Review of related Literature/ Research

**Angeli and Valanides, (2005)** conducted a study to evolve an Instructional Systems Design (ISD) model that was based on an expanded view of Shulman’s concept of pedagogical content knowledge (PCK). The study was conducted among Cyprus preservice elementary teachers who participated in an Instructional Technology course. The main question that was investigated in the study was how to develop elementary teachers’ Information and Communication Technology related Pedagogical Content Knowledge. Totally 312 preservice teachers participated in the study which was designed into three phases. Case-based instruction was applied in the first phase of the design experiment. A new Instructional Systems Design model was developed and assessed in the two other sessions of the design experiment. In the first two phases of the study, teachers were guided to use multimedia-authoring tools, while in the thirds phase teachers were asked to use a modelling tool. The ISD model was found to be effective. The study constituted a starting point of intensive future research efforts for seeking more culturally bound or situated ISD approaches where the influence of school context and teachers’ epistemological beliefs and experiences are to be more considered in ICT enhanced instruction. The study suggested that teachers are to be made more competent to teach with ICT with more knowledge about different tools and their affordances, specific pedagogies, specific contents, specific learners and in specific contexts.

**Al-Bataineh and Brooks, (2003)** undergone a historical look at the lessons learned in the twenty years of computer-based technology integration in educational systems in U.S.A. Phases of print automation of the 1980s, a more learner-centered shift in the early to mid 1990s, internet shifts focus to high order thinking in the late 1990s and current challenges were discussed. Vision with support and proactive leadership from educational system, skilled educators in the use of
technology in learning, assessment of the effectiveness of technology for learning, technical assistances, ongoing financial supports and policies supporting new learning environments were the themes identified as current needs and challenges.

**Baker, (2003)** synthesized the reflections on emerging issues related to contemporary technology-enhanced assessment. Linkage to cognitive demands or requirements, methods for attributing validity for various assessment purposes, procedures for generating multiple instances of a task, analytic approaches for providing reports targeted to users, quality control routines to assure content quality, appropriateness to the learner and fairness were recommended as the minimum features that are to be included for technology design and assessment. Placing learning at the heart of the endeavor is to be considered vital in the synthesis of technology and assessment.

**Buendia, (2002)** examined the manner American primary school teachers deployed Instructional Technologies according to their contextual conditions and institutional systems of knowledge. The theoretical framework firmly identified the curricular initiatives and teachers practices as another aspect of Instructional Technology. The study analysed the history of revolution of Instructional Technologies. Instructional Technology within the frame of study was conceptualized as devices, texts or instruments constructed to enable, shape or manage human beings to fulfill particular tasks.

**Braund and Reiss, (2006)** analysed the problems of science education in schools. The study suggested reformations in the science curriculum, pedagogy and nature of pupil discussions in science instruction. The study criticised that current science education is too routed in the science laboratories and substantially greater use needs to be made „out-of-school” sites for teaching
science in schools. The study revealed the importance of teachers' competency to complement laboratory-based school science teaching by out-of-school science learning that draws on the "actual world" through field trips, the "presented world" in science centres, botanic gardens, zoos and science museums and via the "virtual worlds" that are increasingly available through information and communications technologies.

Singh, B.K. (1988) studied growth and development of technology in education in secondary schools in Bihar's Monghyr district. The objectives of the study were to study the growth and development of educational technology in the secondary school of Bihar with and investigation of its impact in science. The findings of the study were there is very less use of technology in the secondary schools in Monghyr dist. those secondary school which were using the advance technology were brighter than other schools. There are very few schools where advance technology used while teaching.

Rajseker’s and Vaiyapuri Raja P, (2007) studied knowledge and attitude towards computer in higher secondary school teachers. The objectives were study the level of the computer knowledge of teacher their attitude towards computer and the nature of the relationship existing between the teacher computer knowledge and their attitude towards computer. The findings of the study were teachers are weak in their computer knowledge; there was no significant difference in computer knowledge between the teacher secondary grade teacher and graduate teacher. Also there was no significant difference in computer knowledge. Between the teacher working in government schools and private schools and there was no significant difference in attitude towards computer between teacher working in urban area and rural school.
S.K. Panday studied Teacher attitude towards computer in relation to sex, age and experience. The objectives of the study knew the level teachers attitude towards use of computers in secondary schools of Uttarakhand state. Majors findings of the study were, Teachers above 40 years and having length service more than 20 years have more favorable opinion about computer knowledge but they sue less computer in classroom teaching their counterparts, there was no significant difference between male and female teachers of computer education and also in rural and urban teachers attitude in relation to utility of computer in their classroom teaching.

Sibien, K.K Annaraja P. studied Teachers, Trainees, Computer, Competency enhances their technology use in classroom teaching. The objectives of the study were found out the level techno-pedagogical skills. Skills in learning materials instrumental strategy, communication evaluation and guidance of the secondary teachers. Also finding the significant difference between secondary teacher, education student who have attended computer course and who have not attended computer course. Finding of the study were there was significant difference between secondary teacher education students who have attended computer courses in their skill in learning, evaluation and techno-pedagogical skill. While comparing the means source of secondary teachers education student who have attended computer course and who have not attended computer course in their skill in learning secondary teacher education students who have attended computer course are better than those who have not attended computer course in their skill in learning. This may be due the fact that secondary teacher’s education students who have attended computer course have a solid foundation and can work with their previous knowledge and experience. While comparing mean scores of secondary school teacher education student who have attended computer course and who have not attend computer course in their skill in evaluation. Secondary teaches education students who have attended the
computer course in the skill in evaluation, secondary teacher education students who attended computer course are better than those who have not attended computer course in their skill in education

**K. Saikumari**, studied computer phobia of IX standard students and their attitude educational usage of computer. to investigate the level of computer phobia among IX standard students investigate the computer phobia of IX standard students in terms of locality of the school, age, gender and type of management of school the second objectives was attitude of IX standard students towards computer usage education in terms of a locality of the school, age, gender and types of management of schools not influence the computer phobia of IX standard student and their attitude towards computer usage in education. the investigator also realized that the role of the teachers in significant in helping the students get rid of their computer phobia so the teachers working in urban and rural areas must be given computer literacy to guide their students the teachers working in government so that they can help their students to develop a positive attitude towards computer learning and usage the government must ensure that all the schools in urban and rural areas have the infrastructure facilities to have a computer lab and well trained teachers that students can methodology in despite their conclusion.

**Sangeetha, (2000)** collected the opinions of primary school teachers of Kerala towards the use of computers. 300 teachers 41 primary schools of Kannur district participated in the study. Desirable opinions about the academic use of computers were reported from the part of primary school teachers. Emerging need for computer usage among teachers was given as conclusion in the work.
Hennessy, et.al (2005) reported a collaborative programme of projects undertaken by 15 teacher researchers of Cambridge University using various forms of computer-based ICT to support subject teaching and learning. A typology of pro-active and responsive pedagogic strategies for mediating pupil interactions with ICT was identified. The strategies emerging illustrated how teachers structured instructional activities judiciously; supported guided and challenged, encouraged pupil collaboration, experimentation, reflection and analysis; avoided floundering and maintained a focus on subject learning; integrated the use of other resources; and developed information handling skills. The study was drawn on socio-cultural learning theory as a conceptual framework for analysing how teachers can structure classrooms activities and interactions during „Technology-integrated Instructional Conversations”. A cross-case analysis was conducted by lesson observations, follow-up teacher interviews and teachers research reports.

Hung, (2001) described the dominant schools of thought in relation to learning theories and how computer mediated technologies. The study illustrated how learning theories can be integrated in computer instructional contexts. Behaviorism, cognitivism, constructivism, and social constructivism were discussed in the light of different instructional strategies

Shyni, (2000) analysed the views of secondary and higher secondary school teachers regarding the use of computers in education. 160 secondary school teachers and 155 higher secondary school teachers participated in the study. It was identified both strata of teachers have almost similar views regarding the use of computers in education. The study emphasised need for encouraging computer education in schools and the need for making teachers competent to cope with recent changes in the field of computer technology.
Balasubramanian, (2002) investigated about the need for computer education in teacher training programmes, both pre-and in-service teacher education. The study recommended that all teacher educational institutions and training programmes have to include computers as an integral part of their instructional aids. The study also identified that most private schools were comfortably placed in the accessibility of computers, but the same cannot be said about government schools. The study concluded with an urgency of computer literacy among schoolteachers and also recommended longer training programmes to prepare teachers to develop instructional software for their students.

Joy and Manickam, (2002) conducted a study among fifty primary school teachers who were undergoing an in-service teachers' training programme. The major objective of the study was to assess the index of teachers' knowledge in computers and computer assisted instruction awareness. The level of teacher competency of the teachers undergoing in-service training did not shown any change as a result of the in-service training programme. The investigator commented that it may be a reflection of the reliability of the test. Gender difference was also not found in the achievement through in-service training. The study found that the teachers' attitude towards the use of computer became more favourable with the increase in the awareness about use of computers in the process of instruction. The study concluded with a suggestion that the contents that enrich positive attitude towards computer assisted instruction are to be included more in the future in-service training programmes for the teachers.

Rajagopalan, (2002) investigated about teaching strategies adopted by schoolteachers and their pupils' achievement. The study was conducted among 50 secondary school Malayalam teachers and 400 pupils. The study revealed that well experienced teachers especially in government schools were not using preferred teaching strategies for imparting effective attainment of the
objectives envisaged through language education. The study indicated about the absence of timely implementation of inservice teacher training programmes that created lack of familiarisation among teachers with effective and new instructional strategies.

**Rasku-Puttonen, et al (2002)** investigated about the role of teacher in the promotion of successful learning and collaboration in Information and Communication Technology based learning environments. Instructional scaffolding in the technology based learning environments was another key issue in the work. The persistence of important role of teacher even in the individualised and child-centered instructional environments was proven in the study. A need for research and developments for realizing pedagogical innovations was revealed in the conclusions. The study concluded that novel practices in teaching will be challenging in inservice training programmes of teachers adopting technology based learning environments.

**Swamy, (2002)** reviewed different areas of information technology and its context in the field of instruction. The study suggested that teacher educators and teacher training programmes should recognize the new skills and needs required for today's instruction process, and train teachers to develop those skills. The study concluded that the teacher community must welcome a partnership with new electronic instructional methods. The importance and features of on-line instruction were more discussed in the study.

**Usha Devi, (2002)** reported an immediate need for orienting the in-service teachers in Information Technology skills. The study also recommended Information Technology as a compulsory content in the preservice teacher education courses. The study identified the areas required in-service training programmes for teachers. Hyper-text, multi-media instructional
techniques, computer assisted instruction, internet, intranet, and intelligent tutor system are some of the areas identified, in which in-service teachers training programmes were to be conducted.

**Unwin, (2005)** explored some of the reasons for the identified gulf between the rhetoric advocating use of ICT in education in Africa and the reality of classroom practices. The study also outlined a possible framework for the successful implementation of teacher training programmes that makes advantageous use of appropriate ICTs. Six fundamental principles of good practice were insisted in the study that is to be addressed for such programmes to be effective. The six principles were a shift from an emphasis on „education for ICT“ to the use of „ICT for education“, an integration of ICT practice within the whole curriculum, a need for integration between pre-service and in-service teacher training, a need for development of relevant and locally produced content, a need for appropriate educational partnerships and an emphasis on the development of sustainable costing models. The paper concluded with a framework for action to deliver the very real benefits of ICT for teacher training in African countries.

**Andrea, (2004)** analysed the history of Information and Communication Technology education in Hungarian public education sector that dates back to the 1970s. In Hungary as well as in most countries that ICT education was introduced as a compulsory school discipline. The study reports that a shift was observed from a technology-centred towards a teaching-learning centred approach. In-service teacher training programmes were introduced in large numbers to satisfy the accelerating needs of schoolteachers in the late 1970s. The study describes a design contest for school computers that was launched by the Hungarian Ministry of Education to equip a large number of schools with affordable and easy to use computers, completely with pedagogically valid educational programmes. An unrealised project was also illustrated in the study that was
designed with objectives to give in-service training for schoolteachers of different disciplines to use computers in their preparation and daily teaching practices. The main problem identified for the dissemination of ICT-based instructional methods is the low level ICT competency among teachers. More intensive in-service training programmes on ICT for the schoolteachers were recommended in the study.

Kirkwood and Price, (2005) discussed issues relevant for teachers and instructional designers anticipating using information and communication technologies. The study summarised that although ICTs can enable new forms of teaching and learning to take place, they cannot ensure that effective learning outcomes are achieved. The discussion concluded that it is not technologies, but educational purposes and pedagogy make students how to work with ICT and why it is of benefit them to do so. The importance of appropriate contextual instructional approaches and designs was revealed in this work. Knowledge about students’ use of media as well as their attitudes and experiences can help teachers and instructional designers develop better learning experiences.

Burnett, et al (2006) conducted a study on the transformative influence of new digital technology connections on the practical implications for transforming literacy in primary schools in U.K. Children’s digital texts were analysed alongside interview and observational data were used for the study. The study revealed the emerging need for making primary school teachers to be equipped with latest digital technologies, to promote new literacy practices in the classrooms through production of new kinds of digital texts and new technology to offer children in classrooms, to explore broader notions of literacy, and new forms of communication and learning in primary classrooms. The study also documented the emergence of peer-based learning relationships and changing perceptions of teacher’s role.
Carmichael and Procter, (2006) conducted a study on the use of electronic networking in primary and secondary schools in U.K. The survey was conducted among 250 teachers. The study discovered that while use of IT is a well-established element of classroom practice, teachers made less use of electronic networks. The study made comment that time is needed for in-service teachers to make sense of new practices for themselves. More in-service training to make teachers sense of new practices in ICT for themselves was recommended in the study. The study concluded that there is still much to be done in the area of providing resources, services and online environments, which are supportive of innovation and knowledge creation about teaching and learning.

Chaudhary, (2006) edited and analysed 15 papers of ICT initiatives and quality improvement in Elementary Education in India. The material revealed that teachers could facilitate learning process by building awareness on contextual issues, help children learn concepts, acquire theoretical knowledge about curriculum areas and also provide individualised instruction to learners.

Lee, (2006) conducted a study on online learning in primary schools in Hong Kong. The study was conducted to explore how primary teachers use an online Integrated Learning Environment (ILE) catered for individual learning difficulties. The study recommended that when adopting ICT for teaching and learning in primary school classrooms, teachers should be sufficiently open-minded to explore different approaches and apply adaptation strategies. The study concluded that teachers are to train well to understand the rationale and philosophy for the use of ICT to cater for individual differences.
Passey, (2006) analysed uses of ICT by primary and secondary schools in England. The study identified that the evolved wide diversity in the forms and uses of ICT had created challenges for teachers to select appropriate uses of ICT to support learning most effectively in specific situations. The study identified a clear need from the part of teachers to know how each form of ICT supports precise aspects of learning in each subject area, topic and activity. Teachers also need to consider the different forms of technological resources that are accessible, how these specifically work within learning environments in classrooms and other settings, and how uses of resources match social, behavioural, emotional and cognitive needs of pupils.

Postholm, (2006) conducted a study on the teacher’s role when pupils work on task using ICT in project works. The study acknowledged ICT and project work were challenging issues for many teachers to deal within the classrooms. The study was conducted in three classrooms in threes schools at the lower secondary school level in Norway. The data were collected through observation, tape recordings, video recordings and logbook entries throughout project periods in the classrooms. The study reported that ICT places great challenges on the teachers and heavy demands on both pre-service and in-service teacher training programmes in Norway. Teachers need to be trained to determine when and why ICT should be used, and also how the equipment should be integrated in proper instructional situations.

Stemler, et al. (2006) proposed seven strategies for teachers for dealing with practical issues of teaching. The study highlighted the importance for in-service training for teachers to have sound practical skills in interacting with students, parents, administrators and other teachers. The study presented a new framework for conceptualizing practical skills in dealing with others that follows directly from Sternberg’s theory of successful intelligence. Comply, consult, confer,
avoid, delegate, legislate and retaliate were the seven strategies suggested for teachers to improve their interpersonal skills.