CHAPTER – II  
REVIEW OF RELATED LITERATURE

2.0 OVERVIEW

This chapter presents the review of studies related to the theme that has been chosen by the investigator for her study. It comprises six sections. The First section is an overview of the entire chapter. The Second section points out the Need and Purpose of the Review of Related Literature. The Third section explains some of the Indian studies briefly which are related to this investigation. The Fourth section gives a comprehensive account of a number of studies conducted abroad related to the theme of the investigator. The Fifth section summarizes the outcomes and recommendations of the studies cited in this chapter. The sixth section is solely for documenting the references cited in this chapter.

2.1 NEED AND PURPOSE OF THE REVIEW OF RELATED LITERATURE

The review of related literature is a significant part of research study. This helps the research worker to gather the data and information about what has been done in the particular area on which she intends to study.

Review of related studies further avoids duplication of effort that has already been done and it helps the investigator to go further deep into the problem in hand. It also helps to study the different facets of the problem. It provides the opportunity of giving an insight into the methods, measures and various other
parameters adopted by others which would lead to the improvement of the research design significantly. It is a valuable guide in defining the problem, recognising its significance, suggesting the promising data gathering devices, appropriate study design and source of data. Hence, a review of previous studies in the relevant areas of the present study is attempted here.

Mouly (1964) says, “Review of related literature avoids the risk of duplications, provide theories, ideas, explanations or hypothesis valuable in formulating the problem and contributes to the general scholarship of the investigator”. According to Best, J. (1986) says, “Since effective research is based upon past knowledge, a review of related literature helps to eliminate the duplication of what has been done and provides useful hypothesis and helpful suggestions for significant investigation. A summary of the writing of recognized authorities and of pervious research provides evidence that the researcher is familiar with what is already known and what is still unknown and untested”.

The review of related literature is not without purpose. The following are some of the purposes of the review of related literature.

i. Complete survey of the related literature gives the research necessary insight into the problem. It enables him to put forth vigorously the rationale for the study.

ii. It becomes an important part of the introductory part of the thesis.
iii. It helps to orient the readers with types of researches that have been conducted in the field previously.

iv. It widens the horizon of the researches.

v. It suggests appropriate method to take the problem under study.

vi. It helps in avoiding unnecessary duplication of researches by spot lighting the solution of the problem that the researcher desires to undertake.

vii. It contributes to the basis for formulating valuable hypothesis.

viii. It helps to locate data that can be used in comparative interpretation of results.

The purpose of this chapter is to record briefly the findings of a few research studies conducted in India and abroad on topics that are related to the problem under study. Hence, the investigator has attempted to collect relevant information related to his problem of study from literature available in the field of research.

2.2 CLASSIFICATION OF THE STUDIES

The investigator has gone through the researches related to the present problem. Hence, an attempt was made by the investigator to put forth the reviews related to the present investigation. The investigator identified Eighty four studies conducted in India and Abroad. Among the total 56 studies conducted in India 41, 11 and 04 studies were carried out under different headings like Information
Communication Technologies (ICT), Attitude and Anxiety respectively. Likewise out of identified 28 studies made Abroad 20, 04 and 04 studies were carried out under different headings ICT, Attitude and Anxiety respectively. The investigator suitably located the related studies and the details of the above studies are presented below.

2.2.1 Studies Conducted in India

Among the identified studies conducted in India the investigator had located 56. The studies conducted in ICT, Attitude and Anxiety were 41, 11 and 04 respectively.

a) Studies conducted on Information and Communication Technologies

The brief summary of the studies are presented below.

Dodia (2012) conducted a study on Use of ICT: Required Competency for Teachers. The major objectives of the study were to study the required ICT competencies to develop in teachers. To find out the required ICT competencies to develop in teachers according to components. To study the required ICT competencies to develop in teachers, the self made five point rating scale of ICTBC was used as a research instrument. Total 30 teacher educators were randomly selected from different teacher training colleges like B.Ed., P.T.C., and M.Ed. College. All the teacher educators were given the ICTBC scale for rating the required ICT competencies. To find out required ICT competencies for teachers, the chi-square statistics was applied.
The results indicated that among technological ICT competencies that teacher required to develop are use of email, fill up online forms, accessing internet for required references. Among Didactical ICT competencies that teachers required to develop are previously decide about teaching method for different content, decided about how students will interact with ICT based tools & materials, arrange the tools & materials based on past knowledge for healthy interaction. Among social ICT competencies that teachers required are maintain continuous, positive, constructive feedback to encourage student's participation in ICT based activities, teacher should create environment in which student can communicate with full confidence and also create healthy & social relations with other, to know the culture, lifestyle of people with the help of internet, teacher have competency to present content with the help of technology. Finally study indicated that most of the ICT competencies are required to develop in teachers.

Gopal, Mirunalini & Anandan (2012) made a study on Gender and Parental Income towards the Effectiveness of Computer Assisted Instruction on Achievement in Science among Primary School Students. The aim of the present study is to measure the Gender and Parental Income towards the Effectiveness of Computer Assisted Instruction on Achievement in Science among Primary School Students. The Study belongs to Experimental Research. Single group sampling design was followed in the study. The size of the sample is Forty Two students studying in primary school were selected through Random Sampling Technique.
The investigators themselves developed the tool ‘Achievement in Science’ which consists of forty items comprising three units in multiple choice pattern. Standardised CAI Software on selected science concepts were used as treatment. Mean, Standard deviation and ‘t’ test techniques were used for analyzing the data. The findings revealed that the Gender and Parental Income towards the Effectiveness of Computer Assisted Instruction on Achievement in Science among Primary School Students. It also revealed that there is no significant difference on Gain Scores of the Mean Achievements in Science through the treatment of CAI software among Primary school students with respect to Gender and Parental Income.

**Jebmalar Anna Jothi (2012)** investigated in her research study on the Effectiveness of Computer Integrated Method on the Performance in English of Upper Primary Students. To develop a Flash based Software package in English for Standard VI. To find out the significant difference, if any, in achievement scores in English of the Standard VI students between the control group, who learned through traditional method of teaching English and the experimental group, who learned through Computer Integrated Method of teaching English. The design of the study was Experimental Research Method. 70 students of the sixth standard were selected as the samples. The tool used in the study were Achievement in English, An attitude scale towards Computer Integrated Method in learning English, Entry behavior test in English which were developed and
validated by the Investigator and another Standardized Catell’s Culture Fair Intelligence Test (1961) tools.

The statistical techniques used for the study were Mean, Standard Deviation, t-test for Independent groups and Correlated t-test for dependent groups, ANCOVA and Pearson Product Moment Correlation. The findings of the study were found out that there was a significant difference between the Control and Experimental groups in their Retention test scores and with regard to variables such as objectives, Father’s education and occupation and Mothers education and occupation. The mean scores show that the retention scores of the experimental group are higher than the control group. There is significant difference in achievement between Computer Integrated Method and Traditional Method in learning English. There is significant difference in change in attitude towards learning English through Computer Mediated method before and after treatment.

Sheeba (2012) attempted an experimental study on Development of Instructional Packages for Vocational Higher Secondary School Students for Enhancing the Awareness on Fresh Water Ornamental Fish Culture and Aquarium Maintenance. The major objectives of the study were to develop Instructional packages such as Self-learning module and Multimedia Instructional material and to test the effectiveness of the same and also to compare them. The study was conducted on a sample of 96 VHSE aquaculture students. The data collected were analysed using the ‘t’ test, ANOVA and ANCOVA. The study revealed that
Multimedia Instructional material was found to be the most effective strategy among the three strategies adopted in the study for enhancing the awareness of VHSE Aquaculture students. The study concluded that the need for developing vocation oriented instructional packages.

**Tholappan & Krishna Kumar (2012)** made a study on Effectiveness of Video Assisted Instruction in Learning Economics. This experimental study is an attempt to find out the effectiveness of developed software on Video Assisted Instruction in learning Economics at first year higher secondary level. To find out its effectiveness in relation to certain selected variables i.e. Gender, Locality and Entertainment facilities at Home. Stratified Random sampling technique used to select sixty students from first year higher secondary class as sample for this study. The statistical technique employed were Mean, Standard Deviation and ‘t’ test. The major findings of the study were Achievement of students in learning Economics at first year higher secondary level through Video Assisted Instruction is more than the Conventional method. The Gender difference and Locality variations of the students did not affect the achievement of students in learning Economics through Video Assisted Instruction. Entertainment facilities like TV with VCD and Computer influence the students’ achievement.

**Anandan & Venkateswaran (2011)** conducted a study on Awareness towards Computer Education among Elementary Teacher Trainees. The objectives of the study are to find out the level of awareness towards Computer Education
among Elementary Teacher Trainees, to find out the significant difference between Government Institute Teacher Trainees and Self-finance Institute Teacher Trainees towards Computer Education. There is no significant difference between the Government Teacher Training Institutes and self-finance teacher training Institutes towards awareness towards computer education. The descriptive survey method was adopted for the study and the sizes of the sample were 300 Elementary Teacher Trainees in both Government and Self-finance Institutes at Namakkal district. Awareness towards Computer Education questionnaire developed by the Investigators was used as tool for the study and statistical techniques like Mean, Standard Deviation and ‘t’ test for analyzing the data. The major findings of the study were found out that the Teacher Trainees have more awareness towards computer education. The Teacher Trainees of Government institutions have more awareness than the Self-finance Institute Teacher Trainees based on the gender and locality. The study clearly shows no significant difference within variables of government and self-financing teacher trainees.

Doddamani Giriyappa Channabasappa (2011) studied the Effectiveness of Computer Multimedia Interactive Strategy on Achievement in Geography of Secondary School Students. The objectives of the study were as follows: To construct and develop the multimedia interactive instructional package in geography for 9th standard. To study the relative effectiveness of computer multimedia interactive strategy programmed learning strategy and conventional
instruction on achievement in geography of secondary school students. The study was based on Experimental research and 150 samples of the IX standard students. The tools used for the study were Intelligence Test (RPM), Computer Multimedia Interactive Strategy for teaching Geography by the Investigator, Programmed Learning Strategy Package, Conventional teaching lesson plans, Reasoning ability in Geography, Geography Processes Skill were developed by Investigator. The statistical techniques used in the study were Mean, SD, t-test and ANOVA. The study revealed that the post test achievements in Geography are higher than pre test scores of students of experimental group 1 and 2.

Maya (2011) conducted a study on Computer Assisted Learning and Learning Environment. The objectives of the study to assess the extent of availability of resources, extent use of Computer Based Learning materials in Higher Secondary Schools and the training received by higher secondary Biology teachers regarding the preparation of Computer Based Learning Materials. To identify the practical difficulties encountered by teachers while adopting Computer Based Learning materials. Survey method was adopted and Questionnaire and Rating Scale for teachers were used as tools for the study. 42 higher secondary school Biology teachers were taken as sample. Simple percentages were used to analyse the data. The study found that in the case of availability of resources the majority of teachers reported that they have computers in their schools (97.6%) and computers in the schools are having multimedia
facilities (95.23%). Teachers reported that there is no sufficient literature available on the preparation of computer based learning materials in their schools (95.23%) and very few multimedia computers lessons were available in their schools related with the syllabus.

Rajandran (2011) made a study on Teachers’ Views on Application of Information Technology in Teaching University Students. The study belongs to the Survey Method with the following objectives such as to examine the respondents’ frequency of using digital resources in their teaching purposes and to analyze the respondents’ mode of using digital resources in their teaching purposes. The total samples selected for the study were 663 professors working at six universities in Tamilnadu through Stratified Random Sampling technique. The tool used for the study based on 5-point scale related to extent of utilizing digital resources and frequency of using digital resources have been assessed. The statistical measures used in this study were chi-square test and ANOVA two-way model. The major findings of the study revealed that high level priority to make use of digital resources and high level priority is assessed on the basis of their maximum per cent of their expressed views in terms of almost all the time use and often frequency of uses among the respondents. The results of sex wise analysis show that male respondents occupy the first position with respect to high level utilization of all digital resources in their teaching process and female respondents lag behind them.
Verma (2011) attempted a Survey study on Use of Communication Technologies by Male and Female Teachers of Professional Courses. The objective of the study was to examine the communication technologies being used by teachers of professional courses in classroom on the basis of gender. The sample comprises of 102 teachers of degree colleges running professional courses in Rohilkand region of U.P. of which 75 male teachers and 27 female teachers were selected through stratified random sampling. A tool was developed to assess the use of communication technologies depending upon various aspects of computer, internet, O.H.P, L.C.D, ETV facility, Slide projector, Audio and Video conferencing, CD-ROM. The statistical techniques used in the study were percentage and critical ratio. The study revealed that the significant difference exists regarding the use of O.H.P. between male and female teachers of professional courses. It was also found that communication technologies; computer internet; audio, video conferencing facility and CD-ROM were used by more number of male teacher than female teachers but the difference is not significant. It also revealed that the use of educational television and audio-video conferencing were adopted only by a very few percentage of teachers.

Ajatha Swamy (2010) investigated a study on Internet Awareness and Competence among High School Students and Teachers. The present study examined the effect of ‘Mahiti Sindhu’ project which aimed to train high school students in the basics of computer operation and create general awareness
including Internet. The sample comprised 100 high school students and 40 teachers taken from 5 talukas of Bijapur district were selected through Stratified Random Sampling technique. The tools used were Test of Internet Awareness and Test of Competence to use Internet. The researcher used Mean, SD and t-test for analysis of scores obtained. The findings of the study stated that the Mahiti Sindhu project has significantly enhanced the awareness and competence to use Internet among high school students. There is no significant difference between high school Boys and Girls and also rural and urban students in terms of awareness and competence to use Internet. Mahiti Sindu project has significantly enhanced the awareness of Internet and competence to use Internet among the teachers who were involved with the project.

Anandakumar & Anandan (2010) conducted a study on Awareness and Utilisation of Information and Communication Technologies (ICTs) among the Self-financing B.Ed. College Student-teachers in Krishnagiri District. The study belongs to Normative Survey Research. The objectives of the study were to find out the level of Awareness and Utilisation of ICTs among the Self-financing College B.Ed. student-teachers. To find out the level of Awareness on ICT devices among the Self-financing College B.Ed student-teachers with regard to demographic variables and to find out the level of Utilisation of ICTs with regard to demographic variables. The tool used in the study was Awareness and Utilisation Questionnaire developed by the Investigators. The Stratified Random
sampling technique was followed and 171 samples were selected for the study. Different Statistical measures such as Mean, Standard Deviation and ‘t’ test to analyse the data. The findings of the study noted that mean Awareness scores of Female and Student-teachers of age above 25 years are significantly more aware than their counterparts. There is no significant difference between student-teachers with regard to Martial Status and Basic Qualifications. On observing mean Utilisation scores, it was noted that among Male-Female and UG-PG qualified student-teachers the Utilization of ICTs were similar whereas student-teachers of age upto 25 years and unmarried are significantly more aware than their counterparts.

Leela Gnanale & Ramakrishnan (2010) made a experimental study on Effectiveness of Multimedia Programme in Teaching Environmental Education – A Study. The objectives followed in the study were to prepare a multimedia package for the teaching of environmental education at secondary level. To find out the effectiveness of compute multimedia program in the teaching of environmental education at secondary level. To compare the effectiveness of computer multimedia programs in the teaching of environmental education with that of the traditional method of teaching. The sample of the study consisted of 60 students studying in ninth standard under Matriculation syllabus at Chennai district. The following tools were used for the study i.e. multimedia programme developed by the investigator for the teaching the concepts in environmental
education and Achievement test in environmental education. The statistical measures used in the study were Mean, Standard Deviation and ‘t’ test. The findings of the study stated that there is no significant difference between the experimental group and control group in the learning of environmental education at the pre-test level. There is a significant difference between the experimental group and control group.

In one of the study conducted by Muthupandi & Amalraj (2010) on “Relationship between ICT competency and knowledge competency of Distance Mode B.Ed students” was carried out among B.Ed students in distance mode of Nagercoil and Madurai study centers. The method followed by the investigators was the survey method and census study sampling technique was used. The sample size was 200. Research tools used were ICT competency scale and knowledge competency questionnaire prepared and standardized by the investigators. Mean, Standard deviation, ‘t’ test and Pearson’s product–moment correlation statistical techniques were used by the investigators. The findings are ICT and knowledge competencies of distance mode B.Ed students are found to be average. There was an ICT and knowledge competency of distance mode B.Ed students with reference to their gender, marital status and locality of the school. There was significant relationship between ICT and knowledge competencies of male, unmarried and urban distance mode B.Ed students. There is no significant
relationship between ICT and knowledge competencies of female, married and rural distance mode B.Ed students.

**Neeraj Kaushik & Anita Sharma (2010)** studied Computer and Internet Awareness in School-going Students with the objectives carried out to know about the awareness of Computer and Internet among the school-going students; to ascertain the usage pattern of Internet and Internet services by school-going students and to find out the perception of the students regarding the usage of computers. Survey method has been applied for the present investigation. A sample of 200 students were selected using Random Sampling technique and statistical techniques like Mean, S.D. and ‘t’ test were employed in the study. The results shows that majority of students had used computers and out of these 62.7 percent had also done some sort of computer course. Almost half of the students had exposure to the Internet. Only 34 percent students were having e-mail id. 24.5% affirmed that they used chatting. 26 percent of the students reported that they have used the downloading service.

**Noushad Husain (2010)** investigated a study on Teacher Competencies for the Use of Information Communication Technology. This study aimed to identify the competencies needed by teachers for development and implementation of Information Communication Technology (ICT) based education. Survey method of research was employed for the study. A rating scale was used to know the ICT related competencies that teachers need for instructional purpose. The rating scale
consisted of 47 items based on four types of teacher competencies namely- Technological ICT competencies, Pedagogical ICT Competencies, Didactical ICT Competencies and Social ICT Competencies. The sample consisted of 73 teacher educators among which 44 were males and 29 females. Data was collected through the use of e-mail and by personally contacted the respondents and analyzed using frequencies and percentage. Findings of the study reveal that all the Teacher Educators were agree that the following ICT competencies that teachers need to develop are: (i) Use ICT skills in developing and presenting information; (ii) Prepare ICT-based learning environment, designing effective learning experiences and creating rich learning environments with the support of ICT and Understanding of computer technology can enhance student learning; (iii) Using ICT as a didactical tool in the class s well as implement co-operative learning strategies using ICT. Using ICT as didactical tool implies using it to establish dynamic and powerful instructional strategies and environment and (iv) Demonstrating knowledge and skills for using technology in ethical, legal and safe ways and to use humor and good manners during the teaching and learning process.

In another study conducted by Rajalakshmi & Anandan (2010) on Opinion of the Teacher Trainees towards ICT is to measure the level of opinion towards ICT among the Teacher Trainees and also to find out the significant difference between the Mean values of level of opinion towards ICT among
selected variables. The tool on the Opinion towards ICT among Teacher Trainees consisting of 30 items was constructed by the Investigators. The nature of the study was Survey method and sample size was 120 Teacher Trainees from 3 private Teacher Training Institutes. The statistical techniques such as Mean, Standard Deviation and ‘t’ test were used to analyse the data. The salient findings of the study are Significant positive opinion was observed among the Teacher Trainees towards ICT with various dimensions such as Computer, PowerPoint Presentation and Internet. Women Teacher Trainees show high positive significant difference in the PowerPoint presentation of opinion towards ICT than their counterparts. Rural and Urban Teacher Trainees have similar level of opinion towards various dimensions of ICT. Arts group Teacher Trainees shows positive opinion towards PowerPoint presentation of ICT than the Science group Teacher Trainees. Similarly Science group Teacher Trainees shows positive opinion towards Internet of ICT than Arts group Teacher Trainees. In PowerPoint presentation Women Teacher Trainees opinions was significantly higher than the Man.

Siddique & Abraham (2010) made an analysis on Availability and Use of ICT in Schools in Delhi. The objectives of the study are to study the availability of hardware and software facility in schools in Delhi. To study the extent use of technologies in different type of schools as evident from competencies in students. To study the impact of ICT on students. The study was conducted on sample of
309 schools. The sample were selected using random sampling method taking 822 primary school students, 970 students of class VII/VIII and 196 teachers of above five different type of schools. Tools used in the study were (a) Questionnaire for Heads of the Schools (b) Questionnaire for the Class IV/ V and class VII and VIII and (c) Questionnaire for teachers. Data were interpreted by using statistical techniques like Mean, Standard Deviation, Percentage, etc. The major findings of the study stated that 94 percent of the total schools in Delhi had Computers, whereas 100 percent of KVS and Zamina Schools had computers. The effect on ICT on students made a difference in dropout rate in the schools. 7.5% decreased in dropout rate in schools under ICT compared with schools without ICT (5.7%). ICT has helped in improving the results of the students in the terminal examination. The study found that 35.25 per cent teachers had no training in computer, while only 32 percent teachers had received departmental training in computer education. Teachers without training computers were willing to undergo training and use computers in classroom teaching.

Sulochana (2010) made a study on the Efficacy of Utilising the Computer Assisted Instruction on Achievement in Economics at Higher Secondary School. An experimental study based on the objectives to develop the Computer Assisted Instructional Software and to find out the significant difference if any, between the mean Achievement of the Control and Experimental groups. The size of the samples was 60 students of which 30 students in each groups studying at higher
secondary schools. The tools used for the studies were self-made tool i.e. CAI-Economics – XI std. and Achievement Test and the statistical techniques employed in the study were ‘t’ test and correlation. The findings of the study revealed that Gain scores of the Experimental group students scored better than the Control group students.

**Vasanthi (2010)** conducted an experimental study on Effectiveness of Computer Mediated Learning on Achievement in English Grammar among the Students of Class VIII. The major objective of the study is to find out the effectiveness of Computer Mediated Learning through Branched programming model in English Grammar. The tools used for the study were Achievement test in English Grammar (ATEG) for measuring the achievement and Simplex Junior Intelligence Test for measuring the intelligence for students of VIII standard and 45 samples were selected through Random sampling technique. CML software package was developed by the Investigator with the support of M/s Schoolnet, Bangalore for the treatment. The statistical techniques used for the study were Mean, Standard Deviation, t-test and r values to analyse the data. The findings of the study revealed that the mean achievement gain scores of the experimental group students were better than the control group students in Total.

**Ananda Kumar (2009)** conducted a study on Utilisation of Information and Communication Technologies in Training the B.Ed. Student-teachers in Tamilnadu. The major objective of the study was to find out the level of
Awareness and Utilisation of Information and Communication Technology among the B.Ed. student –teachers. The study belongs to Normative Survey method and the tools used in the study were Questionnaire to measure Awareness and Utilization (AUQ) of ICT devices and Availability of ICT schedule. The 880 samples of student-teachers from 10 different colleges of education were selected though stratified random sampling technique. The statistical techniques used in the study were average, standard deviation, ‘t’ test and Correlation Co-efficient ‘r’ value. The major findings of the study revealed that level of Awareness and Utilisation of ICT devices among the colleges with high availability of ICT devices was found to be high among the student teachers of age group above 30 years whereas their utilization was less. The awareness and utilization of ICT devices among the female student-teachers were significantly more than male student-teachers. The utilization of ICT devices among the Science major student-teachers were more than the Arts and Mathematics major student-teachers.

**Harendra Singh & Mishra (2009)** conducted a study on “Effectiveness of E-learning: an experimental study”. 50 pupil teachers of R.N Institute of modern Management Education and research centre, Meerut were taken as sample for this study. By lottery method experimental group and controlled group were selected. The experimental groups of students were trained in using internet facility for one month. Teacher made achievement test was used to measure achievements.
Finding is reveals that there is a significant difference between two groups. That was Experimental group scoring higher than the Control group.

Nimavathi & Gnanadevan (2009) investigated a study on Developing Study Habits through Multimedia Program. The objectives were to prepare multimedia program for the teaching of science at secondary level. To find out whether there is a significant difference between the experimental group and control group in their study habits. The sample of the study consists of 180 students studying ninth standard in three different schools under State Board syllabus, Thiruvanamalai district. Multimedia program was developed by the investigator for the teaching of the concepts in biology topics was used for treatment. A standardized tool Study Habits Inventory was used to assess the study habits of secondary school students. The statistical measures used in the study were Mean, Standard Deviation and ‘t’ test. The findings of the study stated that there is no significant difference the experimental group and control group in their study habits at the pretest. There is significant difference between the experimental group and control group in their study habits at the post-test.

Rafeedali (2009) made a study on Computer-Based Technology and its Pedagogical Utility. The objectives of the study were to identify the basic computer knowledge among the higher secondary school teachers; to find out the purposes of using computer resources among the higher secondary school teachers; to find out the extent of use of computer resources in the teaching-
learning process among the higher secondary school teachers. The investigator used the self developed tool for collection of data (Computer Awareness Questionnaire). The sample selected for the study was 300 teachers of higher secondary schools from Malappuram district of Kerala using Stratified Random sampling technique. The statistical measures employed were percentage analysis. The results show that most of the higher secondary school teachers have basic computer knowledge. Only 12.67% of higher secondary school teachers are able to handle LCD. Most of the higher secondary school teachers are using computers for educational purposes. Among the higher secondary school teachers female teachers are using computer more for educational purposes than male teachers.

Srinivasan & Muthumanickam (2009) conducted an experimental study on Computer Assisted Instruction and the Lecture Method: A Comparative Study. The objectives of the study were to construct and validate a CAIP in the lesson “Learning” in Educational Psychology for the trainees of Diploma in Teacher Education. To find out the effectiveness of CAIP upon Lecture Method in the lesson ‘Learning in Educational Psychology. The sample selected for the study was 50 teacher trainees of DIET, Tirukoilur block. The statistical techniques employed in this study were Mean, Standard Deviation and ‘t’ test. Control group Pre-test – Post test experimental design followed. A criterion referenced test prepared by the researchers and administered on the subject for find the
effectiveness of CAIP. It was found that the CAIP is more effective than lecture method.

Subhashini (2009) conducted study on Development of e-content in teaching mathematics education for the secondary teacher trainees and its effectiveness. Experimental method was adopted in the study, 40 teacher trainees were selected as sample. The following are the objectives of the present study a) To find out whether there is any significant difference between pre-test and post-test scores of control group trainees. b)To find out whether there is any significant difference between pre-test and post-test scores of experimental group trainees. To find out whether there is any significant difference between pre-test scores of control and experimental group trainees in attainment of knowledge, understanding and application objectives. To find out whether there is any significant difference between post-test scores of control and experimental group trainees in attainment of knowledge, understanding and application objectives. The major findings were there is a significant difference between pre-test and post-test scores of control group trainees. There is a significant difference
between pre-test and post-test scores of experimental group trainees. There is no significant difference between pre-test scores of control and experimental group trainees in attainment of knowledge, understanding and application objectives. There is a significant difference between post-test scores of control and experimental group trainees in attainment of knowledge, understanding and application objectives. There is a significant difference between pre-test and post-test scores of control group trainees in their attainment of knowledge, understanding and application objectives. There is a significant difference between pre-test and post-test scores of the experimental group trainees in their attainment of knowledge, understanding and application objectives.

Amuthavalli & Zuneetha Bai (2008) conducted a study on “The Problems of B.Ed Trainees in Learning Educational Technology” discussed the problems of B.Ed Trainees in learning Educational Technology. The sample for the study consisted of 400 college student teachers selected randomly from Andhra and Rayalaseema colleges. The data were collected using checklist cum rating questionnaire to elicit the opinion of the student teachers about their difficulty and intensity level of the problems in learning educational technology. The checklist contains 45 statements related to learning of educational technology by the student teachers. It can be inferred also that the variables namely sex and management had no impact on the intensity level of problems related to learning Educational Technology.
Azim Premji Foundation & Vidya Bhawan Society (2008) conducted a Survey study on the Achievements and Constraints for Computer Assisted Learning Programme (CALP) in Andra Pradesh, Tamil Nadu, Karnataka and Uttarakhand. The main objective was to find out the achievements and Constraints CALP. The selection of the sample was carried out from the population of 4481 schools (CAL Centres) out of which 438 schools were selected as sample. The size of the sample was 18, 7, 13 and 34 from Tamil Nadu, Andra Pradesh, Karanataka and Uttarakhand respectively from the universe. Tools for the collection of data were Observations, Focus Group Discussions, Interviews, Questionnaire, Data Perusal and Self-Completion Scales. Percentage was used for the process of the data. The findings of the study were: the functioning of the CAL Centres indicates the great deal of confusion in the school, in the minds of Teachers and head teachers which is to be sort out for the success of the programme. Regarding teaching through CDs, teachers were not clear about their role and how to deal with the content of CDs which seems to be a lack of communication and understanding of the program. Positive factor arrived with respect to CDs which are attractive, enhance interest and creativity among students which help in recapitulation, increase concentration and peer learning. It was observed that the small CAL centres are functioning well.

Babu & Vimala (2008) conducted an experimental study on Impact of Multimedia Method in Accountancy Learning in Higher Secondary Level. The
objectives of the study were to diagnose the common errors committed in accountancy learning by the higher secondary school students. To construct and validate multimedia instructional materials for developing learning skills in accountancy learning. To compare the error level of students in pre-test and post-test. The methodology of the study was carried out with 240 students of aided and corporation schools of Chennai city which includes 120 boys and 120 girls. The tool Multimedia Remedial Teaching Material (MMRTM) was used in order to reduce the various types of errors committed by students in passing the Journal entries, posting them in Ledger and Trial Balance preparation. ‘t’ test was performed to find out the significance of the method used. The Findings revealed that there is significant difference between pre-test and post-test errors of experimental group of aided school students with respect to the remediation in multimedia method. But there is no significant difference between the pre-test and post-test errors of experimental group of aided school students with respect to the remediation in multimedia method in error of posting. There is significant difference between pre-test and post-test errors of experimental group of corporation school students with respect to the remediation in multimedia method in error of principle, omission, recording, casting, posting and other type of error.

Jagga (2008) investigated a study of Internet Usage Behavior of Students in Relation to Gender, Grade and Sites. The objectives of this study were to prepare the profile of students using internet on the basis of gender and grade. (ii)
To find the time spent by students on Internet usage. (iii) To find the type of sites accessed and information sought by students. Methodology of the study was Survey method and stratified random sample of 140 students (Male = 60; Female = 80) studying in the first and fourth final year of BPT in the colleges affiliated to Kurukshetra University was selected. The investigator himself prepared the questionnaire, Internet Usage Questionnaire to know the frequency and purpose of using internet and also the sites used by the students. The data were analysed with the help of percentage and t-ratio techniques. The findings of the study revealed that there is a significant difference in the average time spent on internet by male and female students. There exists a significant difference in the average time spent on internet by I year and IV year students. In this study majority of the students accessing the Educational sites followed by other sites. The major purpose of visiting educational sites by the students was for Assignments, Curriculum and Project.

Jebaraj & Mohansundaram (2008) made a study on Effectiveness of e-Content in Teaching Physics at Tertiary Level. The objectives drawn from the study were to develop and validate an e-content on “Solar System”. To find the effectiveness of e-content on ‘Solar System’ in teaching beyond cognition at tertiary level. To find out the differences in achievement between the Teacher Trainees learning ‘Solar System’ through e-content with respect to gender and subject of study. The Methodology was experimental method was followed in this
study and test of ‘g’ Culture Fair Scale 2 form B constructed by RB Catell was administered to the B.Ed trainees of Government College of Education, Orthanad and Arunmalai college of Education, Mannargudi. The control and experimental groups were formed by considering the trainees’ performance in an average manner in the above test. The control and experimental groups has 40 students each. Pre-test was administered to both the groups and data was collected. The control group was taught through conventional method (Lecture method) and the experimental group was taught with the help of developed e-content.

The ICT teaching aids such as PC, CD-ROM and LCD projector were used for this purpose. Then the post-test was administered to both the groups and the data were collected and converted to percentage and subjected to ‘t’ test. The findings of the study were the study indicates that the experimental group and control group trainees differ in their achievement. The male trainees in the experimental group and control groups differ in their achievement. The experimental group and control group trainees belonging to science faculty differ in their achievement. The experimental group and control group trainees belonging to Humanities faculty differ in their achievement.

**Rajeswari (2008)** conducted a study on “Awareness and Application of ICT in Higher Education at Kodaikanal”. This study discussed the awareness of ICT in Higher Education. The sample of the study includes six higher education institutions. 66 women teachers and 24 men teachers constituted the sample. Two
Questionnaires were constructed via Awareness of ICT and Application of ICT. It is recommended that all the teachers in higher education should be given rigorous and compulsory ICT Training for application of ICT is not very satisfactory in Higher Education Institutions at Kodaikanal. It is suggested all the institutions could share their resources in conducting periodical workshops and training in ICT for Teachers to enrich the applications of ICT in teaching and learning process.

**Amutha (2007)** conducted a study entitled Development and validation of e-Content on cloning for Higher Secondary Biology students. The experiment research method was adopted in the study. In this study, 20 Higher Secondary students studying Biology were selected on a sample. E–Content developed and validated by the investigator was used for teaching the sample. The major findings of the experiment reveal that e-Content was effective in teaching Commerce at Secondary level. The e-Content which is turn in the form of Short Learning Object increases the performance of the students.

**Rekha (2007)** conducted a study entitled “Development of PowerPoint based learning package for 11th std students in Botany and its effectiveness”. Experimental method was adopted in the study. In this study 40 XI standard students were selected as sample. The investigator used achievement test as a tool for his study. The Pre-test conducted for Experimental group and Control group which received the traditional lecturing method for a particular topic in Botany indicated that there is no significant difference between the two groups in their understanding of the topic “Pollination”. The Post-test conducted for Experimental
group after using the PowerPoint package for the topic “Pollination” indicates that there is marked improvement in the understanding of the particular topic by the Experimental group than the Pre-test performance. In the case of Controlled Group which received the traditional lecture method there is no variation of improvement over Pre-test performance. Therefore the results prove that the teaching method using PowerPoint presentation is more effective tool for teaching the particular topic than the traditional chalk and talk method. In other words when the students were used with the PowerPoint package, the students curiously listen and understand the topic. It indicates that if the PowerPoint packages are used with the suitable tests and animation for teaching any selected topic in Botany, the students can enjoy the learning and enhance the understanding level too.

Singaravelu (2007) conducted an experimental study towards the Impact of Internet Learning in Research Methodology. Objectives; (1) to find out problems in learning research methodology through traditional approach at the learner of B.Ed. Government College of education, Orthanandu. (ii) To find out whether there is any significant difference between Control group and experimental group (iii) to find out the impact of Internet in learning research methodology. Methodology: (i) Experimental approach was adopted for the study with Qualitative and Quantitative approach. (ii) 80 B.Ed students of Government College of Education, Orathanadu were taken as sample. (iii) Self-made Achievement test was prepared for the study. (iv) The teacher taught that the Research methodology through conventional approach and measured the
achievement mean scores of the learners test. (v) The researcher introduced the using of Internet in learning research methodology and administered the test to the experimental group. The findings of the study revealed that B.Ed. students have poor average scores in learning research methodology through conventional approach in B.Ed. in Government College of Education (ii) there is significant difference between control group and experimental group in learning research methodology. (iii) Learning research methodology through Internet is more effective than conventional approach.

Porter (2006) investigated that the instructional utility of a web based progress monitoring system. Objective: This study investigated the effects of a web based progress monitoring system on teacher planning in languages arts and mathematics. Methods: Seventy four teachers in grades 1-8 in mathematics and grades in languages arts participated in the study. The teachers were located in 10 elementary, 3 middle and 2 high schools in a small southeastern school district that serves approximately 11000 students. Teachers were randomly assigned to either a diagnostic feedback or a no diagnostic feedback condition. During an in-service, teachers wrote lesson plans for their students for the upcoming week.

Teachers with diagnostic feedback had access to class and selected individual student performance data from the web based progress monitoring system. Teachers in the without diagnostic feedback condition did not have access to the diagnostic feedback information prior to writing lesson plans. Findings: (1)
Results suggest that the diagnostic feedback contained in the web based progress monitoring system may affect teacher planning for modified instruction for individual students. (2) No differences were noted for whole-class planning.

Thiyagu (2006) conducted a study on the effectiveness of web-based instruction in learning mathematics education among teacher trainees. The following are the objectives of the present study: a) To identify a web site address on the selected contents, b) To validate the identified web based instruction. c) To develop an achievement test in Mathematical Education at Teacher Trainees based on the selected content. d) To find out the effectiveness of web based instruction in learning mathematical education over the conventional teaching methods. The pre-test and post-test equivalent group design was used. 40 teacher trainees from Pudukkotai area were selected also sample. ‘t’-test, standard deviation, chi-square test were the statistical procedures used in this research.

The major findings were: There is significant difference in mean achievement scores between the students taught through traditional method and by taught through web-based instruction. Web based instruction has brought about positive impact on learning out comes. There is no significant difference in achievement scores between the experimental boys and control boys. And there is significant difference in achievement scores between the experimental girls and control girls. Hence the experimental girls have higher mean scores than the control group girls. There is no significant difference in achievement scores
between the experimental and control group students based on their age below 25. and there is significant difference in achievement scores between the experimental and control group students based on their age above 25. There is no significant difference in achievement scores between the experimental arts students and control arts students. Similarly there is no significant difference in achievement scores between the experimental vocational students and control vocational students. There is significant difference in achievement scores between the experimental science students and control science students.

**Darshana (2005)** did a study on Techno-pedagogic analysis of children ETV programmes and their effectiveness in terms of achievement with and without discussion and perception of students and teachers. The objectives of the study were: i. To analyze the CETV programmes Techno Pedagogically, to study the effectiveness of the CETV programmes in terms of achievement of students. ii. To compare the achievement of students in CETV with and without discussion. iii. To study the effectiveness of CETV programmes in terms of reaction of teachers and iv. To study the views of the students on CETV programmes.

A Pre-test, Treatment and Post-test in both the Experimental and Control group design were employed for the study. 60 students of Standard V of Shree Krishna Hindi medium school constituted the sample for the study. Also all the 5 teachers teaching Standard V were selected. 5 programmes were selected.
purposely out of the 15 recorded. Techno-pedagogic analysis tool, achievement
test on each selected CETV programme, reaction scale, and un-structured
interview were employed. Content analysis, presentation analysis, independent’
test and percentage analysis were used for the study. The programmes were
largely found effective Techno-Pedagogically in terms of media Audio-Visual
Compatibility, Contiguity between text and animation between audio and visuals,
media language proficiency, use of technological aids, correspondence among
communication elements, and view composition. All the six programmes were at
knowledge level, 5 at understanding level, whereas 4 were at application level.
Most of the programmes focused on receiving and responding. Three focused on
valuing also. One of the 6 programmes focused on imitation, manipulation and
articulation level. There was significant difference between the mean gain scores
of control and experimental group in all the 6 programmes. In five out of six
programmes, the mean achievement of the group with discussion was found
significantly higher than that of without discussion. Children and teachers were
found to have positive views regarding the programmes.

Karpaga Kumaravel & Ramakrishnan (2005) on Web access and usage
behavior of teacher educators and student teachers. Objectives: The objectives of
the present study were to investigate the following issues: (i) the frequency of
access. (ii) The purpose of accessing web. (iii) Web searching skills possessed.
(iv) Web searching methods. (v) The difficulties faced while surfing, and (vi) The
evaluation of the information obtained from the web. Method: The survey was conducted among teacher educators and student teachers from U.P., New Delhi and Rajasthan. To avoid the rural, urban bias, all the three places were having the city background. To avoid the effect of the rural/urban difference, all the three places were chosen as big cities where internet facilities are freely available.

The survey questionnaire was sent to 100 teacher educator and 200 student teachers by main and e-mail. 77 teacher educators and 151 student teachers completed the questionnaire and returned. Out of them 75 teacher educators and 150 student teachers were selected as the sample. The survey method is used to gather information on how the teacher educators and student teachers access the web, their web searching skills, the difficulties face by them and the evaluation of the information obtained from the web. The authors in relation to that made a survey instrument. A questionnaire consisting of 6 sub questionnaire was made by the authors. Some sub questionnaire consisted of items on a 4 point Likert scale. Descriptive statistics frequencies, weighted mean, and S.D. analyzed the data collected. The major findings of the study stated that the frequency of Web access and usage was found to be high among the Teacher-educators whereas in the case of Student-teachers was above average.

Rakesh (2005) conducted a study on the relative effectiveness of CAI and CAIPI in learning Trigonometry by English medium students of Standard IX of Baroda City. The objectives of the study were to develop the CAI and study its
effects in mono, diad and triad settings and its relative effectiveness in the three settings and through reactions of the students. The hypotheses of the study were formulated in the null form. The study was conducted in the three sections of Standard IX of Zenith High School, Baroda, dividing each section into two groups- experimental and control. The CAI was developed using Flash-MX, Directors and Corel Draw 11.0 along with the Internet. An achievement test was constructed for administering as pre-test and post-test.

The data were analyzed through mean, SD; un correlated’re’ and ANOVA. No significant difference was found in the mean achievement scores of the groups in mono, diad and triad. No significant difference was found in the mean achievement scores of the experimental group in mono, diad, and triad and control groups, respectively. Significant difference was found in the mean achievement scores of the experimental group in triad and control group. The students were found to have positive reactions towards the developed CAI.

Singh (2005) conducted a study on “Effectiveness of computer Assisted instruction for Teaching Biology”. The objective of the study is to compare the effectiveness of Computer Assisted Instruction (CAI) as compared to lecture method on the topics tissues and cell. Experimental method was used for conducting this study. Pre-test, Post-test, Experimental group and Control group design was used for this study. The sample selected 28 students (14 in Control group and 14 in Experimental group) of class IX by random sampling from the
students studying in Ramanujan Public School. The findings of the study were while Lecture method was more effective than CAI for teaching cell, CAI was more effective than Lecture method for teaching tissues. The gain score of the Experimental group were higher than the gains recorded by the Control group.

b) Studies conducted on Attitude

Out of 56 studies 11 were conducted on Attitude related to the problem of this study are given below.

Mirunalini & Anandan (2012) conducted a Survey Research on Attitude towards ICT among Student-teachers. The present study was intended to find out the opinion on Information and Communication Technologies among Teacher-trainees of Teacher training institutions. The size of the sample in the study was 250 student-teachers which were selected through Random Sampling Technique. The investigators developed tool ‘Attitude on ICT’ which comprises five components in four point rating scale. The Statistical techniques used in this study were Mean, Standard Deviation and ‘t’ test to analyse the data. The major findings of the study were (a) Opinion on ICT among Teacher-trainees was high. (b) No significant difference has been found towards Attitude on ICT among the teacher-trainees of Teacher Training Institution with respect to Gender, Age, Educational Qualification and Nature of Management and (c) It is found that the Female Teacher-trainees have positive Attitude than the Male Teacher trainees in Multimedia component.
Rengarajan & Senthilnathan (2012) conducted a study on Teacher-educators Attitude towards e-learning. The major objective of the study is to assess teacher-educators attitude towards e-learning. The normative study technique has been adopted and 160 teacher-educators from 20 colleges have been chosen as sample through random sampling technique. A standardised questionnaire in five-point scale aimed at the assessment of e-learning attitude was administered. The collected data was analysed through chi-square analysis. The major findings of the study were nearly 55 per cent of the sample felt that e-learning does not make teaching more difficult. More than 23.13% of the teacher-educators have 2 to 4 years experience in computer and only a very few of them 13.13% have less than one year experience in computer. When it comes to the length of experience with the Internet, 25.62% of the teacher-educators who formed the sample had no experience with the Internet. More than 60 percent of the sample held a negative view about e-learning possibility of interaction with students.

Tholappan & Krishnakumar (2011) attempted a Study on Attitude of Higher Secondary Students towards Computer Assisted Instruction. The objectives of the study were to study the level of attitude of higher secondary students towards Computer Assisted Instruction and to study the factors influencing the attitudes of higher secondary students towards Computer Assisted Instruction. The methodology of the study adopted in this study was Survey
Method and the sample was collected from the 300 higher secondary students at +1 level using stratified random sampling technique. The tool employed was Attitude Scale developed by the investigators and the statistical techniques used for the study were Mean, Standard Deviation and ‘t’ test values. The major findings of the study were nearly 16% of students are having high level attitudes towards CAI. Both male and female students are having equal attitude towards CAI. The attitude of students towards CAI who belong to urban residential background was found to be higher than the students with rural background. The attitude of students towards CAI government schools was found to be higher than the students form Aided Schools.

Dakshinamurthy (2010) conducted a study on Effect of Teachers Personality, Attitude towards Profession and Teaching Effectiveness on Academic Achievement of Students. The purpose of this study was to examine the relationship between teacher variables on academic achievement of secondary school students. This study collected data from 150 teachers and 450 students of 68 secondary schools in Karnataka state using questionnaires that were composed of background information related to teacher variable tools like Kundu’s Introversion/Extroversion Inventory (KIEI) (1976), Ahluvalias, Teacher Attitude Inventory (1974) and Deshpande’s Students Ratings of Teaching Effectiveness Scale (2001) and Achievement test was constructed by Investigator for assessment of Academic Achievement of students. A statistical technique employed was
ANOVA. The findings of the study revealed that there is a positive relationship between teacher’s personality, attitude towards profession and teaching effectiveness of secondary school teachers on academic achievement students.

**Gopal (2010)** investigated a study on Attitude on e-learning in Classroom Instruction among the B.Ed. Students at Colleges of Education. The Major objective of the study is to find out the Attitude on e-Learning in Classroom Instruction among the B.Ed. Students at Colleges of Education. The Study belongs to a Survey Research Method. The size of the sample is 360 B.Ed. Students selected through Random Sampling Technique. Investigators developed the tool, ‘Attitude on e-Learning in Classroom Instruction (AECI)’ based on the four components such as Multimedia, Web, Video-Conferencing and Closed Circuit Television (CCTV). The Tool consists of fifty items in Four-point Rating Scale. Mean, Standard deviation, Percentage and ‘t’ test were used for analyzing the data.

The findings revealed that there was no significant difference between the Mean scores of the attitude of B.Ed. students towards e-learning in classroom instruction with respect to Gender and Parental occupation. There is a significant difference between the Mean scores of the attitude of B.Ed. students towards e-learning for classroom instruction with respect to their discipline of the Subject. Further, the Attitude score on e-Learning for Classroom Instruction among the B.Ed. Students was 53.03% which is found to be average. In the case of
component-wise percentage scores, the Web component is higher than the other components.

Joytiprakash Swain & Saroj Tokash (2010) conducted a study of Attitude towards Teaching Profession of Primary School Teachers. The main objectives are to study the teaching attitude of Government and Private Primary school teachers towards teaching profession. The descriptive survey research used for this study and 200 primary school teachers selected from G.B. Nagar district through Simple Random Sampling technique. The tools used for this study was self-made questionnaire for teaching attitude and reliability of the tools was found to be 0.75. The statistical techniques employed in the study were Mean, Median, Mode, Skewness, Kurtosis and ‘t’ test. The findings of the study reveal that there is no significant difference between the attitude of government and private primary school teachers towards their teaching profession. There is no significant difference between the attitude of rural and urban school primary teachers, male and female primary teachers, married and unmarried and having D.Ed. or B.Ed. educational degree towards their teaching profession.

Parvati & Jagadesh (2009) investigated a study on Attitude of Secondary School Teachers’ towards their Teaching Profession. The main aim of this study is to find out the attitude of secondary school teachers towards teaching profession. The methodology of the study was Survey method and Umee Kulsum’s Attitude Scale administered on a random sample of 100 teachers working in secondary
schools. The data was analysed using ‘t’ test. In this study the results found out that the attitude towards teaching profession of secondary school teachers is highly favorable. The teachers working in secondary schools do not differ significantly in their attitude towards teaching profession with respect to gender and type of school.

Muralidharan (2008) conducted to study on Attitude towards e-learning among Post Graduate students of Thanjavur District. Survey Research method was adopted in the study. 250 samples were collected randomly from post graduate students of Thanjavur District. The following are the some of the objectives of the study: a) To find out whether there is any significant difference in the mean scores of attitude towards e-learning among the postgraduate students with respect to their age, sex, year of studying and subject. b) To find out whether there is any significant difference in the mean scores of attitude towards e-learning among the postgraduate students with respect to their residence of the student, locality of the institution and types of management.

The following are the some of the findings of the study; a) the postgraduate students have favorable attitude towards e-learning. b) There is a significant difference between below 23 and above 23 age group of student’s attitude towards e-learning. The above 23 age group of students have more favorable attitude towards e-learning then bellow 23 age group of students. c) There is a significant difference between male and female students attitude towards e-learning. The
male students have more favorable attitude towards e-learning than female students. d) There is a significant difference between I year students and II year student’s attitude towards e-learning. The II year students have more favorable attitude towards e-learning than I year students. e) There is no significant difference between the arts and science student’s attitude towards e-learning. f) There is no significant difference between the rural and urban area students’ attitude towards e-learning. g) There is a significant difference in the attitude towards e-learning of postgraduate students’ towards e-learning on the basis of the locality of the college. The rural area locality college students’ have more favorable attitude towards e-learning than urban area locality college students.’

Narayan Prasad Uniyal & Pandey (2008) made a study on Teachers’ Attitude towards Computer in relation to Sex, Age, Locality and Experience. The objective of the study was to know the level of teacher’s attitude towards the use of computers in secondary schools of Uttarakhand state. To find out the difference, if any between all subject teachers in respect of their acceptability of computers vis-à-vis their sex, locality, age and teaching experience. The survey method was employed. A questionnaire consisting of 5 statement answered ‘yes’ or ‘no’ form was used. The tool was administered on a sample of 70. Percentage analysis was used to find out the results of the study. The findings of the study stated that Teacher’s attitude about availability of computers in their schools is that they are fully equipped, but in case of acceptability and utility of computers they are
sluggish. There is no major difference between male and female teachers of computer education. There is a major difference between the rural and urban teachers attitude in relation to the utility of computers in their classroom teaching. Teachers who are above 40 years and having length of service more than 20 years have more favourable opinions about computer knowledge but they use less computers in classroom teaching their counterparts.

**Dhamija & Panda (2007)** investigated a study on Attitude of Post-graduate Students towards Internet. The major objectives of the study were (i) to study the attitude of the postgraduate students towards Internet; (ii) to compare the attitude of male and female postgraduate students towards the Internet; (iii) to compare the attitude of rural and urban postgraduate students towards the internet; (iv) to compare the attitude of arts and science post-graduate students towards Internet. The survey method was employed in the study. The total sample consists of 200 post-graduate students of Kurukstetra University. The random sampling technique was used. The investigators used a self-prepared questionnaire. Mean, frequency, Distribution, Standard Deviation and ‘t’ test. The findings of the study were Post-graduate students have more favourable attitude towards the Internet. There is no significant difference between the male and female post-graduate students towards the Internet. There is significant difference between the attitude of rural and urban post-graduate students towards the Internet. There is no
significant difference between the attitude of Arts and Science post-graduate students towards the internet.

**Joy (2007)** conducted a study on Usage of Internet: Practices and Attitude of Teacher Trainees. The objectives of the study were to evaluate the self efficacy of computer technologies and Internet use of teacher trainees. To assess their attitude towards Computers, Computer Assisted Instruction (CAI) and use of Internet. To find the correlation between the age of the teacher trainees’ usage of computer, usage of Internet, computer literacy and attitude towards computer usage, Computer Assisted Instruction and Internet Usage. The methodology was Survey method and sample was chosen based on purposive sampling and it consists of 171 B.Ed. students. The tools used in the study were Self efficient questionnaire in CAI and Internet, Attitude towards computer, CAI and Internet scale and Basic information schedule. The findings of the results shows that among the total sample of 171, 69% had acceded computer, 9.3% accessed at home, 9.9% at college and 29% at computer centre and 4.1% had used the computer at all above places. On the other hand 31% had not at all accessed computers. Among those who had used computer at the time of study 7.6% used computer all days, 13.45% used once in a week, 12.28% used once in a month and 16.37% used once in three months, during one year period.

c) **Studies conducted on Anxiety**

Out of 56 studies, 04 were conducted on Anxiety which were presented briefly below.
Shaheen Perveen (2012) investigated to study the Anxiety Level and its Relationship with Academic Achievement of High School Students. The major objective of the study was to find out relationship between anxiety level and academic achievement of IX standard students. The present study follows Normative Survey Method and stratified random sampling method used to select 400 students of class IX from English medium schools of Aurangabad city as sample. The following tools were used (i) An standardised anxiety scale constructed by D.N. Srivastasva & Dr. Govind Tiwari and (ii) School Records for academic achievement. Statistical techniques used for the study for Pearson's product moment correlation technique and ‘t’ test. The result showed that there is significant co-relation between anxiety and academic achievement and there is insignificant difference between anxiety levels of CBSC & State board students.

Merline Preetha & Francisa (2011) investigated a study on Teaching Competency of College Teachers in relation to their Anxiety. The objectives of the study were to find out significant difference if any between college teachers in teaching competency in respect of Gender, Age, Type of Institution and Domicile of the Institution. To find out significant difference if any between college teachers in anxiety in respect of different variables in the study. The method of the study was survey technique and 310 teachers from ten colleges as samples were selected through random sampling technique. The tools used for the study were Personal Data Sheet, Teaching Competency Scale developed and validated by the
investigators and Anxiety Inventory Scale. Statistical techniques such as ‘t’ test and Karl Pearson’s Product Moment Correlation were adopted to analyse the data. The major findings of the study were college teachers do not significantly differ in teaching competency and its dimensions with respect to age. Comparing the mean scores, the teachers of rural colleges are more competent than the teachers of urban colleges. The teachers 41 and above in age, teachers of Autonomous colleges and teachers of Urban colleges have more anxiety than their counterparts. There is no significant correlation between teaching competency and anxiety of college teachers.

Selvaraju & Pazhanivelu (2011) conducted a study on Impact of Anxiety on Academic Achievement among the Higher Secondary Students – A Gender Wise Analysis. This study is intended to find out the impact of anxiety on academic achievement among the male and female higher secondary students. The investigators used the descriptive survey method. 794 higher secondary students have been selected randomly from Tirunelveli, Thoothukkuddy and Kanyakumari Districts. The tool adopted for this study was Anxiety Scale developed by Manjurani Agarwal (1979). Statistical techniques such as Mean, Standard Deviation and ‘t’ test were used. The major findings of the study were 14.1% of the higher secondary students have high level of anxiety and 17.9% have high level of academic achievement. In the case of gender-wise 17.7% and 19.2% of male higher secondary students and 14.4% and 18.3% of female higher secondary
students have high level of Anxiety and Academic Achievement. There is no significant difference between male and female higher secondary students in their anxiety. But there is a significant difference between male and female higher secondary students in their academic achievement. There is a significant relationship between anxiety and academic achievement for the whole sample and for female students but for male students there is no significant relationship between anxiety and academic achievement.

Parvathamma & Sharanamma (2010) conducted a study on Anxiety Level and Level of Self-confidence and their Relation with Academic Achievement. The objectives of the study was as follows; to find out the relation between Anxiety level and level of Academic Achievement of IX standard students; to find out relation between level of Self-Confidence and level of Academic Achievement of IX standard students; to find out the difference between Anxiety level of Boy and Girl students; to find out the difference between level of Self-confidence of Boy and Girl students. The methodology of the study was Survey method and totally 300 students were selected as samples by randomly selecting 50 students from each school. The tools used for the study were Self-Confidence Checklish (M. Basavanna), Anxiety Scale (D.N. Srivastasva and Govind Tiwari) and school records for Academic Achievement.

The statistical techniques used for the study were ‘t’ test and Pearson’s product moment correlation technique. The major findings revealed that there is
significant co-relation between Anxiety and Academic Achievement; there is a significant co-relation between Self-confidence and Academic Achievement; there is a significant difference between Anxiety level of Boys and Girls and there is a significant difference between Self-confidence levels of Boys and Girls.

2.2.2 Studies Conducted in Abroad

The investigator has identified 28 Studies which were conducted Abroad. Out of these, the studies conducted in ICT, Attitude and Anxiety were 20, 04 and 04 respectively. The brief summary of the studies are presented below.

a) Studies conducted on ICT

Out of identified 28 studies conducted Abroad, 20 studies related to ICT for the present study were given briefly below.

Jacobson Barineka bina, Obomanu & Baribor Vikoo (2011) conducted a study on Utilization of Information and Communication Technology for Quality Instruction in Rivers State University of Education Port Harcourt: An Assessment. The study was guided by the following research questions: i. To what extent do lecturers utilize Information and Communication Technology (ICT) in enhancing instruction? ii. Which of the ICT facilities are mostly utilized by the lecturers in their instruction? The design adopted for the study was descriptive. A sample of 207 was drawn from the population through stratified random sampling technique. The data collected for the study were analyzed using mean. The results show that very few of the lecturers utilize ICT facilities in their instruction.
Abbas Zare-Ee & Abbas Shekarey (2010) conducted a study on Comparative Study of the Use of ICT in English Teaching-Learning Processes. The present study was conducted to compare the amount and quality of ICT use in English teaching-learning processes among the faculty members of Medical and Non-medical Universities in Kashan, Iran and to explore the dimensions in which the two groups can benefit from one another and from ICT training in this respect.

Out of a total of 255 full-time university teachers teaching at medical and non-medical universities in the region, 193 were chosen to participate in the study using a simple random sampling technique and the Morgan & Kritjki table for sample selection. A researcher-made 5-point Likert scale questionnaire containing 50 items was used to collect the necessary data on the amount of access and use ICT in the two environments. The Chronbach Alfa reliability for this instrument was shown to be 0.8. To answer the research questions, t-test and the analysis of variance were used and the differences in ICT use for learning and teaching were analyzed.

The results of the analyses showed that there was a significant difference in the amount of ICT use among the faculty members of medical and non-medical universities. For reason considered in length, teachers at medical universities used ICT significantly less than the other group. Results also indicated that there was a significant difference between the two types of universities with regard to the availability of computers and the amount of ICT training and use. No significant
effects on the use of ICT in education were observed for age, teaching experience, and university degree. University teachers with different fields of study showed significant differences only in non-medical universities. Based on the findings of the study suggestions are made for the improvement of teaching and learning activities through the use of ICT.

The study conducted by Cher Ping Lim David Hang (2010) on the topic “An activity theory approach to research of ICT integration in Singapore schools” were analysed on the 783 educators of five Vietnamese teacher education institutions by a questionnaire. This analysis illuminated teacher educators’ access to ICT, their intensity of use, their related skills, and their confidence in using ICT, as well as their conceptions of learning. Exploratory multiple regression analysis addresses the importance of these different factors at the level of the educator for use of ICT in teaching practice. Even though teacher educators adhere to a constructivist approach to student learning, the use of ICT applications in teaching practice remains limited, mostly replacing traditional teaching practices. The factors currently determining the use of ICT in teaching practice are ICT skills and computer confidence. Suggestions were provided for the country to move beyond an access and skills based approach of integration of ICT in education and for emerging developing countries to cease the promise of ICT for education.

David (2010) conducted a study on Assessment of English Language Teachers’ Knowledge and Use of Information and Communication Technology
(ICT) in Ibadan Southwest Local Government of Oyo State. The study aimed at finding out how knowledgeable teachers of English are about ICT and to what extent they use it in English language instruction. Attempt was made to provide answers to four Research Questions using survey research design. The participants were 94 English Language teachers from 30 randomly selected senior secondary schools in Ibadan Southwest Local Government of Oyo State. A self-designed questionnaire was used to collect pertinent data which were analyzed using frequency counts, simple percentage and t-test. Findings revealed that the level of knowledge of ICT possessed by English Language teachers was poor and as such, they rarely use ICT in English Language instruction. It was also found that there was significant difference in the male and female teachers’ knowledge of ICT with the males demonstrating a higher level of knowledge than their female counterparts.

Sunday (2010) investigated a study on the Impact of Information and Communication Technology (ICT) On Teaching and Learning of Physics. This study investigated the extent of the impact of ICT on teaching and learning of physics and found out whether students were taught physics with the use of ICT materials such as computer system, internet facilities, projectile, video player etc performed better than those taught with textbook only. The descriptive survey design was adopted for this study. The samples for this study were selected through stratified random sampling technique across the five educational districts
which include 200 students and 20 teachers. Data were collected using two basic instruments namely: Information and Communication Technology Impact on Teaching (ICTIT) and Learning Questionnaire (LQ) which was analyzed using statistical techniques such as Simple percentages and Chi – Square. The research findings indicated that ICT have great impact on teaching and learning of physics. Also the introduction of ICT makes learning of physics so interesting for the students.

Bee Theng Lau & Chia Hua Sim (2008) conducted a study on Exploring the Extent of ICT Adoption among Secondary School Teachers in Malaysia. Hence, the aims of the study were to describe the level of ICT use by teachers among schools in Malaysia. To determine teachers’ perceived competency and perception of ICTs. To describe the obstacles faced by teachers in ICT use and to identify teachers’ training and support need. A survey was conducted to collect both quantitative and qualitative data on ICT adoption of teachers’ in schools. The instrument used was a self-administered questionnaire consists of six sections. The questionnaires were randomly distributed to some 250 secondary schools teachers of Mathematics and Science. A total of 212 completed questionnaires were received and data were analysed using SPSS version 15. From the study, it appears that most of them are positive with the use of ICT use in school, and they appreciate the use of ICT in enhancing teaching and learning. Result also showed that they are positive towards further integration of technology into classroom
training. Training therefore, should be offered to teachers on a continuous, rather than a one-off, basis so that their IT knowledge is upgraded over time.

In one of the studies conducted by **Littlejohn, et. al. (2008)** on Characterizing Effective e-Learning Resources summarized that the widespread availability of digital learning resources in a variety of media formats offers the possibility to make a profound difference in education. This potential has not been fully realized for range of interrelated reasons. In this paper we study the key characteristics of learning resources that have proved effective in changing learning and teaching, and relate them to existing frameworks for understanding resources. We outline the relationships between resources, their users, and the way they are used, and explore issues that influence practitioners in choosing a particular resource. Our study is based on a review of resources for e-Learning and chemistry in post-compulsory education, undertaken for the UK Joint Information Systems Committees (JISC), as part of a wider study examining the Effectiveness of Resources, Tools and Support Services used by Tutors in Designing and Delivering E-Learning Activities.

**Maria (2008)** conducted a study on the “Use of ICT by ELT students in a Mexican University”. The results showed that in general the participants used ICT tools for academic purposes although some training may be necessary. In terms of frequency of use, some differences were observed among some tool types. Also the participants reported using several functions offered by every single ICT tool.
Van Rosmalen, et. al. (2008) revealed the fact that the introduction of e-Learning often leads to an increase in the time staff spends on tutoring. To alleviate the workload of staff tutors, we developed a model for organizing and supporting learner-related interactions in e-Learning systems. It makes use of the knowledge and experience of peers and builds on the assumption those lifelong learners, when instructed and assisted carefully, should be able to assist each other. The model operates at two levels. At level 1, prospective peer tutors are identified, based on a combination of workload and competency indicators. At level 2, the thus identified prospective peer tutors become the actual tutors; this is performed by empowering them with tools and guidelines for the task at hand. The article will situate the model in networks for lifelong learning. For one kind of interactions, answering content-related questions, we will review a set of existing approaches and emerging technologies and describe our model. Finally, we will describe and discuss the results of a simulation of a prototype of the model and discuss to what extent it matches our requirements.

Yasemin Gulbahar & Ismail Guven (2008) conducted a Survey research on ICT Usage and the Perceptions of Social Studies Teachers in Turkey. This research study sheds light on the use of ICT tools in primary schools in the social studies subject area, by considering various variables which affect the success of the implementation of the use of these tools. Convenience sampling was used to reach the participants in this study. The participants for this study were 326 social
studies teachers from fourth and fifth grade of various primary schools, who voluntarily participated in the study. The results showed that although teachers are willing to use ICT resources and are aware of the existing potential, they are facing problems in relation to accessibility to ICT resources and lack of in-service training opportunities.

Martin Valcke. et. al. (2007) conducted a evaluation study on “ICT teacher training: Evaluation of the curriculum and training approach in Flanders” By stratified sampling 100 schools was selected and the principal and ICT co-ordinator was interviewed. The questions are related to Technical ICT-skills Educational use of office packages, Working with multimedia, Development and management of a website, Determining and solving technical ICT-problems, Knowledge of ICT policy of Ministry, Selection and evaluation of educational software, Integration educational software in teaching practice, Internet-use in the classroom, Educational use of ICT for specific subjects, E-learning (on-line, distance teaching), Organisational level Developing ICT school policy, Planning and organisation integrated ICT-use in the Classroom. The results indicate that ICT school policies are not well developed and reveal a partial match between policies, needs, and the actual in-service training. Innovative applications of ICT are not promoted. The supply-driven approach, the school-based nature, and follow-up activities are questioned.
Traci (2007) carried out an investigation into the Comparative Effectiveness of Web-Based and Classroom Instruction: A Meta-Analysis. Method: Meta-analytic techniques were used to examine the effectiveness of Web-based instruction (WBI) relative to classroom instruction (CI) and to examine moderators of the comparative effectiveness of the two delivery media. Findings: Overall the results indicate WBI is 60% more effective than CI for teaching declarative knowledge, the two delivery media are equally effective for teaching procedural knowledge, and trainees are equally satisfied with WBI and CI. However, WBI and CI were equally effective for teaching declarative knowledge when the same instructional methods were used to deliver the two courses, suggesting media effects are spurious and supporting Clark’s (1983, 1994) theory. Finally, WBI was 14% more effective than CI for teaching declarative knowledge when trainees were provided with control during WBI and in long training courses. Study limitations and directions for future research are discussed.

Bassoppo & Temba (2006) conducted a study on Evaluating e-Learning: A Front-end Process and Post Hoc Approach. The study examines e-Learning from three related perspectives i.e. Current and recommended front-end approaches to improving online instruction; The planning, implementation and administration of online courses and the reliable and valid approaches to online measurement and testing methods that are designed to eliminate such problems as plagiarism, technical problems associated with access, matching learners' and
instructors' technical skill levels, learner isolation, and the impersonality of computerized assessment. The study also examines how instructors and instructional designers can maximize control over assessment conditions, and yet at the same time increase online instruments validity and reliability and address issues that are administrative in nature. Future cutting edge assessment of learning outcomes techniques are discussed in regard to how they may affect online, instructional design and technology application strategies. The second part of this paper examines the assessment and evaluation of learning outcomes in an e-Learning environment.

Nwachukwu Prince Ololube (2006) conducted a study on The Impact of Professional and Non-professional Teachers’ ICT Competencies in Secondary Schools in Nigeria. The objectives of the study to identify and evaluate the relevant strategies professional and non-professional ICT instructional material utilization competencies play in stimulating students’ academic achievement during and after instruction. The population comprises of 10 (3.3%) principals, subject heads and teachers 270 (90%) from ten (10) randomly selected secondary schools, as well as supervisors 20 (6.7%) from the Ministry of Education and Post Primary Schools Board. Out of the total number of respondents 76 (25.3%) were academically qualified, while 224 (74.7%) were professionally qualified. See figure 1 for the rest of the respondents’ background information. Four-point likert-type scale (summatated) of (4 = strongly agree; 3 = agree; 2 = disagree; and 1 =
strongly disagree), which allows them to rate their perception on possible ICT material utilization competencies used as tool for this study.

The statistical techniques used for the study are Mean and Standard Deviation, ANOVA and T-test of significance. The results of the findings points out that variety of techniques are needed for teachers to effectively utilize ICT instructional materials in the teaching and learning processes. The findings also revealed that there are significant differences in the effectiveness between professionally trained teachers and untrained teachers in their ICT instructional material utilization competencies.

**Whitely Michael (2006)** conducted study in the impact of multimedia learning on student’s perceptions of cross-community initiatives, future orientation regarding peace and social distance between groups (Northern Ireland). The Instructional Multimedia Presentations and Cooperative Technology (IMPACT) conference was created, in part, to challenge these findings through the monitoring of cognition, future orientation, and social distance of the attending students. A total of 522 fifth grade students participated in the study from the Northeastern Board of Education in Northern Ireland. The study utilized the Solomon four group research designs. Schools participating in this research were selected through a stratified random sampling procedure and included 12 Catholic and Protestant schools. The study found significant effects of the IMPACT conference on participants in the areas of cross-community cognition and future orientation. No significant effect was found in the factor of social distance.
Willem, et. al. (2006) conducted a study on “Evaluation of a Media Literacy course at the University of Barcelona”. It focuses on some aspects of Self-Regulation and on the learning environment used by students. The students' learning processes were embedded in an e-Learning project, in which students analyzed the representation of immigrants and ethnic minorities in the media. Key findings are the usefulness of this particular Technology-Enhanced Learning Environment (TELE), and its specific settings regarding Self-Regulated Learning (SRL). Students self-regulated their learning processes, in that they were working in a blended learning environment. However, their acquired media literacy skills seem to be fostered by the TELE rather than by the self-regulation mechanisms. Throughout the article, special attention is paid to the conceptual framework of digital and media literacy and the specific competences related to them.

Challis & Di (2005) discusses the advances in computer based technologies and the emergence of e-Learning, there are unprecedented opportunities to reconsider assessment of learning (and, axiomatically, of teaching) and how this can be undertaken. One approach is adaptive assessment. Although it has existed in the tertiary environment since the time of the oral examination, advanced technologies allow much fuller exploitation of the possibilities inherent in a dynamic system of testing that responds to the user. Having described the characteristics of adaptive assessment, this paper considers how it can achieve significant pedagogical aims within the sector. The paper
differentiates between adaptive assessment to assist learning and adaptive assessment to assess achievement. How adaptive assessment can be put in place and salient issues, such as security and system integrity, when such assessment is used for credit, are then discussed. The paper concludes that the capability exists but it has yet to be exploited within higher education as a viable approach to assessment and as a contributor to quality learning.

**Sari Juntunen, et. al. (2005)** conducted a study to find out the reaction of the teachers who participated in the ICT programmes and concluded that the use of ICT was considered as a matter related to maintaining and development of teachers’ knowledge and skills. Teachers expressed their willingness and need to continuous practice and use of the learned skill. They expressed a great interest to take part in the further training as long as it would be possible to arrange for the time and the other resources needed.

**Muhammad, et. al. (2004)** made a study on “The impact of information and communication technology (ICT) on the management practices of Malaysian Smart Schools” The size of the sample was 36. The questionnaire used for this study was the ‘School Management Team Questionnaire’ developed and validated by the authors. It was designed to be answered by the school principals or senior assistants of the schools that participated in the SSPP. The questionnaire was consist the current ICT used in the management of the school, impact of ICT on the management of the school, Smart Schools impact on the school management,
Respondents’ demographics, the ICT status of the school. The analysis revealed that the impact has resulted in changes that include the enrichment of the ICT culture among students and teachers, more efficient student and teacher administration, better accessibility to information and a higher utilization of school resources. This analysis also revealed that time constraints, higher administrative costs, negative acceptance/support from some untrained staff, abuse of the ICT facilities and problems related to the imposed rigid procedural requirements are among the challenges encountered by the schools.

**Uys & Philip (2004)** analyze and suggest possible technological innovation strategies in higher educational institutions in Africa. The paper describes management issues in the implementation of e-Learning with particular reference to its usage in higher education abroad and in Africa, and also suggests appropriate approaches for technological innovation of higher education in Africa. The major findings of the paper, which are based on three case studies, suggest that e-Learning needs to be implemented within a strategically developed framework based on a clear and unified vision and a central educational rationale. The findings further highlight the importance of using a combination of strategies--top-down, bottom-up and inside-out--during the diffusion process to attain coherence, collegiality and ownership. The process of technological transformation is not a smooth translation process but one of dislocations, dilemmas and uncertainties and
it is an art to effect change and sustainable technological transformation since 
people are central to this transformation process.

b) Studies conducted on Attitude

Out of identified 28 studies conducted Abroad, 04 were conducted on 
Attitude. The brief summary of the studies are given below.

Mudasiru & Modupe (2011) made a study on Student-teachers’ 
Competence and Attitude towards Information and Communication Technology: 
A Case Study in a Nigerian University. The main purpose of this study was to 
investigate the competence and attitude of student teachers towards information 
and communication technology. The participants were 382 student-teachers 
randomly sampled from the five departments of the Faculty of Education, 
University of Ilorin, Ilorin, Kwara State, Nigeria. The students were undergraduate 
student-teachers enrolled in the concurrent teacher education programmes. The 
data collected through a questionnaire were analysed using percentages, means, 
and chi-square statistics.

Findings revealed that majority of the student-teachers have positive 
attitude towards the use of ICT and they are competent in the use of few basic ICT 
tools. Overall, no significant difference was established between male and female 
student-teachers attitudes and use of ICT. The implication is that the student-
teachers lacked the necessary competence in the full integration of ICT in the
curriculum. This underscores the need to improve the ICT contents of teacher education programs in universities in developing nations.

Naser Jamil Al-Zaidiyeen, Leong Lai Mei & Fong Soon Fook (2010) investigated a study on Teachers’ Attitudes and Levels of Technology Use in Classrooms: The Case of Jordan Schools. It investigates the level of ICT use for educational purposes by teachers in Jordanian rural secondary schools. In this study, a survey was employed to collect data. Two separate questionnaires were used in this study, namely Technology Level of Use developed by Isleem (2003) and Teacher Attitudes towards ICT Scale developed by Albirin (2006). Questionnaire was distributed to 650 teachers in Jordan, randomly selected. Four hundred sixty teachers responded to the questionnaire. The statistical techniques employed in this study were Mean, S.D. and Pearson's correlation coefficients

The survey included questions concerning the level of ICT use as well as questions related to the attitudes of teachers towards the use of ICT. The findings of the study, which were obtained by analyzing the data collected from the teachers revealed that, teachers had a low level of ICT use for educational purpose, teachers hold 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.
Bulent Cavas, Pınar Cavas, Bahar Karaoglan and Tarik Kisla (2009) conducted a survey research Study on Science Teachers' Attitudes Toward Information and Communication Technologies in Education. The main aim of this study was to find out Turkish primary science teachers’ attitudes toward ICT in education and then explore the relationship between teachers’ attitudes and other variables which are related to teachers’ personal characteristics: gender, age, computer ownership at home and computer experience. Stratified sampling was used to obtain data from 1071 science teachers of primary. In order to collect data, an instrument Science Teachers’ Attitudes toward ICT in Education (STATICTE) scale with 31 Likert-type items was developed by researchers. Parametric statistics like ANOVA and t-test pair-wise comparison were conducted to analyze any differences between teachers’ attitudes and other dependent variables. The results indicate that Turkish science teachers have positive attitudes toward ICT and although teachers’ attitudes toward ICT do not differ regarding gender, it differs regarding age, computer ownership at home and computer experience.

Philip Olu Jegede, Odusola Olutoyin Dibu-Ojerinde and Matthew Olugbenga Ilori (2007) investigated a study on Relationships between ICT competence and attitude among some Nigerian tertiary institution lecturers. The study investigates the relationship between ICT competence and attitude as well as attitudinal constructs of teachers. Four hundred and sixty seven teachers randomly selected from 10 institutions (5 universities and 5 colleges of education)
participated in the study. Information bordering on ICT competence and attitude of the teachers were collected employing two research instruments. These include Computer Competence Scale (CCOS) and Computer Attitude Scale (CAS) is a 21-item five-point Likert scale. The resulting data were analyzed using multiple regressions. Findings revealed that attitude bears significant relationship with and also predicts competence. It was further obtained that two of the five attitude constructs predict competence. It was observed that as teachers perceived computers to be useful in their pedagogical enterprise, the interests become aroused which in turn help their computer skills.

c) Studies conducted on Anxiety

Out of identified 26 studies conducted Abroad, 04 were conducted on Anxiety. The brief summary of the studies are given below.

A study conducted by Rafiu Olatoye (2011) on Levels of participation in ICT training programmes, computer anxiety and ICT utilization among selected professionals aimed to assessed the levels of participation in ICT training programmes, computer anxiety and ICT utilization among professionals in Ogun State Nigeria. A stratified random sample technique was used to select 477 respondents from four different professions in Ogun State, Nigeria namely teaching, broadcasting, medical and banking. Three questionnaires were used in this research. They are Level of Participation in Training Questionnaire (LPTQ), Computer Anxiety Questionnaire (CAQ), and ICT Utilization Questionnaire
Data collected were analyzed using regression analysis, t-test and Pearson product-moment correlation. In this study, the levels of ICT training and ICT Utilisation are highest for bankers with least anxious about computers and lowest for the medical professionals. Also, this study reveals that there is a significant positive relationship between ICT training and utilization. There is no significant difference between male and female professionals in level of ICT training.

Richard Keith Rogers & Wallace (2011) made a study on Predictors of Technology Integration in Education: A Study of Anxiety and Innovativeness in Teacher Preparation. The focus of this study was to determine if there existed significant relationships between the level of computer anxiety, innovativeness, and the level of technology integration in pre-service teachers. The study used convenience sampling to select 201 undergraduate education majors at a small southwest private university. The statistical measures used in the study were Mean, S.D. and Correlation co-efficients. Significant relationships were found between computer anxiety, innovativeness, and technology integration. While anxiety was generally reported low across the board, all-level certification seekers had higher computer anxiety than other levels of certification. No significant differences were found between certification level and innovativeness. Neither computer anxiety nor innovativeness was significantly different when compared across content area. Gender delineated scores did not show any significant differences regarding innovativeness or anxiety.
Alaba Olaoluwakotansibe Agbatogun (2010) conducted a study on Self-concept, Computer Anxiety, Gender and Attitude towards Interactive Computer Technologies: A predictive study among Nigerian teachers. This study examined the relative and combined contributions of computer anxiety, self-concept and gender to teachers’ attitude towards the use of ICTs. The study adopted a descriptive survey research design. 454 Nigerian teachers constituted the samples which were selected through simple random sampling method. Three instruments were used to collect the data analysed with Pearson Product Moment Correlation, Multiple Regression and Analysis of Variance. The findings revealed that the combination of the three independent variables significantly predicted the independent variable. Gender did not make any significant contribution to the prediction of the dependent variable.

Hong Kian Sam, Abang Ekhsan Abang Othman and Zaimuarifuddin Shukri Nordin (2005) investigated a study on Computer Self-Efficacy, Computer Anxiety, and Attitudes toward the Internet: A Study among Undergraduates in Unimas. This survey research investigated undergraduates’ computer anxiety, computer self-efficacy, and reported use of and attitudes toward the Internet. This study employed a survey research design and the subjects for this study were 148 undergraduates at Universiti Malaysia Sarawak (Unimas). A questionnaire was used to collect data for this study. The questionnaire was divided into five sections. Data analyses were carried out with the Statistical Packages for Social
Sciences using frequencies, percentages, cross-tabulations and chi-square tests, t-tests, One-Way ANOVAs and Pearson’s correlations. The findings suggest that the undergraduates had moderate computer anxiousness, medium attitudes toward the Internet, and high computer self-efficacy and used the Internet extensively for educational purposes such as doing research, downloading electronic resources and e-mail communications.

2.3 ANALOGY OF THE STUDIES

The investigator has identified Fifty-Six studies conducted in India related to the topic and Twenty-Eight studies conducted abroad. Majority of the studies belonged to Survey Research Design method. Most of the reviewed studies analyzed the effect of Utilisation of Information Communication Technologies in the Classroom Instruction.

In almost all the above studies, Random Sampling Technique was followed in the collection of data and the size of the selected samples ranges from 20 to 1988 samples. In majority of the studies, the Questionnaire in Rating Scale developed by the investigator was used as a tool to measure the influence of Information and Communication Technologies in Classroom Instruction. In few studies, Interview scales, Achievement Test, Criterion Referenced Test, Attitude scale, Anxiety Scale, Software Packages, e-content developed by the Investigator were used as tools. All the reviewed studies were related to Information Communication Technologies (ICT), e-learning, Multimedia Approach, Computer
Aided Instruction/ Assisted Instruction, Video Assisted Instruction, Attitude and Anxiety which are appropriate for the present study. Mean, Standard Deviation, and ‘t’ test were the Statistical Technique followed in the majority of the studies. Other Statistical Techniques used in some of the studies were ANOVA, ANCOVA, Pearson Product Moment Correlation, Chi-square, Percentage Analysis, Critical Ratio and Multiple Regression.

The findings of the various studies conducted in India revealed that Influence of Information Communication Technological components such as the Computer Aided Instruction, Video Assisted Instruction, Net Based Instruction, Multimedia packages and e-content development showed positive sign on the performance in the Teaching-learning process. In the case experimental study, Achievement scores of the Experimental group showed higher value than Control group. In a Survey type of research study conducted by Dodia (2012) on the Use of ICT: Required Competency for Teachers, indicated that most of the ICT competencies are required to develop in Teacher-educators. A study conducted by Rajandran (2011) on Teachers’ views on Application of Information Technology in Teaching University students indicated that majority of the teachers expressed their views to make use of digital resources. In another study conducted by Anandan & Venkateswaran (2011) on Awareness towards Computer Education among Elementary Teacher Trainees revealed that the Teacher Trainees have more awareness towards Computer Education. In another study conducted by Ajatha
Swamy (2010) on Internet Awareness and Competence among High School Students and Teachers stated that Mahiti Sindhu Project has significantly enhanced the awareness and competence to use Internet among high school students and Teachers who involved in the project. Similar findings were found in the studies conducted by Anandakumar & Anandan (2010); Neeraj Kaushik and Anita Sharma (2010); Noushad Husain (2010); Rajalaksmi & Anandan (2010); Siddique & Abraham (2010); Rafeedali (2009); Azim Premji Foundation and Vidya Bhawan Society (2008) and so on.

In the case of Experimental study conducted on Effectiveness of Computer Integrated Method, the results revealed that there is significant difference in Achievement scores between Computer Integrated Method and Traditonal Method, Jebamalar Anna Jothi (2012). Similar results were found in the related studies of Tholappan & Krishna Kumar (2012); Doddamani Giriyappa Channabasappa (2011); Thiyagu (2006); Dharshana (2005) and Singh (2005). In the experimental study conducted by Leela Gnanalet & Ramaakrishnan (2010) on the Effectiveness of Multimedia Programme in Teaching Enviromental Education found that there is significant difference between the experimental and control group in the post-test mean scores. Similar results were found in the studies conducted by Harendra Singh & Mishra (2009); Nimavathi & Gnanadevan (2009); Subhashini (2009); Jebaraj & Mohansundaram (2008), Amutha (2007) and so on.
The Investigator identified some of the studies related to Attitude and Anxiety. The study on Attitude towards ICT among Student-teachers conducted by Mirunalini & Anandan (2012) has revealed that opinion on ICT among Student-teachers was high. Similar findings were found in Muralidharan (2008) and Dhamija & Panda (2007). It is contradictory to the results found in the study of Gopal (2010) which stated average among the Student-teachers on e-learning. Regarding the study conducted on Teachers Attitude revealed that there is a positive relationship between teacher’s personality, attitude towards profession and teaching effectiveness of secondary school teachers on academic achievement students, Dakshinamurthy (2010). Similar results were found in Narayan Prasad Uniyal and Pandey (2008) and Joy (2007). From the studies related to the Anxiety conducted by Shaheen Perveen (2012) showed that there is significant co-relation between anxiety and academic achievement. The similar findings were found in Selvaraju & Pazhanivelu (2011) and Parvathamma & Sharanamma (2010).

From the analysis of studies conducted abroad, the results of all the studies were in support of utilisation of Information Communication Technologies, Teaching Attitude and Anxiety. The study investigated by Jacobson Barineka Bina, Obomanu & Baribor Vikoo (2011) on Utilization of Information and Communication Technology for Quality Instruction I Rivers State University of Education Port Harcourt: An Assessment stated that very few lecturers utilise ICT
facilities in their Instruction. This is contradictory to the results obtained by Bee Theng Lau & Chia Hua Sim (2008) states that most of the teachers are positive with the use of ICT in school and they appreciate use of ICT in enhancing teaching and learning. In another study investigated by Sunday (2010) on the Impact of Information and Communication Technology (ICT) on Teaching and Learning of Physics found out that ICT have great impact on Teaching and learning Physics. Similar results were found in the studies of Nwachukwu Prince Ololube (2006); Whitely Michael (2006); Willem, et.al. (2006) and Sari Juntunen, et.al. (2005).

The study related to Teachers’ Attitude conducted by Naser Jamil Al-Zaidiyeen, Leong Lai Mei & Fong Soon Fook (2010) on Teachers’ Attitudes and Levels of Technology Use in Classrooms revealed that the teachers hold positive attitude towards the use of ICT. Similar result was found out in the case of study conducted by Bulent Cavas, Pinar Cavas, Bahar Karaoglan and Tarik Kisla (2009). However, this result is contracdictory to the study conducted by Rengarajan & Senthilnathan (2012) on Teacher-educators towards e-learning. On the study related to the Anxiety conducted by Richard Keith Rogers & Wallace (2011) on Predictors of Technology Integration in Education: A Study of Anxiety and Innovativeness in Teacher preparation indicated that the significant relationships were found between Computer Anxiety, Innovativeness and Technology Integration.
On the review of the above research abstracts, the investigator got an idea on the previous researches conducted in the field of his research topic. No doubt, many of the researchers clarified and verified common myths and beliefs about factors related to Utilisation of Information and Communication Technology in Classroom Instruction. The review of related literature helped the researcher from the methodological point of view. In addition, the review of the studies helped to get needed theoretical background to the investigator pertaining to the objectives of the study different sampling techniques development of tool, procedures of data collection and salient finding arrived in the researchers conducted by the predecessors. The Investigator could get a clear idea on Tool development, Data gathering technique and appropriate Statistical Techniques to be followed for his study etc. This analysis had paved way for the investigator to proceed successfully without any repetition or duplication.

The following Chapter deals with the Methodology of the present study.