CHAPTER - II

RELATED LITERATURE – A REVIEW

2.0 INTRODUCTION

Review of related literature is one of the significant aspects of research. It enables the researcher to know the amount of work done in the concerned area. It also helps to explore the need of research in unknown and unexplored areas It is necessary that the researcher is aware of the knowledge generated and the ongoing process of knowledge generation in an area of research for the better clarity of the problems in that area of research. The review of related literature can help a lot to the researcher in this aspect. It also helps to through an insight into the methodological aspects of research in a specific area and issues related to methodological aspects of it. For any researcher, review of related literature forms the basis for the problem identification, helps to find ways and means of studying problem, methods used in studying problems, tools used to collect data and the ways of analyzing data to arrive at a solution. In a nut shell it helps the researcher to arrive at the proper perspective of the study. In the present study the researcher had gone through review of related literature in the area of his study. In the present chapter the researcher had presented some of the reviews of related literature in a summarized form those are related to the present study.

2.1 REVIEW OF RELATED STUDIES

In the present chapter, few studies have been reviewed in the area of Computer Education and those are presented under two categories viz. (i) studies conducted in India and (ii) studies conducted abroad.

2.1.1 Studies Conducted in India

An attempt has been made here to present the review of some of the related literatures in Computer Education conducted in India which helped the researcher to provide a sound background to the present study.

A study was conducted by **Saivji (1986)** entitled "A Status Assessment of Computer Literacy and Studies in School (CLASS) Project in Baroda". The objectives of the study were: (i) to study the organization of the CLASS project with reference to the resource centres and participating schools in Baroda, (ii) to study the functioning of the resource centres and the schools in Baroda, (iii) to assess the effectiveness of the CLASS programme on the basis of the perception of resource centre personnel, principals, teachers and students involved in the CLASS Project. The sample of the study consists of two units of resource centers and six schools of Baroda. Thirty students were selected as the sample of the research on the basis of an aptitude test. The data were collected with the help of interview, observation, and questionnaire and information schedule. Major findings of the study were as follows. Computer awareness programme would take some more years for the fulfillment of its objectives. Teachers and students were engaged. But teachers were not having positive attitude towards the project as they felt, that it was an extra load to their work. Principals felt alien to computers and were not much involved with the project activities as they were not provided with proper information about the project. Neither students nor teachers were able to see computer classes as an integral part of the general curriculum. Regarding the extent of achieving the objectives of the CLASS project, the achievement was found to be at minimum.

A study was conducted by **Indian Space Research Organization (ISRO) (1990)** entitled "The Evaluation of the CLASS Project" with the main objective to evaluate the CLASS project. Under this study, ISRO covered the 51 CLASS project schools spread all over India. Findings of the study were as follow. None of the 51 schools could provide 30 hours of theory and 60 hours of practical to the computer students. There were only two computer terminals per school for practical thereby limiting the operational time for each student. On an average only thirty eight students were selected for computer class in each school, and a batch of twenty students could use two computer terminals once in a month or maximum twice in a month. Students who had not been selected for the project found to be very much interested in learning computer. Most of them were unhappy about being left out. Computer evoked considerable interest among the students during the initial period. But this enthusiasm gradually faded with the passage of time due to insufficient time available for practices. The software packages provided for CLASS project were found to be interesting. The goal of computer demystification was not achieved. Since there were no incentives for teachers in any form, the principals were unable to motivate teachers to devote time for the computer classes. The interpersonal relationship among the principals, computer teachers and other teachers also affected the management of CLASS project. The agency suggested that, keeping the educational policy of the country in view, efforts were required to provide equal opportunity for computer learning of school teachers. It was also found that after the introduction of computers in schools through CLASS project many schools were motivated to start Computer Education in their respective schools.

A study was conducted by **Patadia (1993)** entitled "A Critical Study of Computer Education Imparted by the Schools of Baroda City". The objectives of the study were: (i) listing the objectives of teaching Computer Education as decided by the schools in Baroda city, (ii) to evaluate the Computer Education syllabus with reference to age and abilities of the students, and (iii) to judge the appropriateness of the content of Computer Education in the light of the objectives of teaching. The sample of the study consisted of 14 school of Baroda city. The major findings of the study were as follows. Most of the schools had sufficient number of computers but time allotted for the Computer Education was not sufficient. Content implemented at elementary level was suitable to the age group of the children but the syllabus was not revised for the higher classes.

A study was conducted by **Sahasrabudhe (1994)** entitled, "A Study of Computer Education in the Secondary School of Baroda City". The objectives of the study were: (i) to study existing status of Computer Education in secondary schools, (ii) to find out organizational problems of Computer Education in secondary schools, and (iii) to identify the perception of teachers and students on integrating computers with classroom teaching. The sample of the study consists of all the teachers and 114 students of 20 school of Baroda city. Information schedule and questionnaire were used for data collection. Major findings of the study were as follows. Most of the principals showed a positive attitude towards Computer Education at secondary level. Many of the principals were eager to make Computer Education compulsory at primary and secondary level of education. Most of the schools kept the periods of the

Computer Education in their daily school time table. In most of the schools Computer Education was privately managed and there were no problems regarding the management of Computer Education in these schools, whereas, schools with CLASS project were facing difficulties regarding management.

A study was conducted by **Mahajan, Arun and Rajiv (1997)** entitled, "Importance of Computer Education at Secondary School Level". The objectives of the study were: (i) to find out the use and the importance of the study of computers at secondary school level, (ii) to find out the necessary or need to study computers for all students at secondary school level, (iii) to find out the interest of boys and girls in learning computers, (iv) to find out the students in depth knowledge of computers, (v) to find out the extent of use of computers in the schools by students, (vi) to find out the availability of adequate text books in the school library and in the market on computers, and (vii) to find out the encouragement given by parents and teachers to students to learn about computers. The sample of the study consists of 30 students of standard IX of English medium schools of the Ambarnath area of Thana district of Maharastra. The data were collected through questionnaire. The major findings of the study were as follows. 77 percent to 100 percent students favour the necessity to study computers at secondary school level. Boys have greater interest to learn about computers by seven percent as compared to girls. 67 percent to 100 percent students possess in-depth knowledge of computers. 70 percent students use the computers in schools. 63 percent to 100 percent students stated that computer textbooks available in the library of the schools and market were adequate. 93 percent to 100 percent students were encouraged by their parents and teachers to learn about computers. There was no difference in the encouragement found given to girls, as compared to boys.

A study was conducted by **Ansari (1998)** entitled "A Study of the Computer Education Imparted in the Secondary Schools of Navsari Block". The objectives of the study were: (i) to study the opinion of the students about the teaching learning process, physical facilities, curriculum, time, evaluation and economic aspects, with reference to Computer Education imparted in the secondary schools of Navsari block, (ii) to study opinions and suggestions of the principals with reference to the Computer Education imparted in the secondary schools of Navsari block, (iii) to study the opinion and suggestions of the computer teachers with reference to the Computer Education imparted in the schools, and (iv) to conduct the comparative study of the rural and urban students' opinion with reference to the Computer Education imparted in the secondary schools of Navsari block. The sample of the study consists of 563 students, seven principals and fourteen computer teachers of seven Gujarati medium schools imparting Computer Education. The data were collected with the help of opinionnaire and interview schedule. The major findings of the study were as follow. Students understand the Computer Education easily. Sufficient numbers of computers were available in the classrooms. Proper importance was not given to the practical examination. Students were satisfied with the Computer Education imparted against the fees charged to them. In general, similar situation was prevailing in the rural and urban area of the Navsari block, regarding Computer Education. Half of the computer teachers were satisfied with the present situation of Computer Education. Principals were found dissatisfied with the present situation of Computer Education because of limited time, high fees, limited computers etc.

A study was conducted by **Matai (1998)** entitled "Difficulties in Computer Literacy felt by Students of Secondary Schools of Surat City: A Survey". The objectives of the study were: (i) to identify the difficulties pertaining to teachers, literature, practical work, language and others with reference to the Computer Education, (ii) to collect the information about social encouragement received by the students for Computer Education, (iii) to collect the information about the importance given to the Computer Education by schools, and (iv) to compare the difficulties felt by male and female students of the secondary schools in Computer Education. The sample of the study consisted of 300 students (150 male and 150 female) of seven schools of Surat city providing Computer Education since last two years. The sample was selected purposively. The data were collected with the help of opinionnaire. The major findings of the study were as follows. Computer teachers were not able to teach this subject effectively. Computer teachers were not prepared to give extra time for the teaching this subject. More than two students were allotted to each computer for practical work. Students were facing difficulties in learning this subject because of the dominance of English language. Fees charged in the schools for this purposes were found to be high. The difficulties regarding the teaching and practical work were found intensive among the students. Very few difficulties were found about the social encouragement. Proper importance was not given to the Computer Education. Male and female students were facing almost same difficulties.

A study was conducted by **Gupte (1999)** entitled, "A Survey of Computer Education in Schools of Baroda City with respect to Infrastructure, Teachers' Qualification and Syllabus". The objectives of the study were: (i) to find out the qualification of computer teachers with respect to basic discipline, knowledge in computers and training in pedagogy, (ii) to find out the utilization of computer infrastructure and personnel for non-instructional purposes, (iii) to find out the extent to which infrastructure and resource facilities are available in schools to teach computers in terms of number of computer teachers, number of computers, networking of computers, maintenance of computers and number of printers, (iv) to find out the time devoted to theory and practical of Computer Education per week per class in schools, and (v) to find out the content and methodology followed for Computer Education in schools. The sample of the study consisted of 31 secondary schools of Baroda city affiliated to GSEB. The data were collected with the help of questionnaire, information schedule, and semi structured interview schedule. The major findings of the study were as follows. All the computer teachers have learned computers from private computer institutions. Only nine percent computer teachers were trained in computer pedagogy. 35 percent schools had only two computers in each school and remaining schools had three to 20 computers. Syllabus of all the schools was not uniform.

A study was conducted by **Gupta (1999)** entitled, "A Study of the Status of Computer Education in Higher Secondary Schools of Baroda City". The main objectives of the study were: (i) to study the status of Computer Education in higher secondary schools of Baroda city with reference to infrastructure facilities, teachers' qualification, areas of use, place of Computer Education in curriculum, sources of funds and managing body of computer departments, and (ii) to study the perception of teachers and students about Computer Education in higher secondary schools of Baroda city. The sample consisted of all the higher secondary schools of Baroda city imparting Computer Education. The data were collected with the help of information schedule, perception scale, and questionnaire. The major findings of the study were as follows In 85 percent schools student computer ratio was 2:1. In most of the schools computer was taught as a subject only. Medium of instruction was English in majority of the schools. Computer subject was given different weightage in time table in different schools. All the schools had separate computer laboratory. Most of the schools had sufficient and adequate stationary and floppy disk. Computers were used for teaching, administration, for preparing study materials, and for admission and evaluation purpose. Number of students with computer subject varied from 42 to 180. Sources of generation of funds in 81 percent schools were fees charged from students and assistance from trust. Evaluation of learning was done through test and ability to carry out functions although the number of tests in this subject varied from two to five in a year.

A study was conducted by **Gujarati (1999)** entitled, "A Study of Difficulties in Teaching and Learning Computer Education in Schools of Gandevi Blocks". The major objectives of the study were: (i) to know the students attitude about the Computer Education, (ii) to collect the information about the curriculum of Computer Education, (iii) to identify the difficulties faced by the students with reference to timing, economic aspects and physical facilities of Computer Education, (iv) to collect information about the examination pattern of the Computer Education, (v) to know the appointment procedure of the computer teachers and their training, (vi) to collect the information about the difficulties faced by the computer teachers in teaching this subject, and (vii) to know about the work load of teachers, available physical facilities and the co-operation given by the management to the computer teachers. From eight schools imparting Computer Education, 200 students of standard IX (91 male and 100 female with computer subject) were randomly selected as the sample of the study. All the fifteen computer teachers of these schools were also included in the sample. The data were collected with the help of opinionnaire and questionnaire (both for teacher and students). The major findings of the study were as follows. Students were interested in Computer Education. Students were of the opinion that more time should be allotted for Computer Education. Students were dissatisfied with the method of teaching adopted by the computer teachers. Computer Education was not affordable by the students as the fee was very high. Very few computers were available in the schools for practical. In general, students were found satisfied with the Computer Education. Computer teachers were appointed by the computer company. Computer teachers were not being sent for the training from the schools. Computer teachers could not teach the curriculum satisfactorily because of lack of time and infrastructure facilities. Proper co-operation was received from other subject teachers and the management.

A study was conducted by **Vaghela (2000)** entitled, "A Study of the Computer Education in Shreyas Vidyalaya of Baroda City". The objectives of the study were: (i) to study the development of Computer Education in the school, (ii) to study the status of Computer Education in the school, (iii) to study content and methodology used for Computer Education in the school, (iv) to study achievement of students in Computer Education in the school, and (v) to study perception of computer teachers, head of the computer department, students and parents, regarding Computer Education in the school. The findings of the study were as follow. School had common computer laboratory with all required facilities except air conditioner. It was properly maintained. Student computer ratio was 2:1 and 3.1 in certain classes. Qualified and experienced staff was there. Teachers were low paid i.e. from Rs. 1500/- to Rs. 2500/- and head of computer department was paid 3000/- although they were satisfied with the salary given to them. Windows 95, Logo, games were taught in all the classes. In IX Standard C++, and in XI Standard M.S. Office was taught with Windows 95, Logo and games. Students' attendance and performance were the criteria for evaluation. Two tests of fifty marks were taken in a year and uniform achievement of students was observed over tests. Majority of the students were not satisfied with facilities available, curriculum of subject, time allotted for practical, teaching methodology of teachers and with existing software packages. Teachers were found satisfied with existing circumstances of Computer Education in the school and two of them suggested to add the latest software packages in the curriculum. There was no similarity in the opinion of parents. On certain aspects they were satisfied and on the others they were found unhappy. They believe that private institutions were providing better quality Computer Education than the schools. It was found that school faced difficulties related with finance, medium of instruction, to set time table for computer practical, etc

A study was conducted by **Biswal and Das (2001)** entitled, "Computer Education Curriculum for Schools: An Integrated Approach". The objectives of the study were: (i) to study the existing status of Computer Education in the schools of

Vadodara city, and (ii) to prepare suitable Computer Education curricula for schools according to the need of different classes. Twenty schools with Computer Education facilities from Baroda city were taken purposively as sample and twenty experts from the field of Computer Education were taken to collect their suggestions about the proposed Computer Education curriculum for the schools. The data were collected with the help of questionnaire and interview schedule. The major findings of the study were as follows. In all the schools there were well equipped computer laboratory, and they had common software like DOS, WordStar, LOTUS 1-2-3, M.S-Office dBASE, FoxPro, Logo, print master and Banner. Most of the schools had computer teachers who were graduate and hold a diploma in computer application. The syllabus of Computer Education differed from school to school. 50 percent of the schools introduced Computer Education in class III. 40 percent schools introduced Computer Education in class II and 10 percent schools introduced it in class VIII. According to 80 percent experts, Computer Education should be introduced in Class I. According to the most of the experts, there should be an integrated computer curriculum from class VI to XII. Those should consist of one Disk Operating System, one language and one Data Base Management package. In higher secondary classes there should be some professional packages. According to the experts, computer teachers for primary Classes (I-V) should be preferably lady teachers with minimum diploma in computer application along with primary teacher training and for secondary and higher secondary classes teachers should be trained graduates with a diploma/ degree in computer applications and/or some experience in the field of computer application.

A study was conducted by **Shah (2002)** entitled, "The Survey of Computer Education in Secondary Schools Affiliated to G.S.E.B. in Baroda City." The objectives of the study were: (i) to find out the extent of infrastructure and resource facilities available in schools for Computer Education, (ii) to gather information regarding the modes of evaluation of students in Computer Education at secondary level, and (iii) to study the perception of computer teachers and students towards Computer Education. The data were collected with the help of information schedule and questionnaire. The major findings of the study were as follows. More than half of the schools had enough infrastructure facilities. In 64.71 percent schools three tests were conducted in a year and in others only one test was conducted to evaluate the achievement of the students. The weightage for theory was more than practical in evaluation. Majority of the teachers were satisfied with curriculum of the subject, time allotted in time table and availability of facilities in computer laboratory. Most of the students opined that practical hours should be more and desired to enjoy more facilities than existed. In rest of the things like teaching methodology and curriculum etc., they were satisfied.

A study was conducted by **Ansari (2002)** entitled, "A Status of Computer Education in the South Gujarat Region". The objectives of the study were: (i) to study the development process of the Computer Education in the secondary schools of the South Gujarat region, (ii) to study the opinions of the principals regarding present status of the Computer Education imparted in the secondary schools of the South Gujarat region, (iii) to survey the opinions of the students regarding the present status of the Computer Education imparted in the schools of the South Gujarat region, (iv) to invite the responses of computer teachers regarding the present status of the Computer Education imparted in the secondary schools of the south Gujarat region, and (v) to offer suggestions to improve the quality and status of the Computer Education imparted in the secondary schools of the South Gujarat region. The sample of the study consisted of 109 schools of South Gujarat region imparting Computer Education. 50 percent schools from each area (rural and urban) were taken with the help of stratified sampling method. The data were collected with the help of questionnaire, information schedule, opinionnaire, and interview schedule. The major findings of the study were as follows. Computer Education commenced in 1985 in South Gujarat region and speeded up after 1995. 33.29 percent secondary schools were imparting it. It became popular after CLASS project, average number of computers were 2.99 in each school, majority of the schools were imparting Computer Education through contract system and the major source of funds for these institutions were grant from government and donation from society. The principals of the schools were not found satisfied with present Computer Education imparted in school on grounds of financial, infrastructure, computer teachers largely. Majority of the students i.e., 70.61 percent students were found dissatisfied with present state of Computer Education in the grounds that enough time was not allotted to computer subject, teachers methods of teaching were not effective, very few computers were available in schools, curriculum was too lengthy and fees were high. Majority of the teachers (68.42 percent) were found dissatisfied on the grounds of less salary, large number of students, disappointing government policy, more burden of work and no freedom to teachers to do related activities. The rest of the teachers were found satisfied. The researcher suggested that computer subject should be offered as a compulsory subject, more periods should be allotted to Computer Education, students should be encourage to take computer subject specially in rural area and computer teachers should be appointed on permanent basis

A study was conducted by **Chandrakar (2002)** entitled, "An Analytical Study of the Computer Education Teaching Learning Process at Secondary Schools in Gujarat". The objectives of the study were (i) to study the nature of computer curriculum used at secondary school level in Gujarat, (ii) to analyze the practice of Computer Education teaching at secondary school level in Gujarat, (iii) to analyze the Computer Education learning among secondary school students in Gujarat, (iv) to study the experts view and suggestions for effective Computer Education teaching learning process at the secondary school level in Gujarat, and (v) to design a framework for effective Computer Education teaching learning process at secondary school level in Gujarat. The data were collected with the help of observation schedule and interview schedule. The findings of the study were as follows. The class was teacher centered and there was no proper interaction among teacher and students. In all the theory classes teacher followed lecture cum discussion method and used blackboard as a media. In practical classes students were not properly instructed and they followed their note book for practice. While teachers were supervising the class, students used to concentrate in their practical work and the experts differs in their views regarding Computer Education teaching learning process but all of them suggested the need for training of computer teacher and suggested that training institutions should take this responsibility.

A study was conducted by **Gohil (2005)** entitled "An Evaluative Study of Computer Education at Standard VIII of Gujarat State Board in Baroda City". The major findings of the study were: No specific guideline from Gujarat Board of Secondary Education for eligibility for Computer Education teachers. Along with teaching, computer teachers were expected to do different tasks like, administrative work, register work, developing account books, project preparation etc. On an average two periods was given to the students for hand on practical per week. Teaching strategy adopted by teachers was found to be monotonous following only lecture method, where as, only in few classes teachers used discussion method. All the schools had their own criteria for evaluating students but it was comprehensive for covering all aspects. All the schools were charging extra fee for Computer Education and also gets financial assistance from the Government. The researcher also suggested that the board should specify the eligibility criteria for computer teachers in terms of educational qualification and knowledge of pedagogy; teacher training institutes should also offer training in teaching of computers, methodology of teaching computer, handling different instructional programmes and evaluation strategies; computer teachers should be given full salary and all the benefits as per government's norms; each school should appoint two computer teachers so that at a time the teacher can handle theory and one practical, and the board should make computer as a compulsory subject in secondary school.

2.1.2 Studies Conducted Abroad

An attempt has been made here by the researcher to present the review of some of the related literatures conducted abroad in the area of Computer Education related to the present study which helped to provide a sound background to the present study.

A study was conducted by **Al- Furaih (1989)** entitled, "Implementation of a Computer Literacy Curriculum in Secondary Schools in Kuwait: Teachers Perception". The main objectives of the study were: (i) to investigate the attitudes, needs and obstacles encountered by teachers implementing a Government mandated computer literacy curriculum in secondary schools in Kuwait, and (ii) to investigate the influence of teachers' background and training on their innovation. Data were collected through a questionnaire distributed to 56 teachers in 32 schools. Follow-up interviews were conducted with 10 teachers. The major findings of the study were as follows. Teachers endorsed the value of having a computer literacy curriculum for all secondary school students in Kuwait. However, they expressed dissatisfaction with the content of the curriculum. Instead of introducing students to computers through programming, teachers felt that initial exposure to computers should emphasize the computer's role as a tool and its effect on their society and culture. Teachers also expressed that the curriculum was mandated for all students, but no incentives were provided for the students to take the training seriously. Teachers' perception of their needs varied. Teachers with a computer science background felt the need for more training methods appropriate to the computer literacy curriculum and less training focused on curriculum content. Teachers without a computer science background felt the need for both types of training. Many teachers reported the need for more support from school principals to reinforce the importance of computers in daily school activities. Teachers requested Kuwait Ministry of Education to provide accessible instructional resources to support the computer literacy curriculum and training based on the actual needs of teachers. The main obstacles reported by the teachers were the inadequate prerequisite skill of students. Specially, teachers felt hat students needed more preparation in Mathematics, English and keyboard operation to be successful in this curriculum.

A study was conducted by **Devoe (1991)** entitled, "An Assessment of Computer Literacy Education: Perception of Boston Computer Teachers Concerning the Teaching of Computer Literacy in the Boston Public Schools". The main objective of the study was to assess the perceptions of Boston computer teachers concerning the teaching of computer literacy in their schools. A questionnaire was designed with three areas of interest called Curriculum, Facilities and Policies. The questionnaire was mailed to every certified computer teachers listed by the city of Boston School Department, with extensive follow-up procedures. The return rate of questionnaire was 78 percent Data were analyzed through SPSS generated means, means discrepancies and ANOVA. The findings of the study were as follows. The data from Boston Computer Literacy teachers ranked the three areas of interest, with "Curriculum" most favourable and "Policies" least favourable. Middle school teachers with longer experience were most contented with the current conditions. Those teachers with an average (four to six years) length of experience appeared to be the most disturbed, regardless of the school level at which they worked.

A study was conducted by **Pusiri (1992)** entitled, "An Examination of Microcomputers in Education in Thailand". The major objectives of the study were: (i) to focus on the historical development, problems and trends of microcomputers use in education in Thailand, and (ii) to compare the status of computer in education in

Thailand with ten other countries in Asia and the Pacific region. Information about microcomputers used in Thailand and in other countries was analyzed and interpreted from interviews, questionnaire and related documents. The major findings of the study were as follows. It was found that Thailand had a well developed computer curriculum but it lacked funding, personnel, standards and support from the Government. The trends in computer application in Thailand were towards learning computer application rather than programming. There was an increase use of computers for management, administration and for several kinds of school tasks. Compared to other countries in Asia and pacific region, Thailand had the most flexible computer curriculum. However, Thailand was found behind Australia, Japan, Singapore and Sri Lanka in the area of Government support in Computer Education. All the countries surveyed are facing the same problems of not enough computers for instructional use and lack of qualified personnel. In all the countries under the study, the trend of using computers in education had been shifting from learning about computers to learning with computers. Computer Education in secondary schools in Thailand had progressed steadily since its first introduction in 1982. It had well developed Computer Education curriculum but standards needed to be set and implemented. It was concluded that support and clean policy on Computer Education from Government was essential and vital to the progress of Computer Education in Thailand.

A study was conducted by **McCrow (1993)** entitled, "Rural Elementary School Teachers: What They Believe about Computers: A Case Study". The objectives of the study were: (i) to examine teachers' perception of computers in the general school setting, (ii) to examine technology problems perceived by the teachers that would inhibit the educational process, and (iii) to examine the teachers' belief about their technology training, their own role in integrating technology into the curriculum, the role of the school organization in implementing successful technology integration and the influence on technology implementation from sources outside the school. Data were collected through observation of the teachers in the laboratory and in their classrooms. Interview data from selected teachers in the program were collected through formal interviews. The major findings of the study were as follows. There was a need for a long term technology plan to be installed at the same time that technology is acquired with regular evaluation for accountability structured into the plan. It was also found necessary to provide technology training to both teachers and administers in the school system, if the technology plan is made to be effective. Administrators must continually update the school board about the needs and uses of technology in their schools. Without long term goals and strong leadership there was little chance of technology being used effectively. Lack of teacher training in technology, problem with software acquisition and its effective use, teachers' resistance to curriculum integration and the change process were noted.

A study was conducted by **Tengku (1994)** entitled, "The Implementation of a National Computer Education Project (NCEP) in Secondary Schools in Malaysia: Teachers' Perception". The major objective of the study was to provide realistic picture of the actual implementation of the NCEP project. A descriptive survey supplemented by observations and interviews was utilized in this study. A questionnaire was administered to 120 teachers involved in the project. The major findings of the study were as follows. The findings of the study were presented in the form of suggestions. Implementing a computer curriculum in schools should be based on clearly defined educational objectives. Computer in-service programs should have at least two characteristics confirmed by this study, (a) the concerns and needs of the teachers involved should be the basis for staff development program in computer literacy, and (b) in-service should be linked to instruction and should have clear and relevant objectives. The availability of adequate educational resources was essential for introducing change related with computing. School principals and Ministry of Education must play important role in supporting teachers' commitment toward change. Implementation of educational innovations clearly affects teachers; those must directly responsible for bringing about change. Teachers' concerns and needs should be considered before and during the introduction of any educational innovation.

A study was conducted by **Kabbi (1995)** entitled, "Analysis of Educational Computer use in Lebanese Urban Private Schools". The objectives of the study were: (i) to study the current status of personal computers used in the private schools in the Greater Beirut area of Lebanon, (ii) to examine whether or not implementation of computer knowledge and use has met or fallen short of the initial plans for its implementation, and (iii) to compare the status of computers in education in Lebanese with that of some other developing countries in the middle East, Asia and the Pacific region. The sample of the study consists of 50 percent of the 411 private schools located in the Greater Beirut area of Lebanon which was selected randomly. Information about personal computers used in Lebanon was analyzed from the transcriptions of interviews, questionnaire and related documents. The important findings of the study were as follows. The study found that Lebanese was still in the early stage of implementing computers in schools. This was due to lack of funding, qualified personnel and support from the Government. It was found that Lebanese has no set or established computer curriculum. The computer curricula courses offered to students at that time were based almost entirely upon the individual computer experience of the teachers who gave the courses. Teachers in Lebanese believed that teaching of computer applications to students was more important than training them in computer programming. They also felt that teaching intermediate school students programming language for writing small programs and more advanced programming languages in the secondary schools would help students in the future when they reach the university level. All of the countries surveyed in this study are facing the similar problems like not enough computers for instructional use and lack of qualified personnel. The trend toward using computers in education had been shifted from learning about computers to learning with computers.

A study was conducted by **Jabber (1997)** entitled, "A Survey of Factors which Influenced Teacher's Use of Computer Based Technology". The objective of the study was to study the factors which influence teachers' use of computer based technology. A survey of K-12 teachers in two rural country school systems was conducted. One was in Southern West Virginia and the other was in South-Western Virginia. The major findings of the study were as follows. It was found that computer access in the classroom influenced the frequency of the use for some instructional activities. Lack of internet access and computer equipments resulted in a negative influence to the teachers' use of the computer based technology in the classroom. Teachers also expressed a desire for continuous type of training program in the use of computers.

A study was conducted by **Eileen (1999)** entitled, "Development of Instructional Expertise by Geology Teaching Assistants: Testing a Training Model".

This study describes and tests a training program to improve instruction in Graduate Teaching Assistants (GTAs) in a development of Geology at Research University in the western United States. The training programme in detail based on planning, adult learning, and Knox's Proficiency theory. The training programme consists of six components: (a) training workshop, (b) GTAs meetings, (c) videotaping, (d) informal observations and feedback on GTAs teaching, (e) mid-semester and end-semester student evaluation, and (f) a refresher workshop between semesters. A quasi-experimental design using a non-equivalent control group, design model was used. The data was analyzed using a two way analysis of variance (ANOVA).The findings of the study reports statistical significant differences in favour of the treatment group in student evaluation (p=.001), and two measures which approach significance; research evaluations (p= .06), and GTA self-report on comfort using the lesson plan components (p= .06). Adult learning models, sustainability, internal and external validity were discussed.

A study was conducted by **William (1999)** entitled, "A Qualitative Assessment of Computer in-service Training in One Medium Sized School District". The purpose of this study was to develop a better model for in-service training in K-12 schools. Three cases (A,B, and C) were conducted for this research. Each case was conducted at a different school and represented a different level of teacher computer literacy. Case A was a high computer literacy school, case B was a medium computer literacy school, and case C was a low computer literacy school. Case computer literacy levels were determined during in-service training and were based upon in-service evaluation as well as professional consultation between in-service providers. There were a total of 17 classroom teachers, 3 library media specialists, and 3 computer laboratory assistants for a total of 23 participants in this research. Participants filled out a demographic survey as well as consent to participant form. Traditional qualitative research methodologies were employed using interviews, observations, and document collections. Interviews were conducted in computer laboratory at each school, and documents were generated and collected at each school from the Integrated Learning System. The findings of the study suggests that <u>technology in-service should be guided by needs assessment</u> which takes into account the curriculum requirements of teachers and students. <u>In-service training should also</u>

be continuous and ongoing to be effective. Teachers indicated that they preferred to had a variety of options for technology based in-service training.

A study was conducted by **Thompson (2000)** entitled, "Factors Affecting Computer Implementation and Impact on Teaching and Learning in North-east Louisiana". The objectives of the study were: (i) to find out the relationship between degree of computer implementation with teachers' personal use of computers, teachers' motivation, curriculum integration training and curriculum integration support, and (ii) to establish the relationship between degree of computer implementation with collaborative learning, self -directed learning, active learning, teacher practices. The major findings of the study were as follows. Results demonstrated a significant relationship ($P \leq .05$) between degree of computer implementation and (a) teachers' personal use of computers (b) curriculum integration training, and (c) curriculum integration support. No significant relationship was found between teacher motivation and degree of implementation. A significant relationship ($P \leq .01$) was found between degree of computer implementation with collaborative learning, self directed learning, active learning and teachers practices. A significant multiple regression analysis showed self-directed learning, curriculum integration support and teacher practices to be significant predictors of degree of computer implementation.

A study was conducted by **Wilson (2000)** entitled, "An Assessment of Computer Usage within the Bahamian Public School System and Recommended Guidelines towards the Development of the Strategic National Computer Plan". The major objectives of the study were: (i) to assess the computer usage within the Bahamian public school system, and (ii) to give guidelines towards the development of the strategic national computer plan. It was a descriptive study for which an extensive review of literature in areas of computer hardware, software, teacher training, research, curriculum, support services and local context variables was undertaken. A survey was conducted involving 201 teachers and 51 school administrators from 60 randomly selected Bahamian public schools. Based on the literature review and the data gathered for this study a number of recommendations were presented These recommendations may be used by the government of the

Bahamas to establish policies with regard to the use of computers within the public schools system.

A study was conducted by **Troyan (2001)** entitled, "Development and Evaluation of an Instructional Design Model for International Training Programs". The purpose of the study was to develop and evaluate the instructional design model for training programs delivered to international audiences. Cultural factors, affecting training program design at various design phases, were examined. Design approach and techniques that facilitate the development of training programs appropriate for foreign audiences are also described. The proposed instructional design model is intended to guide developers design training for international audiences, helped them address the relevant cultural factors, and utilize the appropriate design techniques. The model was applied to the design of a large-scale training program delivered in Russia. The model was evaluated by a variety of means, including expert review of the model and evaluation of the resulting training program. Evaluation data from the training program were collected using trainee questionnaires, pre-and post tests for classroom training sessions, performance tests for on-the-job training sessions, and structured interviews with focus groups. Evaluation results from the training program were examined with regard to the utilized design driven by the proposed model which was applied at various phases of the design process. Recommendations for model revision and possible directions for future research were proposed.

A study was conducted by **Toshigki (2001)** entitled, "The Development and Evaluation of Training in Electronic Presentation Skills for Pre-and In-service Teachers". The purpose of this study was to design, develop and evaluate training in electronic presentation that incorporates a hands-on, individualized approach in the group setting, and to document the process as a case study. The methodology of developmental research was used to accumulate information that could lead to the improvement of such training in teacher education. To assist participants' learning manuals for electronic presentation skills were produced that included step-by-step instruction, screen capture accompanying the instruction, a series of lessons as content, hands-on experiences, and the learning of message design principles. This training was carried out using the step-by-step visual manual. The instructor demonstrated the task and participants were able to practice it using this manual by themselves after the demonstration. The effectiveness was evaluated in terms of participants' skill improvement, gain in knowledge and understanding, anxiety reduction, and attitude toward technology integration into instruction. Results showed that this training contributed to the improvement of participants' skills and to their knowledge of electronic presentation. In addition, participants' confidence levels appeared to be reinforced by the training. This study suggests that the training using step-by-step manuals is effective for teaching pre-and in-service teachers to learn electronic presentation and that the implementation was efficient in group settings where individualized training was needed or desirable.

A study was conducted by **Vusumuri (2001)** entitled, "The Development of an In-service Training Programme for Science Teachers at Vista University". The study was motivated by a number of factors, including shortage of qualified science teachers and/or inadequately trained science educators, poor science metric results and a rapid increase in the advancement of science and technology. The aim of this study was to develop an innovative in-service education and training programme for science teachers at Vista University, so that they would became highly skilled and competent in their practice. The constraints which hindered the development of an effective in-service education and training programme for science teachers were analyzed and possible solutions considered. Alternative forms of in-service education and training as well as programmes in other countries were studied with a view to the development of an effective in-service education and training programme for science teachers at Vista University. Opinion of teachers concerning their past-experiences of in-service education and training were elicited, as well as the determination of their future in-service education and training needs were required. The in-service education and training programme at Vista University was planned with the consideration among others, the science educator's needs, objectives, methods and techniques to be used, as well as the learning matter to be presented. A pilot in-service education and training programme was presented with a view to testing the validity of the proposed programme at Vista University. At the end of the program, its effectiveness was evaluated in order to eliminate weakness and improve upon the strengths identified. The study culminates with the drawing up of recommendations to implement an in-service education and training programme for science teachers at Vista University based on the out come of the pilot programme conducted.

A study was conducted by **Unger (2002)** entitled, "The Design, Implementation and Evaluation of a Web-Based Training Programme for Future School Administrator in North West Florida". A web-based instructional product was successfully developed and evaluated through a field test. The module was the prototype of a new learning and training system which was required for the Florida principal certification. The participant consisted of 1 instructor and 25 trainees. To guide the production of the module, 3 instructional design models were combined. The statistical analysis revealed trainees scored significantly higher on the post-test (M=37.56) than the pretest (M=26.88), P<.001 and the instructor confirmed all trainees had met identified instructional objectives. Trainees evaluated the web-based training favourably. Reported advantages, and participants indicated they would enroll in additional modules. Participants also offered several recommendations for the revision of the module.

2.2 IMPLICATION FOR THE PRESENT STUDY

The studies reviewed in this chapter were of to kinds: (i) assessment of computer education programme in schools, and (ii) studies related to training programme. Studies conducted by McCrow (1993), Shashrabudhe (1994), Jabber (1997), Gupte (1999), Gujarati 1999), Biswal and Das (2001), Shah (2002), Ansari (2002), Chandrakar (2002)and Gohil (2005) emphasized the need of training for computer education teacher working in the schools. Further, Pusuiri (1992), Kabbi (1995) identified the lack of qualified teachers for computer education at school level. Gujarati (1999), Vaghela (2000) showed that students are not satisfied with the method of teaching of computer education teachers. Al-Furaih (1998) emphasized on the need for more training methods appropriate to the computer literacy curriculum and less training focused on curriculum content. Chandrakar (2002) identified the lack of proper interaction among the computer education teacher and students. Studies conducted by ISRO (1990), Patadia (1993), Gupta (1999), Gujarati (1999), Vaghela (2000), Ansari (2002) showed the insufficient time and weightage of time allocation differs from school to school were the major barriers for the implication of computer education in school. Al-Furaih (1998) also emphasized on the support needed from the principals to reinforce the importance of computers in daily school activities.

Further, Matai (1998) identified that computer teachers were not able to teach the subject effectively and there was also improper importance given to computer education subject in the school. Studies conducted by Eleeen (1999), William (1999), Thompson (2000), Vusumeri (2001), Unger (2002) showed the effectiveness of teacher training programme. Further, Toshigko (2001) showed the effectiveness of teacher training programme on electronic presentation skill on the improvement in participants' presentation skill and confidence level. William (1999) emphasized on in-service training taking into account the curriculum requirement of teachers and students and suggested that in-service training should be continuous and ongoing to be effective. Further, Tengku (1994) suggested that a computer in-service programme should have at least two characteristics, (1) the concern and needs of the teachers and clear and relevant objectives; and (2) innovations that clearly affect teachers in bringing change.

From the review of the studies, following implication for research can be drawn.

(i) There is a need of training programme for computer education teachers. Further, there is an absolute lack of research in computer education training programme on pedagogy for computer education teachers in India.

(ii) There is no proper interaction among teachers and students in the computer classroom and students are not satisfied with the methodologies of teaching which became the barrier in students learning. So, computer classroom requires proper interaction and appropriate methodologies of teaching.

(iii) Educational environment (inside the computer classroom both in theory and practical) provides opportunities to foster higher order thinking skills and develops creativity in the students.

(iv) Any training programme based on the need of teachers and innovations affects teachers in bringing desirable change in learning situation.

Thus, considering these specific implication, a need to conduct the following study was felt. Therefore, the present study was undertaken entitled as ***"Designing, Developing and Implementation of a Teacher Training Programme to teach Computer Education at Secondary School Level".***