Chapter II
Review of Related Literature
CHAPTER II
REVIEW OF RELATED LITERATURE

For planning and execution of any research work, review of related literature is an essential pre-requisite. The review of research studies has been presented in the following section:

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2.1 REVIEW OF RELATED LITERATURE ON COMPUTER SELF-EFFICACY

Enoch, Riggs, and Ellis (1993). Study focused on the development and validation of a survey instrument that would provide insight into the self-efficacy beliefs of in-service teachers toward the use of computer technology in classroom teaching practices.
Wallace (1999) reported that computer students expressed low levels of computer knowledge, computer liking, and computer confidence in comparison with education students.

Computer self - efficacy was also found to be associated with attitudes toward computer technologies (Zhang & Espinoza, 1998). Further, it was also reported that past enrolment in computer programming courses was found to be positively related to self - efficacy and computer self - efficacy was positively related to plan to take more computer related courses.

Albion (1999) noted that teacher’s self - efficacy or belief in their capacity to work effectively with computer was a significant factor in determining their patterns of computer use. This implied that decisions to use computers in classrooms or in schools are likely to be influenced by teachers beliefs. That is, teacher’s beliefs about their abilities to use computers effectively and significantly influence the patterns of classrooms computer usage.

Gardner and Rozell (2000) provided a comprehensive list of determinants of a person’s computer self-efficacy based on Gist and Mitchell’s (1992) work. Gardner and Rozell (2000) classified the determinants of computer self – efficacy into four quartiles according to the variability (low/high) and locus (external/internal) of these determinants. Factors like ability and personality are internal with low variability, while factors such as watching others (modeling), persuasion and feedback have an external locus and high variability. Gist and Mitchell’s (1992) pointed out that computer self-efficacy represents as comprehensive judgment of one’s ability to perform a task. It is not static or stable trait; rather a dynamic judgment that changes with the information acquired, such as the change of environment setting, the change of task conditions and feedback, and so on.

Agerwal, Sambaurthy and Stair (2000) found that judgment of self-efficacy serve as key antecedent of perceived cognitive efforts (ease of use) associated with
technology usage. Further, self-efficacy judgments in the task domain of computing are strongly influenced by the extent to which individuals believe that they are personally innovative with respect to information technology.

Holcomb, Bron, Kulikowich and Zheng (2003) found that computer Self-Efficacy is positively correlated with a willingness to choose and participate in computer activities, an expectation of success, the ability to persevere when faced with computer-related difficulties, and one’s computer-related performance.

Studies have investigated the nature of self-efficacy and beliefs in technology for teaching (Wang, Ertmer, & Newby, 2004). Later examining self-efficacy beliefs toward technology use have focused on their influence on attitudes toward computers (Torkzadeh, Koufteros, & Pflughoeft, 2003).

Stern (2004) in his study reported that the relationship between computer self-efficacy, anxiety, experience and support were positively related to computer self-efficacy and computer self-efficacy was negatively related to anxiety and positively related to usage.

Nanjappa and Lowther (2004) investigated the influence of perceived computer self-efficacy on technology integration beliefs of school teachers in India. The technology survey instrument was used to collect data from 267 school teachers of Mumbai, India. Data analyses revealed that the participants had strong beliefs about the impact of technology integration on instruction and students; but belief about their own readiness was comparatively weak, even though their computer self-efficacy scores were above average. Multiple regressions reflected a positive significant relationship between teacher technology beliefs and computer self-efficacy. The study had important implications for a population of novice computer users and the success of the technology integration program, as envisaged by educational planner in India.

Yusuf (2005) investigated teachers perceived self-efficacy in the implementation of computer education in Nigerian secondary schools. It also examined the influence of gender on Teacher’s perceived self-efficacy. 161 male and 148 female teachers were asked to indicate their experience and level of
proficiency in the use of computers. Percentage analysis indicated that over 60% of male and female teachers do not have minimum experience in the use of computers, in basic computer operations, and in the use of applicant software. Chi-Square analysis indicated no significant difference between male and female teachers competence in the use of computers, basic computer operations, and in the use of applicant software.

Tublin (2006) found that teachers use technology in two ways. One way is to use technology to attain the same traditional goals under the same conditions, without significant changes to the classroom activities. The second way is to use technology to expand classroom boundaries, connect student to real-world events and guide students to become independent learners. These two ways of using technology for teaching was supported by Brawner and Allen (2006) who asked 462 students teachers how they had used technology during their intership. The authors found that the responses could be grouped according to Type I (drill and practice) and Type 2 (user-centred) uses of technology (Maddux, et al., 1997). Research has found a positive relationship between teachers' beliefs and uses of technology. For example, Becker (2000) found that teachers who hold constructivist beliefs about teaching are more aligned to the Type II application of computers. A study on student teachers’ about teaching and learning and technology use found a positive and strong correlation between a belief in constructivist teaching and constructivist (or user-centered) use of technology (Teo, Chai, Hung, & Lee, 2008).

Saleh’s (2007) research indicated that computer self-efficacy (CSE) may be one determinant of who uses technology and who does not. A survey of education faculty at the Lebanese University in Beirut, Lebanon, conducted in 2006, revealed varying degrees of CSE; of 127 respondents, 14 had low levels of CSE; 68 were at a moderate level and 45 self-evaluated themselves to have high CSE. Although other barriers may deter the implementation of technology in teaching, strategies and techniques for increasing CSE should be developed. For those with low CSE, special attention must be given to enhancing their levels of CSE.
Özçelik and Kurt (2007) reported that primary school teachers who have high self-efficacy use computer technologies in their classes more. Embi (2007) reported computer self-efficacy as the best predictor of level of computer anxiety. He found that thirty six percent of the variation in computer anxiety can be explained by regression model with computer self-efficacy as a single predictor alone. Moreover, an inverse relationship exists between computer anxiety and computer self-efficacy. It indicated that computer self-efficacy is an important factor in determining the accounting faculty levels of computer anxiety and the extent to which computer applications had been used either as a tool to support instruction or taught to students as part of the course curriculum.

Valanides and Angeli (2008) suggested that to develop self-efficacy, science teachers need to be introduced to computer technologies systematically and be engaged in activities that will provide them with positive experiences with regard to computer use. Ocak and Akdemir (2008) revealed that science teachers’ computer literacy level is related to their computer use. And, also computer literacy level of the teachers increases their integration of computer applications in their teaching. In the study, most of the teachers use internet, email, and educational software CD as computer applications in the classrooms. They found statistical differences in the integration of computer applications as an instructional tool.

Teo (2009) studied the relationship between computer self-efficacy and intended uses of technology of teachers (N=1094) at a teacher training institute in Singapore. Self-efficacy was assessed by three factors: Basic Teaching Skills (BTS), Advanced Teaching Skills (ATS) and Technology for Pedagogy (TP) and intended use of technology was measured by two factors: Traditional use of Technology, (TUT) and Constructive use of Technology (CUT). Results showed that significant relationships exist among BTS, TP, TUT and CUT. However, ATS did not influence TUT and CUT in significant way, overall, the result of this study offers some evidence that teacher’s self-efficacy is a significant influence on whether they use technology in traditionalist or constructivist way.
Topkaya (2010) investigated pre-service English language teachers’ perceptions of computer self-efficacy in relation to different variables. Secondarily, the study also explored the relationship between pre-service English language teacher’s perceptions of computer self-efficacy and their perceptions of general self-efficacy. A sample of 288 pre-service English language teachers at Canakkale Onsekiz Mart University was surveyed. The findings indicated that pre-service English teachers had a moderate level of computer self-efficacy perceptions. Computer experience, frequency of use and gender were identified to create a significant difference (P<.05). The correlation analysis between general sense of self-efficacy and computer self-efficacy revealed a moderate and a positive correlation between the two psychological constructs. Finally, the regression analysis showed that computer experience was the variable that affected the computer self-efficacy belief of pre-service English teachers most.

Varma (2010) found that computer self-efficacy, which has been seen as an important variable for women’s academic performance and perseverance, from in-depth interviews with 60 female undergraduate students majoring in computer science (CS) in 2007-2008 in India. It shows that CS is viewed as a woman-friendly field, as it offers lucrative jobs, professional careers, safe working environments, flexible working hours, and independence. Verbal persuasion from family members provided additional support to pursue CS education. Though they did not have early exposure to a computer at home or in school, female students' school preparation in mathematics facilitated their academic performance. Their peer’s desires to join and succeed in the CS field further enhanced their confidence. The findings suggest that self-efficacy computing and gender are constructed more diversely than generally accepted in the American research.

2.2 TREND ANALYSIS OF RESEARCH STUDIES RELATED TO COMPUTER SELF-EFFICACY

Review of studies on computer self-efficacy reveals that teachers who have high self-efficacy use computer technologies in their classes more (Askar and Umay, 2001, Torkzadeh, Koufteros, & Pughoefi, 2003; Ozcelik and Kurt, 2007),
greater achievement of computer competence (Agerwal, Sambamurthy and Stair, 2000), Computer self-efficacy has been reported to be the best predictor of computer anxiety (Embi, 2007), and high computer literacy level is related to computer use (Ocak and Akdemir, Valanides and Angeli, 2008). Computer self-efficacy has a positive and significant relationship with psychological construct (Teo, 2009; Topkaya, 2010).

2.3 REVIEW OF RELATED LITERATURE ON COMPUTER ANXIETY

Heinssen (1987) reported that a high level of computer anxiety has been negatively related to learning computer skills. Pxton & Turner (1984) indicated that avoidance of computing activity may be a particular application of more general finding that people with high anxiety use avoidance as a coping strategy for anxiety-generating situations.

Igbaria and Chakrabarti (1990) found that computer anxiety played an important mediating role for computer attitudes and that most of the demographic variables influenced attitudes only indirectly, through their effect on computer anxiety. Moreover, both computer anxiety and attitudes influenced the way students accepted and used computers.

Weil and Rosen (1995) examined technological sophistication and the level of technophobia in university students from twenty-three countries. They concluded that there was no worldwide consensus on who were more computer anxious males or females. As for computer attitudes, in some cases it was found that males held more positive attitudes than females (Liaw, 2002; North & Noyes, 2000). Others found that males and females did not differ significantly in their attitudes toward computers (Kesici, Sahin, & Akturk, 2009; Popovich et al., 2008).

Gos (1996) reported that computer experience does not reduce the anxiety level of the user. Instead, the quality of the experience plays a significant role in reducing the anxiety level. This means that pleasant or unpleasant experience makes a difference. He suggested that teachers and instructors play a crucial role in making the students’ early computer experience as pleasant as possible. While Hakkinen
(1994/1995) stressed that one way of increasing users’ computer experience is through encouraging them to work on their own on the computer at the initial stages. What matters is the pleasant experience in their first encounter with computer. Hakkinen (1994/1995) warned that an unpleasant experience can create negative attitudes which hampers learning and strongly suggested that making the atmosphere of the learning situation positive and relaxed would be beneficial for learning.

Kanter and Heggestad (1997) concluded that the negative feeling linked with high anxiety was likely to detract cognitive resources from task performance. There has been a growing recognition over several decades that computer phobia is a widespread phenomenon in the student population.

Bandura’s (1977, 1986a; Schunk, 2000) research has confirmed that high levels of computer anxiety recourse levels of self – efficacy which in turn lowers computer – based performance attainment. Similarly, experience with computers improves subsequent computer performance if the experience leads to increased levels of self-efficacy (McNemey, McNemey, & Sinclair, 1994).

Brosnan (1998) examined the relationship between computer anxiety and computer performance using a self-efficacy framework. The results indicated that computer anxiety directly influenced the number of correct responses obtained from databases. Shermis and Lombart’s (1998) study suggested that much of what was considered computer anxiety might infact be a manifestation of test anxiety.

Hsieh (2000) studied computer self-efficacy, computer anxiety, computer coping strategy and computer literacy in junior and elementary high school teachers. The study was conducted on 318 female and 134 male teachers of Taipei (China). The findings revealed that high computer anxiety leads to low computer self-efficacy. Teachers with high computer anxiety tend to show poor coping strategies in problem solving, support seeking and self-adjustment and a shallow understanding of computer and computer assisted instruction. Computer coping, computer self-efficacy, computer anxiety are significantly related to their computer literacy.
McLroy et al (2001) found that regularity of access to computing facilities outside the university had no relationship to any of the computer anxiety characteristics, while Teo (2008) found that students who owned computer at home reported a lower level of computer anxiety. It also seemed that computer anxiety levels, attitude and usage may be affected by participants’ cultural environment (Anthony et al., 2000; Li and Kirkup, 2007; Tekinarslan, 2008; Weil & Rosen, 1995). Gunter (2001) stated that many institutions of higher learning have failed in providing a positive experience to those while learning essential technology skills.

Luan (2002) stated that anxiety towards IT is defined as the user feelings of uneasiness and apprehension in using the internet, specific software applications, and software applications in general, computer and IT for leisure or work.

Studies examined the relationships between computer anxiety and attitudes, and have also examined their correlation with a lot of different factors. In a number of studies, the relationship between computer anxiety and computer attitudes was negative (Durndell and Haag, 2002; Popovich et al., 2008; Sam et al., 2005).

Aziz (2004) carried out a study to investigate the relationship between I.C.S students knowledge, anxiety and attitude towards computer. Sample of study consisted of all students of computer science studying at intermediate level in Punjab. The key conclusion based on description and inferential statistical analysis indicated that majority of the students had no previous knowledge of computer and no home computer, while majority of colleges had computer graduate teachers and insufficient physical facilities. It was revealed that there was positive correlation between knowledge and attitude and negative correlation between anxiety and attitude.

Sam, Othman and Nordin (2005) in their study on computer self-efficacy, computer anxiety and attitudes towards the internet, found a significant relationship between computer anxiety and attitudes toward the internet.
Undergraduates who were highly computer anxious generally have more negative attitudes toward the use of internet.

Li and Kirkup (2007) found that British students were more likely to use computers for study purposes than Chinese students, but Chinese student were more self-confident about their advanced computer skills. Yaghi and Abu-Saba (1998), in a study addressed to teachers in Lebanese schools, found that the language of teaching seemed to play a role in computer anxiety. Teachers who taught in French and Arabic seemed to have higher computer anxiety than those who used the English language.

Rajesekar and Vaijapuri (2008) studied the Higher Secondary Teacher’s Computer Anxiety. Normative survey technique has been adopted in the study on the sample of 670 teachers belonging to the Cuddalore Educational district in Tamilnadu. Findings revealed that the entire sample of teachers has high level of computer anxiety. The teachers handling the subjects of the Science group and those who have not attended any computer classes have high level computer anxiety than their counterparts in the Arts group.

Saade and Kira (2009) studied the influence of computer anxiety on perceived ease of use and the mediating effect of computer self-efficacy on this relationship, within an e-learning context. A survey methodology approach was used in this study using 18 items for 3 constructs (perceived ease of use, anxiety and self-efficacy). Survey data from 645 university students were analyzed. The psychometric properties of the items and constructs were validated followed by the assessment of mediation of computer self-efficacy. Results from the use of a learning management system indicated that computer self-efficacy plays a significant role in mediating the impact of anxiety on perceived ease of use. This role is observed by computer self-efficacy (1) reducing the strength and significance of the impact of anxiety on perceived ease of use and (2) having a strong and significant relationship with computer anxiety. The findings demonstrated the importance of self-efficacy as a mediator between computer anxiety and perceived ease of use of learning management system (LMS). With the continuous development of richer and more integrated interfaces, anxieties
about learning to use the new interface and executing tasks effectively becomes of primary importance.

Ekizoglu and Ozcinar (2010) investigated the relationship between the teacher candidates’ computer and internet based anxiety and perceived self-efficacy. This research that aims to define how much computer anxiety, internet anxiety, computer perceived self-efficacy and internet perceived self efficacy predicts each other was held by using 590 candidate teachers. In the research, computer anxiety scale (alpha = 0.84) computer perceived self efficacy scale (Alpha = 0.97) Internet anxiety scale (Alpha = 0.90) and internet perceived self efficacy scale (Alpha = 0.939) were used. As a result of the survey, it is found out that there is a positive and high level relationship between computer perceived self efficacy and internet perceived self efficacy, and thus analyzing the other variables, it is clear that the correlation between the variables is calculated as 0.845. It has been concluded that computer anxiety, together with internet anxiety and computer perceived self efficacy anxiety variables explain approximately 0.72% of internet perceived self-efficacy variance. When analyzing the t-test results that are about the regression numbers, it has been seen that computer perceived self-efficacy and computer anxiety are important factors on computer perceived self efficacy. It has also been found out that there is a positive and medium level relationship between computer anxiety and internet anxiety, and analyzing the other variables, it has been seen that the correlation between the two variables is calculated as 0.36. Also, it has been concluded that computer anxiety, computer perceived self efficacy, and internet perceived self efficacy jointly explain approximately 0.21% of internet self efficacy variance. When analyzing the t-test results on regression, it has been found out that only computer anxiety is an important predictor on internet anxiety.

Sabapathy (2010) investigated attitude and anxiety towards computer among secondary school teachers in India. The investigator used stratified random sampling technique. In order to get a fairly representative and unbiased sample the investigation was carried out on a sample drawn from three different type of schools namely aided private, government and unaided private school. The total
sample comprised of 101 male teachers and 173 female teachers from each type of school. The data was collected through computer attitude scale devolved by the investigator and computer anxiety rating scale by Chupe and Spire (1991). The findings revealed that there was a significant and negative correlation between attitude of secondary school teachers towards computer and their anxiety. The t-test also revealed that teachers with low computer anxiety had better attitude towards computers than teachers experiencing high computer anxiety.

Mehra and Omidian (2011) compared computer anxiety among Indian and Iranian university students. The study was conducted on 800 post-graduate students of different faculties and departments of Panjab University (India) and University of Tehran (Iran). The data were collected through computer anxiety rating scale (CARS) validated by Embi (2007). 2x2x2 ANOVA design was employed to study computer anxiety of Indian & Iranian male & female university students belonging to different faculties. The results indicated that country type, faculty type and interaction between country and faculty had significant effect on university students’ computer anxiety scores.

Chaudari and Halder (2011) studied computer self-efficacy and computer anxiety of trainee teachers: Issue of concern. The study was conducted on 84 in-service secondary school teachers from various parts of West Bengal (India) who were pursuing B.Ed. programme at University of Calcutta. The findings indicated that there is no significant difference in computer self-efficacy based on gender among science teacher trainees. However, significantly higher self-efficacy among the male training teachers of the faculty of Humanities. The results indicated that depending on the faculty, center and residential status, trainee teachers exhibit significant differences in their computer self-efficacy and computer anxiety.

2.4 TREND ANALYSIS OF RESEARCH STUDIES RELATED TO COMPUTER ANXIETY

Review of studies on computer anxiety reveals that the major reason of computer anxiety included feeling of uneasiness and inexperience with computer.
lack of training and unpleasant experience (Geo 1998) so it is suggested that positive and relaxed atmosphere would be beneficial for learning (Hakkienen 1995). In addition, those students and teachers heavily reliant upon technology would have a higher degree of confidence and lower anxiety when dealing with computer technology (Anthony et al. 2000, Li and Kirkup 2007, Tekinarslan 2008). It was also revealed that there was a negative correlation between computer anxiety and computer attitude (Aziz 2004, Sam Othman and Nordin 2005) computer self-efficacy (Saade and Kira 2009, Mehra and Omdian 2011).

2.5 REVIEW OF RELATED LITERATURE ON ATTITUDES TOWARDS COMPUTERS USAGE

Archibald (1980) reported that variability in teacher’s adoption of technology behaviors can be predicated based on the variability in their perception or their personal or situational characteristics. The development of teacher’s positive attitudes towards computers is a key factor not only for enhancing computer integration but also for avoiding teacher’s resistance to computer use.

Milstein (1990) reported about the concept of educator plateauing or career stalling, that the ultimate attitude changes that occurs in teaching. It is a situation where the teacher or administrator, after experiencing a long period of career stability, experiences a reduction of enthusiasm and satisfaction from his/her job. This dissatisfaction negatively impacts the organization and reduces its ability to achieve its educational goal.

Woodrow (1992) asserted that any successful transformation in educational practice requires the development of positive user attitude towards the new technology. Na (1993), in his study on Korean teachers, found a positive correlation between teacher’s attitudes towards computers and computer ownership, accessibility to school computers, the level of accessibility to school computers, and number of computer locations in the school.

Butzin (1992) observed that the effective use of computer technology remained an elusive goal for many teachers. Rogers (1995) felt that teachers are slow to adopt new ideas and practices and people’s attitudes towards a new
technology are a key element in its diffusion. Morton (1996) aptly summarized that “while the real world used computers to move forward, educators too often look studiously backwards.” In effect, the adoption of micro computer for developing instruction lagged behind its increasing availability in the schools.

Zang and Espinoza (1997) found that undergraduate students’ attitude towards computers and self-efficacy were significant predictors of the perceived need to learn computer skill. The greater one’s perceived computer competency, the less perceived need for learning computer skill.

Bradly and Russel (1997) found that male teachers who reported greater computer ownership and access to computers also indicated greater computer competency than female teachers. UCLA Internet Report (Lebo, 2000) similarly found that men have more access and spend more time online than woman. However, this study also found that females aged 12 to 15 and 45 to 55 are more likely to have computer access than males.

Charistensen (1998) found the effect of technology integration education on teachers’ and students’ attitudes toward information technology. Two instruments measuring similar attributes were used to assess teachers’ attitudes. Differences in pre- and post-test scores were used to determine changes that may have occurred during the course of the study. Approximately sixty teachers in an elementary school in Texas received needs-based instruction in the integration of computers in the classroom. Two similar schools in the same school district were used as the comparison group. It was hypothesized that properly instructing teachers to use information technology in the classroom would positively affect not only their attitudes toward information technology, but also the attitudes of their students.

The development of teacher’s positive attitudes toward ICT is a key factor not only for enhancing computer integration but also for avoiding teacher’s resistance to computer use (Watson, 1998).
Johnson and Liu (1998) found that teacher education students were positive about their learning experiences with technology and found it relevant and meaningful to use information technology.

Robertson and Stanforth (1999) found that computer attitudes were significantly related to self-reported computer skill levels. Wiggins (1984), Dambrot, Watkins-Malek, Silling, Marshall and Gaver (1985) and Marcoulides (1988) also identified significant relationship between computer attitude and computer competency.

Van Braak (2001) reported that positive computer attitude are expected to foster computer integration in the classroom.

Howery (2001) investigated that teacher training in technology with its effect on teacher attitude and use of technology in the classroom throughout the 150-hours training. Teachers were provided with necessary computer skills and knowledge to run applications needed to incorporate technology into the curriculum. The control group did not part take in the technology literacy grant training. Teacher attitudes and use of computers were measured by the computer technology survey. The result suggested that through the training, teachers become more comfortable with the use of technology and their positive attitude towards computer increased.

Baylor and Ritchie (2002) rightly stated that “regardless of the amount of technology and its sophistications, technology will not be used unless faculty members have the attitudes, skills and knowledge necessary to infuse it into the curriculum.”

Kersaint, Horton, Stohl and Garoflo (2003) reported that teachers who have positive attitudes toward technology feel more comfortable with using it and usually incorporate it into their teaching.

Zavaraki (2003) performed a study on the “use of network Communications in academic transactions by university teachers and its impact on learning outcomes of postgraduate students” in India. This study employed a two
sample of 260 university teachers and 500 postgraduate students of faculty of science, social science and commerce, Panjab University, Chandigarh. He compared user and non-user faculty (level of use of computers) and their students in their attitude towards network communication. The findings revealed that user-faculty teachers had attitude more positive about internet in higher education as compared to non-user faculty teachers. In addition, postgraduate students of belonging to user faculty teachers had attitude more positive towards Internet technology and more general information about computers (Microsoft Word, Microsoft Excel, PowerPoint) as compared to students who belonged to non-user faculty teachers.

Bullock (2004) found that teachers’ attitudes are a major enabling/disabling factor in the adoption of technology. Van Braak, Tonjeur and Valcke (2004) found that attitude towards computer influences teachers acceptance of the usefulness of technology and also influence whether teachers integrate ICT into their classroom.

Regina, Regina, Grozman and Ticzon (2004) conducted a survey of 498 teachers to determine the incidence of technophobia and attitude of teachers toward online learning and teaching technologies. This study showed that Philippine public school teachers are generally more afraid of computers than their peer working in private schools. They found that teachers in Manila suffer from “technophobia,” which was largely manifested in terms of computer anxiety rather than cognitions. That is, resistance is generally on the level of affect or feeling about using computers. Age was also a big factor influencing the attitude of teachers towards computer. Older teachers are more afraid of technology than younger ones. The study found that teachers in general had a positive attitude towards online teaching and learning technologies. Most of the teachers surveyed viewed computer aided teaching and learning as beneficial, innovative, interactive and efficient. Women teachers were also more open to technology than men. The low adoption of technology among Filipina teachers is mainly due to lack of skills, a fear of technology and perceived difficulty in using technology.

Albirini (2005) reported the attitude of high school English as Foreign Language (EFL) teachers in Syria towards ICT. In addition, the study investigated
the relationship between computer attitudes and five independent variables: computer attributes, cultural perceptions, computer competency, computer access, and personal characteristics (including computer training background). The finding suggested that teachers have positive attitudes towards ICT in education. Teacher’s attitudes were predicted by computer attributes, cultural perceptions and computer competence. The result points to the importance of teachers’ vision of technology itself, their experiences with it, and the cultural conditions that surround its introduction into school in shaping their attitude towards technology and its subsequent diffusion in their educational practice.

Garland and Noyes (2005) pointed out that in the educational context, confidence should lead to more positive attitudes towards computers, and this will enhance learning and associated activities.

Mehra (2007) conducted a study on 200 government senior secondary school teachers of Chandigarh to explore the teachers’ attitudes towards computer use. The findings revealed that teachers possessed fairly positive attitudes towards computer use, but majority of the teachers do not possess the required computer competence. So, the teachers need to be provided training for using computers in teaching learning process.

Ogunkola (2008) investigated the effect of computer attitude, ownership and use on the computer literacy of science teachers in Nigeria. One hundred and twenty (120) Science teachers drawn from the four political divisions of Ogun State, Nigeria were used for the study. Two valid and reliable instruments namely Computer Attitude, Ownership and Use Scale (CAOUS) and Computer Literacy Self-Assessment Scale (CLSAS) were used to collect the needed data. Percentages, standard deviation and multiple regression statistics were employed for data analyses. The findings revealed that the science teachers have positive attitude towards computer. Also, a little above half of the science teachers had personal computers and not all the teachers used computers frequently. Finally, computer attitude, ownership and frequency of use jointly predicted the science teachers’ computer literacy with the influence of computer ownership being the highest when considered individually.
Korobili & Malliari (2009) studied the computer anxiety levels and attitudes toward computers of the students (N=800) of the Library and Information systems (LIS), Department of Technological Educational Institute (TEI), Thessaloniki (Greece) using computer anxiety rating scale (CARS) and computer attitudes scale (CAS). Both constructs were examined using explanatory factor analysis. Internal consistency of the factors of each construct was satisfactory. It was found that there was a strong negative relationship between the two concepts. Canonical correlation analysis demonstrated that anxiety explains more variance of the attitudes than vice versa. Another finding was that most of LIS students were not anxious towards computer and with positive attitudes. Factors correlated negatively with anxiety and positively with attitudes were knowledge of English language, PC ownership, and access of students to computers at younger ages, perceived advanced computer skills and computer experience as reflected by frequency of computer use.

Mitra (2009) studied the professionals of educational institutions in Delhi (India) on their computer attitude to use ICT for education. The result illustrated that computer attitude of the group of professionals working in educational institutions was positive. Computer access and work experience of this group showed differences but age, gender and other personal characteristics did not have any relation with computer attitude.

Osodo and Indoshi (2010) conducted a study to establish the attitudes of students and teachers towards the use of computer technology in Geography education. The survey was conducted in Kisumu District of Nyanza Province, Kenya. The study sample was 80 teachers and 1165 from three high school students representing 30% of the population. The Loyd Gressard Computer Attitude Scale was administered to establish Geography teachers’ and students’ attitudes. Attitude was determined by mean while differences in attitude between teachers and students were established by use of the non-parametric Mann – Whitney U Wilcoxon Test at a confidence level of 0.05. The study established that the majority of Geography teachers (mean of 4.89) and students (mean of 4.81) had a positive attitude towards the use of computer technology in teaching and
learning and hence favored the integration of computer simulations into the Geography curriculum.

Kumar (2010) studied the attitude of rural and urban secondary school teachers towards computer as an instructional aid. The study was carried out on 300 secondary school teachers (150 rural and 150 urban) of Bangalore city. Data was collected by using information schedule and attitude towards computer assisted instruction scale. It has been found that approximately 75% of teachers were reluctant to use computer as an instructional aid only 25% of teachers having unfavorable attitude.

Upreti and Surya (2011) studied the Attitudes and Perceived Computer Competency among Senior Secondary School Teacher. The sampling frame of the study consisted of secondary school in-service teachers in Almora district of Uttarakhand state in India. From the accessible population 200 in-service teachers (males=90; females=110) were selected by random sampling method. Most of teachers in this study were between the ages of 30 to 40 years with teaching experience of between 2 to 12 years in schools. The results revealed that most teachers possess positive attitudes. However, the findings established that most teachers have moderate levels of competency.

Tamer (2011) investigated Teachers’ Computer Usage Profiles and Attitudes toward Computers. For this purpose, “Information form about using computer” and “Scale of the attitudes for computers” was applied to 172 teachers. This study was conducted with survey methods. The data was analyzed through standard deviation and mean value as well as t-test and one way ANOVA for group comparison, besides to find which group causes the difference in the group comparison, a post hoc Tukey HSD test was employed. Finding revealed that the teachers use computers more at home and internet cafes and their levels of using computer programme are intermediate or upper. It is also determined that there is a significant difference according to the variables of taking computer classes, having a computer, level of using a computer, frequency of using computer, experience of using computer and class of the scores of attitudes toward computers.
Dasari and Mallu (2012) examined the attitudes of tribal pre-service teachers towards use of computer. For the purpose, a sample of 47 pre-service teachers was selected randomly from a Tribal College of Teacher Education and Computer Attitude Scale was administered using a Likert type method with four factors: affective, perceived usefulness, perceived control, and behavioral intention to use the computer. The results of this study showed that tribal pre-service teachers had a positive attitude towards use of computer and no gender and sub-community differences were found among tribal pre-service teachers in their computer attitudes.

Modi (2012) investigated the attitudes of primary teachers towards computer literacy with respect to their gender, educational qualifications and extent of experiences. The descriptive method of comparative type was adopted for the study. The sample of the study comprised of primary teachers of Mehsana district of Gujarat state (India). A random stratified sampling technique was employed. The findings of the study revealed that there is no significant difference in the attitude of primary teachers towards computer literacy with reference to their gender, educational qualification. But there is significant difference in attitude of primary teachers towards computer literacy with reference to their experience.

2.6 TREND ANALYSIS OF RESEARCH STUDIES RELATED TO ATTITUDE TOWARDS COMPUTER USAGE

On the basis of review of literature related to attitude towards computer usage, it can be concluded that any successful transformation in educational practice requires the development of positive user attitude towards the new technology (Woodrow 1992). It was hypothesized that properly instructing teachers to use information technology in the classroom would positively affect not only their attitude towards information technology but also the attitude of their teachers (Chraristensen 1998, Howery 2001; Van Braak, Tonjeur, and Valcke 2004). Teachers’ positive attitude towards ICT, teachers vision of technology itself, their experience with it and cultural conditions that surrounds its
introduction into school in shaping their attitude towards technology (Albirini 2005). Teachers possessed fairly positive attitude towards computer use but majority of the teachers do not possess required computer competence so that the teacher needs to be provided training for computer in teaching learning process (Mehra 2007, Ogunkola, 2005) but gender, age, other personal characteristics does not play any role in computer attitude (Mitra 2009, Upreti, and Surya 2011, Dasari and Mallu, 2012).

2.7 REVIEW OF RELATED LITERATURE ON LOCUS OF CONTROL

Arlene and Yoder (1986) found the relationship among personal and psychological factors and the computer literacy of elementary teachers (Locus-of-control, In-service Training, Ohio). 101 classroom teachers were randomly selected from Wood County, Ohio. The findings revealed that there is a positive relationship between internality and attitudes among elementary school teachers of Ohio (United States).

Singh and Sinha (1986) conducted a study in India where 156 male supervisory public sector employees were administered questionnaires. The results showed that high perception of time urgency and challenges in work were associated with high internal locus of control and with low interpersonal relationship, job-person fit, and organizational commitment.

Hsieh (1991) in her research suggested that nurses with an internal locus of control tend to have lower levels of occupational stress, higher frequencies for using formal relaxation techniques, exercise and expression strategies to cope with stress, and lower level of blood pressure than those with an external locus of control. Findings from the study also indicate that the performance and the relationship subscales of locus of control can have significant moderating effects on the relationship between stress and cognitive coping. Furthermore, the locus of control was found to relate to the job levels of the subjects.

Connell (1992) reported that multimedia computing will bring the power of all the audio-visual media within the grip of everyone, including the learner. It
brought positive result in shifting the locus of control from computer to learner, our perceptions of the capabilities and purpose of the computer in the classroom had to be shifted too. Effective learning was to be task based.

Marko and Simpson (1994) found that locus of control is an important variable describing individual differences and predicting behavior about control over life events. The concept of Locus of control refers to the degree to which an individual sees himself in control of his life and the events that influence it.

Nina (1995) indicated that student teachers of Temple University (United States) with an internal locus of control had more positive attitude towards computers than students teachers with an external locus of control. Student teachers with high computer efficacy had more positive attitudes towards computers than student teachers with low computer efficacy.

Volansky and Habinski (1998) found that internal-external locus of control is an important personal attribute related to an individual's organizational commitment. Smith and Adams (1999) indicate that locus of control is a critical psychological attribute affecting teachers' perceptions of their environment and attitudes (Somech & Drach-Zahavy, 2000).

Potosky and Bobko (2001) reported that computer attitudes mediate the relationship between individuals’ locus of control and computer experience and between monitoring beliefs about computers and computer experience.

Woodrow (2002) indicated that teachers positive computer attitudes were found to be correlated with an externally oriented perception of Locus of Control. The external attribution of luck was mostly high correlated with positive attitude and internal oriented negative attitudes towards computer. Locus of Control was found to account for more variation in computer attitudes towards teachers, age, gender, computer experiences and computer occupation.

Hawk (2002) found that individuals with an external locus of control have a less positive attitude towards computers and have greater difficulty in working with unfamiliar computer technology than individuals with an internal locus of control. Since past studies have not examined attitude towards a specific computer
based information system (CBIS) that had been used regularly, the implications of past research on computer attitudes in a work setting are not clear. This study sought to investigate the relationship between locus of control and user attitude towards information system used at work. Additionally, the impact of user involvement on this relationship was examined. A field study failed to provide support for the general assertion that locus of control affects a user’s attitude towards a specific CBIS. When user involvement was considered, external - control users who had not been highly involved during CBIS development had a less positive attitude towards the CBIS than either internal control users or external-control users who had been highly involved.

Falaleeva and Johnson (2002) noted that in the domain of computing technology, evidence has been reported that computer phobics not only exhibit feelings of limited control in multiple, independent domains. This suggests that locus of control should play an important role in how people interact and perceive their interactions with computer technology. In this case, individuals with an external locus of control are expected to perceive the computer as influencing their beliefs, attitudes, and performance. When an individual attributes the results of the interaction with the technology, he or she is making a social actor attribution. Conversely, individuals with internal locus of control would perceive their interaction with computer technology to attribute to factors internal to themselves, thus perceiving technology simply as a tool and making tool attributions.

Wang (2005) reported that there was no difference in Turkish college students' attitudes based on locus of control. Based on the locus of control variables, the effect size of cognitive strategies and computer attitude was small in application, memorization, summarization, rehearsal, and computer attitude. It was weaker in explanation and analytical.

Gifford, Briceno-perriott and Mianzo (2006) recognized that students with an external locus of control attribute learning and performance to factors outside of their control, such as the instructor's teaching or luck. Successful distance education students should exhibit a more internal locus of control, particularly given the amount of independent, student-centered learning required.
Ceyhan (2007) examined the computer anxiety of teacher trainees in the framework of personality variables of irrational beliefs, learned resourcefulness, optimism/pessimism and self-disclosure. The research was carried out by 690 teacher trainees. Data were collected through Computer Anxiety Scale, Irrational belief Scale, Learned Resourcefulness Scale and Information Form. Data analysis was carried out by ANOVA and t test - for the comparison of independent groups. The findings of the study revealed that the computer anxiety is related to irrational beliefs, optimism/pessimism and self-disclosure whereas no relation is found out in terms of learned resourcefulness.

Kasici, Sahin and Akturk (2009) studied cognitive learning strategies and computer attitudes among college students, based on gender and locus of control. The study groups were comprised of 263 pre-service teachers of Turkey. The result demonstrated that the level of adherence to cognitive learning strategies on the part of female college students was significantly higher than those of male college students, especially in terms of memorization, analytical and explanation. This study found that college students’ gender has an effect on cognitive learning strategies and computer attitudes. In terms of locus of control, college students cognitive learning and computer attitudes were found statistically significant in the following levels: small in application, small in memorization and weaker in analytical, small in summarization, weaker in explanation, and small in computer attitude. Observance of cognitive learning strategies was found to be significantly higher for college students with internal locus of control than for those with external locus of control in terms of summarization and rehearsal.

Bond (2010) in a study titled ‘Psychological acceptance and occupational stress’ claimed those with an internal locus of control perceive that they can manage situations through their decisions and behaviors, whilst those with an external locus of control believe that what happens to them is beyond their influence.

Ptrogiannis (2010) examined Greek kindergarten teachers’ (n=396) perceived preparedness for computer use in the preschool classes and the potential difference between compute experienced and non-experienced group of teachers.
Attention was given to the Relationship between perceived preparedness and a number of other psychological constructs that the relevant research literature has revealed as significant factors, namely: internal locus of control, perceived stress, attitudes toward computers, perceived usefulness and ease of use, and computer anxiety. The data analyses confirmed the hypotheses concerning the differences between the two groups of teachers with regard to their sense of preparedness as well as among the variables inter correlations. In addition, based on regression analyses, different patterns of predicting variables were revealed for each of the two groups.

Joshi (2012) Studied Assessment of E-Learning readiness among senior secondary school teachers and students in relation to their locus of control techno stress and computer self-efficacy. The study was conducted on 200 teachers’ (100 government and 100 private teachers) and 200 students (100 government and 100 private students) of Chandigarh (India). The data was collected through E-learning scale by Watkins and Triner (2004), locus of control scale by Rotter (1966), technostress scale by Raghunath (2002) and computer self-efficacy scale by Embi (2007). 2x2x3ANOVA design was employed in the study. The findings of studies revealed positive relationship between e-learning readiness and locus of control, e-learning readiness and computer self-efficacy and negative relationship between e-learning readiness and technostress.

2.8 TREND ANALYSIS OF RESEARCH STUDIES RELATED TO LOCUS OF CONTROL

Review of studies on locus of control suggests that locus of control plays an important role in how people interact and perceive their interaction with computing technology and events that influence it (Marco, and simpson 1994). It indicated that positive computer attitude was found to be correlated with an externally oriented perception of locus of control. The external attribute of luck was mostly highly correlated with positive attitude and Internal oriented negative attitude towards computer. (Woodrow 2002). In addition, individuals with an external locus of control are expected to perceive the computer as influencing their
beliefs, attitude and performance. Conversely, individuals with internal locus of control would perceive their interaction with computing technology to attribute to factor internal to themselves, thus perceiving technology simply as a tool and making a tool attribution (Flalaleeva and Johnson 2002). Teacher students cognitive learning strategies were found to be significantly higher with internal locus of control than for those with external locus of control in terms of summarization, explanation and computer attitude (Kasici, Schin and Akturk 2009) and positive relationship was found between e-learning and locus of control (Joshi, 2012).