learners in developing countries like India to attain the required knowledge and skill at an affordable cost. The goal of making learning universal and removing all the barriers in reaching this goal are to be given the prime priority by facilitating e-learning.

1.15 MAJOR INITIATIVE AND POLICY FOR INTRODUCING ICTS IN HIGHER EDUCATION

The major initiative and policy for introducing ICTs in Higher Education were summarized below.

i. Indira Gandhi National Open University (IGNOU) uses Radio, Television and Internet Technologies.

ii. National Programme on Technology Enhanced Learning where the concept similar to the open courseware initiative of Madras Institute of Technology (MIT). It used Internet and television technologies.
iii. In Eklavya initiative the uses of Internet and Television to promote distance learning.

iv. IIT-Kanpur has developed Brihaspatai, an open source e-learning platform.

v. Premier institutions like IIM-Calcutta have entered into a strategic alliance with NIIT for providing programmes through virtual classrooms.

vi. Jadavpur University is using a Mobile-Learning centre.

vii. IIT-Bombay has started the program of CDEEP (Centre for Distance Engineering Education Program) as emulated classroom interaction through the use of real time interactive satellite technology.

viii. One Laptop Per Child (OLPC) programme in Maharashtra (One Laptop Per Child, 2007).

### 1.16 NATIONAL MISSION ON EDUCATION THROUGH ICT

Under this mission, a proper balance between content generation, research in critical areas relating to imparting of education and connectivity for integrating our knowledge with the advancements in other countries is to be attempted. It has three guiding principles.

**i. Human resource development:** Talent in the higher education should be identified, trained and utilized in the service of the country.

**ii. E-content/resource development:** Quality e-content should be developed and delivered through the network connectivity.
iii. Building connectivity and knowledge network: In order to provide maximum benefit to the learners, the maximum possible inter-connectivity should remain available among and within institutions of higher learning in the country with a view to achieve critical mass of skilled human resource/researchers in any given field.

The objectives of National Mission on Education through ICT expected to lead to various important steps in planning and implementation as follows.

- Generation of quality e-content, questions bank as modules-based learning.
- Development of interface modules for physically challenged learners.
- Facility of Geographical Information System (GIS) for planning up to the village level.
- Efficient and effective knowledge transfer to learner with proper interaction.
- Voice Over Internet Protocol (VOIP) supported communication between learner and teacher.
- Enterprise Resource Planning (ERP) and e-governance for education, coordination and synergy for implementation of the policies, setting up virtual laboratories and support for creation of virtual technical universities.
- Performance optimization of e-resources.
1.17 INFORMATION LITERACY WITH NATIONAL KNOWLEDGE NETWORK (NKN)

The Indian government approved the establishment of NKN in 2010. It is a major step towards building a knowledge society without boundary. It is a multi-gigabit, unified, high speed network that aims to connect over 1500 institutions like universities, research institutions, libraries, laboratories, healthcare and agricultural institutions, nuclear, space and defence research agencies in the country. The major benefits of NKN described below are

- The participating institutions can directly or through distribution layer connect to the NKN at speeds of 100 mbps/1gbps.
- NKN enables creation of Virtual Private Networks (VPN) for special interest group. It also provides international connectivity to its users for global collaborative research.
- The NKN is a platform for delivering effective distance education where teachers and students can interact in real time. The network enables co-sharing of information such as classroom lecture, presentations and handouts among different institutions.
- The NKN enables collaboration among researchers from different Global entities. NKN also enables sharing of scientific databases and remote access to advanced research facilities.
- The virtual library involving sharing of journals, books and research papers across different institutions, is a natural application for NKN.
• The network enables a large number of institutions to access high performance computing to conduct advanced research in areas such as weather monitoring, earthquake engineering and other computationally intensive fields.

1.18 TEACHING ATTITUDE AND ANXIETY

An assistance of any type that facilitates learning is called teaching. Teaching is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and much of it is available to students as well as teachers at the same time. As new concepts of learning have evolved, teachers are expected to facilitate learning and make it meaningful to individual learners rather than just to provide knowledge and skills. Modern developments of innovative technologies have provided new possibilities to teaching profession but at the same time it have placed more demands on the teachers to learn how to use these new technologies in their teaching.

Teacher Competency depends upon two major factors – Aptitude and Attitude. Both are equally important. They equally determine success in teaching. Attitude refers to one’s general tendency to behave in a particular way – a mind set – a mental set to behave in a set pattern. Opinion is the verbal expression of an attitude. Attitudes are implicit – covert modes of behaviour. Attitudes are manifest only through overt/external modes of behaviour. If a teacher’s attitude towards teaching is positive and favourable, one is likely to be a good teacher. On
the other hand, if attitude towards teaching is negative and unfavourable then one
is not likely to be a good teacher even if one has aptitude for teaching. Teaching is
not only ‘cognitive’ but ‘affective’ as well.

Attitude towards teaching and Aptitude for teaching are usually studied as
correlates of Teaching Competency/Performance.

1.18.1 ANXIETY

Anxiety is a vague feeling that something bad is likely to happen if the
assigned task is not performed. In fear one is clear of what one is afraid of whereas
in anxiety one is not able to specify what exactly frightens one. A little amount of
anxiety may make individual prepare for the task set in fairly well and achieve the
desired results. However, when anxiety exceeds the limit (there are individual
differences in this ‘limit’) it makes the individual ineffective and prevents one
from rising to their potential.

Pressure (either perceived or real) to perform upto a criterion level will
make the individual anxious. Anxiety will affect physical as well as mental
health. Home climate and institutional climate play a vital role in reducing
anxiety. If the emotional climate at home and in the institution is conducive
individuals will rarely develop anxiety. Close relatives and superiors are largely
responsible for pressure on individuals when they are expected to achieve a level
which they cannot even if they give their best. Individuals must be accepted as
they are by respective superiors. Individuals who grow and develop in an anxiety atmosphere will become anxious individuals. They cannot perform effectively, nor can they give their best.

Teaching Attitude and Anxiety correlates with the utilization of ICT which were necessary to create the classroom environment more effective. Authors such as Potter & Darbyshire (2005) and UNESCO (2004) are of the view that ICT competencies are concerned with the ability to know when to apply or develop a particular skill in using an ICT resource. Be aware of the reasons for using ICT and its effect on both users and context, and have a critical and confident attitude to learning with the technology.

1.19 FEATURES OF IDENTIFIED ICTs COMPONENTS IN THE PRESENT STUDY

The detailed features of various components of ICTs identified by the investigator in the utilization of classroom instruction in this study which are used by the Teacher-educators are discussed below.

a. Closed Circuit Television (CCTV) leads to the realistic experience and level of understanding in their learning process. CCTV makes the Student-teacher to acquire Micro-teaching skills through by witnessing teaching by themselves. An individual teacher can manage many classrooms by transmitting the teaching in a
single room to many of classrooms of the same standards in the campus. Best teaching of subjects can be shared by number of learners through CCTV.

b. Educational Television (ETV) will make use of ETV programs for real experience on teaching the concepts to the student-teachers. To view the experts opinion on important educational themes and also EDUSAT programs through ETV.

c. In Video Assisted Instruction (VAI) the student-teacher can learn the content interestingly and effectively which can provide text, graphics, images, photos and animations. Moreover, it is easy to handle video recording, previewing, editing, duplication and transmission of video. It provides a realistic feel of events. The variety of information can be given on the same topic and immediate access to different content facility for repetition to achieve mastery in learning.

d. Computer Assisted Instruction (CAI) has increasingly employed for Classroom Instruction which refers to self-paced learning and continuous level of assessment of the students through the computer in many different modes of instruction such as Tutorial mode, Drill and Practice mode, Simulation mode, Discovery mode and Gaming mode.

e. Net-Based Instruction (NBI). In this, Teacher has the option to employ the Internet for teaching at any time. Therefore Net-Based Instructions are useful in promoting flexible learning environment and be best suited to meet their
demands and requirements in the classroom teaching. Some of the features are Blogs, User Groups, Discussion Forum, Video conferencing, Chat, E-mail, Instant Messaging, YouTube and Slide share.

The above specified components are utilized in sharing information, delivering the content material, discussions and communication effectively even outside the classroom anywhere at anytime.

1.20 RATIONALE FOR THE STUDY

Teacher-Educators in the Colleges of Education mostly utilize the ICT tools such as CD-ROM, Power-Point Presentation, Closed Circuit Television (CCTV), Educational Television (ETV), Video Assisted Instruction (VAI), Computer Assisted Instruction (CAI) and Net Based Instruction (NBI) to provide rich experience not only on the content but also in the nature of utilizing modern technologies in Classroom Instruction. If this kind of experience are not been provided to the Student-teachers they will not get experience about modern technologies anywhere else. This experience will help them to integrate ICTs in Classroom Instruction when they are becoming Teachers in the schools.

It is the fact that level of utilization of ICTs differs from Institution to Institution based on their type i.e. either Self-financing or Aided or Government Colleges. Moreover, it depends on the interest and attitude of the Teacher-Educators working in different types of colleges of education. As Teaching
Attitude and Anxiety are tends to enrich their latest knowledge and skills which is required to enhance the teaching-learning process. This factor is necessary for utilization of ICT’s in classroom instruction. So if a teacher doesn’t have a minimum level of the above aspects definitely one cannot shine as effective teacher in the day-to-day classroom instruction. Hence the investigator has chosen the topic as “Influence of Teaching Attitude and Anxiety towards Utilization of Information and Communication Technologies in Classroom Instruction among Teacher-Educators at Colleges of Education”.

1.2 SCOPE OF THE STUDY

Out of this study, it will help others to know the possibilities to know what extent the educational institutions are having ICT facilities and to what extent they allow faculty members to utilize ICT in classroom instruction. The study may also highlight the extent of using ICT in Classroom Instruction by the Teacher-educators. The study may also identify the level of influence of Teaching Attitude and Anxiety towards utilization of ICT which are very essential for Classroom Instruction. The study may lead to aware the significance of ICT in the Teaching Learning process and inculcate the skills in ICT. The study might give clear idea to the government regarding the priority to be given to develop the Information Communication technology in the Teaching-learning process.
### 1.22 CHAPTERISATION

The thesis contains five chapters as follows.

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Description</th>
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<tbody>
<tr>
<td>Chapter I</td>
<td>Introduction of the study deals with the Meaning of Education, Technology in Education, Information and Communication Technology (ICT) in Education, Varieties of Information Communication Technological Tools, Benefits of ICT in Classroom Instruction and Integrate ICT in Classroom Instruction. This Chapter also explains Approaches to ICT Integration in Teacher Education, Role of Teacher in the Utilization of ICT in Teaching. Finally this chapter explains the Teaching Attitude and Anxiety, Rationale for the Study, Scope of the Study and ends with Chapterisation.</td>
</tr>
<tr>
<td>Chapter II</td>
<td>Review of Related Literature concentrates on the studies related to Information Communication Technology, Attitude and Anxiety done in India and Abroad and the Analogy of the studies related to the present study.</td>
</tr>
<tr>
<td>Chapter III</td>
<td>Methodology of the Study provides the Information regarding the Design of the study, Selection and Size of the Sample, Tools Used in the Study, Data Collection, Statistical Measures Used in the Study and Delimitations of the Study.</td>
</tr>
<tr>
<td>Chapter IV</td>
<td>Data Analysis deals with the results of the Data Analysis with respect to the Variables such as Sex, Type of Institution, Major Subject and Years of Experience in working with Computers.</td>
</tr>
<tr>
<td>Chapter V</td>
<td>Findings and Conclusion of the Study deals with the Design of the Study, Findings, Discussion and Conclusion of the Study,</td>
</tr>
</tbody>
</table>
### Bibliography

| Educational Implications and Suggestions for the Further Study in detail. |
| Bibliography Provides list of Books, Dissertations, Journals and websites which helped the Researcher in the process of the Study. |

The ensuring chapter deals with the Review of Related Literature.