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2.0 INTRODUCTION

Once a researcher decides a general research question, then he/she has to equip himself/herself with the knowledge what has been done in that particular area. It is a vital part of research. The strength of a building is depends upon depth of base. In similar way review of related literature helps researcher to prepare a blue print of the research by knowing what has already been done by other researchers and what can be done in similar area. The review of related literature focuses on two words: review and literature. Review means to organize and assimilate the knowledge in a specific field to make sure that proposed study is authors’ additional contribution to that field. Literature means existing knowledge in specific field in term of theories, its applications and research studies.

Use of computers can be seen in every walk of life now-a-days. A person, who is not computer savvy in prevalent situation, faces difficulties to survive; it is important that the person must be free from anxiety to use it and have positive attitude towards the use of computer. To use computer for any purpose self-efficacy is an important factor. Keeping in view, some educationalist and computer experts have conducted research regarding anxiety and attitude towards computer and self-efficacy in computer use.

Review of related research is a bridge between past researches and proposed research. In present chapter, researcher has studied available literature in the form of research papers published in form of journals, online journals available on Google Scholars and ERIC, online thesis available on Shodhganga and dissertation works to know what has been done by other researchers and to find out gaps. The investigator has tried to cover all the studies directly related to present investigation. According to need of the study, the review of related literature was divided in to following areas:

- Studies related to Computer Use
- Studies related to Computer Anxiety
- Studies related to Computer Attitude
- Studies related to computer Self-Efficacy Scale
2.1 REVIEWS ON COMPUTER USE

Various researchers studied extent of computer, computer usage, ICT usage and internet usage by teachers and students (Turan, 2015; Kumar, 2014; Wilson, 2014; Bhalla, 2013; Kurt, 2013; Amenyedzi et. al., 2011; Aboderin et. al., 2011; Afshari et. al., 2010; Gulbahar & Guven, 2008; Ocak & Akdemir, 2008; Franklim, 2005; Bekkenkamp & Sherwood, 2004; Russell et. al., 2003; Albion, 1996; Witten et. al., 1991). Eme et. al. (2015), Devaki (2015), Ozaslan & Mden (2013), Muraina et. al. (2013), Acikalin (2010), Corbel (2007) contributed to explore impact of computer in teaching-learning, efficacy of e-content package, use of power point presentation, influence of CAI and computer supported instructions. Most of researchers (Koksal et. al., 2016; Narsin & Varshneg, 2015; ER et. al., 2015; Eristi et. al., 2012; Mohamed et. al., 2011; Birgin et. al., 2009; Li, 2007; Dexter et. al., 1999; Vockell & Sweeneg, 1993) studied views and perceptions of teachers regarding computer use whereas researchers (Ahmed et. al., 2016; Jain, 2015; Jali et. al., 2014; Kozola & William, 2016) explored status of web 2.0, ICT applications and current computer and ICT knowledge among teachers. Bhatia & Haider (2015), Bardhan et. al. (2015), Mohmad et. al. (2011) explored effectiveness of social media as well as perception of teachers to integrate social media in teaching-learning process. On the other hand Saini & Abraham (2015) investigated importance and challenges of social media in classroom. Computer literacy encouraged utilization of computer during teaching (Ogundele & Etejere, 2013).

Witten et. al. (1991) attempted to know extent of computer use among principals of secondary schools in Kentucky. The researchers also studied various aspects like computer knowledge, training, commitment, plans and computer use. The findings demonstrated that respondents were uninformed and poorly trained to use computer in management of school. Thus, computers were used inadequately. They considered computer as new toy having no knowledge about its utilization.

Vockell & Sweeney (1993) studied perception of teachers towards computer, level of competencies and computer use in instruction in two school systems. The researchers concluded that teachers of both school systems at different levels of competence possessed similar perception about computer use in instruction. It was also concluded that those teachers in system who considered themselves as more competent used computer more as compared to those who considered themselves as less competent.
Marcinkiewicz (1994) conducted a study to compare level of computer use of practicing teachers with expected level of computer use by pre-service teachers. 170 practicing teachers and 167 pre-service teachers constituted sample for the research study. About half of the practicing teachers reported that they were not using computer in teaching but all pre-service teachers were expected to use computer in teaching. Also, it was found that self-competence and innovativeness contribute to predict computer use by practicing teachers whereas perceived relevance contributed to expected use of computers.

Albion (1996) examined computer use by student teachers during final year practicum. In general the respondents viewed computer positively but they were nervous while using computers in classrooms. They lacked in computer knowledge. Nearly two-third student teachers used computer at least once during four week practicum and wanted to continue more. The researcher suggested that in pre-service course computer is associated with pedagogical issues and should provide more opportunities to practise classroom computing.

Dexter et. al. (1999) attempted to study views of teachers about use of computers in instruction, impact of computers and change that occur due to computer use in classroom practices among teachers. The desired data was drawn from 47 teachers with the help of questionnaire, semi structured interview and observations of classroom. 32 teachers who were interviewed in study were considered as constructivists. They used computer software for their own productivity i.e. grading and word processing. 31 teachers responded that they used computer in classroom with students. 25 teachers pointed out that word processing, multimedia authoring, and digital information sources like encyclopedia on internet and CD-ROM were most valuable software. 5 teachers considered instructional software like drill, educational games as the common use of computer in classroom practices. The study concluded that teachers who had accepted computer use in teaching practices were of the views that computer helped them but they did not consider computer as catalyst for change.

Yuen & Ma (2002) were of the opinion that teachers’ computer acceptance is an important factor to the successful use of computers in education. Technology acceptance model was used by authors to investigate gender differences among prospective teachers in computer acceptance. Questionnaire was administered on 186
prospective teachers to collect desired data. The questionnaire contained two independent variables like perceived usefulness and perceived ease of use and a dependent variable like intention to use. The study conclude that perceived usefulness and perceived ease of use affected intention to use computer among female prospective teachers more than male prospective teachers but perceived ease of use affected perceived usefulness of male prospective teachers as compared to female prospective teachers.

Russell et. al. (2003) conducted a survey among 2894 teachers to inspect extent of technology used in classroom and outside classroom. The evidences supported that teachers used technology for preparation and communication as compared to instructional delivery and assigning technology based learning activities. Also new teachers possessed higher levels of technology comfort and used it for preparation.

Jamlan (2004) considered e-learning as an important tool for delivery, interaction and facilitation of teaching-learning process. In order to access opinion of faculty members about e-learning, questionnaire was administered on a sample of 30 faculty members. The descriptive analysis of data signified that they considered e-learning as a positive force for students to achieve learning objectives. According to researcher, training of staff, preparation of online courses and learning material are necessary for successful transition of traditional mode of teaching-learning to implementation of e-learning.

Bekkenkamp & Sherwood (2004) made efforts to analyze computer usage by teachers in teaching-learning as well as studied those factors which affect computer usage. The study was carried out among 184 teachers by adopting survey method. The findings of study showed absence of significant difference in relation to gender, age and subject taught.

Dey et. al. (2005) conducted a study Information Communication Technology and Teacher Educators: An Empirical Study to examine use of ICT in teacher training institutions by teacher educators. 200 teacher educators participated in the study. Researchers observed that more than 80% teacher educators were found not using educational technologies like magic lantern, epidiascope, video camera, film projector, LCD projector, radio and DVD in their teaching. About 70% to 90% teacher educators did not use internet, tape recorder, T.V., overhead projector,
computer and slide projector during teaching their classes whereas 68% teacher educators did not use working models during their teaching.

Sarupria (2005) attempted to study the status of Computer Education Programme (CEP), issues related to CEP and future perspectives of CEP in Rajasthan. Descriptive survey method was used by researcher to collect information from 600 computer students, 40 heads of schools and 40 computer teachers of 40 senior secondary schools in five districts of Southern Rajasthan. Researcher concluded that most of the schools have computers but certain issues like salaries of contract based computer teachers, teaching experience, in-service training, CEP budget, dissatisfaction of students towards the quality of study materials, lack of correlation between theory and practice, guidance given by teachers during practical classes, ICT policy in Rajasthan were matter of concern.

Franklin (2005) focused to study the ways how elementary teacher graduates use computer technology in instructions and factors which affect computer use. Elementary teacher graduates in teachers training programme at Mid-Atlantic University constituted population for research study. The author found that 84% participants felt well prepared to assimilate technology in curriculum. All the teachers were of the views that computer had great potential to allow students to find out or construct ideas for them. Teachers’ preparation, teachers’ philosophy and grade level were some observed factors which affected computer use by teachers.

Can & Cagiltay (2006) designed a study to examine perception of prospective teachers about use of computer games in education. 116 prospective computer teachers participated in study. Quantitative as well qualitative data were gathered by researchers using questionnaire and interview schedule. 85% participants reported that playing computer games need too much engagement time, 77 % agreed with the statement that it leads to addiction whereas 63% were of the view that it is not an important leisure time activity. On the other hand 79% prospective teachers were of the opinion that games help in development of useful knowledge and skills.

Wozney et. al. (2006) administered Technology Implementation Questionnaire on 764 elementary and secondary schools’ teachers under three dimensions called perceived expectancy of success, perceived value of technology use and perceived cost of technology use. The study concluded that expectancy of success and perceived
value were significant issues in differentiating levels of computer use and use of personal computer outside teaching activities was significant predictor of technology use in classroom. Furthermore, it was concluded that teachers use computer technology mainly for informative (World Wide Web and CD-ROM) and expressive (word processing) purposes.

Rakes et al. (2006) administered Levels of Technology Implementation tool to examine relationship between technology use and skills & use of constructivist instructional practice among rural school teachers. The findings of study indicated positive relationship between levels of classroom technology use with personal computer use as well as between use of constructivist instructional practices with personal computer use.

Corbeil (2007) attempted to compare two teaching tools i.e. conventional use of textbook & blackboard and power point presentation. Four classes participated in the study. The findings of the study indicated that no differences were observed from pretest to post test on written exercise or essay writing. Thus, power point presentation was efficient tool as text books and blackboard. Although, responses of students on questionnaire indicated their first choice for power point presentation as an efficient learning tool as compared to text books.

Shi & Bichelmeier (2007) attempted to compare findings of two studies regarding use of computers by teachers from 1991 and 2004 and to explore how teachers’ experience with computers changed. The results indicated that in 1991, only small number of teachers attained level to integrate technology in classroom practices due to lack of accessibility and technical support, the teachers who had personal computers were considered as innovative teachers and they used it due to their own interest and only few teachers used computer in administrative purpose like MS Word to maintain assignments and test scores, grade book, and create database to track grades but in 2004, most of teachers attained basic level to integrate computer in daily activities, all teachers had computers in their classrooms despite how much they used computer for administration and instruction purpose and it was mandatory for teachers to use e-mail for internal communication, preparing grades, taking attendance and to make database of examination but primary use of computer was word processing and internet search but only few teachers integrated computers in teaching activities.
Li (2007) inspected critically the views of teachers and students about integration of technology in schools. Researcher collected data from 15 mathematics and science teachers of secondary schools’ teachers and 450 secondary schools’ students. The findings of the study indicated that 87.3% schools’ students were of the views that they like to use technology and believed that it could be effective in learning whereas teachers’ views regarding use of technology were found to be negative.

Gulbahar & Guven (2008) designed a research to study ICT usage by social studies teachers in primary school teachers of Turkey. Total 326 participants participated in the study. The main finding of study pointed out that all participants agreed to use ICT resources. Moreover, it was found that 98.2% social science teachers have access to computers at working place and amongst them mostly 88.7% have access to internet. 53.1% teachers reported that they use computer less than one hour daily, 30.7% for 1-3 hours, 2.8% for 3-5 hours and 1.5% for more than five hours respectively.

Tondeur et. al. (2008) attempted to study characteristics of teachers and schools which were related with computer use in primary schools. Authors conducted a survey among 527 primary teachers in Flanders. School characteristics like schools’ openness to change and availability of ICT policy plan of a school were found to be positively related with use of computers as a learning tool but no cultural school characteristics were found to be related with computer use as an information tool. On the other side, characteristics were associated with computer use like gender. Male teachers integrate computers more.

Ocak & Akdemir (2008) conducted a study to examine level and frequency of computer use among science teachers as an instructional tool in classroom practices. The sample constituted of 63 primary school science teachers. The results revealed that computer literacy leads to increase computer use and its integration as an instructional tool in classroom practices. The computer application like educational software, CD, internet and e-mail found to be highly useful in classroom. In addition, gender differences were also observed between science teachers to use computer as an instructional tool.

Gorder (2008) aimed to explore how teachers are currently using and integrating technology in teaching and learning based on some characteristics like gender, age, teaching experience, grade level taught, content area, and educational
level. 174 teachers responded to Technology Integration Standards Configuration Matrix (TISCM) developed by Mills and Tincher (2003) as a model for determining technology integration by teachers. The major finding of the study was that significant differences were found for technology use and integration on the basis of grade level but no significant differences were found on basis of gender, age, teaching experience, content area and educational level.

Hermans et. al. (2008) focused to study teachers’ educational beliefs (constructivist beliefs and traditional beliefs) as antecedent of computer use. To find out differences in determinants of computer use by teachers in classroom, multilevel modeling was used by researchers. Class Use of Computer Scale developed by Van Braak et. al. (2004) was used to measure teachers’ computer use in teaching-learning process. The study revealed that teacher beliefs were important determinants in clarifying computer adoption in classroom by teachers. Also positive effect of constructivist beliefs was observed on computer use while negative effect of traditional beliefs was found on computer use in classroom.

Birgin et. al. (2009) attempted to examine views of mathematics’ student teachers towards computer assisted mathematics instruction. In this survey research, questionnaire was administered among 180 mathematics student teachers. It was consisted of 5-point Likert type items. The study indicated that views of all the participants were positive towards computer assisted mathematics instruction. In addition, no significant differences were observed in views of mathematics’ student teachers towards computer assisted mathematics in relation to their gender and computer ownership but significant differences were found in relation to frequency of computer usage, computer competency, experience with CAI and year of study.

Afshari et. al. (2010) tried to explore the degree to which computer is used by principals of Iranian secondary schools as well as various variables related to use of information and communication technology. The researchers concluded that all principals possessed moderate level of perception about computer use and majority of principals were internet user. More common use of internet was to send and receive e-mails and all participants used internet at home and at school. Researchers concluded four factors i.e. high level of computer access, strong perception of the attributes of ICT, high level of computer competence and high level of transformational leadership behaviors contributed to extent of computer use.
Fakeye (2010) evaluated use and effectiveness of computer in teaching-learning of English language in secondary schools. Two research tools i.e. students’ evaluation questionnaire and teachers’ evaluation questionnaire were constructed and standardized by researcher. The reliability coefficients of tools were found to be 0.734 and 0.872 respectively. As far as validity is concerned, tools had construct validity. The results of research shown that only 2.5% students reported that teachers use computer in teaching of English language but 95% teachers agreed on the point that computer is an efficient tool for pronunciation and spelling of words. 75% teachers reported that availability of computers in term of numbers influence teaching and learning of English whereas 90% reported that ability and skills of teachers should be improved.

Kim et. al. (2010) focused to study intention of pre service teachers to use computer based technology when they become teachers and use of computer based technology by in service teachers. Intent to use computer based technology was used to collect data from pre service teachers whereas in service teachers’ computer based technology survey was used to collect data from in service K-12 teachers. The findings indicated differences between intentions of pre-service teachers to use computer based technology when they become in-service teachers in future and actual use of computer based technology by in-service teachers.

Almekhlafi et. al. (2010) considered educational technology as a cornerstone for any country’s efforts to improve students’ performance at K-12 schools. Researchers conducted a study to examine technology integration in two schools of K-12 schools in United Arab Emirates. Focused group interview and questionnaire were used as research tools to collect research data. 100 K-12 teachers were constituted as research sample for study. The findings of research study revealed that teachers of both schools integrate variety of technologies in classroom activities to enhance students’ learning. Techniques of technology integration by male teachers were different as compared to female teachers.

Kiptalam & Rodriguez (2010) tried to study level of access to school computers, ICT literacy skills and extent of ICT use in teaching-learning among Kenyan teachers. The results of study indicated that use of ICT in teaching-learning was widely spread. Teachers use it as mean of communication and for searching information. Access to ICT indicated worth of huge investment in higher education.
Muraina et al. (2011) studied influence of computer assisted instructions on performance of students. The students were divided into two groups. One group was taught by conventional teaching method which includes use of textbooks, lecture notes and reference books whereas other group was taught with computer assisted instruction software package. The achievement of students indicated that computer assisted instruction had significant influence as compared to conventional teaching methods.

Kutluka (2011) concluded in his study that in a sample of 126 prospective teachers, 52.4% of respondents have their own computer, 23.8% were working on computer for 2 years, 43.7% were working for 3-5 years and 32.5% were working for more than six years. As far as weekly hours spent on computer usage is concerned it was found that 40.5% prospective teachers used 7 or more than 7 hours in a week, 30.1% spent 3 to 6 hours in a week on computer while 32.5% participants used computer for more than 3 hours in a week.

Akbulut et al. (2011) conducted a study to know the views of pre-service teachers about indicators of ICT of Turkish education faculties. In order to fulfill objectives of the study a cross-sectional survey design was used by researchers. To collect data research tool was administered on 2515 graduate students of education department. It was concluded by researchers that respondents criticize present situation of ICT indicators in their organizations. Perception of respondents varied with different departments, gender and frequency of ICT use for instruction purpose but did not vary according to income, PC experience and having PC at home.

Friedrich & Hron (2011) focused to explore factors which promote computer use among teachers. The sample constituted 361 teachers. In the study researcher studied technology use in schools, individual teachers’ characteristics and school contextual factors. The researchers concluded that student centered classroom computer use was predicted by certain contextual factors like the type of school (secondary modern and high school), the existence of an ICT school policy plan, as well as by the individual teacher characteristics of belief in constructivist pedagogy and their frequency of classroom computer use.

Amenyedzi et al. (2011) conducted a study to explore computer and internet usage by teachers and students. The authors concluded in their study that 92% of teachers were computer literate whereas 78% students had basic knowledge of
computer but only 15% teachers used internet as innovative technique to improve teaching-learning. Only 30% teachers used computer for research work. However, only 40% students reported that they use computer for entertainment, 25% of them use for research and learning and less than 40% students used internet for e-mailing and browsing.

Wilson et. al. (2011) investigated the level of ICT integration in teacher trainees’ training at university of Education at Winneba. 100 teacher trainees were selected purposively to perform tasks in ICT. These tasks were performed both before intervention and after intervention. Along tasks observation checklist was also used as a research instrument to collect desired data. Statistical analyses of data indicated significant relationship tasks before and after interventions. Interventions contributed to enhance ability of participants to perform ICT tasks.

Aboderin et. al. (2011) conducted a study to examine extent of computer and internet use among secondary school teachers and students. 450 teachers and 3000 students were randomly selected as sample of the research. The main finding of the study suggested that computer and internet use contributed to personal cognitive interests as compared to enhancing teaching-learning activities. 55% and 41.1% of teachers had reported that they had access to computer and internet while 51% and 46.9% students had access to internet and computer. 38.7% teachers and 64.5% students reported that they used computers in schools’ computer laboratory whereas majority of teachers used internet in school cyber café but students used internet on internet enable mobile phones.

Mohamed et. al. (2011) studied perception and use of social networking sites among 150 university students. The university students reported that majority of students were aware about social networking sites and use for communication. Orkut was found more popular social networking websites as compared to Facebook and Myspace. Most of students visit these sites twice a week to send scraps and to find new friends. Security and privacy were main concerns but majority of them used real names and profile pictures.

Eristi et. al. (2012) focused to reveal views and suggestions of teachers about process of technology integration in education and problems faced by teachers during integration of technology in education. For this purpose 21 teachers were selected as research sample and data were collected with help of focus-group interview and
observation. The findings of the study revealed that teachers were willing to use technology but they require support to integrate technology in their teaching courses. Lack of staff to provide technological support, lack of sub structure, teachers’ efficiency and lack of time to become technology efficient were main problems faced by teachers in process of integration of technology. The teachers reported that most of students performed better while using technological tools.

Buabeng-Andoh & Totimeh (2012) focused to study computer use by secondary school teachers in classroom in term of gender, years of teaching experience and school type. Questionnaire was used as research tool to carry out the study among 231 teachers. The findings of the study revealed no significant difference in innovative use of technology between male and female teachers but it was found that male teachers had more access to computers than females. Also, study indicated maximum use of ICT for organizational purpose and instruction purpose in urban schools than semi-urban and rural schools. Furthermore, no significant differences were found between years of teaching experience and use of ICT but computer access was positively found related to computer experience.

Yeung et. al. (2012) conducted a survey among pre-service teachers in Singapore to know how they respond to the use of technology in personal lives as well as in teaching. The findings explored that they frequently use computer technology for various purposes like checking online dictionary, web browsing, e-mail and use of computer software. Computer software was used by them for personal use as compared to teaching. Respondents reported least computer use for audio recording, video recording and global positioning system.

Oluwatayo (2012) studied computer literacy of secondary school teachers in terms of sex, years of experience and location where they teach. Total 300 teachers selected for research and self-assessment of computer literacy questionnaire was used by researcher to gather desired data. The reliability coefficient of scale was 0.72. The collected data was analyzed with help of quartile range, frequency counts, percentages, t-test and one-way ANOVA. The overall finding of the study implied that computer literacy was low and no significant differences were observed with respect to sex and location but significant differences were concluded with respect to years of teaching experience. Less experienced teachers possessed high computer literacy as compared to more experienced teachers.
Bhalla (2013) investigated extent of computer use among 300 central school teachers in India. A questionnaire was constructed by researcher which was spread over three main dimensions computer aided learning, computer managed instruction and computer based instruction. The results stated that teachers often used computers for various purposes like updating subject knowledge, teaching skills, developing lesson plans, preparation of instructional material, preparation of question banks etc., computer was sometime used for showing something in classroom, preparation of test papers, games, simulations, student assignments but rarely used for presenting whole lesson, tutorials, information sharing with parents, individual instruction etc. Further, research suggested that among three dimensions, computer aided instruction was more popular whereas computer assisted instruction was least popular.

Ozaslan & Maden (2013) focused to study attitude of prospective teachers and teachers towards use of power point presentation in the department of foreign language education at Middle East Technical University. To fulfill the objectives interview was conducted by researchers with 3 instructors who teach literature, linguistics and English Language Teaching (ELT) methodology courses. Also a questionnaire was administered on 35 prospective teachers to collect quantitative data regarding their general views about power point presentation, attitude towards use of power point presentation and ideas about teachers’ encouragement for using power point presentation. The results of study suggested that both teachers and students have positive attitude towards power point presentation and teachers use power point presentation in their teaching as they considered it as effective visual aid. Moreover prospective teachers were of the view that it was essential to motivate them to use power point presentations in future.

Kutlu & Marangoz (2013) aimed to study difference between opinion of 135 technology and science teachers towards computer assisted technology and science instructions. Researchers also studied effect of gender and seniority on their opinion towards computer assisted technology and science instructions. The results had shown no influence of gender on opinion towards computer assisted technology and science instructions although seniority influence their opinion towards computer assisted technology and science instructions

Ogundele & Etejere (2013) attempted to analyze relationship between computer literacy and teachers’ job effectiveness of Nigerian secondary schools in
Kwara state. 1800 participants were selected by using stratified random sampling technique. The results of study explored that computer literacy encourages appreciation and utilization of computers during teaching learning processes which regularly assist teachers’ job effectiveness, such as job performance, record keeping, school discipline, and supports students’ academic performance. It also indicated that computer literate teachers perform better than non-computer literate teachers in the schools by using computers during their teaching.

Topolovcan et. al. (2013) focused to study how new media was used by elementary school teachers and what are differences between teachers of rural and urban region in relation to ownership of new media. In findings of study no significance difference was found out in relation to rural or urban area in which school is situated. Teachers of both region used personal computers, internet and multimedia software in classroom. Some gadgets like computer, mobiles and internet were owned and used frequently than social media.

Aydin (2013) aimed to study knowledge of Computer software among Turkish EFL teachers. The sample constituted of 157 Turkish EFL teachers. The main finding of the study suggested that they had little knowledge about definite software and faced difficulties in using software programme. They faced lack of technical and instructional support but they had positive perception about computer use.

Kurt (2013) attempted to know the extent to which technology is used by teachers in classroom and outside classroom in elementary Turkish schools. The findings of the study indicated that teachers used technology for various purposes like administration, technology education, non-educational purposes, instructional preparation; teacher’s directed instructional delivery, student homework and instructional assessment.

Kumar (2014) investigated ICT usage by faculty members of college of education in terms of ICT tools, place of ICT access, purpose to use, frequency of ICT use, their opinion regarding ICT and problems faced by them in using ICT in Haryana. The author found that respondents used ICT tools like computers, e-mail, internet, telephone and mobile phone in the college lab, in administrator block and in the office. All faculties used e-mail, 48.75% used search tool, 42.5% used newsgroups, 21.25% used web, 13.75% used video conferencing and only 10% did online shopping. 62.5% of faculty used ICT for 0-5 hours per week, 11.25% for 6-10
hours, 15% for 11-15 hours and 8.75% for 16-20 hours a week. Limit access to computers, limitation of internet access, lack of time, and lack of knowledge and lack of confidence in using ICT are main problems faced by faculty members.

Remetio (2014) adopted triangulation technique i.e. classroom observation, one to one interview and focus-group discussion to study beliefs of teachers and utilization of computer technology by them in reading instructions. Researcher concluded that perception of participants about technology, their experience with technology and obstacles faced by them affect their views on how to utilize technology in reading instructions.

Jali et. al. (2014) conducted a study to explore current level of computer knowledge and internet usage among graduate dental students. The findings of study revealed that 94.4% participants had computer knowledge and 77.4% had own computer. About 40.8% used computer for general purpose, 28.5% for entrainment purpose and 22.8% used computer for research purpose. On the other hand as far as internet usage is concerned, 92.9% had internet knowledge, about 42.1% used internet occasionally, 34.4% were regular internet users, 21.7% rarely used internet whereas 1.8% do not use internet.

Wilson (2014) aimed to find out the level to which students’ use computer, observing gender differences and relationship between age and computer proficiency. The data were collected from a sample of 1500 students. The collected data were analyzed by mean, frequency, SD, t-test, Chi-square test and cross-tabulation. The main findings concluded by researcher were younger students possessed higher computer proficiency skills as compared to the older students, the students used computers for various activities like listening to music, playing games, researching, chatting, and e-mailing, they get access to educational resources including electronic journals, e-books, open educational resources (OER), educational digital video disk/compact disc (DVD/CD), and online databases and male students have higher technology literacy skills than female students.

Jain (2014) found in this study that the teacher educators have sufficient knowledge about MS Word, MS Excel and MS Power Point. Applications of various computer software, e-mail and internet were used at occasional situations and they rarely used ICT for presentation.
Nasrin & Varshney (2015) attempted to examine perception of prospective teachers towards learning with social networking websites in Aligarh Muslim University. 100 B.Ed. trainee teachers were selected as sample for research study. Researchers administered own constructed and validated 5 point Likert type scale as research tool to collect desired data. Cronbach’s alpha reliability coefficient of tool was 0.72. The statistical analysis of collected data reached at conclusions that prospective teachers perceive social networking websites as an efficient learning tool and significant differences were absent in perception of prospective teachers in terms of gender, educational qualification and time spent on social networking websites.

George & Ogunniyi (2015) worked on two main objectives: To assess the availability of ICT resources and their use into the selected science classrooms; and to determine the interviewed science teachers’ perceived intention to use ICT in their classrooms. 45 science teachers were randomly selected as sample from 10 high schools. The investigators concluded that most of the schools have basic ICT resources in science classrooms but they were not properly used. Further, it was concluded that perceived usefulness of ICT resources was an important factor for intension of teachers to use CAL.

Eme et. al. (2015) conducted a research on Computer Studies and its impact in Secondary Schools in Umuahia-North Local Government Area of Abia State, Nigeria with objectives to study impact of computer studies in secondary schools, computer literacy level of teachers and students in secondary schools and various reasons why teachers use computers. Survey technique was used by researcher to fulfill purpose of study. The researchers concluded that computer studies has positive impact in teaching-learning, computer literacy levels of teachers was high than students and teachers used computer for various purposes like preparing learning material and for personal research.

Singh (2015) aimed to study use of internet by faculty and post graduate students in Haryana in term of frequency of internet use, time spent on internet and various purposes of internet use. The analyses of data shown that one fourth of participants were daily internet user and two-third of participants use internet twice or thrice in a week. 30.76% respondents admitted that they use internet for academic purpose, 9.23% for visiting websites and chatting purpose, 7.69% for e-mail and only
few i.e. 1.53% for searching electronic journals. Also 55.38% respondents stated that they used internet at home. Only 24.61% respondent used internet in college.

Turan (2015) examined use of computer and internet applications among Chinese and Turkish prospective teachers in terms of similarities and disparities. The sample of research study constituted 292 prospective teachers from China, Shanghai and Turkey, Izmir. Prospective teachers of both country used education aimed media. Female prospective teachers of Turkey were using less internet and computer as compared to Chinese female prospective teachers. Moreover, it was concluded that internet use by Turkish female prospective teachers were influenced by social-economic and cultural factors whereas internet use in China was decided by Chinese Government.

ER et. al. (2015) intended to study views of pre-service science teachers towards computer use and computer based instruction. The study was completed on six participants by semi-structured interview. The participants agreed with statement that computer and computer based instruction should be used in science courses but important finding of the study was that basic course provided in undergraduate education did not contribute to teaching practices. All participants were in favour of CAI because it enhances learning, visualization of lessons is possible, save time and appeal to multiple senses. Participants were of the view that teachers who have knowledge of MS Word, MS Power Point and MS Excel can use CAI efficiently in delivery of science lessons.

Bhatia & Haider (2015) conducted a study to examine potential of WhatsApp in teaching-learning. 10 pre service teachers of Delhi University enrolled in B.Ed. course participated in the study. The findings of the study indicated that participants considered WhatsApp as an effective tool in creating collaborative learning environment during school experience program. All participants reported that they enjoyed this kind of virtual teaching-learning environment as they can share information, lesson plans, their problems, can receive feedback easily and collaborate easily with friends and teachers.

Saini & Abraham (2015) discussed importance, approaches and challenges of using social media in classroom. Social media helps teachers to understand and recognize the learners’ need, provide immediate feedback to students, enhance
communication, creates a collaborative atmosphere and increases students’ engagement. Also authors considered social media as constructive approach which can use to exchange academic information, dialogue and discussion, sharing videos and pictures, maintenance of reflective journal writing and to carry project-based learning. The authors also mentioned that lack of infrastructure, lack of training or technological expertise among teachers and cyber bulling, divert attention of students and also discourage face-to-face communications which were major challenges and concerns in using social media.

Khandpur (2015) attempted to study the aspect of ICT to which upper primary and secondary science teachers were comfortable in terms of use and what kind of learning resources can be created by upper primary and secondary science teachers for use in classroom. The research sample comprised of 30 private school teachers in NCR who are using technology based resources in science curriculum. Researcher found smart boards, interactive white board, Microsoft word documents for presentation of information, Microsoft power point presentations, educational software, CDs, games and computer aided learning laboratories as ICT resources used by teachers. Researcher also concluded that teachers were comfortable with internet searches, CD players, LCD projectors, downloading resources for late use and creating power point presentations.

Devaki (2015) attempted to study efficacy of e-content package in mathematics teaching for class XI students. The sample constituted of 39 class XI students. Pretest and posttest research design was used by researcher. The researcher concluded significant effect of e-content in achievement of mathematics. 12.82% students scored 90% and above marks, 43.6% scored 80% and above marks, 23.07% scored 70% and above marks and 17.95% students scored 60% and above marks.

Bardhan et. al. (2015) studied educational use of online social networking sites by university students. 120 students pursuing post graduate courses comprised target population for research study. The findings of the study pointed out that female students used more online social networks to educational purpose. The students of science discipline used maximum online social networks as compared to humanities and arts discipline. Further, it was found that E-mail was highly used for educational purpose followed by You Tube, Facebook and blogs.
Sampath Kumar & Badavaraja (2016) attempted to explore expectations of rural students in relation to computer access and their expectations from school and local government in making available ICT infrastructure. Data were collected by interview schedule from 300 students. Most of students reported that lack of support from teachers and non-availability of computers at home and schools were main issues avoiding computer use but most of the students have shown interest towards computer use. Most of the students were of the view that the state/local government should establish computer laboratories with internet connections in rural schools.

Ahmed et. al. (2016) attempted to study current status of using Web 2.0 tools by faculty of education in Sudan University of Science and Technology. 40 faculty members constituted sample for the study. The findings of the study indicated that the faculty members possessed medium level of using Web 2.0 tool and it was highly used in scientific research. They used it for downloading books, articles, research material and to find out what is new in the field.

Noh et. al. (2016) attempted to explore influence of experience in computer use and level of ICT knowledge towards personal innovativeness. The research sample constituted 546 library and media teachers who were selected randomly. The desired data for research were collected with the help of set of research tool consisting personal innovativeness and ICT knowledge. The collected data were analyzed with the help of percentage, frequency, mean and MANCOVA. The results of the study implied that majority of library and media teachers possessed moderate personal innovativeness. Also computer experience, educational level and ICT knowledge influenced personal innovativeness significantly.

Koksal et. al. (2016) conducted a study to examine perception of Turkish pre-service science teachers towards technology. 264 pre-service science teachers constituted sample for the study. The collected data were analyzed with the help of t-test, ANOVA and Mann Whitney U test. The Main finding of research suggested that male pre-service teachers who were found to be week in computer competency possessed positive perception toward instructional technology as compared to female pre-service science teachers.

Kazoka & William (2016) examined knowledge of teachers to use ICT in teaching-learning process. Interview protocols, discussion and practical observations
were used as data collection instruments. The findings of study revealed lack of ICT knowledge among teachers. Only few ICT facilities were available in schools. The teachers reported that effective use of ICT can be attained through cooperation among education stakeholders, schools and teachers.

Thus, the above sited review of previous researches on computer use concluded that the most of the researchers conducted their studies on use of ICT and internet by different group of teachers and students. Very less number of studies were conducted on teacher educators and prospective teachers. Here it is noted that no study could be found which was conducted in Himachal Pradesh on the use of computers by teacher educators and prospective teachers. There has been as effort made in this direction under the present study.

2.2 REVIEWS ON COMPUTER ANXIETY

Various researchers (Beste & Kilic, 2015; Saeed et. al., 2014; Chen, 2012; Mehra & Omidian, 2011; Miller, 2010; Rahini & Yadollahi, 2010; Rostegarpour et. al., 2009; Anderson, 2005; Hong & Koh, 2002; Lam, 2000; Hong & Koh, 1998; Yaghi & Abu-Saba, 1998; Russell & Bradley, 1997; Rosen & Weil, 1995; Kotrlik & Smith, 1989; Akinyemi, 1986) studied computer anxiety among teachers. Many researchers (Joshi, 2014; Saxena et. al., 2014; Saxena & Kaur, 2014; Seyyedrezaire et. al., 2013; Ozturk, 2013; Altinkurt & Yilmaz, 2012; Gihar & Tyagi, 2012; Halder & Chaudhuri, 2011; Roger & Wallase, 2011; Simsek, 2011; Hismonoglu, 2011; Sharma & Amar, 2009; Ursavas & Karal, 2009; Hallam, 2008; Ceyhan, 2006; Roslan & Mun, 2005; Wong et. al., 2003; Savenye, 1992; McHorney, 1990) investigated computer anxiety among prospective teachers and some researchers (Achuonye & Ezekoka, 2011; Qian et. al., 2009; Birol et. al., 2008; Tekinarslan, 2008; Doyle et. al., 2005; Sam et. al., 2005; Chua et. al., 1999; Colley et. al., 1994) explored computer anxiety among undergraduates and university students. Some researchers (Beste & Kilic 2015; Saxena et. al., 2014; Altinkurt & Yilmaz, 2012; Halder & Chaudhuri, 2011; Liu et. al. 1992; Mullan, 1990) revealed in their respective studies that females were more computer anxious whereas Saxena & Kaur (2014) and Birol et. al. (2008) discovered high computer anxiety among males. Majority of researchers (Joshi, 2014; Saeed et. al., 2014; Roger & Wallase, 2011; Rahimi & Yadollahi, 2010; Qian et. al., 2009; Ursaval & Karal, 2009; Tekinarslan, 2008; Anderson, 2005; Brosnan, 1999; Yang et.

Akinyemi (1986) examined phobia in context with educational technology. The author found phobia among Nigerian teachers towards educational technology as a reason to avoid use of different equipments in teaching process. 48 respondents reported that lack of knowledge of educational technology’ equipments led to technophobia.

Campbell (1988) paid attention to study the gender differences in terms of variables perceived effect of computer ability on interpersonal relationship, fear of computer hardware, availability of a computer in the home, perceived relationship between math and computer abilities, and perception of computer ability. The results of the study revealed that these factors were significant forecasters of computer anxiety for males as well as females. For both males and females, perceived effect of computer ability on interpersonal relationships was the main predictor of computer anxiety.

Kotrlik & Smith (1989) aimed to study computer anxiety among vocational agriculture teachers and other vocational teachers. The authors conclude that some vocational teachers were experiencing computer anxiety ranging from mild to intensive.

Mullan (1990) collected data from 44 participants and concluded that educators were not using computer technology in classrooms. Further the author studied the correlation of anxiety with gender, education level, computer experience, and in –service training. The findings indicated that men had less computer anxiety than women, the computer experience and in-service training result in reducing
computer anxiety. In addition, the master degree students have lower computer anxiety than baccalaureate degree students.

Savenye (1992) focused to study influence of computer course on computer anxiety and computer attitude of pre service teachers. The researcher concluded that participation in a systematically designed computer literacy course helped to develop positive attitude towards computer and reduce computer anxiety.

Liu et. al. (1992) conducted a study to investigate computer anxiety among 914 teacher education undergraduates over a time period of four years. The findings of the study indicated decrease in trend of computer use ranging from 33.5 percent to 28.2 from first year to fourth year but tremendous growth was found in CAI with 6 percent to 21.6 percent. Significant differences were concluded in computer anxiety on comparing with prior computer experience. Although many males did not have prior computer experience as compared to females but they exhibit less computer anxiety than females.

Gordon (1993) focused to study computer anxiety of 116 secondary technical education teachers in West Virginia. The data were collected by using Oetting’s Computer Anxiety Scale (COMPAS). The analysis of data revealed that 46 percent of the teachers experienced some overall computer anxiety. No gender differences were observed in the study. Only 45 percent teachers considered themselves as complete beginners. The teachers considered in-service training workshops as a more regular kind of formal computer instruction.

Colley et. al. (1994) studied effect of gender and prior experience on computer anxiety among the university students. The sample constituted of 144 students who just started their study at university level. The finding of the study indicated lower computer anxiety among the males and as far as prior experience is concerned, it was found that greater computer experience at home resulted in lower computer anxiety for both male and female students.

Fletcher & Deeds (1994) determined level of computer anxiety of secondary agricultural education teachers in the United States. A sample of 224 teachers was selected by using systematic sampling technique with the help of random entry point. The findings revealed that 42% of teachers were very relaxed, 17.1 % were generally relaxed, 27.2 percent were mild anxious whereas only 4.6% were very anxious. The
teachers perceived themselves as beginner computer user with minimal typing skills. 84.4% agricultural educators reported that they used computer for one to three hours in a week.

Rosen & Weil (1995) focused to study technophobia as a reason for low level of computer utilization in terms of computer/technology experience, computer availability and current computer use. The research was conducted among elementary teachers (171), secondary teachers of science discipline (117) and secondary teachers of humanities discipline (200) of 54 schools situated in urban areas. The result yielded that computers were available at schools but were not used by many teachers; many teachers were technophobic specially elementary and secondary humanities teachers and teachers were anxious to use computer device in classroom.

Kellenberger (1996) concluded in his study that pre-service teachers believed that computers were valuable for children, future students and society. The researcher conducted a study among 222 primary/junior teachers who were enrolled in a teacher training programme to find out relation between achievement, value-related beliefs regarding computers and their perceived computer self-efficacy. Perceived past success and own values were found to be significantly related to perceived computer self-efficacy.

Russell and Bradely (1997) administered a questionnaire to randomly selected 600 primary and secondary teachers in urban and rural areas to study nature and extent of cyber phobia in teachers. Only 350 teachers responded to the questionnaire. The open-end items were included in questionnaire after identifying three independent sources of computer anxiety i.e. fears included concerns about computer damage, task performance and social embarrassment. The findings of this study were presented under four headings: computer access and usage, computer competence and anxiety, past training and professional development, and preferred models of computer training and professional development. The teachers were very supportive of the use of computers in education. 91 % of them agreed with the statement that computer is a necessary tool now days. Access to computers at home and at schools was considered very important by many teachers. Most of the teachers pointed out that they possessed moderately low levels of computer competence. 22 % of teachers agreed with the statement that ‘they have no difficulty in understanding the technical aspects of computers’ and 39% teachers agreed with the statement that ‘successfully using a
computer nearly every day to help me with my work.’ On contrary 42% teachers agreed on the statement that ‘computer terminology seems like a foreign language for me’ whereas 43% agreed on the statement that ‘apart from word processing, I have no computer skills’. Gender differences were observed in computer competencies. Males were more confident as compared to females. Those who had access to computer were reported themselves as competent. The computer anxiety level among teachers were not found very high, one-third of them believed that computers were a source of anxiety whereas one-third claimed to be always calm and relaxed while working with computers. Teachers acknowledged their past training as a explanation of why their use of computer is less effective than they want.

Hong & Koh (1998) attempted to study computer anxiety level of rural secondary school teachers and to determine differences in computer anxiety level based on the basis of demographic characteristics like gender, computer ownership, number of computer courses attended and amount of computer experience of 112 rural secondary school teachers in Malaysia. The researcher conducted study in two phases. The first phase included the development of a suitable instrument to measure computer anxiety whereas the second phase was to use this instrument to collect data. At the end of study, it was concluded that generally the teachers have a low computer anxiety level. Gender differences were absent on computer anxiety instrument. However significant differences in computer anxiety levels were found for computer ownership, number of computer courses attended and computer experience. It was found that teachers who had their own computers were found to have lower computer anxiety than teachers who had no own computers. Teachers who have attended more computer courses were found to have a lower computer anxiety than teachers who have attended less computer courses. Further the teachers who have more computer experience were also found to have lower computer anxiety than teachers with less computer experience.

Yaghi & Abu-Saba (1998) investigated computer anxiety among 308 Lebanese teachers in terms of teaching at different educational levels (elementary, intermediate, and secondary), gender and computer experience. No significant differences were found due to different educational levels but a minor significant difference was observed between elementary and intermediate level teachers. In addition, no gender differences were found in the study. The computer experience is an important factor in reducing the computer anxiety.
Brosnan (1999) observed no gender differences in computer anxiety in all dimensions of computer anxiety scale like computer self-efficacy, perceived usefulness, or perceived ease of use. Also no gender differences were observed between current level of word-processor usage and expected word-processor usage. But significant differences were observed in age of initial computer experience. A gap of three years was found between female and male initial computer experience.

Yang et. al. (1999) selected 245 vocational-technical educators by stratified random sampling to study how computer related experience affects the relationship between computer anxiety and demographical variables. The demographical variables were learning style, age, gender, ethnic/cultural background, teaching/professional area, educational level and school type. The computer anxiety scale developed by Oetting (1983) was administered on these teachers. The overall computer anxiety scale range is 10 to 50. The subscale range and their respective classification are: 10-19 (very relaxed/confident), 20-26 (generally relaxed/comfortable), 27-32 (some mild anxiety), 33-36 (anxious/tense), and 37-50(very anxious). Cronbach alpha reliability coefficient was 0.88. The analysis of data was done by percentage and one-way ANOVA. The result of the study had shown no relationship between computer anxiety and demographical variables like learning style, age, gender, ethnic/cultural background, teaching/professional area, educational level and school type.

Chua et. al. (1999) conducted a study, “Computer Anxiety and its Correlates: A Meta-Analysis” to study meta-analysis relationship between computer anxiety and three variables i.e. gender, age and computer experience. The researchers conducted the study on university undergraduate students. The conclusion of meta-analysis indicated that female university undergraduates were found more computer anxious than their counterparts. In addition, the researchers concluded an inverse relationship between computer anxiety and computer experience.

Lam (2000) tried to understand whether technophobia among teachers was a factor behind their choice to choose technology by adopting oral interview method. The findings of the study indicated that teachers were not really technophobic, but institutions were technophilic in order to obtain the latest innovations without bothering the need of teachers.

Hsieh (2001) studied computer anxiety among 452 elementary and junior high school teachers by using computer anxiety scale. The result of the study indicated that
with respect to personal background, gender, age, degree, field of study, frequency of computer use per week, availability of computer, respondents exhibited higher computer anxiety. Teachers with higher computer anxiety avoided frequent use of computer.

Panagiotakopoulos & Koustourakis (2001) tried to study computer anxiety of first-year students studied at department of primary education at University of Patras. The analyzed result indicated general anxiety towards computer among the participants. It was found that anxiety reduced significantly after completing a six month course in terms of seminar and lecture. On the other hand, significant differences were found among different groups e.g. who owned computer at home and those who did not have computers at home, those who used computer in free time and those who did not use computer in free time, those who participated in seminars on computer already and those who did not participate and those who used computer in completing homework and those who did not.

Hong & Koh (2002) examined computer anxiety level of 200 rural secondary school teachers in Malaysia. Also the researchers tried to find out relationship between computer anxiety and computer attitude. The researchers concluded that the respondents reported low level of computer anxiety and a negative linear relationship was found between computer anxiety and computer attitude. The respondents who had their own computers and who had more computer experience reported less computer anxiety. Higher level of computer anxiety towards hardware was found among female teachers as compared to male counterparts.

Wong et. al. (2003) focused to study the effect of constructive learning environment on level of anxiety towards information technology among pre-service teachers. The researchers divide the participants into two groups i.e. IT competent group and IT incompetent group. The study was aimed to investigate whether there was change in anxiety level after completing the course. The study concluded significant change in incompetent group after completing the course. The result of post test revealed no significant differences between both groups. The participant of the IT incompetent group benefited more from course as compared to participants of IT competent group.
Becker & Schmidt (2003) studied a six-factor model of computer anxiety on two groups of university students. The dimension of the model were computer literacy, self-efficacy, physical arousal caused by computers, effective feeling about them, belief about beneficial aspects of computers and beliefs about their dehumanizing aspects. The result revealed that computer literacy had a strong directional influence on physical arousal and affects. Self-efficacy contributed to computer literacy. Training program can enhance self-efficacy and computer literacy can reduce computer anxiety.

Namlu (2003) examined the effect of learning strategy training on computer anxiety. The participants were divided into two groups- experiment group and control group. The participants of control group were taught by giving a seminar on the issue without giving any training whereas the experimental group was treated with training how to improve learning strategies. The computer anxiety scale and learning strategy scale were administered before and after the study. The mean difference was observed after giving the treatment for developing learning strategies. In addition, comparing the pretest and post test scores of computer anxiety it is found that computer anxiety scores of experimental group were decreased in the post test.

Bozionelos (2004) focused to study how socio-economic background related to amount of current computer use, its relationship with computer anxiety and computer experience. The findings of the study revealed a positive indirect relationship among socio-economic background and amount of current computer use. Further, direct positive relationship was concluded between socio-economic status and computer experience while an indirect negative relationship was observed between socio-economic background and computer anxiety.

Roslan & Mun (2005) aimed to study computer anxiety and sources of computer anxiety among teacher graduate students in Malaysia. The finding of the study revealed that most of the participants were generally relaxed and confident in using computers. An examination of source of computer anxiety, the researcher found strong relationship between task anxiety and computer anxiety, followed by damage anxiety and social anxiety.

Anderson (2005) aimed to study presence of computer anxiety in terms of age, race, gender, level of educational attainment and purpose of computer use in rural school teachers in Mississippi. In order to collect desired data, a questionnaire with 52
items was administered by author who consisted of 12 items belonging to demographic information and remaining were modified version of Oetting’s (1983) computer anxiety scale. The findings of the research study showed that majority of teachers used computer and its application for research and word processing. Age, race, gender and level of educational attainment were not forecaster of computer anxiety.

Doyle et. al. (2005) aimed to study the relationship between computer experience, computer anxiety and self-efficacy. The sample of 163 participants was drawn from students pursuing four years degree in computer science. The sample comprised of 32 female and 131 male students. The authors concluded that respondents experienced low level of computer anxiety but respondents of first year experienced greatest level of anxiety. In addition, the findings of the study concluded a significant negative relationship between computer anxiety and computer experience. Computer anxiety decreases as computer experience increases. Also, computer anxiety decreases as level of computer self-efficacy increases.

Sam et. al. (2005) studied computer anxiety among 148 undergraduates in Malaysia. The sample consisted of 81 female undergraduates and sixty seven male undergraduates. The data were collected with the help of computer anxiety scale by adopting survey method. The findings of the study suggested that respondents had moderate computer anxiety. The authors further studied the influence of internet use on computer anxiety and concluded that higher level of internet use decreased computer anxiety among respondents.

Ceyhan (2006) conducted a study “Computer Anxiety of Teacher Trainees in the Framework of Personality Variables”. The author focused to study computer anxiety of 690 teacher trainees in term of personality variables irrational beliefs, learned resourcefulness, optimism/pessimism and self-disclosure. The findings of the research exposed that the computer anxiety is related to irrational beliefs, optimism/pessimism and self-disclosure while no relation is observed in terms of learned resourcefulness.

Hallam (2008) studied the effect of socio cultural factors on computer anxiety among pre-service teachers. Case study research methodology was adopted by the researcher. Four cases were selected out of which two had computer anxiety and two did not have computer anxiety. Interview, field observation and student journal were used to study cases. A cross-case analysis revealed that cases with no computer
anxiety and cases with computer anxiety had differences related to differences in social resources.

Tekinarslan (2008) investigated level of computer anxiety between Dutch and Turkish university students. The researcher focused to study computer anxiety level in relation to their culture, gender and computer experience. The collected data were analyzed by using t-test and one way ANOVA. The study yielded that Turkish students had higher computer anxiety as compared to Dutch students. The gender differences were absent in the findings. However, it was found that Turkish female students had higher level of computer anxiety than Dutch female students. The level of computer anxiety decreased as the students’ computer experience increased.

Birol et. al. (2009) studied the relationship of gender and computer anxiety, motivation, self-confidence and use of computer in job or career. 157 university students were selected by using random sampling. The male students scored higher values for computer anxiety, motivation and use of computer in job or career but did not differ significantly. On the other hand significant difference was found between male and female students on self-confidence. Both male and female students shown confidence in working with computers but the male students got higher scores on self-confidence.

Rastegarpour et. al. (2009) tried to study computer use in instruction and its relation with computer anxiety. A sample of 548 teachers was selected with 282 male teachers and 266 female teachers. Computer anxiety test was administered as a pretest and posttest. The data analysis done by using descriptive and inferential statistics indicated that a negative relationship between computer utilization and computer anxiety and significant relationship was found between computer anxiety and computer experience as well as hours spent on working with computer.

Sharma & Amar (2009) aimed to compare the computer phobia between management students and teacher trainees. A sample of 300 respondents consisted of 150 management students and 150 teacher trainees. The sample of 150 management students consisted of 75 male students and 75 female students. Same number i.e. 75 male and 75 female students were selected from 150 teacher trainees. The researchers constructed and standardized their own five point rating scale having 30 items. The scale consisted of both positive statements as well as negative statements. The scoring procedure of 4, 3, 2, 1, 0 was followed for positive statements and reverse scoring was
done for negative statements. t-test was employed to find out the meaningful findings from collected data. The analysis of data indicated significant difference on computer phobia scores between management students and teacher trainees. The main finding of the study revealed that teacher trainee students had higher computer phobia than management students, male teacher trainee had more computer phobia as compared to male management students, female teacher trainees had high computer phobia in comparison to female management students, male teacher trainees had more computer phobia than male management students and female teacher trainees exhibited higher computer phobia in comparison to female management students.

Qian et al. (2009) completed a quantitative study to predict the effects of gender and computer experience on computer anxiety. The population was 306 Chinese undergraduate students. The result of the study revealed that no significant difference was found among male and female. Also, it was concluded by the researchers that computer experience did not have any influence on computer anxiety.

Ursavaş & Karal (2009) determined the level of pre-service teachers’ computer phobia in relation to gender and computer experience. The study was conducted on a sample of 430 pre-service teachers (227 females and 203 males) at the Education Faculty in Rize/Turkey. The mean age of participants was 21.87 years. The collected data were analyzed with statistical techniques such as t test, and correlation analysis. It was monitored that 68% of the pre-service teachers reported no computer phobia, and 32% of them reported computer phobia from Low to Moderate/High levels. On the other hand, in terms of Computer Thoughts Survey, 79% of the respondents reported no computer phobia, while 21% of them reported computer phobia from Low to Moderate/High levels. The independent group t-test was used to test the differences between the computer phobia and gender & computer usage. No significant differences were found for the variable of gender. But female students relatively scored higher on the computer anxiety scale than males did. It was also observed that there is a negative and intensive relationship between computer experience and computer anxiety. Meanwhile it was found out that pre-service teachers using computer regularly indicated lower computer anxiety. Obtained results were tried to be discussed in terms of the number of computer classes in the Education Faculty curriculum, hours of computer class and the computer availability of student teachers.
Miller (2010) studied computer anxiety in using new software technologies in instructional purpose, computer anxiety level and relationship between computer anxiety and demographic variables. The study was conducted among 110 teachers in rural areas of U.S. who had minimum bachelor degree. The findings indicated low computer anxiety in using new and emerging software technology when teachers had moderate degree of confidence, liking and usefulness. The researcher concluded significant relationship between computer anxiety and age & computer anxiety and years of teaching.

Rahimi & Yadollahi (2010) studied level of computer anxiety among EFL teachers and its relationship with ICT integration. The researcher administered computer anxiety rating scale, ICT integration rating scale and a personal information questionnaire. Analysis of data indicated positive correlation between computer anxiety and age. The older EFL teachers had higher level of computer anxiety as compared to younger teachers. On the other hand an inverse correlation between computer anxiety and ICT integration was concluded. The teachers who had lower levels of technophobia had higher level of ICT integration in classroom practices. The gender differences were absent in ICT integration.

Hismanoglu (2011) employed computer anxiety scale designed by Heinssen, Glass & Knight (1987) to study computer anxiety of 70 prospective EFL teachers. The researcher also examined the effects of background characteristics on prospective EFL teachers’ computer anxiety. The study disclosed that prospective EFL teachers’ scores were relatively moderate in computer anxiety scale. As far as association between computer anxiety and computer liking was concerned, the results of this study revealed a positive correlation between computer anxiety and computer liking. Related to the impact of age & effect of year of study on computer anxiety, no significant relationship between age & effect of year of study and computer anxiety was found. With respect to the effect of computer ownership on computer anxiety, no significant relationship found between computer ownership and computer anxiety. In relation to the effect of computer experience on computer anxiety, the study found no significant relationship between computer experience and computer anxiety.

Mehra & Omidian (2011) in their study compared computer anxiety among Indian and Iranian university students in terms of country and faculty. A sample of 800 post–graduate students of different departments of Panjab University (India) and
University of Tehran (Iran) were the participants of the study. The results pointed out that country type, faculty type and interaction between country and faculty had significant effect on computer anxiety scores of university students.

Achuonye & Ezekoka (2011) suggested that technophobia among female undergraduate may become a clog in the wheel of progress for the empowering women. The author studied technophobia among 200 undergraduate students. Random sample technique was used by the researchers to select 100 students from science department and 100 students from arts. The study concluded that technophobia exists among respondents but technophobia did not exist significantly between female science undergraduate students and arts undergraduate students. Further the study revealed that technophobia did not affect their choice of course but affected their academic performance.

Halder & Chaudhuri (2011) examined the computer anxiety of teacher trainees with respect to gender, discipline and residential status (rural, semi urban and urban). The data were collected by administering Computer Anxiety Scale (Ceyhan and Namlu, 2000; Heinssen, Glass and Knight, 1987) on 84 teacher trainees. All the participants were in the age group of 30-40 years. All participants were found to be moderate computer anxiousness. When the relationship between time spent on using internet and computer anxiety was studied, it was found that higher level of the internet decrease the level of computer anxiety. When gender differences were examined, it was concluded that male had less computer anxiety than female counterpart. Teacher trainees from the science faculty had lower computer anxiety than teacher trainees from the humanities faculty. Teacher trainees of urban and semi-urban origin exhibit lowest computer anxiety while the reverse is true for the rural teacher trainees.

Rogers & Wallase (2011) studied computer anxiety of 200 pre-service education students by using convenience sampling. The sample comprised of 153 (76.5 percent) female pre-service education students and 47 (23.5 percent) male pre-service education students. The participants were in the age group of 18 to 55 years but one participant did not respond. The result did not find significant relationship between technology integration and computer anxiety. No gender differences were reported in the study. Moreover, subject area and computer anxiety were not significantly related to each other.
Simsek (2011) studied computer anxiety among students and teachers in elementary and secondary schools in Turkey. The sample constituted of 845 students and teachers. The summary of findings indicated that overall mean score on computer anxiety scale shown moderate level which means that respondents were generally relaxed and comfortable. Further the author concluded no significant difference between students and teachers and teachers of elementary and secondary schools.

Altinkurt & Yilmaz (2012) examined the computer anxiety among prospective teachers. 195 prospective teachers participated in the study and attended formation courses. The study concluded moderate level of computer anxiety among prospective teachers. Further the author investigated computer anxiety in terms of gender, department and personal computer ownership. It was observed that female prospective teachers had more computer anxiety as compared to male prospective teachers, the prospective teachers of physics teaching had highest level of anxiety on sub dimension of affective anxiety whereas the prospective teachers of chemistry department had highest level of anxiety on damaging sub dimension and the prospective teachers who had own personal computers had lowest computer anxiety.

Gihar & Tyagi (2012) made an attempt to study computer phobia in between private and Govt. college prospective teachers, prospective teachers having undergraduate and post graduate qualification and in respect to their basic streams i.e. Arts, Commerce, and Science. The sample of the study was 224 prospective teachers selected randomly from 10 colleges of Ghaziabad District. The Computer Phobia Scale was developed and standardized by S. Rajasekar & Vaiyapuri Raja (2002) was used to collect the desired data. The scale has 29 items spread over 3 dimensions i.e. personal failure, human vs machine ambiguity, convenience. The result concluded no significant difference between Government and private organization prospective teachers on computer phobia scale. Also no significant difference was found between the undergraduate and postgraduate prospective teachers on computer phobia scale but higher scores were obtained by PG prospective teachers than UG prospective teachers on their level of computer phobia towards personal failure dimension of CPS. A sharper variation was found between the science and arts stream prospective teachers on personal failure dimension of computer phobia scale. In this case prospective teachers of science stream had scored higher mean values than the prospective teachers of arts stream. Similarly higher scores were obtained by science
stream prospective teachers when compared with commerce stream prospective teachers on their level of computer phobia. Although, there exist no significant variation between arts and commerce stream prospective teachers on computer phobia scale.

Chen (2012) aimed to determine the levels of computer anxiety among elementary EFL teachers in Taiwan and effect of background characteristics of Taiwanese elementary EFL teachers on computer phobia levels. The researcher adopted quantitative method to conduct the research. Computer anxiety rating scale developed by Rosen and Weil (1992) was distributed to 300 EFL teachers to assemble the data. It was a 20-item scale in a 5-point Likert format whose Cronbach’s Alpha was 0.91 for this study. The norms established by Rosen and Weil for computer phobia are as follows: no computer phobia, 20–41; low computer phobia, 42–49; moderate to high computer phobia, 50–100. The collected data was analyzed by SPSS version 17. The descriptive statistical analysis of study indicated that about half (50.2%) of the teachers reported no computer phobia on computer anxiety scale, 27.9% of teachers had moderate/high computer phobia whereas 21.9% teachers were reported to have low level of computer phobia. The author also studied some demographic variables like age, PC usage and computer accessibility at school. Computer phobia of teachers differed significantly in terms of age, PC usage and computer accessibility at school. Teachers in the age group of 51-60 had higher computer anxiety as compared to young teachers while those who used computer at home every day possessed lower computer anxiety. Teachers working at a school with medium to high accessibility of computer hardware and with higher internet accessibility at school tended to have lower computer anxiety.

Seyyedrezaie et al. (2013) inspected computer anxiety of 120 EFL students by administering translated form of Computer Anxiety Rating Scale (CARS) developed by Heinssen, Glass, and Knight (1987). The participants were divided into three levels’ of computer anxiety i.e. no anxiety (29-57), low anxiety (58-86) and moderate/high anxiety (987-114). The result indicated that out of 120 students, 37 had no computer anxiety, 38 had low computer anxiety whereas 45 had moderate/high computer anxiety.

Ozturk (2013) aimed to investigate computer anxiety of 366 prospective teachers. Computer Anxiety Scale and set of some demographic questions were used to gather desired data. The data was analyzed by t-test, one-way ANOVA and Pearson
correlation coefficient. The study revealed that frequency of computer use affects computer anxiety (more frequent users were less anxious) but gender difference was absent on computer anxiety. The participants who had a personal computer at home were less computers anxious. Also a significant correlation between higher self-efficacy and low computer anxiety was reported by researcher.

Joshi (2014) conducted a study “Computer Phobia in Emerging Teachers” to study the computer phobia among 131 trainee teacher in district Dule of Maharashtra. The investigator tried to find out computer phobia in relation to gender, open class category, backward class category and type of institute. The findings of the study concluded that 58.02 percent of the respondents had lower level of computer phobia, only 9.37 percent of teacher trainees who belonged to open class had low level of computer phobia and more than half i.e. 63.04 percent of male teacher trainees had lower computer phobia. No significant differences were concluded between male teacher trainees and female teacher trainees, teacher trainees of aided institutions and teacher trainees of non-aided institutions and between open class category teacher trainees and backward class category teacher trainees.

Saeed et. al. (2014) focused to predict computer anxiety of 160 teachers based on emotional intelligence and personality traits. The findings of the study indicated a significant negative relationship between computer anxiety and emotional intelligence. Within personality traits, neuroticism and openness to experience had highest degree of predicting computer anxiety. Further, no significant relationship was observed between computer anxiety and sex and age respectively

Saxena & Kaur (2014) studied computer anxiety among 600 prospective teachers, out of which 189 were male prospective teachers and 411female prospective teachers were selected from 30 colleges of Education of Haryana State. The researchers used multistage stratified sampling technique to draw the desired sample. In order to collect the desired data the researcher developed and standardized their own Computer Anxiety Scale. The scale was consisted of 57 items having four dimensions. The researchers revealed in their study that male prospective teachers had more computer anxiety as compare to female prospective teachers. The findings of study further revealed that the urban prospective teachers shown less anxiety towards computer whereas no significant difference was found between the prospective teachers of humanities and science background in respect to their computer anxiety.
Saxena et al. (2014) framed hypotheses that there is no significant difference between male and female prospective teachers, rural and urban prospective teachers and humanities and science stream prospective teachers as far as computer phobia is concerned. Descriptive survey method was adopted by researchers to collect the data from 97 prospective teachers (76 males and 21 females). The computer phobia scale developed by Saxena (2010) was used as research tool. The tool consisted of 28 items on three dimensions: individual constraints, propellants and ease of handling computer. Mean, standard deviation and t-test were used by researchers to analyze gathered data. The results of the study inferred that female prospective teachers had more computer phobia than male counterparts, rural prospective teachers had higher computer phobia than urban prospective teachers and humanities stream prospective teachers had more computer phobia as compared to science stream prospective teachers.

Hong & Koh (2014) investigated computer anxiety level of rural background teachers. The 200 participants participated from rural areas of Malaysia. The result showed that rural background teachers have low computer anxiety levels. The teachers who had own computers and had more computer experience had low computer anxiety. Further, it was found that female teachers were more computer anxious than male teachers towards computer hardware.

Beste & Kilic (2015) selected 124 music teachers to investigate computer anxiety among them. The main finding of the study indicated gender differences on computer anxiety scale. Computer anxiety among female teachers was higher than their counterpart. The teachers who had their own computers and were frequent users exhibited low computer anxiety. In addition, the researcher also concluded high level of negative relationship between computer anxiety and computer self-efficacy.

Sanalan (2016) conducted a study to construct a computer phobia instrument and examine computer phobia among 829 teacher education students. The computer phobia scale was administered after completing a computer course. The data analysis included factor analysis, CFA and GLM methods. The findings revealed that it was a reliable instrument and significant differences were observed in term of gender, computer ownership and computer course. Female teacher education students have higher computer phobia and reverse relationship was found between computer phobia and computer course as well as with computer experience.
Thus, from the above cited review, it can be admitted that the studies were conducted by number of researchers on computer anxiety of prospective teachers but the studies on computer anxiety of teacher educators could not found. The researcher could not found that any study on computer anxiety of teacher educators and prospective teachers in Himachal Pradesh.

2.2 REVIEWS ON COMPUTER ATTITUDE


Al-Jabri & Al-Khaldi (1997) explored the computer attitude of a sample of 238 business students in Saudi Arabia. The findings of the study advocated that computer experiences, degree of access, and computer ownership had great influence on computer attitude but age and class was not found to be related with computer attitude of respondents.
McCarthy (1998) constructed own Likert type instrument to study attitude of special education teachers towards computer use and its usefulness in educating disable students. The researcher concluded positive attitude among respondents towards computer to use it in special education. Furthermore, the finding of study concluded significant relation between computer attitude and level of involvement with computers.

Okinaka (1992) examined the factors that influenced attitude of prospective teachers towards use of computer. 90 teacher candidates enrolled in basic computer course participated in the study. The finding of the study indicated that teacher candidates’ attitude towards computer was influenced more when respondents understand how to use computer more effectively and when they got familiar with the power of computers in classroom practices.

Woodrow (1992) used pre-test and post-test technique to study the influence of computer training course on the attitude of pre-service teachers. The sample constituted of 36 pre-service teachers who were enrolled in introductory computer training course while was based on the basic computer programming skills. After completing the computer training course, significant differences were found between the pre-test scores and post-test scores of pre-service teachers. Moreover, gender differences were found absent in the study.

Colley et. al. (1994) studied the affect of family members on computer attitude of 144 students who had just begun their study at university level. The study concluded that males and females had positive computer attitude if they had a brother who used computer, fathers’ computer use had positive influence on males and mothers’ computer use had positive influence on females.

Shashaani (1997) focused to study gender gap in computer attitude of the college students. Responses were drawn from 202 college students which advocated that females had less interest in computers as compared to males. Furthermore, it was concluded that computer training of one semester has also improved their attitude towards computers.

Sexton et. al. (1999) carried out research to scrutinize computer attitudes among 131 early childhood education and care prospective teachers with the help of demographic questionnaire and the Computer Attitude Scale (CAS). The outcome of
the research indicated that the majority of these practitioners reported relatively positive attitudes toward computers although only few were found to have neutral to negative attitudes. Additionally, significant relationships were found between computer attitudes and having access to a home computer as well as having formal computer training.

Pepper (1999) studied whether any significant difference existed between pre-service and in-service teachers’ attitude towards computer use. Sample constituted of 50 pre-service teachers and 30 in-service teachers enrolled in 10 week instructional technology courses. The course provided information about computers and hand-on experience for them. After completing the course changes were concluded on attitudes of pre-service and in-service teachers. Pre-service teachers were influenced more positively as compared to in-service teachers.

Yildirim (2000) focused to study changes in the attitude of pre-service and in-service teachers after completing computer literacy course. The data for study was collected from 114 pre-service and in-service teachers in which 83 were females and 31 were males. The analysis of data indicated changes in attitude of pre-service and in-service teachers towards computer after participation of computer literacy course.

Gurbuz et. al. (2000) studied effect of two computer courses and other demographic factors on the computer attitude of student-teachers. One of the courses was offered online whereas second course was offered by traditional strategy. The data was gathered from 209 student-teachers with 147 females and 62 males. Out of the total sample, 69 student-teachers attended online computer course and 140 attended traditional computer course. The researchers observed combined effect of type of computer course, gender, previous computer attitude, computer availability at home on post attitude of student-teachers towards computers.

Asan (2000) analyzed the effect of gender and length of the computer course on computer attitude of the Turkish pre-service teachers. The result of the study advocated that gender do not affect computer attitude but length of the computer usage had major influence on computer attitude.

Aksar & Umay (2001) tried to study attitude towards computer of pre-service teachers. Responses were taken from sample of 155 pre-service elementary mathematics’ teachers. The main finding of the study revealed positive attitude among
elementary mathematics teachers towards use of computer. Moreover, the teachers were of the view that CAI is more advantageous than conventional methods.

Ridzuan et. al. (2001) adopted survey design method to determine the level of computer use and computer attitude among 224 teacher educators. The questionnaire used for study was divided into three parts. The first part consisted of demographic information of respondents, second part was containing items based on computer Attitude Scale (CAS) developed by Gressard and Lyod (1987) and spreading upon three dimensions: interest, confidence and anxiety towards computer, while the third part measured level of computer usage in teacher-training college for teaching and administration purpose.

The level of computer use was based on four choices: 1=seldom, 2=occasionally, 3=often and 4= very often provided in questionnaire. The scores ranging between 1.00-2.00, 2.01-3.00 and 3.01-4.00 were considered as low, moderate and high computer usage. 63.4 percent of teacher educators used computer moderately, 18.8 percent were low computer usage while 17.9 percent fell in high computer usage category. Further analysis indicated that teacher educators used computer to prepare exercises and examination (M=3.18), implementing course work (M=2.77) but computer was not used in teaching-learning activities (2.06) and computer aided learning (M=2.04).

On the interest dimension of computer attitude scale, 59.4 percent teacher educators showed moderate interest towards computer, 39.7 percent showed high interest but very few i.e. 0.9 percent showed low interest. 50.9 percent of teacher educators showed moderate confidence whereas 49.1 percent showed high confidence in using computer. Almost 96.4 percent showed moderate anxiety towards computer usage, 3.1 percent showed low anxiety and 0.4 percent showed high anxiety towards computer usage.

Torkzadeh & Van Dyke (2002) studied influence of training on computer users’ attitude on a sample of 189 participants. The responses on the survey scale were collected at the beginning as well as at completion of computer course. The study indicated that all the respondents belonging to both groups i.e. high and low computer attitude were equally benefited with the computer course.
Hong & Koh (2002) focused to study computer attitude of secondary teachers in terms of some demographic variables like computer ownership and computer experience. The sample constituted of 200 rural secondary school Malaysian teachers. The findings of the study disclosed positive computer attitude. The teachers those who had their own computers shown higher computer attitude as compared to those teachers who had not their own computers. Similarly who had more computer experience had higher computer attitude than those who had less computer experience.

Tsitouridou & Vryzas (2003) focused to study early childhood teachers’ attitude towards computer and information technology in terms of access, computer use, and experience. Sample constituted of 107 female early childhood teachers. The findings of the study suggested positive but temperate attitude towards computer. They had limited access but they used computer at home. Computer experience and in-service training significantly influenced their attitude towards computer.

Kumar & Kumar (2003) studied the effectiveness of web-based project on improving computer attitude and technology skills of pre-service and in-service teachers. Pre and posttest were used to evaluate effectiveness of web-based project. Sample consisted of 31 pre-service and in-service teachers. The findings of the study indicated significant improvement in the attitude of sample towards computer and in technology skills after completing web-based course.

Rajasekar (2003) focused to study the computer attitude of B.Ed. women students in relation to their gender, locality and educational category. Study revealed the fact that 76.54 percent B.Ed. students had favorable attitude towards computer. 83.56 percent of women teachers had favorable attitude towards computer whereas 70.78 percent men students had shown favorable attitude towards computer. In case of locality, 79.59 percent of urban women along with 77.08 percent rural women had shown favorable attitude towards computer. Thus, urban women students exhibit more favorable attitude towards computer as compared to rural women students. The 78.64 percent of graduate women students had more favorable attitude towards computer as compared to post graduate women students with 76.74 percentages.

Sa’ari et. al. (2005) determined attitude and perceived competency of teachers towards information technology. The results proposed positive attitude of teachers towards information technology. The findings also suggested moderate level of competencies towards information technology.
Ocak (2005) focused to study the effect of gender, age and racial and ethnicity on the attitude of mathematics’ teachers towards computer use. A rating scale with 10 items Likert type, Confidence with Computers in Mathematics’ Teachers (CCMT) was developed. Two experts in mathematics’ education reviewed the instrument and established content and construct validity. The calculated internal consistency reliability of the tool was $r=0.80$. Three Way ANOVA was used to get meaningful results from data. The findings revealed significant difference between effects of gender, age, race and ethnicity on attitude towards computer use among mathematics’ teachers. The study also revealed that low age teachers are more confident in favour of using computer as compared to high age teachers.

Yushau (2006) conducted a study to explore attitude of mathematics professors towards computer in relation to age, computer experience and perceived pedagogical usefulness. The statistical analysis of data indicated no positive attitude towards computers among mathematics professors. Further, age, computer experience and perceived pedagogical usefulness did not influence computer attitude of respondents.

Samak & Tawfik (2006) surveyed various factors that influence Jordanians teachers’ attitude towards information and communication technology. A sample of 363 teachers of English language was selected randomly. The finding of study suggested positive attitude towards information and communication technology. Moreover it was found that age and teaching experience were negatively correlated with attitude towards ICT while qualification was positively correlated with attitude towards ICT. Attitude towards ICT was not significantly correlated with gender, teaching methods and grade level.

Albirini (2006) explored the attitudes of EFL teachers in Syria toward ICT. Further, the study investigated the relationship between computer attitudes and five independent variables: computer attributes, cultural perceptions, computer competence, computer access, and personal characteristics (including computer training background). The researcher adopted descriptive study method. By using the table of random number researcher selected 326 subjects to participate in study. Self-made questionnaire was distributed to 326 EFL teachers. The return rate of questionnaire was 98.16% (320). Only 314 questionnaires were analyzed to get meaningful results because 6 out of 320 were not complete. Multiple regressions were
used to find out the proportion of the variance in the attitude of teachers towards ICT. The main finding of the study explored that participants had positive attitude towards ICT in education. Majority of participants considered computer as a viable tool that has a great potential to bring about different improvements to their classrooms. The study concluded teachers’ low level of access to school computers as a main barrier to technology implementation in schools.

Wong & Hanafi (2007) completed a quantitative study to see the gender differences in attitude towards usage of Information Technology. 73 females and 29 males student teachers participated in the study. All the participants had given a questionnaire related to attitude towards IT before undergoing an IT course of 14 weeks duration which measured attitude towards IT on terms of three dimensions called usefulness, confidence and aversion. On comparing the pre-test and post-test mean scores, no significant differences were found between male and female students’ attitude towards IT. Exposure to IT did not play any role to gender gap. On the other hand paired sample t-test results indicated improvement in attitude towards IT usage in male and female student teachers. The significant improvement in aversion dimension indicated disliking towards IT gradually decreased after completing the course. On confidence dimension female participants shown more confidence after course as contrasting to the male teacher students.

Deniz (2007) studied computer attitude of ninety (90) prospective teachers ranging in age from 20-36 (M=22.26), differences between computer attitudes and computer experiences, computer competencies and influence of gender. The researcher developed own Computer Attitude Scale-Marmara (CAS-M) in 1994, it was five point Likert Type Scale containing 42 items towards the cognitive, affective, behavioral aspects of computer attitudes. CAS-M consists of three sub-scales (computer liking, computer anxiety and use of computers in education/instruction). A self-report questionnaire was also used to collect information about prospective class teachers’ computer experiences. The main findings of the study were summarized as: 62% of prospective class teachers have computer at home, 50% of the computer owners have computers less than three years and no significant differences were found between computer attitudes and computer ownership & years of prospective class teachers, No significant differences were found between computer attitudes and gender but differences were found between general computer attitudes and computer
liking attitudes of prospective class teachers based on their computer competencies in favor of more competent ones.

Shaunessy (2007) studied attitude of gifted students towards Information technology. Total 418 teachers of intellectually gifted students participated in the study and responded to technology attitude survey. The findings of the study indicated positive attitude towards information technology. In addition, the findings revealed that information technology training, age, number of classroom computers are major predictors of attitude towards information technology.

Ogunkola (2008) administered Computer Attitude, Ownership and Use Scale (CAOUS) and Computer Literacy Self Assessment Scale (CLSAS) among 120 Nigerian science teachers to examine the effect of computer attitude, ownership and frequency of computer use on computer literacy. The analysis of data indicated positive attitude towards computer. Approximately half of the teachers had their own personal computers but not all the teachers were frequent computer users. Computer attitude, ownership and frequency of computer use together forecasted computer literacy.

Teo et. al. (2008) studied pre-service teachers’ self-reported future intentions to use computers in Singapore and Malaysia on the basis of Technology Acceptance Model (TAM). The data was collected from 250 participants (175 females and 75 males) and 245 (183 females and 62 males) pre-service teachers in Singapore and Malaysia respectively and all of them owned a computer at home. Structural Equation Modeling (SEM) was implemented on the data gathered. This study contributes to the growing multi-cultural studies on TAM by demonstrating that perceived usefulness (PU), perceived ease of use (PEU) and computer attitudes (CA) have significant determinants of both Singaporean and Malaysian pre-service teachers’ behavioral intention (BI). Differences were, however, detected between Singaporean and Malaysian pre-service teachers in terms of PU, PEU and CA but no differences were detected in BI with regard to technology acceptance.

Teo (2008) tried to find out answers of the objectives: (a) what is the overall profile of pre-service teachers’ attitudes towards computer use? (b) Do computer attitudes differ by age, gender, subject domain, years of computer use, and perceived confidence? Total 139 pre-service teachers participated in the study of these, 102 were enrolled in the one year postgraduate diploma in education (primary) and 37
were enrolled in one year postgraduate diploma in education (primary). Computer Attitude Scale (CAS), developed by Selwyn (1997) was used as the research instrument. It contained 21-items that consisted of four components; Affect, Perceived Usefulness, Perceived Control, Behavioural Intention. It was a five-point Likert scale having options of strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The scores from the items on each component were aggregated to provide individual scores on each component. The scoring procedure for negative items was reverse. The instrument also included questions regarding demographic background, computer experience and perceived confidence. Computer experience in this study was measured by asking the questions like “On an average, how many years have you used the computer?” Also perceived confidence was measured by asking the participants, “How confident are you in using the computer?” with responses on a five-point scale. The results of the study were analyzed on four components of computer attitude scale. It was observed that mean scores for the affective and behavioural intention subscales are the same (mean =4.00) whereas participants scored the lowest on the perceived control (mean = 3.54) followed by the perceived usefulness subscale (mean = 3.98). The result suggested that participants were more positive about their affect towards computers and intention to use computer than their perceptions of the usefulness of the computer and their control of the computer. The overall attitude of participants towards computer was positive. The study did not find gender or age differences among pre-service teachers, years of computer use and level of computer confidence are positively correlated with positive computer attitudes. Participants of subject domains like Humanities, Sciences, Languages, and General (Primary) differed in their perceptions of how much they like computers (affective), how much control they have over computers (perceived control), and their behavioural intentions (behavioural) in using computers. Significant differences were observed in attitudes between pre-service teachers in the General (Primary) course and those who were training to teach specific subjects (e.g. science, humanities).

Cavas et. al. (2009) studied attitude towards ICT in education among 1071 Turkish science teachers and investigated outcomes of age, computer experience, ownership at home and gender on attitude towards ICT. The results of descriptive statistics indicated positive attitude towards ICT. Significant differences were found
on the attitude towards ICT in relation to age, computer experience, computer ownership at home but no significant relationship was found between gender and attitude towards ICT.

Pamuk & Perkers (2009) examined computer attitude of Turkish pre-service teachers. 40 items Likert type computer attitude scale developed by Loyd & Gressard (1984a, 1984b) was adapted according to Turkish language. The computer attitude scale was subdivided into four subscales: computer anxiety, liking of computers, confidence in ability to use or learn about computers and usefulness of computers in life. The scores ranged from minimum 40 to maximum 160. All the participants got high score on CAS, but close look of liking level indicated that males liked computers more than female participants, however they did not differ on the other subscales i.e. computer anxiety, confidence in ability to use or learn about computers and usefulness of computers in life. Computer experience and computer ownership were significant factors for favorable computer attitude of pre-service teachers.

Brisci et al. (2009) focused to study attitude towards computers and Internet use among 191 Turkish prospective elementary teachers. The data were collected by survey instrument. It was divided into three parts. The first part contained some demographic questions like gender, grade level, graduated high school type and monthly family income which were developed by researchers. The second part was containing Computer Attitude Scale-Mamara (CAS-M) test which was developed by Deniz. The last part contained Internet Use Attitude Scale (IUAS) which was developed by Tavsancil and Kerer. The findings of the study indicated high level attitude of prospective teachers’ towards computer and internet use. The study also indicated no significant relation between gender and computer usage but a significant relationship was found between gender and internet use. Grade level, type of graduation high school and monthly family income also effect computer attitude.

Ogunkola & Olatoye (2009) concluded significant relationship between computer attitude and literacy of science teachers in Nigeria. The sample of two hundred and forty science teachers was drawn by stratified random sampling technique. The sample contained one hundred and eight male teachers and one hundred and thirty-two female teachers. Out of the total of 240 teachers, 80 were physics teachers, 80 were chemistry teachers and the remaining 80 were biology teachers. Computer Attitude Scale was used to collect desired data. The instrument
had two sections. The first section consisted of information regarding personal data of
the respondents such as sex, subjects to be taught etc. The second section consisted of
information of computer attitude of science teachers. This section had four sub-
dimensions: (a) computer anxiety (b) computer confidence (c) computer liking (d)
computer usefulness. Simple frequencies, percentages and standard deviation were
used as descriptive statistics while Pearson Product Moment Correlation was used as
inferential statistics. At the end of study it was concluded that as the computer attitude
increased, the computer literacy also increased.

Dogan (2010) conducted a survey to explore attitude of primary mathematics
trainee teachers towards computer and technology. The sample constituted 361
students of primary mathematics teacher training department in two universities. The
study concluded that trainee teachers had positive attitude towards computer use in
mathematics. In general respondents expressed positive feeling about computer and
information technology.

Varol (2010) aimed to study attitude of teacher candidates towards use of
computers with respect to gender, subject area and year of experience with computer.
170 pre-service teachers were asked to complete questionnaire. The findings of the
study indicated absence of gender differences but confidence level of respondents and
years of experience with computer found to be correlated with computer attitude of
teacher candidates. In addition, significant differences were concluded with respect to
subject areas.

Paliwal & Paliwal (2010) concluded in their study that 78 percent of the
teachers had favorable attitude towards computer, 17 percent had neutral attitude and
only 5 percent had unfavorable attitude towards computer in Nainital, there existed
significant differences between attitude of pre-service teachers and in-service
teachers, there existed significant difference between attitude towards computer
among male pre-service teachers and male in-service teachers but no significant
difference existed between attitude towards computer among female pre-service
teachers and female in-service teachers.

Kutluca & Ekici (2010) conducted a study to examine attitude of teacher
candidates towards computer-assisted education. The survey was conducted among
135 teacher candidates. The result of the study suggested that teacher candidates had
positive attitude towards computer-assisted education. Moreover, significant differences were observed between teacher candidates’ attitude towards computer-assisted education and sex as well as frequency of computer use but no significant differences were found between computer-assisted education and computer ownership & computer usage age.

Ekizoglu et. al. (2010) aimed to study attitude on computer technology among 141 teacher candidates. The teacher candidates’ are distributed according to their departments, Pre-school teaching Departments-43, English Language Teaching Departments-30, Turkish Language Teaching Department-34, and Guidance and Psychological Counseling Department-34. In addition Personal Information Form was used by researcher. The findings of the research signified that according to departments there was no significant difference of attitude towards computer technology. The mean scores of teacher candidates are very close to each other and the study concluded positive and high attitude towards computer technology among teacher candidates.

Birgin et. al. (2010) studied computer attitude of 112 Turkish pre-service teachers by using a Computer Attitude Scale. The collected data were analyzed by using SPSS. From results of the study it was found that gender did not affect computer attitude. The 19 percent females are more likely to own a computer than male counterpart but males are found to be more experienced in working with computers. The female pre-service teachers had a computer experience less than three years whereas males had computer experience more than five years. On seeing the frequency of computer use, it was found that 32.1 percent pre-service teachers use a computer more than 6 hours in a week and 39.3 percent use a computer less than 3 hours in a week. In addition it was concluded that pre-service teachers have competency in e-mail software use (M= 3.19), multimedia software use (M= 3.13), word processing (M=2.72), presentation software use (M=2.24), and spreadsheet software use (M=3.13), but had less competency on Web Management Software (M=1.33) and Database Management Tools (M=1.46).

Al-Zaidiyeen et. al. (2010) focused to investigate the level of ICT use for educational purposes among Jordanian teachers. Questionnaire was used as an instrument to collect data. Questionnaires were distributed to 650 teachers, among
460 teachers responded to the questionnaire. The questionnaire included items concerning the level of ICT use as well as items related to the attitudes of teachers towards the use of ICT. The main finding of the research was that teachers had a low level of ICT use for educational purpose, teachers held positive attitudes towards the use of ICT, and a significant positive correlation between teachers’ level of ICT use and their attitudes towards ICT was found.

Alaba (2010) tried to study the effect of three independent variables; computer anxiety, self-concept and gender in predicting the attitude of teachers towards interactive computer technologies. The sample constituted of 454 Nigerian teachers. The finding of the study revealed that the combination of computer anxiety, self-concept and gender contributes towards the prediction of attitude of teachers towards interactive technologies. In addition, gender did not play significant contribution in prediction of teachers’ attitude towards interactive technologies.

Yuksel & Kavanoz (2011) selected 200 pre-service teachers of mean age 24.2 years to examine their attitude towards computers. The sample was homogeneous in terms of speaking language (non-native English speakers) and educational experience (at least of three years’ experience). According to findings of the study, it was concluded that overall attitude of pre-service teachers was positive. Out of 200 respondents, 66.5 percent had highly positive attitude and 30.5 percent had slightly positive attitude towards technology. In addition, significant differences were concluded by researcher w.r.t. gender. It was observed that female respondents had negative attitude towards technology.

Arishi (2011) surveyed the attitude of English faculty towards CALL (Computer-Assisted Language Learning) in relation to age, qualifications, teaching experience, general training in using computers, training on CALL, and use of language laboratory in teaching of English. 75 English teachers participated in the survey. Data were collected by questionnaire as well as lab observations were done by the researcher. Researcher concluded quite interesting finding that the respondents had neither positive nor negative attitudes towards CALL. Further, no definite relation was concluded between their attitude and age, qualifications, teaching experience, general training in using computers, training on CALL, and use of language laboratory in teaching of English.
Rahman (2011) studied attitude of teacher educators’ towards computer technology in Bangladesh. Computer Attitude Scale developed by Loyd & Gressard (1984) was administered on 75 teacher educators’ but only 46 respondents respond to it. The findings of the study pointed out that teacher educators’ possessed high attitude towards computer. In addition, no significant differences were found between attitude of male and female teacher educators towards computer technology.

Kutluca (2011) administered Computer Usage Information Form and Computer Attitude Scale on 126 prospective pre-school teachers to investigate the status of computer usage and attitude towards computers. The collected data were analyzed through mean, standard deviation, t-test and one way ANOVA. The study concluded that 99.2% prospective preschool teachers were computer users, 52.4% prospective pre-school teachers had their own computers at home whereas 67.5% prospective pre-school teachers were internet cafe users. All the prospective preschool teachers have high level of attitude toward computers. The study further revealed that those who frequently used computer and have computer experience shown more positive attitude towards computer. They had positive attitude towards taking computer course and computer ownership. Gender difference was absent in the study.

Bakr (2011) focused to examine 118 Egyptian teachers’ attitude towards computer in term of gender and years of teaching experiences. The data was gathered by questionnaire that consisted of two parts. The first part provided information about the participants’ demographic background, gender, teaching experience and the subject they taught. The second part was the attitude scale towards computer instrument (AICT) developed by Shaft et al., (2004). At the end of study it is concluded that teachers shown positive attitude towards computer and there was no significant difference in terms of gender and teaching experience.

Şahin-Kizil (2011) aimed to study relationship between computer attitude and extension of ICT usage among teachers. The data was collected by survey method by administering a questionnaire on 76 EFL teachers. In order to get meaningful findings from gathered data descriptive statistics and Pearson Correlation method was used. The result indicated that the most widely used ICT tools were gradebook, internet, software for repetitive practices, processing texts, interactive exercises and power point presentations. It was also found that EFL teachers held positive attitude towards
the use of ICT for educational purpose. Their inclination towards computer use was more as compare to traditional method of instruction.

Yusuf & Balogun (2011) focused to study competence and attitude of student teachers’ towards information and communication technology in Nigeria. Total 382 student teachers’ participated in the study with 181 male student teachers and 201 female student teachers. The findings of the study concluded that most of the student teachers had competent in using basic ICT tools and they possessed positive attitude towards ICT use. Further, the author concluded no significant difference towards ICT use between male student teachers and female student teachers.

Erkil (2011) investigated computer attitude of 394 pre-service teachers enrolled in first year and fourth year teacher education programs in Turkey. Data was collected by administering a 45 items questionnaire having two parts. The first part contained information about participants and second part contained items regarding computer attitude. The findings of the study implied that pre-service teachers held above average positive attitude towards computer. Gender, year of study and years of computer ownership did not predict their attitude towards computers.

Ozturk et. al. (2011) inspected 226 prospective science teachers’ attitudes towards computers in terms of gender, general academic achievement and grade level. “Attitude Scale towards Computers” developed by Ekici and Bahceci (2006) and “Demographic Information Form” were used as data collection instruments. It was a Likert-type scale, items in the scale were as I definitely agree, I agree, I neither agree nor disagree, I disagree, I definitely disagree. Descriptive statistics i.e. independent t-test, one-way ANOVA and Pearson correlation coefficient were used to analyze collected data. After analysis of the data it was observed that teachers’ attitudes towards computers were determined as in medium level. Gender differences were observed. Male prospective teachers had more positive attitude as compared to female prospective teachers and teachers’ points of attitudes towards computers didn’t differ significantly according to general academic achievement. Also it was found that prospective teachers’ computer-related attitude points showed a significant difference according to grade level which considered as a sign that computer courses were provided to prospective teachers at school and their use of computers in their presentations have a positive effect.
Yilmaz & Alici (2011) focused to study pre-service early childhood teachers’ attitude towards using computer based education while implementing science activities in relation to gender, year in program, experience in pre-school, computer ownership and frequency of computer usage. In general, it was found that participant had positive attitude towards computer based education. It was also reported that but gender, owning computer, frequency of computer usage did not influence pre-service teachers’ attitude but years in programme and experience in pre-school influenced attitude of pre-service teachers towards computer based education.

Murithi & Indoshi (2011) focused to study attitude of teachers and students towards computer use in teaching of computer studies, curriculum objectives, content, methodology and evaluation. The sample constituted of 20 teachers and 198 students who were selected by simple random technique. The data was collected with the help of attitude questionnaire and analyzed by using both descriptive as well as inferential statistics. The 80 percent teachers exhibited positive attitude towards objectives of computer studies curriculum, 15 percent exhibited neutral attitude and only 5 percent teachers reported negative attitude. 50 percent of teachers shown positive perception that content of computer studies curriculum was appropriate by teaching through computer where as 45 percent reported that the methodology used in teaching of computer studies curriculum was appropriate. 40 percent of the teachers reported that the evaluation methods adopted in teaching of computer studies curriculum was appropriate while teaching-learning through computer.

Sancheb et. al. (2012) examined the attitude of in-service teachers towards ICT use in classroom. 170 teachers ranging from kindergarten to high school were selected as sample of study. The main result of the study suggested positive attitude of teachers towards ICT but fear was observed in using ICT in classroom among teachers.

Mahat et. al. (2012) tried to understand teachers’ attitude about ICT teaching and its relation with teaching time. Respondents were teachers of computer science department between age group of 30 to 40 years. The researchers concluded significant relationship between attitude of teachers towards ICT teaching and teaching time.

Akarsu & Akbiyik (2012) analyzed that teacher candidates have moderate level of computer attitude and computer self-efficacy. The findings revealed that there
were high correlation between perceived computer literacy skills, attitude towards computers and computer self-efficacy level.

Larbi-Apau & Moseley (2012) selected 167 participants from various teaching subjects of higher education to explore the validity of Selwyn’s computer attitude scale. The scale was five-point Likert type scale with four constructs i.e. affective, perceived behaviour control, behaviour and perceived usefulness. The findings of the study suggested high positive computer attitude among teaching faculty, affective attitude was highest predictor of computer attitude, followed by perceived usefulness, behaviour and perceived behaviour control.

Capan (2012) collected data from 70 Turkish EFL teachers to investigate their attitude towards use of ICT and its relation with computer attributes, cultural perception, computer competence and computer access. The analysis of data was done by SPSS version 18 which revealed that despite perceived complexity of computer use in classroom, it was considered as a highly advantageous. In addition, study advocated that computer attributes, cultural perception, computer competence and computer access at home as well as at school are significant aspects that affected their computer attitude.

Ahmad (2012) studied attitude of teacher-trainees towards tech-driven open and distance learning. A sample of 72 teacher-trainees enrolled in a distance programme of secondary teacher education at Maulana Azad National Urdu University, Hyderabad were selected by using random sampling technique. The finding of the study revealed that 38.89 percent of teacher trainees had high level of attitude towards tech-driven open and distance learning, 43.06 percent had moderate level of attitude while remaining 18.05 percent teacher trainees had low level of attitude towards tech-driven open and distance learning. Also, no significant differences were found between attitude of male and female teacher trainees towards tech-driven open and distance learning.

Goktas (2012) attempted to find out attitude towards ICT among physical education sports students and pre-service teachers. The researcher also focused to examine association of attitude with age, gender, department, computer familiarity, frequency of computer use and computer ownership. The sample for the study constituted of 337 respondents. It was found that respondents had positive attitude
towards information and communication technologies and their attitude is strongly associated with age, gender, department, computer familiarity, frequency of computer use and computer ownership.

Rana (2012) aimed to study teacher educators’ attitude towards technology integration in classrooms. 21 teacher educators from a teacher education college of north India were selected by cluster sampling technique to participate in study. Teacher Educator Attitude towards Information and Communication Technology Scale developed by Sharma (2010) was used as tool to collect data. Cronbach’s reliability coefficient (0.86) of items was calculated to test reliability of tool. The scale comprised of 40 items under five subscales namely curiosity to use technology, comparative use of technology, innovativeness and role in improvement. The resulting data were analyzed by using percentage and analysis of variance. The researcher founded that they had positive attitude towards ICT could be attributed to the availability and accessibility to computers and ICT equipments provided to them at their colleges. The finding of the study also revealed that younger age group scored more than middle age group but there was no significant difference with respect to the potential in the use of technology. But gender was not a significant factor in the attitude towards technology in teacher training.

Achor & Shaibu (2013) selected a sample of 427 social studies teachers to study their attitude towards computer usage in terms of qualification and gender. Survey research design was adopted by authors to conduct research. The findings of the study revealed that social science teachers with higher qualification possessed negative attitude towards computer use as compared to lower qualification teachers but no significant differences were concluded between attitude of male and female social science teachers towards computer use.

Saricoban (2013) focused to study attitudes of pre-service teachers’ towards computer use on various dimensions like affective component, perceived usefulness component, perceived control component and behavavioral intention component. The findings of the study indicated high attitude of participants towards computer and no gender differences were found in the study. In addition, it was found that affective component had positive correlation with behavioral intention but negatively correlated with perceived usefulness and perceived usefulness was negatively correlated to behavioral intention.
Syeda & Saadi (2013) studied attitude towards the use of ICT among prospective teachers in Pakistan. The respondents for the study were 250 M.Ed. level prospective teachers of five universities. The findings of the study revealed high positive attitude towards ICT but female prospective teachers were found more anxious on computer anxiety dimension of the scale as compared to male prospective teachers. Moreover, male prospective teachers were found more confident in using computer than female prospective teachers.

Akarsu & Akbiyik (2013) conducted a quantitative case study to explore the relationship among perceived computer literacy skills, computer attitude and computer self-efficacy of teacher candidates. According to findings of the study the respondents had perceived themselves as moderate computer literate, moderate level of computer attitude as well as computer self-efficacy and a high correlation was found between perceived computer literacy skills, computer attitude and computer self-efficacy levels. Those respondents shown higher correlation who learned computer with the help of others.

Suganthi (2013) verified the hypotheses, “There is no significant difference between male and female B.Ed. Students in their attitude towards Information and Communication Technology” by adopting stratified sampling technique. Researcher selected six colleges randomly and further 140 B.Ed. students were chosen randomly from these colleges. The data was analyzed on seven dimensions: enthusiasm, anxiety, acceptance, e-mail for classroom learning, negative impact on society, productivity and attitude towards ICT. The result of the study inferred that female B.Ed. students had better attitude on dimensions acceptance, e-mail for classroom learning, and negative impact on society and productivity. It was concluded that 70.7 percent of B.Ed. students had moderate level; only 10.7 percent of B.Ed. students had high level whereas 18.6 percent of B.Ed. students had low level of enthusiasm in using ICT. On anxiety in using ICT dimension, 66.4 percent of B.Ed. students had moderate level, 17.1 percent of B.Ed. students had high level and 16.4 percent of B.Ed. students had low level. On seeing acceptance in using ICT dimension, 66.4 percent of B.Ed. students had moderate level, 17.1 percent of B.Ed. students had high level and 16.4 percent of B.Ed. students had low level. 69.3 percent of B.Ed. students had high level, 15.7 percent of B.Ed. students had high level and 15.0 percent of B.Ed. students had low level on e-mail for classroom learning dimension. As far as
negative impact on society is concerned, 64.3 percent of B.Ed. students had exhibit moderate level, 18.6 percent of B.Ed. students had exhibited low level and only few 17.1 percent of B.Ed. students had exhibited high level. Highest 70.0 percent of B.Ed. students had moderate level, 17.9 percent of B.Ed. students had high level and 12.1 percent of B.Ed. students had low level on productivity dimension of scale. Maximum 68.6 percent of B.Ed. students had moderate level, 17.1 percent of B.Ed. students had low level and 14.3 percent of B.Ed. students had high level of attitude towards using ICT dimension.

Suri & Sharma (2013) aimed to study the impact of gender on attitude towards computer technology and e-learning. 477 students enrolled in various courses in Panjab University Chandigarh were selected to conduct the study. The finding of the study revealed no significant relationship between gender and attitude towards computer and e-learning.

Kiran Kumar & Patil (2013) formulated objectives: 1) to study the male and female teachers’ attitude towards using new technology at secondary school level, 2) to study the private and government secondary school teachers’ attitude towards using new technology in the classroom. The 60 secondary school teachers (30 Government and 30 Private) have participated in study. Attitude towards Using New Technology Scale developed by Rajasekar was administered on sample. Test of significance was used by researcher to compare the difference between teachers in relation to gender and type of institution. Gender differences were observed in the findings. The mean score of female teachers was 51.76 as their male counterparts with mean score 39.98. The female teachers’ attitude towards using new technology was better as compared to male teachers. Further it was observed that the attitude of private school teachers were better as compared to government school teachers attitude towards using new technology.

Agarwal & Ahuja (2013) studied the attitude of students-teachers towards use of ICT. Purposive sampling was adopted to choose the college. Further random sampling was implemented by researcher to draw a sample of 100 student-teachers, 50 student-teachers belonged to science stream and 50 student-teachers belonged to arts stream. Computer Attitude Scale developed by Khatoon & Sharma (2000) was administered by researcher on participants. The reliability of the scale was calculated by split half method (0.86). Also reliability was determined by Kuder-Richardson
formula whose value came out to be 0.93. The obtained scores are analyzed by mean, standard deviation and t-test by using micro soft excel 2007. The mean scores of science stream student-teachers were 83.18 and arts steam student-teachers were 81.72 which fall between the ranges of 66-99 (positive attitude). In addition, it was concluded that no significant impact of attitude towards the use of ICT was found on academic achievement of science stream student-teachers.

D’souza (2013) employed incidental sampling technique to measure the teachers’ attitudes towards computer use. The Computer Attitude Scale (CAS) developed by Selwyn (1997) was administered on 4 groups of teachers, belonging to 4 different levels of instruction i.e. Primary Level, Secondary Level, High Schools Level and College Level. The scale contained 21-item spread over four components of computer attitudes i.e. Affect, Perceived Usefulness, Perceived Control, and Behavioural Intention. Participants responded to the CAS using a five-point scale of strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The scores from the items were combined to get individual scores on each participants. The reverse scoring was followed for negative items. The findings indicated that there were significant differences in primary and secondary school teachers’ attitude towards using computers in teaching. Primary school teachers possess higher positive attitude towards using computers in the teaching-learning process but no significant difference was found between secondary school teachers and college teachers.

Gujjar et. al. (2013) selected 200 student teachers randomly to find out the attitude towards use of computer. A questionnaire with forty items spread over five dimensions i.e. fear of using computer, problem solving by computer, computer knowledge, using computer and learning computer was constructed. The collected data was analyzed by independent sample t-test and ANOVA. The result specified absence of gender differences on all dimensions of the scale. Those student teachers who had computer at home were significantly having good computer attitude than those who had no computer at home. As far as mothers’ qualification is concerned, significant difference was observed on computer knowledge but no significant difference was found out on any dimension of scale concerning about fathers’ qualification.

Bhalla (2013) conducted a survey among 300 central school teachers to explore their attitude towards computer. The researcher concluded that overall attitude
of teachers was positive. 93 percent respondents reported that they were benefited in organizing work, made teaching effective, save time and efforts, enhance students’ productivity, facilitated use of various teaching strategies to maximize learning by using computer.

Mollaei & Riasati (2013) conducted a research to study attitude towards the use of technology on 40 (20 male and 20 female) undergraduate and graduate EFL teachers of Iran whose teaching experience ranged between 4 to 10 years. Mixed methodology i.e. quantitative and qualitative techniques were used to gather the data. A questionnaire of five point Likert Scale was used as an instrument having 30 items regarding teachers’ perception about technology use whereas interview was used as qualitative technique. Cronbach alpha was used to establish the reliability of questionnaire which was 0.81. The findings of the study had shown that teachers had positive attitude towards the use of technology, particularly towards computer in their classroom whereas gender difference was absent in study.

Celik et al. (2013) conducted the research in order to test the effective levels among the latent variables of attitude to technology, perceived computer self-efficacy, computer anxiety and the attitude towards doing computer supported education. The required data for research was collected by using Technology Attitude Scale, Perceived Computer Self-efficacy Scale, Computer Anxiety Scale and Attitude Scale. The sample consisted of 471 pre-service teachers. The most significant finding of this study was that attitude to technology, perceived computer self-efficacy and computer anxiety are important predictors of teacher candidates’ attitude towards using supported education.

Gehlawat (2014) explored the computer attitude of 120 student teachers undergoing training in government-aided college of Rohtak with respect to gender and stream. Descriptive survey method was employed to collect data. A personal data sheet prepared by the investigator and Computer Attitude Scale developed by Khatoon & Sharma (2012) was used for data collection. The Computer Attitude Scale had five dimensions namely computer anxiety, computer confidence, computer interest, computer as a useful tool and computer as a career. The data were analyzed by using mean, standard deviation, and t-test. Analysis of data shown that no significant difference was found in computer attitude of male student teachers and female student teachers; female teachers possessed higher computer anxiety than male student teachers.
Tatalovic et. al. (2014) interested to study attitude of students of pre-school teaching towards use of computer within pre-school children. The study was conducted in Rijeka with a sample of 77 education students. The data was collected with the help of questionnaire. The findings of the study revealed that future pre-service teachers had not clear and vital attitude towards computer use.

Zupanec et. al. (2014) tried to investigate attitude of primary school teachers towards computer assisted learning. 54 primary biology school teachers involved themselves in the study. The findings recommended positive attitude of teachers towards computer assisted learning in biology. Moreover, findings suggested significant correlation between age, teaching experience, competencies to use modern teaching aid, training in computer and attitude towards computer assisted learning.

Navaneethakrishnan (2014) formulated the objectives, to find out whether there is any significant difference in attitude towards computer among D.T.Ed students with respect to gender, to find out whether there is any significant difference in attitude towards computer among D.T.Ed students with respect to location of school. The researcher selected 400 D.T.Ed students studying at Teacher Training Institute by using simple random sampling technique. The findings of the study revealed that gender differences were absent among D.T.Ed students’ attitude towards computer. In addition it was inferred that rural and urban background D.T.Ed students do not differ significantly in their attitude towards computer.

Cakir (2014) aimed to study attitude of preschool teachers and principals towards computer use. Sample constituted of 460 pre-school teachers and 308 principals. The findings of investigation pointed out higher attitude of entire sample towards computer at the levels of interest and use and lower level of anxiety. As far as gender, marital status, age and educational status was concerned, significant differences were concluded by researcher. Gender, age and educational status were founded as significant factors responsible for computer use.

Varol (2014) reported that prospective physical education teachers hold higher level of computer attitude. Study group consisted sample of 337 prospective teachers. Researcher come to an end with findings that no meaningful variation in attitude towards technology reported according to gender and level of using computer but significant variation was reported according to having computer and class.
Guven & Aydogdu (2014) administered a computer assisted teaching attitude scale of 25 items to verify attitude of 117 science teacher candidates towards computer assisted teaching. The researchers obtained interesting results that the participants’ attitude towards computer assisted teaching keep changing as the items change on the scale. Finally, it was concluded that participants had positive attitude towards computer assisted teaching in general.

Saxena & Bala (2014) studied attitude of research scholars towards computer use. The researchers formulated three objectives, to know the attitude of research scholars towards computer use, to study the attitude of male and female research scholars towards use of computer in society and to study the attitude of research scholars from rural and urban background towards use of computer in society. The study was conducted on 33 participants of National Workshop on Research Methodology in Social Science organized by Central University of Himachal Pradesh, Dharamshala. These participants were Research Scholars registered with various universities and situated in 8 states of India. In order to collect the data the attitude scale towards use of computer developed by Gary S. Nickel & John N. Pinto was used. The collected data were analyzed with the help of mean, SD and ‘t’ test. At the end of study, it was concluded that all the research scholars had favorable attitude towards computer use. Further the findings of the study revealed that both male and female research scholars had favorable attitude towards computer use, and the research scholars of both rural and urban background possessed favorable attitude towards computer use.

Pan (2014) studied computer attitude of teachers with respect to gender, strata, subject group and experience. The sample comprised of 200 teachers containing 100 male teachers and 100 female teachers. A five point rating attitude scale towards using new technology which is developed by Rajasekar was used to measure the attitude of teachers towards new technologies. The scale contained total 30 items out of which 13 were positive worded and 17 were negative worded. t-test was employed by researcher to analyze data. The findings of the study indicated that teachers had favorable attitude towards using new technologies during teaching-learning process. But attitude of teachers differed significantly with respect to gender, strata, subject group and experience. The male teachers had more favorable attitude than their
female counterparts, Teachers of urban background had better attitude towards using new technologies than rural teachers, Science teachers had better attitude towards using new technologies than humanities teachers and teachers having more than 10 years of teaching experience had lower attitude in using new technologies as compared to teachers having less than 10 years of teaching experience.

Kalemoglu Varol & Yaprak (2014) examined the relationship between attitude of prospective teachers towards education technologies and their self-efficacy beliefs. Relational research strategy was adopted by researcher to conduct the study. The study identified that attitude of prospective teachers towards education technologies had medium level effect on self-efficacy belief. Further, the study specified that attitudes towards educational technology and computer self-efficacy beliefs were in high level.

Shirvani (2014) found in her study that the range of mean score of pre-service teachers was found from 2.8 to 4.47, indicating positive attitude towards technology among pre-service teachers. Moreover, the older pre-service teachers significantly exhibited better attitude towards technology as compared to younger pre-service teachers. There were 62 participants who responded to an attitude technology survey having 29 questions about usefulness, competence and attitude towards technology. The five question i.e. (i) technology is useful in managing student data such as attendance and grades, (ii) technology is a good tool for collaboration with other teachers when building unit plans, (iii) I like searching the internet for teaching resources, (iv) computers can be good supplement to support teaching and learning and (v) If I have training, I would like to try out instructional computer technology innovations in my teaching, have scored highest mean which indicated that pre-service teachers considered technology as an important tool in classroom practices.

Ekman et. al. (2015) compared the attitude of teacher educators and educators of other subjects towards technology acceptance model. The researchers concluded that significant differences between attitude of teacher educators and educators of other subjects. Teacher educators’ attitude was found to be more positive towards how IT should be used for development of their pedagogy. Teacher educators had high potential for IT and they were more frequent user of Learning Management System as compared to other educators.
Alothman & Robertson (2015) employed qualitative research method to study gender differences and various factors contributing towards computer attitude of Saudi high school teachers. The authors found that females had negative attitude towards computer, they preferred less to participate in computer workshops and were less well versed in computer skills as compared to male teachers. Furthermore, it was concluded that computer experience and confidence were the significant factors contributing towards computer attitude.

Gupta (2015) selected 150 prospective teachers to investigate their attitude towards use of information and communication technology in relation to gender, locality and stream in teacher education. The data were collected with the help of Likert type scale which was developed by researcher himself. The analysis of data revealed no significant difference between the attitude of male and female prospective teachers towards the use of ICT in teacher education, no significant difference between attitude of science and arts prospective teachers towards the use of ICT in teacher education but significance difference between urban and rural attitude of prospective teachers towards the use of ICT in teacher education.

Sharma & Singh (2015) conducted a study to examine attitude of secondary school teacher towards information technology with respect to gender and locality. 50 secondary school teachers of district Rohtak of Haryana participated in the study. The findings of the study indicated no significant difference on the attitude towards information technology of secondary school teachers with respect to gender but significant difference on the attitude towards information technology of secondary school teachers was observed with respect to locality.

Williams (2015) explored attitude of K-12 teachers’ towards computer in term of age, gender, teaching field and ethnicity. 179 teachers participated in the study. The researcher concluded that age, gender, teaching field were not predictors of computer attitude. As far as ethnicity was concerned, no significant differences were found between ethnicity and teachers attitudes toward computers. The Elementary school teachers were found to have more positive attitudes as compared to high school teachers and middle school teachers. Further, majority of respondents i.e. 93.3% (167) had access to computers at home and 88.3% (158) of the teachers had one year or more experience with computers.
Raman (2015) adopted survey research design to check attitude of prospective teachers’ towards computer in classroom practices. The findings illustrated that prospective teachers were determined to use computers in classroom practices. However, gender differences were concluded in the study and computer experience was important factor responsible for computer use. Also, the various elements like perceived usefulness, perceived ease of use and affective elements were significant factors in recognition of computer in classroom.

Can (2015) accomplish a study in order to investigate attitude of pre-service physical education teachers’ towards computer technology and its relationship with other variables. Study group consisted of 5120 respondents from 49 universities of Turkey in academic year 2010-2011. Survey research design was implemented by researcher by using information form about demographic information followed by computer technologies attitude scale. After analysis of data, the findings disclosed positive attitude of respondents towards computer. Additionally, change in attitude was observed due to variables like duration of computer possession and level of computer use. However, no changes were concluded with respect to personal computer and frequency of computer use.

Zohreh et. al. (2015) studied the impact of attitude of teachers on ICT usage in Kharazmi University. The data was gathered from 100 teachers by using a Likert type self-made questionnaire. The main finding of the study revealed that teachers’ attitude to use ICT was low. Only 37.7 percent teachers believed that computer education had more effectiveness as compared to traditional ways.

Teo et. al. (2016) made an attempt to explore how perceived usefulness, perceived ease of use, subjective norms, facilitating conditions and technology complexity affect attitudes of mathematics pre-service teachers towards computer use in terms of gender, age and course of study. The desired data were collected from 419 respondents by administering self-made questionnaire. The data were analyzed with the help of structural equation modeling approach. The main findings of the study suggested that perceived usefulness, perceived ease of use and technological complexity significantly predict computer attitude whereas subjective norms and facilitating conditions did not affect computer attitude. Further the study indicates that gender, age and course of study did not affect attitude of prospective teachers’ attitude towards computer.
Hasan & Parvez (2016) examined computer attitude of science and social science discipline’s undergraduate students in Aligarh Muslim University. By adopting purposive sampling, 100 students were selected as sample for study. To collect data for research, a standardized computer attitude scale constructed by T. Khatoon & M. Sharma (2011) was used by researchers. The collected data were analyzed with the help of mean and standard deviation and t-test. The authors concluded no significant difference between science and social science discipline undergraduate students on computer attitude scale.

From the corpus of the above studies, it can be concluded that the attitude towards computer have been studied by a number of researchers, but very few researchers were conducted on prospective teachers but it was hard to find such studies conducted on teacher educators. Therefore, an attempt has been made to investigate the attitude of teacher educators and prospective teachers towards computer use.

2.4 REVIEW ON COMPUTER SELF-EFFICACY


Busch (1995) examined gender difference in computer self-efficacy of college students. 147 college students responded to questionnaire whose analysis indicated gender differences in computer self-efficacy in word processing and spreadsheet software but no gender differences were found with regard to simple computer tasks.

Zhang & Espinoza (1998) during the development and validation of 30 item computer self-efficacy scale concluded that computer experience, familiarity with computer software packages, computer ownership and computer training are major predictors of computer self-efficacy. On the other hand, when gender differences were explored in the study, it was found that males were more computers self-efficient as compare to females.

Decker (1998) conducted a study to examine influence of training on computer self-efficacy of university employees. A descriptive research design was adopted by author to collect data from a sample of 2597 university employees. The main finding of the study revealed that computer self-efficacy of employees remained stable for a period of two and half years. Author reported frequency of computer use and training responsibilities as factors responsible to enhance computer self-efficacy by transfer of training.

Cakiroglu et. al. (1999) investigated the effect of computer literacy course based on applications of computer use on the computer self-efficacy of the Turkish prospective teachers. In order to collect the data pre-test and post-test design was
adopted by researchers. The findings of the study revealed that computer self-efficacy of the prospective teachers had been influenced by computer literacy course.

Jones (2000) investigated computer efficacy of pre-service teachers in Australia. 46 graduates of elementary teacher education course constituted the sample of study. The data analysis showed high level beliefs among pre-service teachers to complete basic computer tasks. The study also found that the teachers who had not used computers themselves, did not motivate student-teachers to use computers in teaching-learning process.

Heieh (2001) selected 134 male teachers and 318 female teachers to explore their self-efficacy towards computer use. The author focused to study computer self-efficacy in terms of gender, age, degree, personal background, frequency of computer use, availability of computer and concluded that respondents’ computer self-efficacy was found low with respect to these variables. Their computer self-efficacy was reported to be significantly related to computer literacy.

Albion (2001) conducted a study entitled “Some Factors in the Development of Self-Efficacy Beliefs for Computer Use among Teacher Education Students” to study the factors responsible for improving self-efficacy for computer use. The author used pre and posttest technique to study the influence of time spent on computer use on computer self-efficacy. The findings of the study indicated that after completing a computer course significant variance was found in self-efficacy for computer use. In addition, computer ownership was also contributed to improve computer self-efficacy.

Chu (2001) selected a sample of 206 pre-service teachers to examine the influence of web pages design instruction on developing better computer self-efficacy. A pre and post design was adopted by the researcher which included a 14-week program on web page design for respondents. At the end of the program the scores of posttest indicated significant improvement in computer self-efficacy of pre-service teachers. Computer experience, computer use, internet use, use of word processing, e-mail, game, presentation software were found significantly related to computer self-efficacy. The pre-service teachers who had higher perception towards computer self-efficacy showed more confidence on web software.

Bauer (2003) aimed to study computer self-efficacy of pre-service music teachers and its relation with gender as well as with prior experience with computer.
Total 114 music pre service teachers participated in the study. After analysis of the data, it was concluded that the respondents had good computer self-efficacy; male had higher computer self-efficacy scores than their female counterparts and a positive significant correlation were found between computer self-efficacy and computer experience, hours per week of computer use and previous use of software packages.

Wall (2004) administered a computer self-efficacy scale of 30 items on 121 pre service teachers. The summarized data was analyzed by parametric and non-parametric tests. The main aim of the study was to find out computer self-efficacy between subgroups of pre service teachers at two universities i.e. Austin Peay State University and Tennessee State University. The main finding of the study indicated that majority of the prospective teachers had high to very high level of computer self-efficacy. It was found that ethnicity had significant difference on computer self-efficacy. The computer self-efficacy level of African and American pre-service teachers was higher as compared to Caucasian pre-service teachers.

Nanjappa & Lowther (2004) conducted a study to examine the influence of perceived computer self-efficacy of school teachers on technology integration beliefs. The study was conducted among 267 school teachers in Mumbai. The findings of the study indicated that they had average level of computer self-efficacy, they had strong beliefs regarding importance of technology integration in instruction but their own beliefs about readiness were weak. In addition, positive correlation was found between teacher technology beliefs and computer self-efficacy.

Wang et al. (2004) studied the influence of learning experiences and goal setting on self-efficacy of pre-service teachers towards integration of technology into classroom. 281 students enrolled in an educational technology course were divided into 18 lab sections (three experimental and one control). Pre survey and post survey were employed to explore their self-efficacy beliefs for integration of technology. Various experiences and goal setting have shown significant influence on respondents’ self-efficacy to integration of technology.

Bakar & Mohamed (2005) conducted a study entitled, “Computer self-efficacy of pre-service vocational teachers to examine level of computer self-efficacy of pre-service teachers. The authors concluded that computer self-efficacy of about one half of the sample fell in the moderate level in working with electronic spreadsheet and about one half of the respondents fell in high efficacy level in handling word processing.
57 percent of respondents had shown moderate efficacy in graphic work whereas 51 percent of the respondents had shown moderate efficacy in creating data base.

Jelena (2006) studied the computer self-efficacy beliefs of prospective teachers in terms of gender, age, ethnic origin, previous undergraduate degree, licensure area, software packages use, computer experience, training and ownership. The total participants in the study were 210 pre service teachers. It was found that students’ previous undergraduate degree, licensure area, experience and familiarity with software packages had significant difference on computer self-efficacy. Further study revealed that the pre service teachers with higher scores on Computer user Self-efficacy Scale were more willing to integrate computers into their lessons as compare to pre-service teachers with lower scores.

Magliaro & Ezeife (2007) studied computer self-efficacy of 210 pre-service teachers after completing first practice teaching placements by using quantitative as well as qualitative method. Quantitative study was conducted by using computer user self-efficacy scale and concluded significant influence of previous undergraduate degree, licensure area, experience and awareness with software packages. The qualitative data revealed that society and school had significant influence on their attitude towards computer use but family had highest negative influence on their attitude. Further, after completing two months of the course, those who had higher computer self-efficacy scores were ready to integrate computers in their lessons as compared to those who had lesser scores on computer user self-efficacy scale.

Wangpipatwong & Papasratorn (2007) studied computer self-efficacy, computer attitude and Internet self-efficacy as a factor to apply e-learning as a teaching strategy. A questionnaire was used at the starting and ends of the semester, after completing the semester. 425 respondents responded to it. The findings of the study indicated that increase in computer skill and information technology increased computer self-efficacy, computer attitude and Internet self-efficacy. Also, computer attitude played significant role in changing computer self-efficacy and internet self-efficacy.

Abbitt & Klett (2007) used survey method to study self-efficacy beliefs towards integrating technology into teaching, perceived comfort with computer technology and perceived usefulness of computer technology of pre-service teachers.
Pre and post strategy was adopted by researchers before and after completing course on integration of technology into teaching. The study found that perceived comfort with technology was a significant predictor of self-efficacy beliefs towards integration of technology whereas perceived usefulness was not significant predictor of self-efficacy beliefs towards integration of technology.

Saferoglu (2007) tried to examine perception of students studying in education department at university of Ankara regarding their self-efficacy in relation to computer use, field of study and computer programs they use. The sample of the study constituted 54 students. The findings suggested that 70 percent respondents were males where as 30 percent respondents were females, 76 percent participants had their own computer at home or dormitories but only 9 percent of them had access to computers at college. Only 33 percent respondents reported that they had internet facility at home. 43 percent of respondents used internet at laboratories and 48 percent respondents were using internet at internet cafes. 78 percent respondents were using computer every day for a couple of hour. 57 percent of respondents reported that they had been using computers for five years or more, 30 percent of them had been using for 4-5 years, 13 percent of them had been using computer for 2-3 years. As far as internet use was concerned 32 percent of respondents were using internet for every day couple of hour, 20 percent for a couple of hour, 46 percent opted a couple of day in a week. On asking how students had learnt computer, 15 percent of them chose the option that they used book, 28 percent of them learnt by trial method, 44 percent opted the option courses offered in high school, whereas 57 percent learnt by college courses. Only 17 percent learnt from friends.

Jegede (2007) selected randomly 218 teachers from four colleges of education in Nigeria to study computer self-efficacy. The sample constituted of 146 males and 72 females. The data were collected with the help of questionnaire. The collected data were analyzed by using descriptive as well as inferential statistics. The findings of the study indicated significant difference between computer self-efficacy in relation to computer ownership, access and subject specialization but no significant differences were found according to gender and professional status of teachers. Higher scores on computer self-efficacy were obtained by teachers of science and core education as compared to other subjects.
Ozçelik & Kurt (2007) examined the level of computer self-efficacy of teachers with respect to age, gender, seniority, department, owning computer and frequency of computer use. The findings of the study indicated that most of teachers had moderate level of computer self-efficacy, the teachers of age group 20-25 years had higher computer self-efficacy as compare to other groups, teachers with teaching experience of 0-05 years had higher computer self-efficacy than other groups, computer teachers’ computer self-efficacy was higher in comparison to other subject teachers. Teachers who used more computer and had own computer showed higher computer self-efficacy but no significant differences were found between male teachers and female teachers.

Paraskeva et. al. (2008) investigated relationship between self-efficacy and computer self-efficacy of 286 Greek teachers selected by random sampling technique. Computer Self-Efficacy Scale developed by Murphy, Coover and Owen (1989) was used to collect desired data. It was a Likert scale containing items representing beginner skills, advance skills, file and software. Spearman Rank Correlation method was used to study the correlation between self-efficacy and computer self-efficacy. The result indicated moderate to high computer self-efficacy among teachers.

Saleh (2008) reported that out of one hundred and twenty seven (127) education faculty members, fourteen (14) had low level of computer self-efficacy, sixty eight (68) had moderate computer self-efficacy and forty five (45) had high level of computer self-efficacy. The sample of the study consisted of two hundred and fifty five (255) faculty members teaching in different colleges of education at Lebanon. Only 50% (127) completed the questionnaire and returned. The researcher modified the Computer User Self-Efficacy Scale developed by Cussidy&Eachus, (2002). Self-ranking of computer proficiency and open-ended questions were used to assess the degree of computer self-efficacy. Respondents had to indicate their level of agreement and disagreement on 5 point Likert Scale. The mean score for computer self-efficacy was found to be 3.78. Scores ranged from 2.31 to 5.0. On the basis of mean, 127 respondents were classified in to three groups. 14 faculty members were with mean scores below 3 (11.0%) who were considered to have low computer self-efficacy, 68 faculty members with mean scores between 3.1 and 4.0 (53.6%) were considered to have moderate computer self-efficacy, and 45 faculty with mean scores of 4.1 to 5.0 (35.4%) were considered to have high computer self-efficacy.
Curts et. al. (2008) studied self-efficacy of primary teachers in using technology for pedagogical purpose. The study holds the notion that self-efficacy beliefs affect technology use as well as integration. The main factor contributes towards use and integration of technology in education is comfort level of teachers comprise basic knowledge and skills. It is directly influenced by the time that takes to include technology in instruction and assessment, teachers’ had computer at home or not, and whether it is connected to internet or not.

Pamuk & Perkers (2009) investigated 605 freshmen and senior pre-service science and mathematics teachers’ level of computer self-efficacy in relation to gender, year in program, and computer ownership. Computer Self-Efficacy Scale developed by Murphy, Coover & Owen (1989) was used to collect the data which was translated in Turkish language. The reliability coefficient value was found to be .938 for study. The scale consisted of 24 items. The total score ranged from 24 to 120. 24 indicated lowest level of computer self-efficacy whereas 120 indicated highest level of computer self-efficacy. Descriptive statistics and inferential statistics were used by using SPSS 13.0 version. The findings of the study showed that they got higher scores on CSSS, males and females did not differ w.r.t. level of computer self-efficacy, seniors scored higher than freshmen in CSSS, computer experience with years in programme and computer ownership had positive influence on computer self-efficacy.

Isman & Celikli (2009) aimed to study student’s self-efficacy level at Eastern Mediterranean University (EMU), faculty of education by focusing to examine difference about computer self-efficacy based on the years of computer usage, gender and having computer at home. 70 students were selected by random sampling method. 5 point Likert questionnaire was used to analyze students’ self-efficacy of computer usage. In this instrument there were 25 items, 5 items were related to personal information and 20 items were related with self-efficacy of computer usage. The reliability alpha coefficients of the scale were 0.82 (20 items). Quantitative methods were used to analyze the gathered data. It was observed that students had different computer levels on which their computer self-efficacy depend. As far as computer usage was concerned, it was reported that 20% of students were using computer for 2 years, 22.9% of them were using computer for 3 years, 21.4% for 4 years, 22.9% for 5 years, 4.3% for 6 years, 5.7% for 7 years, and 2.9% for 8 years. 64.3% students had computer at their home whereas 35.7% did not have computer. 87% of students were
confident about their basic hardware knowledge although 13% had moderate computer hardware knowledge. 72% of participants considered themselves confident in preparing Microsoft power point presentation while 28% faced difficulty in preparing power point presentation. 100% students reported that they will be more confident if they enroll in computer course. Significant difference was found between male and female students. Male students were more confident in using computer than female counterparts.

Teo (2009) conducted a study among 1094 student teachers to study relationship between computer self-efficacy and intended use of technology by using a 7-point Likert type scale. Self-efficacy was measured by three factors: basic teaching skills, advanced teaching skills and technology for pedagogy and intended use of technology was assessed by two factors: traditional use of technology and constructivist use of technology. Analysis of data was done by using the structural equation modelling approach. The findings indicated that student teachers’ self-efficacy had significant influence on whether they used technology in a traditional or constructivist way.

Kurt & Atay (2009) used pre and posttest technique to examine whether the incorporation of technology in presentation of lesson influenced the computer self-efficacy beliefs. The desired data were collected with the help of Technology Integration Questionnaire and semi structured interview from a sample of 73 Turkish prospective teachers. The data analysis revealed that incorporation of technology in presentation of lesson influenced self-efficacy beliefs towards technology. Also significant difference was observed on self-efficacy beliefs towards technology integration between pre and post scores due to course including teaching skills based on technology use.

Topkaya (2010) explored in his findings of research that pre-service English teachers had a moderate level of computer self-efficacy perceptions. Total 286 pre-service teachers participated in the study out of which 80.6% (232) were female and 19.4% (56) were male pre-service teachers. The information gathered from participants’ characteristics. It was concluded that 63.9% (184) pre-service teachers had their own computers while 36.1% (104) did not have their own computers. 14.7% (42) pre-service teachers reported that they used computer every day. 34.4% (98) pre-
services teachers spent couple of hours a day, 4.9% (14) spent couple of hours a month and 4% (1) pre-services teachers never used computer. The study concluded that computer self-efficacy perception of student teachers rose with their experience with computer.

Kutluca & Ekici (2010) selected survey method to examine correlation between self-efficacy attitude towards computer-assisted education among teacher candidates with respect to program in which they were enrolled, computer ownership and computer usage age. The statistical analysis of the study revealed positive attitude and good level of self-efficacy towards computer-assisted education, no significant relation was observed between self-efficacy towards computer-assisted education and variables like gender, program in which enrolled and computer ownership but a significant relationship was concluded between self-efficacy perception towards computer-assisted education, frequency of computer usage and computer usage age.

Demiralay & Karadeniz (2010) collected desired data from 1801 student teachers information literacy self-efficacy by using Information literacy self-efficacy scale. The researchers observed that 65 percent of student teachers had computer skills at intermediate level, only 22.8 percent of student teachers had computer skills at advance level and only few 12.2 percent of student teachers had computer skills at beginner level. 35.3 percent of student teachers reported that they always used computer whereas 43.7 percent student teachers often used computer. Computer experience had greater effect on perceived information literacy self-efficacy of respondents. The student teachers with computer experience of 4-6 years or above 6 years reported higher scores on information literacy self-efficacy scale.

Ozder et. al. (2010) selected 143 teacher candidates in order to study relationship among computer self-efficacy beliefs, introduction to computer course scores and their academic achievement. The computer self-efficacy was measured by administering a computer self-efficacy scale whereas academic achievement and introduction to computer course scores were collected from office. The mean scores of male teacher candidates were found higher than female counterparts but their academic achievement scores and introduction to computer course scores were low than female respondents. In addition, no significant correlation of computer self-efficacy was found with academic achievement and introduction to computer course scores.
Teo & Koh (2010) conducted a study to explore the computer self-efficacy among the pre service teachers (N=708) whose average age was 26.39 (SD=4.68). The questionnaire having 13 items was developed to find out computer self-efficacy of pre service teachers. There were three major dimensions of the questionnaire i.e. basic computer skills, media related skills and web based skills. The study concluded that the pre-service teachers had high computer self-efficacy on basic computer skills (BCS) with M=6.26 and on web based skills (WBS) with M=5.52 but they had no confidence on media related skills (MRS) with mean 3.56.

Cemalettin & Acuner (2011) examined computer self-efficacy beliefs of primary pre-service teachers towards educational technologies. The study was based on the variables like gender and computer ownership. The sample consisted of 217 primary pre-service teachers. The authors concluded in their findings that male pre-service teachers had more computer self-efficacy than female pre-service teachers, those who owned their computer had higher computer self-efficacy scores, and their attitude towards educational technology also predicted computer self-efficacy.

Halder & Chaudhuri (2011) explored the extent of computer self-efficacy, influence of discipline of study on computer self-efficacy and effect of gender on computer self-efficacy of trainee teachers by employing t-test. The participants of the study were 84 in-service secondary school teachers from various parts of West Bengal who were pursuing B.Ed. Programme at University of Calcutta. Two types of research tools were used by the researchers i.e General Information Schedule (GIS) and Computer Self-Efficacy Scale (Murphy et al., 1989). The General Information Schedule (GIS) consisted of two parts: first part comprised of demographic characteristics of the participants such as age, gender, and academic discipline and second part included information regarding internet use. Only those participants were selected who were having preliminary/working knowledge of computers. Total 43 (51.20%) males and 41 (48.80%) females participated in the study. 32 (38.10%) teacher trainees belonged to science stream while 52 (61.90%) belonged to Humanities and Social Science Stream. 26 (30.95%) participants of urban, 28 (33.33%) of semi-urban and 30 (35.72%) of rural residential status teacher trainees participated in the study. The entire teacher trainees exhibited moderate computer self-efficacy. The male teacher trainees had high computer self-efficacy than the female teacher trainees. Significant differences were observed in computer self-
efficacy levels on the basis of different faculties. The teacher trainees from science stream had significantly greater computer self-efficacy than trainees from the humanities steam. The teacher trainees of urban origin exhibited highest computer self-efficacy than rural residential status. Teacher trainees of science stream were found to use the Internet longer than those from humanities stream.

Abbitt (2011) studied the self-efficacy beliefs of prospective teachers towards integration of technology to Technological Pedagogical Content knowledge (TRACK). The main result of the study indicated strong and positive correlation between integration of technology and self-efficacy beliefs. The enhancement in teacher knowledge in TPACK domains increased self-efficacy beliefs.

Ismail et. al. (2011) explored the computer self-efficacy level of library and media teachers and its influence with acceptance of Eduweb TV. The study was conducted on 546 teachers. The sample was selected randomly from four states in Malaysia. The main finding of research revealed moderate level of computer self-efficacy to use Eduweb TV.

Aremu & Fasan (2011) concluded that most of the teachers had average computer self-efficacy but female teachers had higher computer self-efficacy than male teachers. The researcher adopted survey method to collect data from 589 teachers selected by simple random sampling technique. The findings revealed that most (68.2%) teachers fall within the average self-efficacy range. 29.8% of the teachers had low computer self-efficacy and 2% had high self-efficacy. As far as gender differences were concerned, no significant difference was found between male and female teachers in their computer self-efficacy. The female teachers had higher self-efficacy score than their male counterparts.

Santos & Pedro (2012) selected 50 teachers with 12 males and 38 females to study their computer self-efficacy. The researchers organized an ICT training programme on use of MOODLE, Google docs and web 2.0 web tools in education practices. The participants were asked to complete computer self-efficacy scales at three different stages. The analysis of data at different stages indicated moderate level of self-efficacy which was more highlighted in the third stage after completing the two month training programme on ICT.

Chen (2012) concluded low level of computer self-efficacy among 300 ELF teachers in Taiwan. 5-point Likert type Computer self-efficacy having 29 items
developed by Murphy, Coover, and Owen (1989), and was refined by Torkzadeh & Koufteros (1994) with some demographic questions was used. Reliability for the scale was reported to be 0.97, which was supported in the present study by a high Cronbach’s Alpha of 0.94. From demographic questions it was concluded that the majorities (90.6%) of the respondents were females, 44% were between the ages of 31 and 40 and 19.7% were between the age of 41 and 50. The majority (61.3%) of teachers held undergraduate degrees, 37.7% had teaching experience between 6 and 10 years, and 53.3% were working in urban areas. 64.1% teachers reported that they used computer every day at home and at work (74.5%) and 57.9% replied that they had internet facility at school. According to scale the scores ranged from 29 to 57, as not confident; 58 to 86, as having little confidence; 87 to 115, as confident; and 116 to 145, as very confident. The study revealed that 41.5% of the respondents showed that their levels of computer self-efficacy were in the confident and 54.7% were in very confident categories. The results of one-way ANOVA indicated that male teachers perceived themselves as having higher computer self-efficacy. The teachers of age group 20-30 had higher computer self-efficacy as compared to other age groups. The teachers who used computer daily at home or school had higher computer self-efficacy. The author also studied relationship between computer anxiety and computer self-efficacy. Pearson correlation analysis concluded that teachers with high anxiety may likely to have low computer self-efficacy.

Thakur (2012) formulated the objectives to study computer self-efficacy of D.Ed. student teachers of rural areas of Jalgaon district, to compare computer self-efficacy of D.Ed. student teachers of rural areas of Jalgaon district with respect to their sex, stream, access to computer, previous knowledge of computer and access to internet to compare the computer self-efficacy and internet use in terms of different variables like sex, stream, computer knowledge and access to computer. The sampling was completed in two stages. In first stage, colleges were selected using stratified sampling technique including rural colleges and second stage focused to select student teachers randomly. 186 participants having 120 female students and 66 male students participated in the study. Quantitative technique i.e. questionnaire was used to assemble the data. The first part of questionnaire dealt with the demographic characteristics like sex, stream, and computer access at home or outside, internet access and previous knowledge of computer while the second part consisted of five
point Likert computer self-efficacy scale developed by Murphy, Coover & Owen (1989). The findings of the study explored that 60.22 percent student teachers had high computer self-efficacy, despite the fact that only 15.05 percent student teachers showed very high computer self-efficacy and only 7 percent student teachers had low computer self-efficacy. No student teacher had very low computer self-efficacy.

Gokcek et. al. (2013) used quantitative descriptive and survey technique to determine the technological self-efficacy of teachers and compared technological efficiencies on the basis of gender and professional experience. The results of the study showed that teachers had mild technology self-efficacy beliefs. Further it was concluded that gender did not affect technological self-efficacy of teachers but differed on the basis of professional experience. The teachers who had teaching experience of 6-10 years, 11-15 years and those who had experience of 25 years or above showed significant differences. The teachers with less experience had better technology self-efficacy as compared to those who had more experience. On the other hand finding related to computer ownership and frequency of computer use, 95 percent teachers had their own computers. 56 percent of teachers used computer for 1-5 hours a week whereas only 19 percent of them used computer for 6-10 hours a week. Only 10 percent teachers used computer for 20 hours or more in a week.

Tuncer & Balci (2013) studied the effect of computer self-efficacy on information literacy self-efficacy and achievement of information literacy among 783 teacher candidates. The researchers concluded that computer self-efficacy had positive effect on information literacy self-efficacy. In addition, the study further revealed that computer self-efficacy had no significant effect on the achievement of information literacy.

Ozturk (2013) examined computer self-efficacy of prospective teachers. A sample of 366 prospective teachers was selected to conduct the study. The result indicated that male prospective teachers reported greater computer self-efficacy than female prospective teachers. The study further revealed that frequency of computer use influenced computer self-efficacy (more frequent user were higher computer self-efficient).

Tuzluova et. al. (2013) studied computer self-efficacy of English language teachers along with their preferred modes of training as well as professional
development which improved their computer self-efficacy. The sample constituted of 113 English language teachers having 41 male teachers and 72 female teachers with various educational, socio-cultural and linguistic environment. The findings of the study displayed that instead of work experience, past and current professional development teachers were facing challenges in various applications of computer technology like excel, presentation software, e-learning etc.

Uzun et. al. (2013) attempted to study self-efficacy perception towards development of education software among teacher candidates by using Educational Software Development Self-efficacy Perception Scale. 40 teacher candidates participated in the study. The statistical analysis of data revealed weak correlation between general academic performance and self-efficacy perception towards development of education software. Self-efficacy perception of teacher candidates did not change with gender. Further, researchers concluded positive correlation between sub dimensions of the scale and achievement.

Celik & Yesilyurt (2013) highlighted the relationship between computer supported education, perception of computer self-efficacy, computer anxiety and the technological attitude of prospective teachers. The participants for the study were 471 prospective teachers. The data were collected with the help of questionnaires i.e. Technology Attitude Scale, Perceived Computer Self-Efficacy Scale, Computer Anxiety Scale and Attitude Scale towards Applying Computer Supported Education. The data were analyzed by using factor analysis. The researchers concluded that attitude towards technology, perceived computer self-efficacy and computer anxiety are significant predictors of the attitude towards computer supported education.

Al Dafaei et. al. (2013) suggested that proper attention should be given on intensive and systematic training to promote self-efficacy of social studies teachers. The authors had made an attempt to study relationship between attitude and level of use towards instruction computer technology mediated by self-efficacy of 450 social studies teachers in Oman. Analysis of data using mediating analysis technique concluded that self-efficacy totally mediated the relation between attitude and level of use towards instructional computer technology.

Kalemoglu Varol (2014) carried out a study to investigate computer self-efficacy beliefs of prospective physical teachers. A group of 337 respondents (169 females and 168 males) responded to computer self-efficacy belief scale. The main
finding indicated that respondents held high level of computer self-efficacy belief. No significant differences were reported according to gender. However, significant differences were found with respect to having computer and computer usage.

Unlu & Suel (2014) focused to study computer self-efficacy of prospective physical education teachers in Turkey. In order to collect the desired data, Computer Self-efficacy Perception Scale was administered on 173 respondents. The result suggested that the prospective physical education teachers had obtained high scores on scale. In addition, no significant differences were obtained in terms of gender, class, year and age, although significant difference was found in term of ownership of computer.

Topolovcan & Matijevic (2014) explained that pupils were more digital natives than teachers by conducting a comparison study to compare computer self-efficacy between teachers and pupils. The survey covered total 507 participants with 184 teachers and 323 pupils. On basic computer skills dimension, no significant differences were concluded between teachers and pupils but pupils reported better scores on media related skills dimension as compared to teachers. Also in web-based skills, the pupils had obtained higher scores than teachers.

Dandekar (2014) examined relationship between attitudes towards using new technology in teaching in relation to computer self-efficacy of 153 student teachers pursuing B.Ed. from different colleges of Mumbai University. Computer Self-Efficacy Scale (Torkzadeh & Koufreros’s, 1994) was administered on the sample drawn from incidental sampling technique. It was a 5-point rating scale whose reliability was checked by Cronbach method with index 0.90. All the statements were positive worded. Inferential statistics was used to get meaningful results from collected data. It was inferred from analysis of data that there exist significant positive correlation between attitude of student teachers towards using new technology in teaching and their computer self-efficacy. The researcher also focused to determine relationship between student teachers’ computer self-efficacy and computer anxiety and found negative correlation between computer anxiety and computer self-efficacy.

Bozdogan & Ozen (2014) conducted a survey to find out various factors that influenced ICT self-efficacy of pre-service teachers. The survey was conducted by using a questionnaire having three open ended items and remaining items focused on use and frequency of ICT technologies. The findings of the study indicated that
majority of the respondents reported themselves self-efficient in use of ICT. Furthermore, lack of knowledge and skills, technical problems and lack of confidence had negative effect on ICT self-efficacy.

Huseyin & Suel (2014) inspected computer self-efficacy of 173 (120 males and 73 females) Turkish prospective teachers. The age of prospective teachers ranged from 18 to 31 years. In order to collect the data descriptive survey technique was followed. The researcher used two scales for data collection. The first scale was developed by researcher to define demography of participants, gender and class year. The second one was scale of Computer Self-Efficacy Perception developed by Askar and Umay (2001), while comprised of 18 items having 7 negative items. The reliability coefficient of the scale was 0.71. Cronbach’s alpha was 0.83. The t-test was used for independent groups to study computer self-efficacy in term of gender and One-way ANOVA was used for comparison in terms of grade levels. The main finding of the study indicated that prospective teachers obtained high computer self-efficacy scores. On examining the computer self-efficacy in terms of gender and age, it was concluded that no significant difference was observed but significant difference was observed in term of ownership of a computer.

DeSantis & Rotigel (2014) studied beliefs regarding self-reported technology used by pre-service teachers, early-career teachers, mid-career teachers and late-career teachers. The authors used online survey technique to obtain information about teachers’ self-efficacy regarding technology use. The findings of the study indicated that early-care teachers made use of technology for communication and social networking more commonly than mid-care and late-care teachers but mid-care and late-care teachers utilized classroom technology more regularly than pre-service and early-career teachers.

Hong et. al. (2014) administered a questionnaire having two parts i.e. part A consisted of information regarding gender, age and qualification whereas second part consisted of computer self-efficacy items. The data collected was analyzed by SPSS software to get meaningful results. Both descriptive and inferential statistics were used to analyze the data. The study explored that teachers had moderate levels of computer self-efficacy. As far as gender difference was concerned, significant difference was observed. It was found that male teachers had higher computer self-efficacy as compared to female teachers.
Gokcek et. al. (2013) used quantitative descriptive and survey technique to determine the technological self-efficacy of teachers and compared technological efficiencies on the basis of gender and professional experience. The results of the study showed that teachers had mild technology self-efficacy beliefs. Further it was concluded that gender did not affect technological self-efficacy of teachers but differed on the basis of professional experience. The teachers who had teaching experience of 6-10 years, 11-15 years and those who had experience of 25 years or above showed significant differences. The teachers with less experience had better technology self-efficacy as compared to those who had more experience. On the other hand finding related to computer ownership and frequency of computer use, 95 percent teachers had their own computers. 56 percent of teachers used computer for 1-5 hours a week whereas only 19 percent of them used computer for 6-10 hours a week. Only 10 percent teachers used computer for 20 hours or more in a week.

Isil (2015) studied computer self-efficacy among 145 physical education teachers. The researcher adopted survey method to collect the data. The study yielded that a positive correlation existed between computer self-efficacy, personal outcome, performance outcome and effect whereas a significant negative correlation was found between computer self-efficacy and anxiety. In addition, the study concluded that with increase of duration of computer usage the computer self-efficacy increased and computer anxiety decreased.

Kilic (2015) investigated computer self-efficacy among 124 music teachers (76 females and 48 males) in Turkey. The data were gathered by using a questionnaire and statistical analysis of gathered data indicated higher computer self-efficacy among male music teachers. Frequent use of computer, computer ownership and more experience in using computer had higher self-efficacy regarding computer. In addition it was observed that those music teachers who had higher computer self-efficacy had lesser computer anxiety.

Beste & Kilic (2015) conducted a study to examine computer self-efficacy among 124 music teachers. The author concluded that the male teachers had higher computer self-efficacy as compared to female teachers. Further, it was found that the teachers who had more computer experience, own computer and who were frequent computer users had higher computer self-efficacy.
Aktag (2015) investigated computer self-efficacy of 145 physical education teachers. Teachers were having variety of teaching experiences. These are 0-5 years=31 teachers, 10-14 years=47 teachers, 15-19 years=24 teachers and 20-more years=20 teachers. Computer self-efficacy scale developed by Compeau and Higgins (1995) was used to collect desired data. Data analysis indicated that mean of computer self-efficacy of physical education teachers was 6.13. Computer self-efficacy of teachers changed according to their teaching experience. The highest computer self-efficacy score belonged to teachers who have 11-15 years of teaching experience (Mean=7.01) and lower computer self-efficacy scores belonged to teachers who had teaching experience of 16-20 years (mean= 5.23).

Awofala et. al. (2015) conducted a study among 480 science, technology and mathematics pre-service teachers, selected by purposive sampling in order to study computer self-efficacy. Computer Self-Efficacy Likert type scale constructed by Durndell et. al. (2000), was used by researcher. The scale consisted of 29 positively worded items ranging from 29 to 145 having three dimensions: beginning skills, advance skills and software skills. It was concluded from study that 73.54 percent pre-service teachers fell in confident range, 25.21 percent pre-service teachers fell in very confident range and 1.25 percent pre-service teachers fell in little confident range. No significant correlation was found between age and computer self-efficacy at any dimension of scale while weak and positive correlation was found between discipline of study and computer self-efficacy on beginning skills but no correlation was found on other dimensions.

Chinaza et. al. (2015) investigated computer self-efficacy, computer related technology dependence and online learning readiness of 129 undergraduate students. The findings of the study exposed that male undergraduates had higher scores on computer self-efficacy and online readiness than female counterparts whereas the females had scored higher scores on computer related technology dependence. In addition the researchers concluded that computer self-efficacy increased with increase in years of experience but no such significant difference was found in case of computer related technology dependence.

Sevim (2015) concluded that prospective teachers had moderate level of computer self-efficacy. 305 Turkish ELT prospective teachers participated in the research. In addition, it was concluded that perception regarding computer self-
efficacy differs with respect to first time computer use, length of computer use and internet use.

Giles & Kent (2016) focused to study self-efficacy beliefs of elementary pre-service teachers related to technology integration in instructions. The research was quantitative in nature. Likert scale was administered on 28 elementary pre-service teachers to collect desired data. Descriptive statistics was used to analyze data. The analysis of data indicated that 93% respondents integrate technology into lessons, 68% respondents admitted higher confidence level in their ability to choose and use technology in teaching and 80% participants reported that they were capable to integrate technology in curriculum.

From the corpus of the above studies, it can be concluded that the computer self-efficacy was studied by a number of researchers, but very few researchers were conducted on prospective teachers but it was hard to find such studies conducted on teacher educators. Hence, to fulfil the gap of knowledge, an attempt is being made in this direction under present investigation.