CHAPTER – I

INTRODUCTION

“The quality of a nation depends upon the quality of its citizen. The quality of its citizen depends not exclusively but in critical measure upon the quality of their education. The quality of their education depends, more than any other single factor, upon the quality of their teachers.”

(American Commission, 1944, p.2)

1.0 INTRODUCTION

Education is the main driving force which affects the quality of life. It gives real meaning to democracy in which a common man participates and contributes effectively to the change and development. It has assumed more importance today than ever before because in its present role, it is adding new dimensions to our present and future. Education for reconstruction of our society is a colossal task. It can be achieved only if it is undertaken with honesty and seriousness of purpose and pursued consistently with commitment by all concerned in a coordinated way. As a result of many ties of interdependence among countries, the world we live in has evolved into a globalized system. Recent history unquestionably shows that the lives of the men and women of this planet may be affected by events and processes thousands of kilometers away. World-wide economic, geopolitical and social relations, modern communications and technologies, media and transport allow a fast flow of information. People and goods are both causes and characteristics of globalization as a process that leads to an interdependent world and to what now a days is called globalization (Silva, 2010). So, there have been noticeable developments in technology and knowledge all over the world which have created an amazing learning environment and impacted teaching and learning.

The world is said to have entered the age when information is central to technology, economy, work, space, and culture. Thus, with the advent of the information age, people argue that an information society at hand (Reddy, 2010). The globalization and technological changes that have accelerated over the past
decade have created a new global economy which is powered by technology, fueled by information and driven by knowledge. Technology is imparting one's life in a significant way. As the new technologies emerge, decisions are made about integrating them into behavior. One of the challenges facing the developing countries is preparing their governments and their people to participate in the globalization process as well as in the communication and information revolution. The emergence of this new global economy has serious implications for the nature and purpose of educational institutions. As the access to information continues to grow exponentially, educational institutions cannot remain mere venues for the transmission of a prescribed set of information from teacher to student over a fixed period of time. Rather, institutions must promote "learning to learn," i.e. the acquisition of knowledge and skills that make possible continuous learning over the life time (Dighe, Hakeem & Shaeffer, 2009).

“The illiterate of 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn” (Toffler, 1972, p.414). Rightly it is an Era of information exploration and information explosion. Due to this revolution, information can be accessed from any part of the world with the help of information and communication technology. ICT is a new medium, a new way of representing, communicating and working with information (Kukreti & Saxena, 2004). A nation's development potential depends upon its ability to educate continuously its population and create armies of skilled man power. In particular, use of information and communication technology (ICT) in acquiring knowledge and skill has become essential element in educational process and has magical effects. It is obvious that emphasis on ICT is a crying need as it acts as a multiplier for capacity building efforts of educational institutions without compromising the quality (Dhulia & Neelam, 2009).

1.1 CONCEPT OF INFORMATION AND COMMUNICATION TECHNOLOGY

Information and Communications technologies are a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information ICT includes the use of computer technology, including hardware, peripheral devices, media, delivery systems and
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software. This term is used by UNESCO in reference to the integration of technology into teaching (UNESCO, 2002).

ICT is an acronym that stands for Information and Communication Technology. ICT covers any product that will store, retrieve manipulate, transmit or receive information electronically in a digital form. It includes digital technology i.e. personal computers, digital television, email, robots etc. ICT is often categorized into two broad types of products, one is the traditional computer based technologies and the more recent, and fast growing range of digital communication technologies. In other words, radio, television, telephone, computer, internet services, web based PC’s mobile phones, WLL network, projectors, wireless sets, I Pods, interactive boards and many more such kind of devices which gather information are (I) part of ICT, and communicate, the data (C) part of ICT, usually over some distance with the help of technology (T) part of ICT by ways of network and connections to the internet. The very air we breathe literally buzzes with all kinds of information signals. ICT encompass all the technologies by means of which we can detect these signals, interpret them, and exchange them with others. ICT is a plural term that refers to many technologies. It is an all encompassing term that includes the full gamut of electronic tools by means of which data are gathered, record, and store information, and by means of which they exchange and distribute it to others (UNESCO, 2010).

So ICTs are tools that comprise electronic devices which are utilized for information and communication needs of institution, organization, students and individuals. Such electronic devices include computer (hardware & software), networking, telephone, video, multimedia and internet. ICT provided students and teachers with practical and functional knowledge of computer, internet and other associated area of ICT (Adebayo, 2008). It changes teaching and learning through its potential as a source of knowledge, a medium of transmit content, a means of interaction and dialogue. Thus, ICT is both a cause of change and a means of achieving it (Jenkins, 1999).

To quote the National Curriculum Framework (NCF) 2005, “ICT is an important tool for bridging social divides. ICT should be used in such a way that
it becomes an opportunity equalizer by providing information, communication and computing resources in remote areas”.

1.2 ICT IN EDUCATION

One of the biggest changes in educational systems around the world has been integration of information and communication technology (ICT). The ICT revolution is well under way across the globe. It is not a revolution in technology, machinery, techniques, software, speed or convergence; it is a revolution in concepts (Reddy, 2010). Information and Communication Technology (ICT) is a very strong force which has lasting impact on the way we live, thing and act. In the last three decades or so, each sphere of life has been influenced by it. The traditional methods are being replaced by modern methods. In the field of education, ICT is now finding wide applicability world over. In recent times, factors have emerged which have strengthened and encouraged moves to adopt ICTs into class rooms and learning setting (Oliver, 2002).

ICT has very strong effect in education and it provides enormous tools for enhancing teaching and learning. There have been many studies that have highlighted the various ways that ICT may support teaching and learning processes in a range of disciplinary fields such as the construction of new opportunities for interaction between students and knowledge; accessing information and etc. ICT can have a useful effect on teaching and learning if it is used under right conditions including suitable sources, training and support. ICT also offers the potential to meet the learning needs of individual students, to promote equal opportunity, to offer learning material, and also promote interdependence of learning among learners (Power, 2005). ICT has been adopted as potentially powerful enabling tool for educational change and reform. When used appropriately, different ICTs are said to help expand and access to education, strength the relevance of education to the increasingly digital workplace, and raise educational quality by, among others, helping make teaching and learning into an engaging active process connected to real life (Tinio, 2009). So, it is right to say that the effective integration of ICT into the educational system is a complex process. This integration involves not only the technology but also curriculum and pedagogy, teacher competencies and
institutional readiness. ICT provides opportunities to the teachers and students so that they can communicate with one another more effectively during formal and informal learning (Yusuf, 2005).

1.2.1 Development and Advancement of ICT in Education

The adoption of ICT into the practice of education is not something that began with the emergence of the new digital technologies (Farrell, 2003). Technologies such as radio, telephone and television was introduced over 50 years ago and they are still being used at present. As noted by Farrell (2003), the 'old' technologies never disappeared. What is new are the many ways that they can be combined and mixed with the new technologies. However, there was not much attention given to these 'older' technologies and their impacts in education, until relatively cheap microcomputers became available in the early 1980s (Pelgrum & Law, 2003).

Micro computers were used in schools, and by the end of 1980s, the focus shifted from computer technology to Information Technology, which signified the capacity of technology to store and retrieve information. However, the interest of technologies in education boosted and increased globally during the introduction of ICT in the early '90s, when e-mail started to become available to the general public, followed by the emergence of the Internet and World Wide Web. By then, ICT was conceptualized as a facilitator for major education reforms in many countries, and initiatives were carried out to improve education (Pelgrum & Law, 2003).

The emergence of Internet and World Wide Web had expanded the potential of ICT in education, where one of the many positive impacts is its incremental development in educational opportunities and its ability to overcome the time and distance boundaries in education. It makes asynchronous learning possible for students, and learning can be done anywhere at any time with resources from all over the world (Tinio, 2003). This has further led to the transformation of learning paradigm from teacher-centered to learner-centered. The learner-centered learning process is underpinned by constructivist theories which assume that learners are active agents who purposefully seek and construct knowledge within a meaningful context (Tinio, 2003; UNESCO, 2002). Also, a
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variety of learning approach and learning theories started to emerge, such as e-
learning, distance learning and blended learning, which all are commonly
associated with learning that uses an information network (Tinio, 2003).

1.3 WHAT ICT BRINGS TO THE CLASSROOM

ICT has had an enormous impact on every aspect of society. "A third
industrial revolution" (p.4), is how UNESCO describes the impact towards
knowledge societies (UNESCO, 2005). ICT was originally intended to serve as
means of improving efficiency in the educational process, further the potential of
ICT in educational setting is said to offer teachers and students the teaching and
learning opportunities that improves teaching and learning process, when used
appropriately (UNESCO, 2002). The type of learning supported in an ICT
learning environment tends to be transformative. The use of ICT in classroom
situation sees the teacher as facilitator rather than dispenser of knowledge.
Teachers serve as guide in teaching and learning. Some of the ICT commonly
used in classroom for educational purposes include laptop computer, local area
network and the internet. The computer has the capacity to put text, graphics, and
pictures on screen and accept students input, which can be easily retrieved and
analyzed. Teacher too will be able to change and update material on a web-page
based on new information or new needs of the learner (Adebayo, 2008).

The use of the new ICTs in schools adds a unique dimension to teaching
and learning. The type of learning supported in an ICT learning environment
tends to be transformative. Thus different new information and communication
means invite for personal interpretation and meaning, evaluation and decision,
reasoning and justification, synthesis and conceptualization, originality, creativity
and innovation. Effective learning with and through ICT would result in pupil
asking more questions and offering hypothesis, as they can answer or explore
them; pupils showing better motivation and willingness to look for answers,
because ICT makes information retrieval, data analyses and modeling easier.
Effective teaching through ICT would prove that individual lesson planning takes
account of school's agreed plan for the development of ICT. Teachers use ICT to
motivate and sustain pupils interest; teachers manage their classroom to
maximize the availability and use of ICT tools; teachers use the ICT expertise of colleagues develop his knowledge (FISTF, 2005).

1.4 ICT IN TEACHER EDUCATION

With governments gearing up to prepare their citizens for the knowledge-economy, greater responsibility has been placed on education institutions to meet the challenges brought about by this new landscape. As globalization and knowledge societies expand, reform on the teacher education programs is becoming an important issue because teachers are always seen as moderators of a changing society (Tarman, 2010).

Teachers are today at the centre of the scene in educational reforms. National governments, international organizations and even international non-government organizations (NGOs) assume that the quality and performance of education systems depend more and more on what teachers know and do in the classroom. (Verger, Altinyelken &, koning, 2013). Consequently, countries had to improve their educational systems in order to provide their people enough knowledge to use this technology. Paralleling fast changes in Indian society, like in other countries, there have been some changes in the purpose of the functioning of education. Hence, the necessity to make improvements in teacher preparation and training is a current issue. To be highly qualified, teachers must be well prepared, especially in improving the quality of education facing global challenges. For this purpose, we need teacher education reform that aligns teacher preparation with the demands of an emerging information society and an increasingly interdependent world in the 21st Century. (Tarman, 2010). So, in this era of information and technological advancement, the teachers and teacher educators must play an important role in incorporating the understanding of the challenges of globalization and making necessary changes into the substance of education.

ICT have the potential to enhance access, quality and effectiveness in education in general and to enable the development of more and better teachers in particular (Sumalatha, 2009). The use of ICT in and for Teacher Education is now seen world wide as both a necessity and an opportunity. With the moral and intellectual strength in the present scenario, the use and implementation of ICT is
the only key for India to attain more advanced system of Education. The quality of education depends on the quality of teachers. Without maintaining the quality of teachers no innovation can be expected. All nations attempt to impart quality education and today when there is virtual explosion of information, it is highly essential that Teacher Education is of the highest quality and standard. Overall quality of education depends to a large extent upon the quality of the Teacher Education. Teachers play vital role in the development of any society. The teachers are considered as the torchbearers in creating social cohesion and national integration. Only enlightened and emancipated teachers lead communities and nations by their efforts towards better and higher quality of life.

In 1947, at the eve of independence, there were 649 training schools with enrolment of 39,000 students. The number of secondary training college all over the country was 42 with an enrolment of about 3,000 teacher trainees. At present there are more than 5 million teachers in India. The enrolments in teacher education institutions are more than 2, 00,000 every year. There were around 2000 teacher education institutions during 2002-03. Today, there are more than 30,000 teacher education institutions in our country. The numbers of teacher education institutions are increasing day by day because of privatization and liberalization of teacher education. However, with rapid expansion in number of teacher education institutions, quality suffered in all manners. We are back step in many areas of teacher education. On the other hand social, economical and technological changes of the past decades are making education and training more crucial than ever. Yet as a whole it can be said that teacher education is struggling to provide educational opportunities to their students with necessary knowledge and important teaching skills as well as conducive environment.

So, there is a need to introduce ICT in teacher education programme. The application of ICT for teachers is a two-fold. Firstly, teachers can use information technology for their own professional growth and secondly, they can use ICT for making teaching and learning process more effective. Whether teachers use technology for self-learning or for enhancing pupil learning, they need to acquire and develop professional knowledge and skills in use of information technology. Teacher's work load can also be reduced by using information technology. Their
role will be changed from that of a teacher to that of a facilitator. They have to teach students how to select information and synthesize it and how to find a right way in conflicting and contradictory situations.

1.5 POLICIES ON ICT

"Teacher education institution may either assume a leadership role in the transformation of education or be left behind in the swirl of rapid technological change" (UNESCO, 2002, p.55).

UNESCO (2002) provides guidelines for introducing ICT in Teacher Education. The two important points related to changing roles of teachers and students are

1. The ICT curriculum should facilitate change toward a more inclusive approach that promotes positive and supportive interdependence between teachers and students.

2. Plan curriculum to promote inter-cultural collaboration and develop a learning community within and between schools and countries using shared and complementary approaches with languages and cultures.

India recognized the importance of Information & Communication Technology (ICT) in education ever since the dawn of its independence. Different policies have been formulated regarding ICT and its integration in education providing professional development to a large number of diverse teacher populations, varying in skills and competencies has always been a challenging task for education policy makers and implementers in India, especially in re-molding teachers’ thinking from traditional teaching practices to student centered pedagogy and developing skills that involve the effective usage of ICT tools. In the recent past there is great emphasis and investment by the state and central governments for ICT in education implementation. However the various ICT initiatives in education do not comprehensively address the preparedness of teachers for 21st century education and ICT integration. Training of teachers is critical to implementation and success of the ICT in education programs in India. Departments of Education across various states having understood the importance of professional development for a diverse country like India, have taken various
initiatives to provide a bouquet of professional development programs for teachers.

The teacher education curricula in ICT have been shaped to a significant extent by the document of the NCERT. The NCERT has taken an initiative to make ICT a compulsory one in the pre-service course in Teacher Education. The major objective of this course is to enable the teacher trainees to effectively use ICT in teaching, learning, use multimedia for preparing lesson plans, document creation, communication and dissemination of information. Almost all state and central government agencies have adopted a liberal policy of encouraging and supporting ICT curricula in pre-service teacher training institutions as recommended by the NCTE.

The Government of India in its national policy on ICT 2009 envisages three stages of ICT implementations at the school level - ICT literacy and Competency enhancement, ICT enabled teaching-learning and lastly, introduction of ICT related elective subjects. The Policy statement also visualizes a progress in pedagogy from the initial projecting media to support a lesson, to multimedia self-learning modules, to simulations to virtual learning environments. Finally, classrooms should be transformed into SMART classrooms. Today, the country’s decision-makers, at both the central and state levels, have chosen to explore the use of newer computer and Internet based ICTs for education, along with broadcast ICTs, and has been promoting the use of open and distance learning for both the formal and non-formal education sectors. The launch of a dedicated broadcast education satellite, EDUSAT, is scheduled for early 2004, with capacity for specialized educational channels and up to 5000 FM community broadcasting stations for use by educational institutions.

In the Eleventh Five Year Plan (2007-2012) importance of ICT in education has been emphasized. In this plan 10,000 crore rupees has been allocated for ICT integration including improving the infrastructure and training programmes. Out of this 5000 crore rupees is for ICT integration in school education and another 5000 crore for higher education. During the 11th plan period, it is proposed to spread the coverage of ICT to all the 360 universities and 17,625 colleges in a phased manner. National governments, international
organizations and even international non-government organizations (NGOs) assume that the quality and performance of education systems depend more and more on what teachers know and do in the classroom. (Verger, Altinyelken & koning, 2013). Hence, the necessity to make improvements in teacher preparation and training is a current issue. For this purpose, we need teacher education reform that aligns teacher preparation with the demands of an emerging information society and an increasingly interdependent world in the 21st Century.

1.6 ROLE OF ICT IN PRE-SERVICE AND IN-SERVICE TEACHER EDUCATION

In the present context there is a need to facilitate teachers training on ICT at the pre-service and In-service level. NCTE and many teachers training institutes should introduce qualitative parameters at the pre-service teachers training as well as In-service teachers training programmes. ICT can play an important role in term of capacity building of the teachers to equip them to face the emerging challenges. ICT in-service training is an entirely different approach to teacher improvement is well access to course content, lesson plans 'and network to other teachers. There are many views on what the pre-service experience should include to increase the likelihood that ICTs will be used in classrooms. Wozney, Venkatesh and Abrami (2006) identify technology related training as a key factor, suggesting that it plays a crucial role in developing teachers' competency with computer applications as well as influencing teachers' attitudes towards computers. Ward (2003) suggests that the first step to ensuring teacher use of computers, as teaching and learning tools, must be to provide them with sound educational reasons for doing so. Steketee (2005) in a review of pre-service teacher experience and preparation to use ICTs in classrooms proposed a classification of preparatory approaches.

1.7 NEW ROLE OF TEACHER

In this age of rapid change and uncertainty there is one thing of which we can be certain that teachers will need to adopt to change if they are to survive and keep pace with new methods and technologies especially ICT. So, ICT brings changes, which are comprehensive embracing teaching methodology, assessment of learning student tracking, communication and evaluation. Teachers have been
polarized in their acceptance of the new technologies, while some have enthusiastically integrated computers and the internet into the classroom, others have been cautious in their welcome and some have simply rejected the technologies, ironically some enthusiasts have inadvertently damaged the reputation of ICT by poor classroom practice, using the technology for the sake of its novelty value, or failing to think through the issues before implementing the technology (John, et al., 1999).

So, the latter-day teachers should be not only an information provider, but also an example to be followed, an adviser and supporter in building up the students' capacities and mobilizing them to acquire knowledge and wisdom. Depending on the educational and social context, the teacher shall play various roles; and in this case, modern ICT can offer an important support and influence the relative importance of different roles. The development of modern information society determines the dynamics of change for various aspects of teachers' activities and mission. The Government of India’s policies have focused especially on teacher education institutes as these institutions are responsible for the education of the teachers of tomorrow. The National Curriculum Framework- 2005 for school education also emphasizes a paradigm shift in respect of the entire process of education. Looking to the potentialities of ICT, National Council for Teacher Education (NCTE) has put lots of emphasis on its use (Khokhar, 2008).

Various approaches have been tried to provide quality teacher education. Prominent among these strategies are training programs designed to raise skill levels and foster positive attitudes towards computers among teachers. National Assessment and Accreditation Council (NAAC) has also put ICT as one of the criteria of grading the teacher-training institute. NCTE also organizes ICT orientation camps for training the teacher educators. One of these programs is Intel Teach Program. It is a professional development program for In-service and Pre-service teachers. This program has been working in association with NCTE since 2002. Later, in December 2006 NCTE and Intel signed an MOU on project named XPDITTE (Rama & Lakshmi, 2008). The objectives of this MOU are to impart sustained professional development to all teacher educators from all the
1.8 INTEL TEACH PROGRAM

No amount of technological upgradation will change the performance of students without the active involvement and support of teachers. A teacher is a professional who requires expert knowledge and specialized skills through a synergetic process of intensive pre-service and extensive in-service training. At both stages, ICT can be utilized effectively for capacity building. Individual institutions are taking initiatives and making a difference in integrating ICT in teacher education institutions. Intel Teach Program has contributed in empowering teachers with skills to integrate technology to enhance student learning and ultimately make them autonomous learners. The Intel Corporation’s Teach to the future programme has made an important contribution in this area during the past decade through interconnected phase extending from computer literacy as parallel to the curriculum, to integration of ICT in the curriculum. Intel’s horizons keep expanding with the current foray into web2 technology. The initial role of Intel has been documented in UNESCO’s publication, in Information and Communication Technologies in Teacher Education- a planning guide.

Intel Teach Program is a worldwide initiative by Intel to empower teachers with skills to integrate technology in their classrooms to enhance student learning. It equips teachers with skills that enable them to turn the power of technology to develop teaching and learning tools that captivate students, motivate them and ultimately make them autonomous learners. Though this program encourages integration of information Communication Technology (ICT) for teaching and learning, The skills learnt can be applied to teach virtually every subject and grade level both at the college and school levels. So it is the flagship program of Intel education which provides training to school teachers.
and also equips teacher educators to adopt ICT based teacher education. More than 4 million teachers in over 40 countries were trained since 2000 under the programme. Of these 750,000 teachers have been trained in India alone. On September 2, 2009, Intel Education Initiative in India celebrated the completion of 10 years.

The Indian program works closely with Ministry of Human Resource Development (MHRD) and five state governments and eminent educationists and academicians. In India, Intel Teach has two important segments: The In-Service segment (comprising Government Schools and private schools) and the Pre-service segment (University Departments of Education and Colleges). The Intel Teach Pre-Service was implemented in the year 2002 in India with an objective to empower teacher educators across colleges of education and the future teachers with the skilful use of technology in the pedagogy. Intel Teach training is imparted to the faculty of teacher education institutions about ICTE, and the Intel curriculum is integrated in the University curriculum for teacher education. Intel has signed an MOU with National Council for Teacher Education(NCTE) to integrate the Intel curriculum in the B.Ed. curriculum nationally and to provide professional development to all teacher educators in all recognized teacher education institutions across the country. The project is entitled X-elerated Professional Development on integration of Technology in Teacher Education (XPDITE).

1.9 ATTITUDE

The concept of attitude is an old one in psychology; and while we tend to associate it more directly with the area of social psychology, it was an important concept in general psychology in Germany at the turn of the twentieth century. It was first used in America by Franklin H. Giddings, the sociologist, and was introduced the concept in a general textbook was Howard C. Warren, in his Human Psychology. Because this text was widely used in the 1920’s, the concept of attitudes no doubt gained more general acceptance by American psychologists than it would have had as a consequence of the influence of Giddings and Thomas, both of whom were professional psychologists. Both sociologists and
psychologists consider attitudes inseparable from values, either personal or social.

An attitude is an expression of favor or disfavor toward a person, place, thing, or event (the attitude object). Prominent psychologist Allport Gordon (1935), once described attitudes as the most distinctive and indispensable concept in contemporary social psychology. Attitude can be formed from a person's past and present. It is also measurable and changeable as well as influencing the person's emotion and behavior.

Attitude is described as the internal state that influences or moderates the individual’s personal action. It is a complex state of human organism, which affects his behavior towards others, things and events. It is a system of belief, a state arising from a conflict or disparity in beliefs (Festinger, 1957). Festinger’s views tend to point out the cognitive aspects of attitudes, while Krathwohl, Bloom and Masia(1964) have given the learning outcomes of attitudes in the affective domain.

According to International Encyclopedia of Education (1991) Attitude is a term which has been used to describe in a general way the reaction of a subject upon any impression received from his environment. Used in this fashion it is sufficiently comprehensive to include feeling, attention and other similar general phases of mental experience. It refers also to bodily activities when these are directed towards given objects and thus serves useful purpose of associating in discussion mental states with the bodily reactions which they condition or by which they are themselves conditioned.

Krech, et al., (1993) define attitude as an enduring system of positive and negative evaluations, emotional feelings and pro or co actions tendencies with respect to a social object. An attitude can be as a positive or negative evaluation of people, objects, event, activities, ideas, or just about anything in your environment, but there is debate about precise definitions. Eagly and Chaiken, (1998) for example, define an attitude as a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor. Though it is sometimes common to define an attitude as affect toward an object,
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affect (i.e., discrete emotions or overall arousal) is generally understood to be distinct from attitude as a measure of favorability (Ajzen, Ice k. 2001).

Aiken (1996) conceptualizes an attitude as a learned predisposition to respond positively to certain objects, situations, institutions, concepts or persons. As implied in this definition, attitudes possess cognitive (beliefs, knowledge, and expectations), affective (motivational and emotional), and performance (behavior or actions) components.

International Encyclopedia of psychology (2000) defines attitude as a positive or negative evaluation of a person, place or thing. Attitude may be based on direct personal experience with the object or person in question or an indirect, second hand experiences.

This definition of attitude allows for one's evaluation of an attitude object to vary from extremely negative to extremely positive, but also admits that people can also be conflicted or ambivalent toward an object Meaning that they might at different times express both positive and negative attitude toward the same object. This has led to some discussion of whether individual can hold multiple attitudes toward the same object (Wood, 2000).

Attitude in Psychology is a mental position with regard to a fact or state. Attitude reflects a tendency to classify objects and events and to react to them with some consistency. Attitudes are not directly observable but rather are inferred from the objective, evaluative responses a person makes. Thus, investigators depend heavily on behavioral indicators of attitudes- what people say, how they respond to questionnaires (Britannica Concise Encyclopedia, 2002).

Oxford Advanced Learner’s Dictionary by Hornby (2003) defines attitude as the way you think and feel about any object or a person.

1.9.1 Attitude towards ICT

With the advent of various formats of Information and Communication technology (ICT), the world is shrinking at a rapid pace. There is a widespread acknowledgement that ICT can be used to enhance both learning and teaching in one go. It provides an array of powerful tools that can help in transforming the
present isolated, teacher-centered and text-bound classrooms into technology enriched, student-focused and interactive knowledge environments. Having ICT in the education environment does not automatically ensure that high quality, effective teaching-learning would take place; it may change a teacher’s role but perhaps not alter pedagogy. To achieve this, teachers must believe or be made to feel that ICT is a valuable educational tool to boost the teaching-learning process. Thus it becomes incumbent upon them to make a commitment to improving their ICT skills, and in turn, integrate the ICT into their regular classroom teaching practices. In order to integrate ICT more effectively in the educational as well as development environment, it may be worth understanding the teachers’ present level of ICT skills and also their attitudes related to the ICT–pedagogy integration syndrome to improve their ICT skills and thereby, making the teaching-learning and development process more effective. So, the success of any initiatives to implement technology in an educational program depends strongly upon the support and attitudes of teachers involved. It has been suggested that if teachers believed or perceived proposed computer programs as fulfilling neither their own or their students’ needs, they are not likely to attempt to introduce technology into their teaching and learning. Among the factors that affect the successful use of computers in the classroom are teachers’ attitudes towards computers (Huang & Liaw, 2005). Attitude, in turn, constitutes various dimensions. Some examples of these are perceived usefulness, computer confidence (Rovai & Childress, 2002), training (Tsitouridou & Vryzas, 2003), gender (Sadik, 2006), knowledge about computers (Yuen, Law & Chan, 1999), anxiety, confidence, and liking (Yildirim, 2000).

Especially, Israel (Klieger, Ben-Hur, & Bar-Yossef, 2010), Australia (Pierce & Ball, 2009), USA (Glazer et al., 2009; Hixon & Buckenmeyer, 2009; Liu & Szabo, 2009), Turkey (Goktas, Yidirim, & Yildirim, 2008) and Asia/Far East (Sang, Valcke, Braak, & Tondeur, 2010) based studies still consider the attitude of teachers towards ICT as an important issue. Bullock (2004) found that, the attitude of teachers is a major enabling and disabling factor in the adoption of the technology. Similarly, Kersaint et. al. (2003) found that, the teachers with positive attitudes towards the technology feel more comfortable while using it and them usually incorporate it into their teaching activities. Therefore, the
teachers’ attitudes towards computers are one of the significant factors in enhancing the quality of computer usage for instruction (Yuen, Law, & Chan, 1999). ICT training in the colleges is important. To achieve successful training we need to be aware of the user's attitudes toward computers (Zoltan & Chapanis 1982). On the other hand, Brown et al. (1978) suggest that exposure to computer related devices may be a factor in determining ones attitudes toward computers.

Researchers revealed a number of factors that influenced teachers’ decisions to use ICT in the classroom such as: access to resources (Gulbahar 2008); quality of software and hardware (Mumtaz 2000); attitude towards technology (Albirini 2006), competence (Knezek & Christensen 2002); ease of use and educational beliefs (Ertmer 2010); self-efficacy beliefs and incentives to change (Granger 2002); support and collegiality in their school (Hennessy 2010); school and national policies and commitment to professional learning (Jung 2005); and background in formal training (Afshari 2009). Among these factors, the strength of teachers’ ICT skills and the attitude towards ICT as such seem to play a pivotal role in helping them make use of ICT in their teaching-learning process and in turn in proving themselves to be successful teachers and facilitators of ICT intervention and integration both of pedagogy and technology as their principal forte.

A person’s attitude towards a computer is influenced by a variety of aspects, e.g., computer liking, computer confidence, computer anxiety or comfort (Delcourt & Kinzie, 1993), achievement (Bandalos & Benson, 1990), usefulness, and value and age and gender (Colley & Comber, 2003; Kutluca, 2010), subject area and years of computer use (Teo, 2008), levels of technology use in classrooms (Al-Zaidiyeen et al., 2010) and self-efficacy (Rovai & Childress, 2002).

1.10 DIGITAL LITERACY

The concept of digital literacy is increasingly recognized as a critical terrain for 21st century life (Beetham, McGill, & Littlejohn 2009; Ferrari 2012; United Kingdom (UK) Joint Information Systems Committee (JISC, 2012). Digital literacy and its use have become commonplace in our colleges and universities. In an environment that demands the use of technology, educators
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should be knowledgeable of the components that make up the overall computer attitudes of students and be willing to invest the processes and techniques of effective teaching and learning that can take place with computer technology (Anderson, 2002).

The term "digital literacy" was first defined in Gilster's (1997) eponymous book as "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers". Gilster's definition is general and conveys almost the same Meaning as information literacy. His further description in the book, however, focuses more on networked computer sources and application of Internet. These details misled many readers as they assumed that digital literacy refers to the technical aspects only (Bawden, 2008). The recent review of the Digital Literacy literature (Hagel, 2012) enhances our understanding of this learning outcome. Digital literacy often understood differently depending on disciplines, however, fundamentally, it focuses more on literacies rather than media and involves finding, using and disseminating information in a digital world. Definitions of digital literacy abound in literature. Idowu, Adagunodo, and Idowu (2004) define digital literacy as the ability to make use of computer system to word process documents, analyze data, develop small computer programmes, browse Internet and install software. The Department for Education in the United State of America (1996) citing Hall (2005) observes that information literate individuals in addition to knowing how to use the computer for word processing, spreadsheets and Internet access make use of increased learning opportunities provided by such technology. Martin (2005) describes digital literacy as “the ability to succeed in encounters with the electronic infrastructures and tools that make possible the world of the twenty-first century.”

Digital Literacy is the ability to use information and communication technologies to find, understand, evaluate, create, and communicate digital information, an ability that requires both cognitive and technical skills. (American Library Association, 2013). The Association of College & Research Libraries (ACRL) (2000) states that information literacy has significant overlap
with digital literacy skills defined as information technology skills, and are interwoven with, and support, information literacy.

1.10.1 Digital Literacy and Information Literacy

Eshet elkalai (2004) affirms that digital literacy is closely related to the concepts of information literacy, computer or IT literacy, and multiple sets of new literacies. Individuals use the term imprecisely, and this leads to miscommunication and misunderstanding. Digital literacy can be information literacy, technical abilities, and even more. He categorizes digital literacy into five different types of literacy: photo-visual literacy; reproduction literacy; information literacy; branching literacy; and socio-emotional literacy. From this perspective, it is clear that digital literacy does not refer to one single type of literacy, but to multiple sets of new literacies. Photo visual literacy refers to our ability to read visual representations of the digital environment incorporating text, sound, images, and symbols. Reproduction literacy signifies our ability to create and reproduce knowledge from the existing rich information environment. Information literacy focuses on our ability to access, find, and particularly evaluate information coming from a large number of sources. Branching literacy looks at hypermedia and the ability we need to navigate in the interactive and non-linear world of hypermedia. Finally, it is not all about technological and cognitive literacy, but about social and emotional literacy, which provide us the ability to behave appropriately in cyberspace.

According to Mackey and Jacobson (2011), digital literacy only applies to activities that occur within a digital environment that necessarily include technologies, whereas information literacy applies to activities that occur within an information environment that may or may not include technologies. However, in the 21st century, the information environment is predominantly filled with digital technologies, so they overlap much more than they used to before the 21st century. According to Spiranec and Zorica (2010), with the rise of Web 2.0, information literacy merges even more with digital literacy. Digital literacy gives individuals and organizations the capacity to respond positively to change, including change in the digital tools and services available. Flexibility, agile adoption of new practices, and the capacity to choose critically among available
technologies are all central to a lifelong digital capability. The idea of digital literacy therefore goes beyond being skilled in current software applications, important though that foundation may be in supporting access to learning and work.

Futurelab (2010) defines digital literacy as functional skills required to operate and communicate with technology and media with the ability to “participate in a range of critical and creative practices. Digital literacy skills are an important part of everyday life in the 21st century. Most careers demand some level of understanding of how to use a computer, how to competently navigate the Internet and find reliable information, how to communicate electronically, and how to manage data.

1.11 STUDY PROCESS

Loughran & Northfield (1998) defined Study-process as primarily a personal inquiry, researcher’s benefits by working with collaborators who help them “step outside” themselves in order to notice patterns and trends in their work.

In the educational community, the level of technology integration can deeply affect what teachers do and what their students experience. Within the last two decades, affordable technology has allowed schools to experience a growing investment in technology for the teaching and learning process. Because technology is changing so rapidly, it “. . . . is causing more and more confusion about the best way to use it in schools” (Bailey, 1997, p57). The ways that teachers incorporate technology into their teaching and classroom may deeply affect what they do and what their students experience (Sheingold & Hadley, 1990).

Because of technological advances, many of the old ways of doing things may be effective but not efficient. Teachers as learners need to acquire lifelong-learning skills and the ability to cope with constantly changing workplaces. In the present age of technology, teachers and students need not only to know how to learn, but how to analyze and summarize data, make decisions, work in teams, plan solutions to complex problems and be capable of adapting to the unexpected
challenges of digital world. Dwyer (1999) noted that the traditional learning paradigm is still being used in which teachers lecture while students listen, take notes and demonstrate mastery on objective exams. This paradigm may not provide learners with all the necessary knowledge, skills, and attitudes for a rapidly changing global community. Dwyer stated that technology-based learning environments can help students acquire the type of needed knowledge, skills, and attitudes for success, for example, cooperative team projects via e-mail and the Internet, electronic discussion, experiential learning activities via specialized software, simulation of real-life observation experiences, computerized movies with interactive check sheets, and practice activities for developing decision-making, problem-solving, and management skills.

1.11.1 Integration of Technology into Study Process

The Office of Technology Assessment’s 1995 report on teachers and technology indicated that schools have made significant progress in implementing technology to help teachers use basic technology tools but they still struggle with integrating technology into the curriculum. The National Center for Education Statistics(2002) studied the integration of various technologies in the teaching/learning process. The center reported the following examples of how teachers had integrated technology: 44% reported using technology for classroom instruction, 42% reported using computer applications, 12% reported using practice drills, 41% reported requiring research using the Internet, 20% required students to use technology to solve problems and analyze data, 27% had students conduct research using CD ROMs, 27% assigned students to produce multimedia reports/projects, 23% assigned graphical presentations of materials, 21% assigned demonstrations/simulations, and 7% assigned students to correspond with others over the Internet.

Sandholtz, Ringstaff, and Dwyer (1997) described an evolutionary process that teachers go through as they continue to increase their use of technology. They described five phases: 1) Entry, where teachers adapt to changes in physical environment created by technology; 2) Adoption, where teachers use technology to support text-based instruction; 3) Adaptation, where teachers integrate the use of word processing and databases into the teaching
process and 4) Appropriation where teachers change their personal attitudes toward technology; and 5) Invention where teachers have mastered the technology and create novel learning environments. Sheingold and Hadley (1990) found that teachers needed five to six years of working with technology before they felt they had developed their expertise, and when they reached this level, they modified instructional strategies and dramatically changed the classroom environment.

Several authors have written about barriers to the implementation of technology. Kerr (1989) stated that “. . . the teacher’s world is substantially limited by powerful social and administrative pressures to teach in a particular way” (p. 7). In his 1997 article, Glenn supported Kerr by noting that the organizational structure of schools inhibits teachers’ efforts to learn about new technologies and resists innovation, for example, the limited “. . . amount of time available to teachers to learn about new technology” (p. 127).

1.12 JUSTIFICATION OF THE STUDY

Reform and change can be either ‘top-down’ or ‘bottom-up’ in terms of its origin (Bailey et al., 2001). Top-down changes are initiated by those at the top of the organizational chart (e.g. reform designers or administrators) and bottom-up changes are those initiated at the ‘grassroots’ level (e.g. by teachers or students). Positive effects of ‘top-down’ strategies include their efficiency and superb overview of higher levels. On the negative side, if reforms are perceived to be imposed from the top (e.g. the Ministry of Education) it can be difficult for lower levels (e.g. local schools and teachers) to accept them. A bottom-up strategy allows for more experimentation and a better feeling for what is needed at the bottom (by teachers or students). Bottom-up changes may occur at the level of awareness, attitude, skills, or knowledge.

The point is that, even with access to ICT, positive ICT policy and technical support, maximum teachers also need to know how to handle the technology and fully exploit it for school use. Individual factors, especially teacher factors, influence teacher take-up of ICT significantly (Veen 1993, Mumtaz 2000). Teacher factors such as beliefs about and attitudes towards teaching methodology, computer-handling technical skills and ICT pedagogy
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(ICT knowledge and skills in managing classroom activities) are regarded as most influential in teachers’ use of computers (Mumtaz 2000; Hu and Webb 2009). Thus, both institutional and individual factors should be taken into account in the implementation of ICT in education. As O’Connor and Gatton (2004) state that without a real commitment on a broad institutional and personal front, even the most successful programme will lose ground.

Information and Communication Technology (ICT) can play an important role in the preparation of quality teachers. It inculcates the necessary pedagogical skills and competencies among the teachers and makes them professionally competent to meet the demand of society and provide access to the technology enhanced learning projects created under the program. ICT Programs can provide more flexible and effective ways for professional development for teachers. They help teachers to promote higher order thinking among the students and create student-centric learning environments. Teacher’s attitude towards ICT programs and digital literacy are major factors related to both the initial acceptance of ICT as well as future behaviors regarding its use.

The technology initiatives taken to be adopted by educational policy-makers worldwide seem to be focused on the tangible potentials of technology per se to manipulate classroom interaction in a more constructive and Meaningful way to cause inclusive development, much though in a hurry. In developing countries, in particular, the policy-makers appear to have adopted ICT in education to accelerate the nation’s development efforts too in the process. In such hasty adoption, however, building teachers’ skills and attitudes toward ICT would have often been ignored. The literature hints at the need for studies not only on the teachers’ level of ICT skills and their attitudes toward ICT but also on the factors responsible to have produced or hindered them. A very little research can be found related to the attitude of teacher educators towards ICT and no research is so far reported related to the effects of Intel Teach Program on Attitude towards ICT, Digital Literacy and Study Process of teacher educators in Haryana. It is, therefore, necessary that adequate research needed to be carried out to assess the extent to which technology integration has taken place in those teacher education institutions in which Intel training is imparted. It would also
reveal that in order to maximize the benefits that can be derived from new technology in the classroom, teachers may need training for proficiency in the technology. It would help the teacher educators to learn how they can best use the technology to enhance teaching and learning using the Intel Teach Pre-service curriculum and how can turn the power of ICT into teaching strategies. Taking the practical relevance of ICT training into consideration, the present research was an endeavor to reveal the effects on the professional development of the teacher educators after attending this program and subsequent use in the actual classroom. The outcomes of the study, it was expected, would not only reveal the status of efforts made by NCTE and Intel Teach Program, but also possible future directions needed to strengthen the process and how it can improve the digital literacy and study process, through developing proper attitude of teacher educators towards ICT. Suggestions based on the perceptions of the individual teacher educators engaged in pre-service teacher education programs may be given to enhance the qualitative functioning of teacher education in colleges of education of Haryana. So, the present research was based on this pressing need to study the effectiveness of this Intel Teach Program on In-service Teacher Educators of Haryana in relation to their Attitude towards ICT, Digital Literacy and Study Process.

1.13 STATEMENT OF THE PROBLEM

EFFECTIVENESS OF INTEL TEACH PROGRAM ON ATTITUDE TOWARDS ICT, DIGITAL LITERACY AND STUDY PROCESS OF TEACHER EDUCATORS

1.14 OPERATIONAL DEFINITIONS OF THE TERMS USED

Effectiveness

It refers to the effect of particular treatment given to a learner which produces a significant change in teacher educators’ behavior in terms of their attitude towards ICT, digital literacy and study process.

Intel Teach Program

Intel Teach Program is an orientation program. It is a professional development program for In-service and Pre-service teachers. It is a world-wide
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accepted professional development program that helps teacher educators to integrate technology into the classroom to enhance student learning, but its effectiveness has yet to be investigated with reference to teacher educators in India.

Attitude Towards ICT

International Encyclopedia of Psychology (2000) defines attitude as a positive or negative evaluation of a person, place or thing. Attitude may be used on direct personal experience with the object or person in question or an indirect, second-hand experience. Similarly, Smith and Fabringer (2000) refer attitude to a relatively generally and enduring evaluation of some object, group or concept along a dimension ranging from negative to positive.

In the present study the investigator has taken the meaning of attitude towards ICT as what the teacher educators feel and think and react about Information and Communication Technology which may affect its use in the classroom positively or negatively. It is thus, their tendency to use or avoid and encourage or discourage the use of Information and Communication Technology in the classroom while teaching.

Digital Literacy

Hansen (2005) defined Digital Literacy as an individual’s abilities to adopt, adapt, invent, and evaluate technology to positively affect his or her life, community, and environment. The term digital literacy is being increasingly used by educational institutions and other organizations, refers to possessing basic level of computer technology skills by their students/employees.

The Digital Literacy in the present study refers to the ability of the teacher educators to use digital technology, communication tools or networks to locate, organize, understand, evaluate, use and create information related to undertaken studies. It involves a working knowledge of current high-technology and understanding of how to use it for education.

Study Process

Loughran and Northfield (1998) defined Study Process as primarily a personal inquiry, researcher’s benefits by working with collaborators who help
them “step outside” themselves in order to notice patterns and trends in their work.

In the present study the Study Process refers to the process in which the teacher educators as users integrate technology and obtain knowledge and become able to communicate the content effectively to the students in a way which will be an effective aid in their appropriate constructions of knowledge.

Teacher Educators

In the present study, the teacher educators working in Colleges of Education affiliated to Kurukshetra University, Kurukshetra were considered as teacher educators.

1.15 OBJECTIVES OF THE STUDY

The objectives of the present study are:

1. To study the Attitude of teacher educators of Haryana towards ICT.
2. To study the Digital Literacy of teacher educators of Haryana.
3. To study the Study-Process of teacher educators of Haryana.
4. To investigate the effectiveness of Intel Teach Program on teacher educators of Haryana in relation to –
   a) Attitude towards ICT
   b) Digital Literacy
   c) Study Process
5. To investigate the differences in Attitude towards ICT of teacher educators on the basis of demographic variables such as-
   a) Gender (Male vs Female)
   b) Management (Government/Aided vs Self-financing)
   c) Streams (Science vs Humanities)
6. To investigate the differences in Digital Literacy of teacher educators on the basis of demographic variables such as-
   a) Gender (Male vs Female)
b) Management (Government/Aided vs Self-financing)

c) Streams (Science vs Humanities)

7. To investigate the differences in Study Process of teacher educators on the basis of demographic variables such as:

   a) Gender (Male vs Female)

   b) Management (Government/Aided vs Self-financing)

   c) Streams (Science vs Humanities)

8. To investigate the relationship of Attitude towards ICT with Digital Literacy of teacher educators of Haryana.

9. To investigate the relationship of Attitude towards ICT with Study Process of teacher educators of Haryana.

10. To investigate the relationship of Digital Literacy with Study Process of teacher educators of Haryana.

1.16 HYPOTHESES OF THE STUDY

Following hypotheses were formulated to achieve the objectives of the present study:

1. There is no significant difference between Pre-test and Post-test scores related to the Attitude towards ICT of teacher educators attending Intel Teach Program.

2. There is no significant difference between Pre-test and Post-test scores related to Digital Literacy of teacher educators attending Intel Teach Program.

3. There is no significant difference between Pre-test and Post-test scores related to Study Process of teacher educators attending Intel Teach Program.

4. There is no significant difference in Attitude towards ICT of teacher educators on the basis of -

   a) Gender (Male vs Female)
b) Management (Government / Aided vs Self-financing)
c) Stream (Science vs Humanities)

5. There is no significant difference in Digital Literacy of teacher educators on the basis of -
   a) Gender (Male vs Female)
   b) Management (Government / Aided vs Self-financing)
   c) Stream (Science vs Humanities)

6. There is no significant difference in Study Process of teacher educators on the basis of -
   a) Gender (Male vs Female)
   b) Management (Government / Aided vs Self-financing)
   c) Stream (Science vs Humanities)

7. There is no significant relationship between Attitude towards ICT and Digital Literacy of teacher educators.

8. There is no significant relationship between Attitude towards ICT and Study Process of teacher educators.

9. There is no significant relationship between Digital Literacy and Study Process of teacher educators.

1.17 **DELIMITATIONS OF THE STUDY**

Due to paucity of time and resources the present study was delimited to the following:

1. In-service teacher educators working in different colleges of education affiliated to Kurukshetra University, Haryana.

2. Only 200 In-service teacher educators were taken.

3. Only the teacher educators who were undergoing training during the years 2009 and 2010 were selected for the study.

4. Only those In-service teacher educators were taken in the study those who were taking part in Intel Teach Program.
5. Only three variables namely – Attitude towards ICT, Digital Literacy and Study Process were taken for investigation.