“The survey of related literature may provide guiding hypotheses, suggestive methods of obligations and comparative data for interpretive purposes”

-C.V. Good

Chapter – II

REVIEW OF THE RELATED LITERATURE
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"The literature in any field forms the foundation upon which all future work will be built".

-Borg (1978)

Survey of related literature is an essential pre-requisite to actual planning and execution of any research project. It is like surveying the area and judging the distance first and then to formulate a plan. It helps the researcher in avoiding duplication on the one hand, and in getting benefit from similar study on the respect of method adopted and devices used in the collection of data and their organization and interpretation. In the word of Goods, Bar, Scats (1954), “The competent physician must keep abreast of the latest discoveries in the field of medicines. Obviously the careful students of education or investigation should become familiar with the location and use of source of educational information.”

The survey of the related studies is a crucial aspect of the planning of the study. In the words of Turney and Robb (1970), “The identification of a problem, the development of a research design and determination of the size and scope of the care and intensity with which a researcher has examined the literature related to the intended research”. The advantage of the related studies is to provide insight into the statistical methods through which validity of the results is to be established. According to David (1969), the literature is review to content from the past for the new study to be conducted with new subjects and newly obtained data.

A review of literature is an essential and important step in any research project. It helps the researcher to develop a deeper insight into the selected topic and gain information on what has been done earlier. The finding of earlier experiments encourage the new worker to embark upon useful project in education, on the basis of earlier experiments avoiding the past mistakes or defects. Researchers under take a literature review to familiarize themselves with their knowledge base. Good (1954), thinks ”The key to the vast stock house of published literature may open doors to source of significant problems and explanatory hypothesis and provides helpful orientation for definition of the problem, background for selection of
procedure and comparative date for interpretation of result, in order to truly creative and original. One must read extensively and critically as to thinking." According to Best and Kahn (1986), literature review of related studies helps a researcher in multiple ways. It helps to assess what is already known, what is still unknown and justified, justify its need of replication, and throw some light on the feasibility of the study and the problems that may be encountered. It also helps to uncover promising methodological tools which shed light on ways to improve the efficiency of data collection, obtaining useful information on how to increase the effectiveness of data analysis.

Integration of Multimedia with the curriculum is slowly and gradually giving a go-by signal to the traditional teaching practices globally to make teaching-learning more effective and authentic. Research scholars/educationists are evincing keen interest in this new emerging field of education. Recently a large number of research studies on multimedia have been initiated. This trend would surely help in making a significant dent in our education system. With this objective in view, a series of computer courses have been introduced at school levels with two main segments i.e. hardware and software, in which Multimedia occupies central stage. With the advent of new technology, the use of multimedia in the field of education is increasing day by day, both in formal as well as non-formal sectors i.e. illustrated stories to support the language teaching, demonstration of the experiments or to prepare the animated pictures to explain the concepts in the environmental sciences and other subjects. Multimedia programmes can enrich the experiences of the children and help the teachers to handle the text and study materials more effectively. As regards multimedia research work, lot has already been studied at International level but very few research studies on multimedia have been taken up in India so far.

2.1 REVIEW OF THE RELATED STUDIES

Literature Review involves a systematic identification, location, scrutinizing and summary of written material that contains information on a research problem. An attempt has been made by the researcher to follow these steps to review the related research and non research literature to broaden the understanding and to gain an
insight into the selected problem under study. Journals, related research studies and articles were browsed in the established libraries.

The infusion of communication technologies into teaching and learning has generated much interest in educational research in recent years. A vast array of instruction strategies using information and communication technologies has been carried out in research studies. They include simulations (Pfahl, Laiterberger, Ruhe, Dorsch and Krivobokova, 2004), online learning (Hanafi, Zuraidah, Rozhan and Mohd. Zubir, 2003), static and animated modes of presentation (Sadiah, 2003), internet and World Wide Web (Finger, 2003), Multimedia Software (Aguilar, Arena, Clarin, Halamani and Montrade, 2003), Microsoft Excel (Munirah, Shafia and Zurida 2003) and Multimedia Learning Package (Mohanty, 2008).

The review of the literature for the present study has been done for both National and International levels. Review of research studies and papers/related literature on multimedia which has been taken up in on the recent past is, listed in the following pages.

Studies conducted by Atkinson (1968) showed that using computer assisted instruction students performed significantly better in their achievement in reading at Stanford’s CAI programme than their peers in normal classrooms.

Study on the Satellite Instructional Television Experiment (SITE; 1975) undertaken by the Govt. of India, Ministry of Human Resource Development (formerly known as Ministry of Education and Social Welfare) assessed the impact of television programmes on children and teachers in the context of the situation in SITE schools and thereby to work out a strategy for a broad base formulation in the entire country. It concluded that there was a very high level of acceptance of television, as it provides a totally different mode of education and entertainment for the school children. The findings clearly indicate that television is capable of holding the attention of children and sustaining their interest in which no teacher with access to a text-book can do.
Report of the Working Group on Educational Technology, Govt. of India, Ministry of Education (1978) laid the foundation stone with the setting up of Educational Technology cells in the states which later culminated in the form of Central Institute of Educational Technology in the National Council of Educational Research and Training in 1984, symbolizing the development of Educational Technology at the national level. CIET ventured into the field of multimedia.

Parihar (1978) study revealed that use of films with an experimental group resulted in more learning in lesser time. Students exposed to films shared better retention as well as more interest in the subject than those were not exposed to them.

Green (1979) suggested that multimedia can act as a servant to the curriculum in that it offers a means to explore other subjects in an imaginative and motivating fashion. On the hand, Multimedia thus feeds into a shared notion of creativity in the curriculum. Equally multimedia offers an innovative way into traditional subject knowledge. On the other hand, a rush to emulate this potential medium may neglect some of the cultural issues which are central.

Schindal (1979) documented that however each year thousands of new stories in animated form for children are published all over the world but the resources are not available to children, so it doesn't reach the target group. The world of multimedia excites children. Television with multimedia effects can change the children's world. Now many such stories have been made into successful animated films, which is simply the most recent refinement in a tradition. The new medium of animation has been the outcome of invention of movable and fascinating images. Animation is an array of techniques, distinguished by one common characteristic i.e. the movement on the screen, created by the artist /computer person rather than by recording of natural movement.
Shah (1979) states that the teachers who were exposed to the treatment of self-instructional multimedia course on effective questioning showed significant improvement in all the skills except one, in context of microteaching.

NCERT Educational Technology Series Vol.5 of 1981 designed to improve the quality of films systematically, listed out the guidelines for the production of films/television programmes for dissemination and use. It also emphasizes the involvement of teachers in teaching-learning situations and the participation of children in viewing of these programmes.

Ravindranath (1982), in his study on development of multimedia instructional strategy for teaching science at secondary level noted that the strategy was effective to the extent that 70 percent of the experimental group students obtained 60 percent and above on all unit tests.

Study by Seth (1983) in the NCERT revealed that the children exposed to ETV were better in language. They had higher organization of information and better scholastic achievement compared with the group that did not watch ETV. The schools where teachers took interest in follow-up programme after watching a programme, achieved higher on all the variables.

Aghi (1984) in her paper on Situational Analysis of Children's Needs in India stated "How research can improve television programmes", no matter how important the content of a programme may be, the manner of presentation can make it or mar it. Hence a dynamic approach to use the medium successfully is mandatory. Neither the content nor the medium should be sacrificed.

Foley and Dam (1984) investigated that interactive computer graphics is a field whose time has come. Most people enjoy interacting graphically more than the traditional communication techniques. It treats fundamental techniques for
representing 3-D surfaces and working out general strategies for making realistic pictures of 3-D objects.

Menon (1984) used a multimedia approach and validated the strategy for postgraduate levels in different areas and found it satisfactory.

An NCERT study report on ET (Educational Technology) by Shukla (1984) stated "Research needs to be an integral part of all programmes of ET, Adoption of some technologies, such as satellite communication and computers, is also very necessary. Their utilization and gains need to be studied. Technology, by itself, cannot solve the problems of extension and needed improvement in education. Human variables are extremely important, both in the use of technical devices and as affected by its use. A continued watchful effort can work help in improvement in the field of education.

Handbook on Television and the Indian Child (1984) sponsored by UNICEF stated that anybody who cares for children, should look into their needs and problems. Research reports are available which clearly answer questions like what kind of language is understood by rural children and what kind of visuals are understood, what would hold attention and what format would be interesting etc. However, no controlled experiments have been designed to answer such questions. All children generally preferred a 'live' image of the presenter. A combination of interesting format with an element of familiarity, worked best for the children which proves the fact that interactivity and multimedia components have greater impact.

According to James (1985) there is nothing more than a straight forward application of more fundamental graphics methods. Computer graphics is a unique subject. It covers animation, 2D, 3-D and multimedia. The main programmes example used to examine an object from any position. Creating effects can be a great fun.

Chaudhari (1986) described that the Instructional Satellite commitment reminding Indian education lies in recording down the ladder beyond the conventional stages of
education. The thrust of education for development lies not in asking people to change but in providing them new ways, through media and modern technology with the ability to see them their own problem and to provoke them continuously to think for solutions.

All India Radio Computer aided Archive Choice Management System (1988), AIR, Delhi Document provided the systemic access to reference materials which are stored in the archives. AIR has developed a computerized Archive Management System (TAMS) to overcome the traditional approach through this interactive software package which provides instantaneous details of the classification levels and other characteristics. The package is menu-based and user friendly.

Mehryar (1998) conducted a survey on the effectiveness of a web-based interactive multimedia system in tertiary education. The results of the survey conducted during the course indicated that students were enthusiastic towards the new multimedia packages.

Mukhopadhyay (1988) reported 33 studies in the field of Media Education. His analysis of the studies done reveals that media programmes in education are generally popular. He emphasises that despite the fact that students get interested in these programmes; still most of the programmes are grossly underutilized.

Goel and Mahajan (1990), in their study on computer based question bank at B.Ed. level observed that science group scored significantly higher than arts group but no significant difference existed between males and females, mathematics and non-mathematics students on their achievement in computer education.

Kozma and Johnston (1991) conceptualized seven ways of using multimedia. The study stated that Instructional Technology can support learning by enabling active engagement in construction of knowledge, making available real-world situations, providing representations in multiple modalities (e.g., 3-D, auditory, graphic, text),
drilling students on basic concepts to reach mastery, facilitating collaborative activity among students, seeing interconnections among concepts through hypertext, learning to use the tools of scholarship. All these seven ways point towards increasing role of multimedia in classroom.

Sinhathambi, V. (1991) conducted a study and concluded that the students who were taught by the video method learned more concepts and the students improved their achievement after viewing the video programme.

The findings of the study conducted by Jayamani and Chandramani (1992) revealed that the experiment which used simulation model of teaching through computer assisted instruction was significantly better in performance than the control group which used the traditional method, but sex wise comparison proved to be insignificant.

Katz and Pyryt (1992) describe a project that focuses on improving student’s self-image, self motivation and decision making skills by using technology like audio cassette, microphone, video, animation and computer software package, sixth grade students.

According to Yang (1992) and Crain (1994), computer based instruction provide better opportunity for creativity, sustained motivation and immediate recall of learnt facts.

Funkhouser and Djang (1993) found that high school algebra and geometry students who used commercially available problem-solving software scored significantly higher on tests of mathematics content than a comparable group of students who did not use the software. The students using the software also made significant gains in problem-solving ability.
The project known as Classroom 2000 Plus study (1993) which was started by the Central Institute of Educational Technology (CIET), NCERT emphases that interaction is the pre-requisite for achieving higher cognitive levels. The study report was based on a variety of interactive techniques, and technologies such as group interaction, interactive media, multimedia and teleconferencing etc.

Beichner (1994) established some very positive points about multimedia through his two year long study. A primarily qualitative, observational investigation was conducted over a two-year period while the teachers and students worked cooperatively to create interactive displays for a touch-sensitive multimedia kiosk for the zoo. Several categories emerged out of the qualitative analysis of the data which included extensive videotapes, interviews, observations, and student-created materials. The students strong appreciation that they were preparing multimedia materials for a real audience emerged as the core category in the analysis. The findings of the study reveal that students demonstrated great concern for accuracy in their displays, students quickly assumed the major responsibility for content and editing decisions despite the fact that the original task of designing the displays had been structured for them by the teacher, students accessed wide ranges of science materials and sources to find the content they desired, and their commitment to and enthusiasm for the project remained very high and the bottom line was that by establishing an environment where creative thinking about content is combined with real-world assignments, students learned the content, enjoyed the learning process, and recognized that they had created something worthwhile.

A study by Carter (1994) suggests that supplementing classroom instruction with tutorial and practice software had a positive impact on mathematics and reading achievement for low-performing ninth graders. A group of students received computer-based instruction for one 50-minute period per week in both their math and English classes for most of one school year; for the remaining time, these students took part in regular classroom instruction. They demonstrated significantly greater
gains in both mathematics and reading skills than another group of low-performing students who received traditional instruction without access to computers.

Fyfe and Fyfe (1994) reported student's positive attitudes towards multimedia in their Australian study. Observations and evaluations of a multimedia-delivered biology experiment indicated that students enjoyed using the program and demonstrated significantly higher on-task behaviours than when participating in traditional laboratory-based experiments. In addition, feedback from tutors indicated there was more time to concentrate on helping individual students, rather than simply supervising them.

Instructional technology creates a whole new world of possibilities for teaching and learning. As Geoghegan (1994) pointed out, however, only a small proportion of faculty are actively using instructional technology, and these tend to be innovators or early rather than mainstream faculty.

A study of the Impact of Educational Telecast (1994) revealed that there is a direct relationship between viewing of educational telecasts and the children performance. They do significantly better in mathematics, environmental sciences and language skill with audio-visual representation if teachers too get involved with them. The study was sponsored by NCERT which indicates that teachers view educational programmes along with the students, but they do not find time to discuss the programmes with the children. The study suggests that the success of educational telecasts depends mainly on the quality of programmes, analyzing the children to enjoy and the quality of support services such as electricity, and television computer sets with a good reception which together adds to the viewing experience. The study recommends the use of multimedia programmes on a vast scale so that the children and teachers could appreciate the potential role that the multimedia can play and lighten their work load. Television/Computer programmes should use one or more animals, cartoons, children, music and dance etc. to have a greater impact on the teaching learning process.
Investigation of Kanning (1994) describes that multimedia approach is most successful in helping students to reach existing curricular goals.

Rathbone (1994) explained the complex role that multimedia plays in the teaching learning process. According to him, multimedia simply means being able to communicate in more than one way. Computers can communicate in several ways—text, pictures and movies which are the elements of multimedia. It flashes text on the screen and beeps (audio communication). This is simply called multimedia. Rathbone states that a multimedia computer can recreate the sounds of musical instruments, play-back recorded sounds, show pictures and movies on the monitor, access information, stored on a compact disc and run windows. Instructional technology creates a whole new world of possibilities for teaching and learning. As Geoghegan pointed out in 1994, though there is great technological advancement but only a very small proportion of faculty are actively using instructional technology, and these tend to be "innovators" or "early adopters" rather than "mainstream" faculty.

Rowry (1994) investigated the effects of a computer videodisc program versus a traditional program in high school chemistry. The pretest-posttest control group research design was used for the 196 participants, randomly assigned to an experimental group (A) and a traditional control group (B). The major finding of the study was that those high school students who were tutored by the computer controlled videodisc method (Group A) showed significantly greater achievement than did those high school students who were tutored by the traditional method (Group B).

Burton (1995) experienced the effectiveness of Computer Assisted Instruction over traditional instruction on academic performance of adult students in Mathematics and reading sections of the test of Adult Basic Education. Age and sex had no effect on the method of instruction.
Goodwin (1995) introduced Multimedia as turning out to be one of the most appealing things that computers do. Most of the computers are already equipped with add-on peripherals that make multimedia applications possible.

Lehrer (1995) revealed the significance of multimedia in increasing the power of retention through his study conducted on students of eighth grade. Study supports distinctive differences in ways, students retain information gathered and applied using multimedia versus traditional modes of instruction. In his study, Lehrer found that students who learned about the civil war using multimedia had made long lasting connections with the materials while students who learned traditionally had little to no retention of the material one year later. It was also noted that the level of student engagement was significantly higher amongst students with both high and low abilities.

ISRO (1995) in its study on the role of television in rural areas - An INSAT Effects study, 1995, Indian Space Research Organisation concluded that the majority of viewers felt that the television plays an important role of providing information and knowledge about important activities, events and happenings. Knowledge level of the viewers was higher than the non-viewers. It is also clear that while entertainment programmes are the major attraction, the development programmes are also watched to a large extent. The study clearly brings out that whenever efforts are made, television viewing helps in increasing the knowledge in all subject areas.

Sinclair (1995) dwelled on the development of text based data, generation of sound and more advanced aspects of multimedia in order to enable to develop multimedia presentations including interaction with a video and camcorder. This implies a virtual marriage of Computer with the television. The conceptual understanding of the teachers, participating in the teleconferencing improves significantly. Teachers are actively involved in the interactive mode of technology and they evince keen interest in taking part in the group activities. They are interested in knowing practical methods for implementing the teaching techniques.
Sewell, Stevens and Lewis (1995) found that the overall response of undergraduate students using multimedia computer packages were favourable. The study concluded that multimedia computer technology presents a powerful aid in the teaching and assessment of Biological science.

Callaway (1996) identified that effectiveness of an interactive multimedia computer package designed to accommodate a number of cognitive and learning style is much higher for learning difficult topic such as 'photosynthesis' for high school students than the typical classroom method.

Chhabra (1996) analyses a comparative study of teaching with and without multimedia support and evaluation of multimedia package and found that there is 8 - 40% gain in achievement in mathematics with multimedia approach.

A science curriculum based on technology and students-centred learning for high school students was developed by Ebert and Strudler (1996). They found that creativity, interest, performance and work habits of the students increased tremendously using low cost multimedia.

Studies conducted by Edmundson (1996) showed that computer assisted instruction students performed significantly better in their achievement of intermediate English.

Skibbe and Chesnut (1996) revealed that Multimedia brings us closer to an optimum instructional, communicative and productive environment and offers exciting learning opportunities, dynamic tools for communicating and responsive fast approaches to do all kinds of work-personal or official. Most multimedia systems contain some or all of the multimedia components. A typical multimedia system contains a CPU, an operating system, a sound band, a CD-ROM drive, an input-device. It is a very powerful technology for all aspects of life including education.
Stone (1996) compared second grade students who had used several mathematics and reading software programs since kindergarten with students in a nearby school who did not use the software. Both schools followed the same Board of Education-approved course of study. However, students who had used the software scored significantly higher in mathematics problem-solving on a standardized test.

Researchers from Leicester University (Underwood, Cavendish, Dowling, Fogelman and Lawson, 1996) found that students using mathematics software in an Integrated Learning System (ILS) at schools throughout the United Kingdom showed significant learning gains, compared to students not using the software.

Research work of Crosby and Iding (1997) examined high school student's performance on an interactive multimedia computer tutorial for learning physics concept in conjunction with their individual differences and indicated that this approach is more effective.

Reddy (1997) studied the effectiveness of multimedia instructional strategy in teaching science to slow learners and the results reveals that it enabled the slow learners to cope with normal students to a considerable extent.

From his study Schnackenberg (1997) showed that a relatively full version of computer-based instructional program is more effective for improving student's achievement and learner control in an instructional program is more appealing for students than program control.

Ayres and Melear (1998) found that there is an increased learning of physical Science concepts via Multimedia when compared to the traditional hands – on exhibit in a science museum.
Dalton and Hannafin (1988) concluded that while both traditional and computer-based delivery systems have valuable roles in supporting instruction, they are of greatest value when complementing one another.

Emerson and Mosteller (1998) concluded that computer technology can support good teaching and can provide active participation. Also found that multimedia has advantages using multiple senses and can accommodate varying needs of students and enhance learning efficiency.

Maheshwari and Raina (1998) described the new technology used to train teachers providing two way (audio and video) transmission and telephone feedback in order that the responses from the teachers and their trainers could indicate considerable potential for the exploitation of new technology where a large number of teachers require training.

Mehryar (1998) conducted a survey on the effectiveness of a web-based interactive multimedia system in tertiary education. The results of the survey conducted during the course indicated that students were enthusiastic towards the new multimedia packages.

Okolo and Ferretti (1998) in their study on multimedia showed that student learnt complex concepts by using multimedia. Students picked up faster when learnt simultaneously through text, audio, video and sound. It also increased the likelihood that students will acquire an understanding of complex information. It is a reasonable conjecture that using an even wider range of media will extend this effect. The same study also noted that students with a wide range of abilities "readily mastered these tools and were highly motivated by the opportunity to augment their writing with other media." That is, multimedia increased variety of expression enhanced attitudes as well.
UNESCO World Education Report (1998) described that the students and teachers must have an access to digital technologies. It also states that the teachers must have the knowledge and skills to use the new digital tools and multimedia resources to help all students, achieve higher academic standards.

Yasmin et. al. (1998) designed a project on collaborative educational multimedia and the findings indicated that students improved significantly in their science understanding programming skills.

Agarwal and Tiwari (2000) in their study on Multimedia System brought to light the concept of Multimedia as the outcome of technological advancement. They mention the types of multimedia, basic terminology, multimedia networking and platforms, relation of multimedia with the internet and the basics of animation including the techniques of Animation Creation.

Simkins (2002) in his study on multimedia projects stated that students learning increases through Multimedia. He also stated that teaching with multimedia is the future of the classrooms. He further added, "My dream is to have multimedia enriched classrooms. Multimedia Teaching Programmes can enhance the achievement of students".

NUEPA (2004) document described EDUSAT Project as a new revolution in education, offering an opportunity of constructing multi-channel learning system, comprising virtual classroom through video conferencing and computer communication, digital storage, retrieval facilities, and internet based and supported learning.

Dash (2005) in his study of learning gain from face to face workshop over SLM reported that learning from SLMs get strengthened by supplementary interactive media.
Das, Mamota (2005) studied the ICT enabled teacher education and found that information technology in teacher education and found that information technology in education is changing the way we teach, learn and conduct research.

NCERT Educational Encyclopedia, 2005 incorporating "Designing scripts for video programmes documents the knowledge and skills required for the development and design of scripts for educational programmes. This clearly distinguishes writing for print media from the writing for television. The basic steps for television script writing are target audience, objectives, programme briefs, academic note, scripting, feedback and evaluation.

EDK (2006) Document on Technology supported Project Based Learning Hand Book for Karnataka schools (2006), Education Department Karnataka, stress that the use of technology in education as the most powerful when used as a tool for problem-solving, conceptual development and critical thinking. In this manner the technology is used as a tool and the teachers and students control the curriculum and instruction. The document states that technology can also analyse and provide immediate feedback on performance and can suggest modification in instruction where necessary to improve student achievement.

Goel (2006) in his paper presented at the National Seminar on Educational Technology, 2006 abstracted 54 studies on Media and Computer Assisted learning Material which were conducted in India from 1998 onwards. The studies establish the effectiveness of Computer Assisted Learning Material (CALM) on a variety of subjects such as Hindi, English, Physics, Chemistry and Math. Review of the studies reveals that there is a significant gain through interaction with the CALM and CAL. It can be inferred through almost all those studies that computer is an effective medium for instruction. The studies also establish the fact that the interaction mode has been found to be more effective than the talk-back mode.
Paily, M.U., (2006) studied the integration of Information and Communication Technology in Teacher Education, and found that the opportunities thrown open by the technological achievements is mind-boggling, and that the teachers should take initiative in the transformation of educational processes to reap the full benefits of ICT.

Ranade, Mridula D. (2006) had undertaken the development of comprehensive Computer Assisted Instructional (CAI) Packages on the concept of Multiple Intelligences (MI) and its application to teaching. The packages were developed to fulfill two objectives: to introduce teacher-educators and student-teachers to the relatively new concept of Multiple Intelligences Approach to teaching, and to expose them to a good model of the use of a slideshow presentation for teaching. The CAI packages were found to produce significantly higher achievement in terms of content when tested on a batch of about 25 teacher-educators. All participants reported that the packages were effective in bringing about learning, and also that the introduction to this new approach would help them to think more innovatively about lesson planning. In another study which was a continuation of the first study, the effectiveness of CAI (on MI) used as a visual aid in teaching was compared with traditional lecture method, and use of CAI was found to lead to significantly higher achievement (at 0.01 level of significance) than the traditional lecture method.

Srivastava (2006) in her research study concluded that there was difference in availability and usage of computers in different Govt schools i.e. Sarvodayas and RPVVs were found to be better in terms of infrastructure than the other Govt Schools, but there is overall lack of syllabus based multimedia packages to supplement classroom teaching. The study also reveals that there is immense need of Information Technology based pre-service and in-service training for teachers. Though students and teachers both are happy using computers but there is lack of motivation.
Viswanthappa (2006) in his research paper concluded that the e-content on concept attainment model has significant influence on concept analysis ability and teaching competence and this approach would help promote certain specific abilities like creative writing abilities, problem-solving abilities etc. which are necessary for the development of the learner.

Tatpuje (2006) described that the learner's gain increased opportunities to experience others culture through interactive learning approach. The educationists have given various pedagogic principles for classroom and distance mode teaching which can be of unique help for package developers to develop highly interactive and interesting packages.

NCERT Report (2007) reveals how live graphics, visual icons etc could be received by a multimedia ready device only or special multimedia card could be inserted into a mobile device i.e. a laptop if it has a slot or provision for that the content could include material for self-study or preparation for examination or some pictures or audio clippings.

Singaravelu and Muthukrishanan (2007) conducted a study in the field of ICT: A Boon for higher education, and concluded that ICT helps the professional development of teaching and learning in individuals involved in the programs of teacher education.

Watters, James J and Diezmann, Carmel M. (2007) in their study of Multimedia resources to bridge the praxis gap: Modelling practice in elementary science education reported that multimedia appears to be a promising approach to complement pre-service elementary science teacher's experiences of teaching and learning.

Kannan (2008) conducted a Study of Effectiveness of use of Computer Technology in teaching the concepts of Physics at Senior Secondary level and found that the
computer assisted teaching is the best method to teach the concepts of physics at senior secondary level. The study concluded that there was significant difference between computer-assisted teaching method (group 1) and method of learning by accessing the computer technology without the aid of the teacher (group 2). But there was no significant difference between method of learning by accessing the computer technology without the aid of the teacher (group 2) and traditional method of teaching (group 3).

Nimavathi and Gnanadevan (2008) reported that by the use of multimedia the students get a live vision of life's aspects and scientific factors. e.g. a diagram can be explained in detail with three-dimensional effect which helps the students in understanding the lesson clearly.

Yuva SLP (2008) Yuva Life Skills Programme of Education. Department Delhi Administration is a classic example of a multimedia programme as a part of the joyful, interesting and meaningful learning. The programme aims at providing orientation training to the teachers of Municipal Corporation of Delhi and Education Department of Delhi Administration. This multimedia enriched programme has been successfully used to bring an improvement in the quality of education in Delhi schools. Its impact has clearly been seen in the CBSE results of Govt. schools of Delhi.

Chaudhary (2009) stated in his research paper "Towards a culture of ICT-Enabled Education" has emphasised digital storage and multimedia system which have opened up new approaches to the development of teaching learning techniques, forcing learners to be independent and more motivated. Accordingly new technologies and the applications of ICT would provide support for effective two way communication which includes multimedia and interactivity.

Madan (2009) studied the Effectiveness of Multimedia Teaching Programs for teaching of English, and found that the experimental group of students taught
English through Multimedia Teaching Programs method showed a significantly higher gain score on the achievement test than the group of students taught through the traditional method.

Rai (2009) described the use of multimedia, not only brings creativity but encompasses all arenas of education through text, graphics, and moving images, sound and music with the help of computers. According to Rai, multimedia is global term and involves presentation using multiple media, including computer based multimedia presentation.

Singaravelu (2009) studied the Effectiveness of Multimedia Package in Learning Vocabulary in Tamil, and found Learning vocabulary in Tamil through Multimedia package is more effective than conventional methods.

Nidhi (2010) in her study of Developing and Validating a Multimedia Learning Package in Educational Technology for B.Ed. Learners, reported that Multimedia Learning package helps in improving the achievement of B.Ed. learners and both teachers as well as students showed positive reaction towards using multimedia learning package.

Khokhar (2010) studied Relative effectiveness of E-content strategy and Conventional strategy of teaching Science and found that the E-Content strategy has enhanced the achievement of students in science of E-Content group and both experts as well as students were having favourable reaction towards different aspects of developed E-Content. Further E-Content has improved the achievement significantly higher in comparison to Conventional Strategy when groups were matched on pre-achievement in science and both male as well as female were benefited to the same extent.

The integration of Multimedia technology in the classroom can prove very effective both for students and teachers.
2.2 OVERVIEW
Multimedia is a recent innovation being inducted in the field of education and forms the hub of computer-aided instructions to improve the quality of education system. Technologists and educationists all over the world have written exclusively on multimedia applications. According to them, use of multimedia as an instructional device for specific content areas offers exciting opportunities for teaching and learning. Multimedia has the unique strength of communicating difficult concepts in simple ways. It keeps the child in the centre of Teaching Learning Process and thus proves effective in the classroom.