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BACKGROUND OF THE STUDY

1.0 INTRODUCTION

The root of Indian Education system lies in ‘Gurukula’ system. Gurukula was a place where ‘shishya’ stay with guru to gain knowledge. In Gurukula, the teacher not only taught his pupils mendatory subjects but shaped his character and personality by instilling in him an awareness of the world around him, to lead a life useful to the society and face various challenges which come across in life and turn these opportunities (Dogra & Gulati, 2006). The word Guru consisted of two words ‘Gu’ and ‘Ru’. The meaning of Gu is darkness and Ru is controller. It means to avoid darkness or ignorance. In Indian culture the place of a teacher is higher than the God. Indian mythology holds a view that

गुरुब्रह्मागुरुविष्णु: गुरुर्देवोमहेश्वर: I
गुरु: साक्षात्परमब्रह्मातस्मैश्रीगुरवेनम: II

The Guru is Brahma (Creator); he is Vishnu (Preserver); he is Shiva (Destroyer); he is Parambrahma. I pay my greeting to the Guru.

In ‘Gurukulas’, ‘Guru’ imparted knowledge verbally. ‘Shishya’ only listen to the text uttered by Guru and tried to reflect by ‘manana’ or ‘chintan’ on the topic they were taught. The knowledge gained by the Guru through sheer hard-work, practice and experiments- all of it was delivered to the students (Kashalkar, 2013). ‘Shishyas’ were able to learn only those things whatever they were able to understand and recall. There was no any source to preserve the knowledge. But later on, people started to store knowledge on palm leaves and bark of the trees. But revolutionary changes occurred in 15th Century with the invention of printing press. According to Elizabeth Palermo (2014), Joannes Gutenberg is usually cited as the inventor of printing press. This invention resulted in production of printed books for use of masses and spreading of knowledge throughout Europe. Paul Saetter mentioned in his book The Evolution of American Educational Technology that Johann Comenius, the Maravian teacher and theologian of 17th Century, saw in the printed book the opportunity to organize subject matter in an optimum sequence making it possible to teach several hundred pupils at once (page,4). The print mass media yielded books, newspapers and
magazines for delivery of information for general public. The term ‘technology’ was used for the first time in 17\(^{th}\) Century which originated from a Greek word *teknoLOGIA* which is composed of two words; *tekhne* and *logia*. *Tekhne* means art or craft and *logia* mean a subject of study.

The history of change from print mass media to audio-visual mass media has completed its journey from books, newspapers and magazine to wireless sound transmission, radio broadcast, visual media like television, computer, internet and digital media. These technological developments resulted in revolutionary changes in preservation of knowledge to make available it to every learner at any time. But role of technology in education came to be emphasized greatly in the second half of the 20\(^{th}\) century all over the world (Paliwal & Paliwal, 2010). The applications of technology in education were known under an umbrella term Educational Technology. The main reason to use technology in education is to achieve the objectives of education effectively by using available resources.

In 20\(^{th}\) century, the use of computer in education has become an effective mean to store the information than ever before. The expansion in the knowledge increased and technology played significant role to access information anywhere. With computer technology education is not limited to chalk and talk but available all over the globe just by clicking on internet.

### 1.1 HISTORY OF COMPUTER DEVELOPMENT: A JOURNEY FROM ABACUS TO MODERN COMPUTERS

The word computer is derived from Latin word “Compute” whose meaning is “to calculate”. Computer is an electronic device which is capable of receiving information (data) in a particular form and of performing a sequence of operations in accordance with a predetermined but variable set of procedural instructions (program) to produce a result in the form of information of signal (Joshi, 2014). Adekemi (2001) defined computer as a combination of related devices capable of solving problems by accepting data, performing described operations on data, and supplying the results of these operations. The characteristics like high speed, versatility, accuracy, diligence, storage capacity, automation etc. make it powerful and useful tool.

In ancient time people performed calculations like addition and subtraction on fingers. Soon they started to present numbers with the help of pebbles and wood bits. For
instance 1 is represented by one pebble or one bit of wood, 2 is represented by two pebbles or two bits of wood and so on. But when they had to deal with numbers over ten, they felt necessity of a counting machine. Pebbles and bits of wood paved the way to construction of Abacus which was consisted of counting boards and bead frames. One of the oldest counting boards was Salamis tablet used in 300BC in Babylon. It was made up of flat marble stone having set of lines to represent various figures. Similar counting boards were used by Greek, Rome and in medieval Europe. With passage of time, modification in counting boards led to construction of Abacus. Today’s abacus was discovered around 2nd Century AD by Chinese. It was built up of wooden frame with 13 vertical wires with 7 beads each. Later on Chinese abacus was modified by Japanese and Russians. The first counting machine called calculating clock was discovered by Wilhelm Schickard in 1624 but did not get fame. In 1642, first mechanical calculator known as Pascaline was invented by Blaise Pascal which was able to perform addition and subtraction up to eight digits. Pascaline was modified by German Mathematician Gottfried Wilhelm von Leibniz by adding a new function of performing multiplication. Charles Xavier Thomas was French scientist who invented first mechanical calculator which was able to do four basic mathematics operations like addition, subtraction, multiplication and division. Charles Babbage, an English mathematician built a mechanical calculator called Difference Engine which led to construction of computer. His idea of breaking down complicated mathematical calculation into simple operation developed Analytic Engines. In analytic engine, the concept of punched cards developed by Joseph Marie in 1820 was used to function as program. Later on, Herman Hollerith used punched cards to store data rather than as program in his machine. The development of binary system by Boole brought revolutionary changes in development of future computers.

There are three machines which claimed to be first electronic computer. The first machine, which claimed of being first electronic computer, was developed by J.V. Atanasoff and Clifford Berry in 1941. They designed it by using boolen algebra and advance technology of vacuum tubes. The second machine claimed to be first electronic computer was designed by Englishman Alan Turning in 1943 during second world war to break code messages of Germans. The third one was ENIAC (Electronic Numerical Integrator and Computer) devloped by J.P. Eckert and J.V. Mauchly for military purpose. Later on ABC (Atanasoff-Berry Computer) was considered as first electronic computer because it used vacuum tubes first before
ENIAC. J.P. Eckert and J.V. Mauchly also developed EDVAC (Electronic Discrete Variable Automatic Computer), the improvement over ENIAC. EDSAC (Electronic Delay Storage Automatic Computer) was developed in 1949 by M.V. Wilkes was first computer which can store a program. UNIVAC-1 was first commercial computer developed by J.P. Ecker and J. Mauchly in 1951.

In 1947, the invention of transistor was the beginning of early super computers. The early supercomputer like Stretch by IBM and LARC by Sperry-Rand were first computers in which binary codes were replaced with programming codes and also had operating system, memory and disk to store data. The inventions of integrated circuits in 1958 overcame the disadvantages of transistors. Also development of operating system in 1960 brought remarkable changes in computer development. In 1970s first computer was developed which offered word processor, spreadsheet and computer games. In 1981, first IBM PCs were launched for home, office and school purpose.

The computers built during 1946-1954 are known as first generation computers. The vacuum tubes were used in these generation computers which caused lot of heating problem. These computers were able to calculate data in milliseconds. This generation includes computer such as Mark I, ENIAC, EDVAC, EDSAC, UNIVAC-I etc. These computers used punched cards for input and used only machine language.

The computers of second generation during 1955-1964 used transistors instead of vacuum tubes. Transistors were made up of semiconductor materials which minimize the problem of heating. They were able to calculate data in micro seconds. The language used in this generation computer was Assembly language. These were small in size as compared to first generation computers and consumed less energy. The main examples are IBM 7094 series, IBM 1400 Series and CDC 164 etc.

The computers developed during 1964-1975 are called third generation computers. Integrated circuits were used in place of transistors. An IC contains many transistors and capacitors on a very thin slice made up of silicon. This generation computers can calculate data in nanoseconds. Keyboard and mouse were used as input devices. The main feature was that with the development of operating system, it was possible to run many applications simultaneously. High level languages like RORTRAN-II to IV, PASCAL PL/1, COBOL, BASIC etc. were used in these generations. The main examples are IBM 370, IBM System/360, UNIVAC 1108, UNIVAC AC 9000 etc.
The computers developed between 1970-1990 is called fourth generation computers. The computers of this generation were based on concept of microprocessor. A thin silicon chip on which large scale integrated circuits (LSIC) are built is called microprocessor which make possible to place central processing unit (CPU) of computer on a single chip. The computers of this generation were known as microcomputers.

The concept of ULSI (Ultra Large Scale Integration) chip is used in fifth generation computers which allow placing millions of transistors on a single chip. New operating systems like window 95/98/XP/7 and LINUX etc. have been developed. 1 GB memory chip, hard disc drives up to 180 GB; optical disks up 27GB have been developed. Java language appropriate for internet programming has been developed. They are based on artificial intelligence. This progress leads to sixth generation of computers. This generation started in early 2000s and still in progress.

1.2 COMPUTERS IN INDIAN EDUCATION SYSTEM

The computer technology as an important aspect of teaching-learning process can be divided into three phases: learning, using and implementing.

- Learning refers to study computer as a course work like ‘computer education’. Learner gains knowledge of hardware component like mouse, keyboard, monitor, printer, scanner etc. as well as software packages like Microsoft Word, Microsoft Excel and MS Power Point etc.
- Using phase refers to utilize applications of computer technology in education like computer assisted instruction.
- Implementation refers to accomplishment of computer technology to support teaching-learning process.

The National Policy of Education (1986) and its modification in 1992 emphasized to make use of educational technology to improve quality of education. The policy stressed to implement two center government schemes called Education Technology (ET) & Computer Literacy and Studies in Schools (CLASS). The Education Technology Scheme was initiated in 1972 through which 100% aid was given to six State Institutes of Education Technology (SIET), States and Union Territories for purchase of radio cum cassette players and colour TVs. Further, Computer Literacy and Studies in Schools (CLASS) was launched by The Ministry of Education as a
pilot project in 1984-85 as an outcome of workshop organized by NCERT. This project was executed as a center government scheme in 1993-98 during 8th five year plan to supply BBC microcomputers with coloured monitors, disc drives and printers to each selected school. NCERT was hand over the responsibility to develop the curriculum which focused to achieve following objectives of CLASS:

- To provide students with a broad understanding of computer and their uses
- To familiarize students with the range of computer application in all walks of human life and the potential of the computer as an information processing tool
- To de-mystify computers and develop a degree of ease and familiarity with computers which would be conducive to develop the individual’s creativity in identifying and developing applications relevant to the immediate environment of the child

The National Task Force on Information Technology and Software Development (IT Task Force) formulated in July, 1998 opened new window of opportunities in education by giving strong recommendations to introduce Information Technology in sector of education. It emphasized on various schemes like Vidyarthi Computer Scheme, Shikshak Computer Scheme and School Computer Scheme to motivate students, teachers and schools to purchase computer under reasonable financial package. The concept of smart schools was promoted which not emphasize on IT but to develop the skills and values which will be important in next millennium. 1 to 3 percent of total budget was invested to have computer in all secondary and higher secondary level schools. By the year 2003 computer and internet will be made available in schools, colleges, polytechnics and hospitals.

Later on, Scheme of ICT @ Schools 2004 paves the way to emerge ICT in educational institutes. Under this scheme facility of broadband connection was provided to Government as well as Government aided secondary & higher secondary schools. This revised Scheme of ICT @ Schools 2010 recommended the provision of computer teacher in every secondary and higher secondary school, capacity building of teachers through ICT, enable teachers to use ICT in their teaching and development of e-content. The Hon’ble Prime Minister of India, Mr. Narendra Modi also dreamt India as Digital India by making use of technology for growth of country. It is only possible when people of country are technology literate.
The 21st century is known as age of information and communication technology. Educational institutions all over the globe are integrating ICT with the teaching – learning process in order to provide knowledge and skills to the learners to meet the challenging educational environment (Jayaghandhi et. al., 2015). Information and communication technologies (ICTs)—which include radio and television, as well as newer digital technologies such as computers and the Internet—have been touted as potentially powerful enabling tools for educational change and reform (Tinio, 2003).

Among these ICT tools, computer is being used in education from four decades. Its use in education is a highly dynamic technology and over the next 25 years will become the dominant delivery system in education (Bork, 1985).

The Government of India is implementing a number of policies to integrate computer technology in Indian classroom practices but its success implementation is on the shoulders of teachers. Today's teachers find themselves wandering in a situation, where they have to make use of computers to update their knowledge and deliver lessons through the computer and on the other side of the picture, they face certain stressful symptoms while dealing with the computer in the classroom (Arya, 2016). The teacher is a key to effective implementation of the use of computers in education system, so it is important to understand the biases and stereotypes that teachers may have about the use of computers (Teo, 2008).

Particularly there is need for the resolving the hidden psychological barriers of teachers towards the use of technology in education like computer attitude, computer anxiety and computer self-efficacy.

1.3 NEED OF COMPUTER-PEDOGOGICAL SKILLS FOR TEACHER EDUCATORS AND PROSPECTIVE TEACHERS

Teacher Education holds a vital place and position for the success of an educational system. A teacher educator is the topmost academic and professional person in the educational pyramid that shapes the future teachers and the onus of quality of teachers therefore rests on the teacher educators themselves (Gloria & Benjamin, 2014). Teacher educators can be called the builder of the nation who gave shape to the teachers, who later shape the future of the students (Chopra, 2013). In the words of Gloria & Benjamin (2014) teacher education is to learn to teach and teach to learn.

Teacher Education = Pedagogical Skills + Professional Development.
The teacher education focused on to learn the pedagogical skills to impart knowledge as well as awareness and ability to use technical tools in the classroom practices. The professional development of teachers is not possible without having knowledge of information and communication technology. A good teacher is not that who has mastery over his/her subject but one who has potential to integrate ICT in daily classroom practices.

The concept of literacy has now been changed from 3 Rs (Reading, Writing, and Arithmetic) to 4 Rs i.e. Reading, WRiting, ARithmetic and ComputeR (Sharma, 2014). As Government of India is mainly focusing on integration of computers in the school education, one should not forget about teacher education too. As the time is changing, there is lot of development in teaching skills rather than content knowledge. As computer technology is becoming available in many schools, the teachers are facing the challenges to deal with rapid developments in technology. It is in this context, the integration of computer technology in teacher education is a matter of concern and priority.

Education in India is facing a lot of problems e.g. lack of qualified teachers, lack of infrastructure, huge student population, curriculum development, administrative burden etc. All these result in poor quality of education. To deal with such problems, an important key is known as computer. Computer is an important tool in hands of teacher as it has many features that make it special. Maintenance of attendance records, result, grading, lesson planning, preparation of examination papers and their print outs are computer generated. Communication with students and teachers etc. are just of a click of internet. Computer include hardware and software, word processing functions, graphics, programmed instruction for problem solving, spreadsheets, databases, networking and telecommunications for today high technology developments as a reflective to education (Isman et. al., 2004). Cuban (2001) considered computer as vehicle for reforming educational practices, to be used as an instructional tool by the teachers. Teacher should be computer literate and should be equipped with the skills to use constructive philosophy by blending traditional teaching with computer technology. Incorporating computer as supplement to traditional teaching approaches will absolutely enhance the quality of teaching.

Nowadays, a teacher has assumed to play the role of a facilitator who facilitates the learner to Learn. It is the right time that computer technology should be made integral
part of teacher education programme, so that computer friendly teachers can be prepared who are able to use it with great potential. Prospective teachers are the future teachers of the nation and the educational wealth of the country totally dependent upon them. Also, it is essential for future teachers to use and understand computer and implement technology in order to be successful in their future career (Rizza, 2000). A teacher teaches in the ways he/she was taught. Therefore, there is a need for teacher educators to use computer during teaching-learning process because they are the teachers of future teachers.

1.4 COMPUTER ANXIETY

Anxiety is a psychological and physiological state characterized by cognitive, somantic, emotional and behavioral components which combine to create an unpleasant feeling that is typically associated with uneasiness, fear, or worry (Kannan et. al., 2012). Anxiety produces confusion and distortions of perception relating to time, space, people and meaning of events which have a negative effect on learning ability by lowering concentration, reducing recall ability and impairing the ability to make associations (Blignaut, 2006). The symptoms of anxiety are restlessness, easily tired, trouble connecting, irritability, frequent urination, lest palptations, backache, trembling, charming stomach etc. (Kannan et. al., 2012). The researchers (Howard, 1986; Igbaria, 1990; Ayersman & Reed, 1995) were of the views that there are three types of anxieties.

- Trait Anxiety
- State Anxiety
- Concept Anxiety

Trait anxiety is an anxiety that is experienced by a person throughout the life; state anxiety is related to experience as anxiety that fluctuates over time and arises to a responsive situation; concept-specific anxiety is range between the trait and state anxieties.

In the literature computer anxiety is defined in a number of ways. Spielberger (1970) was of the view that computer anxiety is a transitory state that appears when an individual interact with computers that can be changed with proper involvement while Heinnsen et. al. (1987) and Digman (1990) argued that computer anxiety is a long term- trait that remains consistent over time.
Computer anxiety is one of the basic factors affecting computer usage (Namlu & Ceyhan, 2003). Specially, computer anxiety can be recognized by an expression of fear regarding present or future interactions with computers or computer related technology, negative global attitudes about computer, or self-critical internal dialogues during computer interactions (Blignaut, 2006). An individual is considered computer anxious, if the emotional state during interaction with computer reduces the benefits of the use of computers and discourages necessary use of computers (Aziz & Hassan, 2012). Computer anxiety refers to an unpleasant emotional state or negative feeling surrounding computers and is the result of negative past computer experience and an over exaggeration of the threat posed by the computer interaction (Ahmad et. al., 2012). Computer anxiety refers to negative emotions and cognitions evoked in actual or imaginary interaction with computer- based technology (Bozionelos, 2001). According to McInerney et. al. (1994) negative cognitions towards computer may accompany feeling of anxiety, including worries about embarrassment, looking foolish, or even damaging some computer equipments. Cakiroglu (2009) considered computer anxiety in term of human physiology and defined sweating, dampening of hands, stomachache, difficulty in breathing of feeling of suffocation, palpitation and stain of lips as symptoms of computer anxiety. Various phrases have been used in place of computer anxiety: computer stress; computer phobia; techno stress; technophobia (Kohram, 2003). Howards (1986) suggested three roots of computer anxiety namely psychological root, knowledge root and operational root. In order to treat psychological root of computer anxiety, it is necessary to bring changes in technological attitude and beliefs of an individual whereas to treat knowledge root, one should provide proper computer knowledge. Hand to hand experience and practical knowledge can be helpful to overcome the operation root of computer anxiety.

In the words of Russel & Bradley (1997), teachers’ lack of confidence in their ability to use computers effectively in classrooms can also understood as a form of computer anxiety or cyber phobia.

**1.5 COMPUTER ATTITUDE**

In the early years of social psychology, attitude was acknowledged as one of the main psychological experience (Jain, 2014). An attitude can be positive or negative evaluation of people, objects, events, activities and ideas (Ahmad & Masoom, 2014).
According to Bagozzi (1994a; 1994b) the term attitude is used as an umbrella expression covering such concepts as preferences, feelings, emotions, beliefs, expectation, judgments, appraisals, values, principles, opinions and intentions. Baron & Byrne (1984) defined attitude as relatively lasting cluster of feeling, beliefs and behavior tendencies directed towards specific person, ideas, objects or groups. Attitude is like and dislikes (Bem, 1970). Walley et. al. (2009) was of view that attitude may be positive, negative or neutral. Eagly & Chaiken (1993) defined attitude as a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour. Many researchers proposed different models of attitude. Expectancy-Value Model proposed by Rosenberg (1956), Multiattribute Measurement Model of Attitude proposed by Fishbein (1963), Vector Model proposed by Calder & Lutz (1972), Tripartite Model proposed by Spooncer (1992), Technology Acceptance Model proposed by Davis (1989, 1993) and ABC Model of attitude are some attitude’s model. But ABC model of attitude is widely used. According to this model, attitude has three components i.e. Affect, Behavior and Cognition. Affect refers to feelings of an individual towards an attitude object, behavior refers to intention of an individual towards an attitude object and cognition refers to beliefs of an individual towards an attitude object. Computer attitude has been defined as a person’s general evaluation or feeling of favour or antipathy toward computer technologies and specific computer related activities (Smith et. al., 2000). Also Simpson et. al. (1994) considered attitude towards computer as a specific feeling that refers to whether a person likes or dislikes employing computer. According to Smith et. al. (2000), computer attitude is defined as a persons’ general evaluation or feeling of favour or anti-aphathy towards computer technologies and specific computer related activities.

1.6 COMPUTER SELF-EFFICACY

Self-efficacy is one of the significant variables used to explain effective aspect of the teachers in the recent years and it is believed that the perception of self-efficacy is an efficient state in learning (Tuncer & Balci, 2013). Self-efficacy theory rooted in Bandura’s social cognitive theory. Self-efficacy is people’s judgment of their capabilities to organize and execute course of action required to attain designated types of performance (Bandura, 1986). Bandura (Cited in Fanni et. al., 2013) also
identify four sources which influences self-efficacy. These sources are mastery experience, vicarious experience, social persuasion and emotional states. Mastery experience refers to memories of past successful experiences that an individual remembers while facing present or future situations. Positive mastery experience fosters self-efficacy while negative mastery experience reduces self-efficacy.

- Vicarious experiences are the process of comparing an individual to other individual.
- Social persuasion signifies verbal positive reinforcement. Self-efficacy of an individual is increased if motivated by others. It is less influential than mastery experience.
- Emotional states refer to feeling of an individual in a specific situation. An individual with high self-efficacy utilizes emotional states to better their performance while as low self-efficacy results in low performance.

The concept of self-efficacy developed in social psychology was used in different fields. This concept was used by Compeau & Higgins to study computer self-efficacy. Compeau & Higgins (1995) defined computer self-efficacy as the judgment of individual about computer skills. Computer self-efficacy, people's beliefs about their capabilities to use computers, is considered an adaptation of self-efficacy (Seferoglu, 2007). Computer self-efficacy is an individual's belief that he or she can perform specific computer task (Murphy et al., 1989). Also Kinzie, et. al. (1994) defined self-efficacy as an individual's confidence in his or her ability, which may impact the performance of tasks.

1.7 SIGNIFICANCE OF THE STUDY

The computers were used in education in mid 1960s. During 1970s, 1980s and 1990s they were used for drills & practices purpose, computer based training and e-learning. Today, education is knocking at door of learner in term of e-books, e-school, e-university etc. As use of computer is increasing in education, it generates new challenges for educators. Some challenges are material like inability of computer and some are psychological in nature like views, perception, attitude, anxiety, self-efficacy etc. Computer anxiety, computer attitude and computer self-efficacy of teachers are some important factors that influence computer use.
The existing data shows that despite the available facilities of computers in school/college most of teachers are not frequent computer users. Some of them used the computer for various purposes but least for education and academics. Jaliet. al. (2014) concluded that 94.4 percent participants had computer knowledge but only 22.8 percent used computer for research purpose. Kutluka (2011) found that 40.5 percent prospective teachers used 7 or more than 7 hours in a week, 30.1 percent spent 3 to 6 hours in week on computer while 32.5 percent participants used computer more than 3 hours in a week. Similarly Gulbahar & Guven (2008) concluded that 53.1 percent teachers used computer less than one hour daily, 30.7 percent for 1-3 hours, 2.8 percent for 3-5 hours and 1.5 percent for more than five hours respectively. Amenyedzi et. al. (2011) concluded that only 15 percent and 30 percent teachers used internet as innovative technique to improve teaching-learning and for research work respectively. Also Fakeye (2010) revealed that only 2.5 percent students reported that teachers use computer in teaching of English language. It is a matter of concern.

Attitude towards computers plays a crucial role in unearthing how individual perceive the computer as a learning tool (Teo, 2008). Teachers’ role is more challenging in computer based teaching. Prospective teachers and teacher educators’ attitude towards computer is an important issue because its implementation in teaching-learning process entirely depends on their attitude and willingness of using computer. The attitude of teachers is directly related to the use of computers in their teaching. A crucial reason to examine teachers’ attitude is that it is a basic indicator of future classroom computer use (Myers & Halpins, 2002).

Computer anxiety is another basic factors affecting computer usage. In literature computer anxiety is identified as a major cause of resistance to using computer.

Miura (1987) has suggested that self-efficacy may be an important factor related to the acquisition of computing skills. The teacher is expected to teach by using the technology with the traditional face-to-face approach. Thus, teacher should be technology literate. Teachers’ self-efficacy or belief is a significant factor in determining their patterns of computer use (Albion, 2001). For prospective teachers, their computer self-efficacy significantly predicted their ability to integrate technology use in the classroom (Zhao et. al., 2002). If high computer anxiety and low computer self-efficacy exist among the educators, they may not prefer to use the computer technology even if they believe that computer will lead to improve teaching.
and learning (Delcourt & Kinzie, 1993). In order to enhance the teaching-learning process computer use, computer attitude and computer self-efficacy should be improved and computer anxiety should be minimized.

Most of the researchers studied computer anxiety (Beste & Kilic, 2015; Hong & Koh, 2014; Ozturk, 2013; Gihar & Tyagi, 2012; Simsek, 2011; Miller, 2010; Sharma & Amar, 2009; Hallam, 2008; Ceyhan, 2006; Doyle et al., 2005; Bozionelos, 2004; Becker & Schmidt, 2001; Hong & Koh, 2002; Lam, 2000, Chau et al., 1999; Russell & Bradley, 1997; Rose & Weil, 1995), computer attitude (Gupta, 2015; Sharma & Singh, 2015; Gehlawat, 2014; Saricoban, 2013; Capan, 2012; Arishi, 2011; Dogan, 2010; Brisci et al., 2009; Deniz, 2007; Yushau, 2006; Torkzadeh & Van Dyke, 2002) and computer self-efficacy (Isil, 2015; Dandekar, 2014; Tuncer & Balci, 2013; Thakur, 2012; Halder & Chaudhuri, 2011, Teo & Koh, 2010; Teo, 2009; Saleh, 2008; Jegede, 2007, Bakar & Mohamed, 2005; Wall, 2004, Albion, 2001, Jones, 2000; Cakiroglu et al., 1999) among pre-service, in-service teachers and university students in terms of gender, computer ownership, computer experience, computer knowledge, frequency of computer use. But only few studies are conducted on teacher educators (Ekman et al., 2015; Rana, 2012; Yang et al., 1999; Gordon, 1993, Mullan, 1990). This study specially targeted to study influence of demographic factor like gender, discipline and socio-economic status on selected variables. Till date very less is known regarding the computer attitude, computer anxiety, and computer self-efficacy of teacher educators and prospective teachers of Himachal Pradesh (India). The present study is designed to explore the computer attitude, computer anxiety, and computer self-efficacy of teacher educators and prospective teachers. Therefore, the researcher believes that proposed study will make an important contribution to the literature from the Indian perspective. Furthermore, it is imperative to understand how teacher educators and prospective teachers enrolled in various teacher education programs in Himachal Pradesh feel towards computers as computers hold the key for a greater tomorrow.

1.8 STATEMENT OF PROBLEM

The problem under investigation may be defined as “Anxiety, Attitude and Self-Efficacy in Computer Use: A Study of Teacher Educators and Prospective Teachers”
1.9 OPERATIONAL DEFINITIONS OF TERMS USED

Most of the terms used in this study are defined according to their use is given below:

1. COMPUTER USE
   Use of computer refers to place of computer use, computer ownership, access to computers, frequency of daily hours spent on computer working and various purposes of computer use like e-mail, downloading study contents, online shopping, social networking sites, downloading movies, chat, financial transactions etc.

2. COMPUTER ANXIETY
   Computer anxiety refers to feeling of fear or worry when an individual think to use or used a computer. Headaches, high rate of heart beating, trembling are symptoms of computer anxiety.

3. COMPUTER ATTITUDE
   Computer attitude refers to emotional responses, behavior, thinking, beliefs and perception of an individual when exposed to computer.

4. COMPUTER SELF-EFFICACY
   Computer self-efficacy refers to judge an individual’s ability to perform specific computer tasks.

5. PROSPECTIVE TEACHER
   Prospective teachers are those students who are enrolled in any teacher education program. In this proposed study prospective teachers are those who are pursuing B.Ed. degree in any recognized teacher education institution.

6. TEACHER EDUCATOR
   Teacher educators are the persons who are teaching prospective teachers. In the present study teacher educators are those persons who are teaching the B.Ed. and /or M.Ed. students.

1.10 OBJECTIVES OF THE STUDY

The present study is based on following objectives:

1. To study the extent of computer use by teacher educators in respect to their gender, discipline and socio-economic status.

2. To study the extent of computer use by prospective teachers in respect to their gender, discipline and socio-economic status.
3. To study the computer anxiety among the various groups of teacher educators and prospective teachers formed on the basis of gender, discipline and socio-economic status.

4. To study the computer anxiety among the various groups of teacher educators formed on the basis of gender, discipline and socio-economic status.

5. To study the computer anxiety among the various groups of prospective teachers formed on the basis of gender, discipline and socio-economic status.

6. To study the attitude towards computer use among various groups of teacher educators and prospective teachers formed on the basis of gender, discipline and socio-economic status.

7. To study the attitude towards computer use among various groups of teacher educators formed on the basis of gender, discipline and socio-economic status.

8. To study the attitude towards computer use among various groups of prospective teachers formed on the basis of gender, discipline and socio-economic status.

9. To study the computer self-efficacy among the various groups of teachers educators and prospective teachers on the basis of gender, discipline and socio-economic status

10. To study the computer self-efficacy among the various groups of teachers educators on the basis of gender, discipline and socio-economic status.

11. To study the computer self-efficacy among the various groups of prospective teachers on the basis of gender, discipline and socio-economic status.

1.1 HYPOTHESES OF THE STUDY

The present study is based on following hypotheses:

1. There exists no significant difference among the various groups of teacher educators and prospective teachers formed on the basis of gender, discipline and socio-economic status in respect to their computer anxiety.

2. There exists no significant difference among the various groups of teacher educators formed on the basis of gender, discipline and socio-economic status in respect to their computer anxiety.

3. There exists no significant difference among the various groups of prospective teachers formed on the basis of gender, discipline and socio-economic status in respect to their computer anxiety.
4. There exists no significant difference among the various groups of teacher educators and prospective teachers formed on the basis of gender, discipline and socio-economic status in respect to their computer attitude.

5. There exists no significant difference among the various groups of teacher educators formed on the basis of gender, discipline and socio-economic status in respect to their computer attitude.

6. There exists no significant difference among the various groups of prospective teachers formed on the basis of gender, discipline and socio-economic status in respect to their computer attitude.

7. There exists no significant difference among the various groups of teacher educators and prospective teachers formed on the basis of gender, discipline and socio-economic status in respect to their computer self-efficacy.

8. There exists no significant difference among the various groups of teacher educators formed on the basis of gender, discipline and socio-economic status in respect to their computer self-efficacy.

9. There exists no significant difference among the various groups of prospective teachers formed on the basis of gender, discipline and socio-economic status in respect to their computer self-efficacy.

10. There exists no significant relationship between computer use and computer anxiety of the teacher educators.

11. There exists no significant relationship between computer use and computer anxiety of the prospective teachers.

12. There exists no significant relationship between computer anxiety level and self-efficacy of the teacher educators.

13. There exists no significant relationship between computer anxiety level and self-efficacy of the prospective teachers.

1.12 DELIMITATIONS OF THE STUDY

1. The present study is restricted to teacher educators and prospective teachers of Himachal Pradesh only.

2. The present study is delimited to only six districts of Himachal Pradesh.

3. The classification of upper income group, middle income group and lower income group is done on the basis of family income decided by National Council of Applied Economic Research (NCAER) Centre for Macro
Consumer Research (2011) and article published in The Economic Times (Feb 6, 2011). NCAER considers a family with annual family income between 3.14 lakhs to 17 lakhs under middle socio-economic status. It means family with annual family income lower than 3.14 lakhs fall in lower socio-economic status and family with annual income more than 17 lakhs fall in higher socio-economic status. In the present study the respondents having family income less than 3.14 lakhs is taken as lower socio-economic status, respondents with annual family income between 3.14 lakhs to 17 lakhs taken as middle socio-economic status and respondents with annual family income above 17 lakhs taken as higher socio-economic status.