Computer-assisted Instruction is one where use of the Computer as a highly adaptive teaching machine weakens the distinction between software and hardware. This type of instructional module was developed by Stolurow and Davis (1965).

1.4.4 Steps in Programming:

i) **Topic Selection:** The programmes should select the most familiar topic; otherwise he has to take the help of a subject expert.

ii) **Content Outline:** After topic selection, its outline may be prepared which cover all the materials, one plans, to teach. For this programme one has to refer to examine relevant books and materials.

iii) **Instructional Objectives:** Instructional Objectives must be formulated which involve both task description and task analysis. The former is the description of terminal behaviours which the learner is expected to achieve and the latter is the series of component behaviours that he is required to acquire in the process of achieving terminal behaviour.

iv) **Entry Skill:** The learner should have some pre-requisite ability and skill to understand properly the new programme. This background experience is called the entry skill and a suitable programme cannot be prepared without proper assessment of the entry skill.

v) **Presentation of the Material:** Suitable format is to be decided for presenting the material from the educational point of view. Then the programmed material should be presented in a sequence of frames arranged as steps towards terminal behaviour.

vi) **Student Participation:** On analysis of the terminal behaviour one will find the critical responses of the students.

vii) **Terminal Behaviour Test:** The effect of programme can be ascertained by administering the terminal behaviour test. It is also known as performance assessment. This provides feedback to the programme and shows the effectiveness of the instructional materials.

viii) **Revision:** Lastly the programme may be revised on the basis of feedback. The instructional materials may be edited and modified according to the needs and requirements of the target audience.
Programmed Learning is a self-instructional device. A rapid learner can cover the material quickly and slow learner may proceed on his own pace. It helps the learner to teach himself at any place and pace according to his convenience. The analytical thinking and self-direction of learners are also promoted through the use of programmed learning materials.

1.5 Computer Assistance Instruction (CAI)

Computer-based education (CBE) and computer-based instruction (CBI) are the broadest terms and can refer to virtually any kind of computer use in educational settings. Computer-assisted instruction (CAI) Computer Aided Instruction (CAI) is a narrower term and most often refers to drill-and-practice, tutorial, or simulation activities. Computer-managed instruction (CMI) Computer-managed instruction is an instructional strategy whereby the computer is used to provide learning objectives, learning resources, record keeping, progress tracking, and assessment of learner performance. Computer based tools and applications are used to assist the teacher or school administrator in the management of the learner and instructional process.

A self-learning technique, usually offline/online, involving interaction of the student with programmed instructional materials.

Computer-assisted instruction (CAI) is an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place.

CAI uses a combination of text, graphics, sound and video in enhancing the learning process. The computer has many purposes in the classroom, and it can be utilized to help a student in all areas of the curriculum.

CAI refers to the use of the computer as a tool to facilitate and improve instruction. CAI programs use tutorials, drill and practice, simulation, and problem solving approaches to present topics, and they test the student's understanding. Typical CAI provides

a) Text or multimedia content
b) Multiple-choice questions
c) Problems
d) Immediate feedback
e) Notes on incorrect responses
1.5.1 Types of Computer Assisted Instruction

a) Drill-and-practice Drill and practice provide opportunities or students to repeatedly practice the skills that have previously been presented and that further practice is necessary for mastery.

b) Tutorial Tutorial activity includes both the presentation of information and its extension into different forms of work, including drill and practice, games and simulation.

c) Games Game software often creates a contest to achieve the highest score and either beat others or beat the computer.

d) Simulation Simulation software can provide an approximation of reality that does not require the expense of real life or its risks.

e) Discovery Discovery approach provides a large database of information specific to a course or content area and challenges the learner to analyze, compare, infer and evaluate based on their explorations of the data.

f) Problem Solving This approach helps children develop specific problem solving skills and strategies.

1.5.2 Advantages of CAI

Computer aided instruction has provided genitor scope to experiment and apply in instruction. The major advantages are listed below.

i. One-to-one interaction

ii. Great motivator

iii. Freedom to experiment with different options

iv. Instantaneous response/immediate feedback to the answers elicited

v. Self pacing - allow students to proceed at their own pace

vi. Helps teacher can devote more time to individual students

vii. Privacy helps the shy and slow learner to learns

viii. Individual attention
ix. learn more and more rapidly  
x. multimedia helps to understand difficult concepts through multi sensory approach  
xi. self directed learning – students can decide when, where, and what to learn  

1.5.3 Limitations of CAI; instruction is professional activity and cannot be disposed from face- to- face facilitator during instruction some of the limitation are as below;  
   a. May feel overwhelmed by the information and resources available  
   b. Over use of multimedia may divert the attention from the content  
   c. Learning becomes too mechanical  
   d. Non availability of good CAI packages  
   e. Lack of infrastructure  

1.6 ONLINE/INTERNET PROGRAMME  

The Internet plays a major role in the lives of young people today. Children and youngsters engage in online activities both inside and outside the classroom (Sefton-Green 2004). Formally, that is in the school, young people use the Internet for instance, when searching for information and when completing tests. Informally, that is in their spare time, they chat with friends, play online computer games and are involved in fan fiction, i.e. using published material to create pictures and films etc. (Olin-Scheller & Wikström 2010).  

The Internet has introduced improvements in technology, communication and online entertainment, but it is also incredibly useful for education purposes as well. Teachers use the Internet to supplement their lessons, and a number of prestigious universities have opened up free online lectures and courses to everyone. It has even allowed retired teachers to read to and educate children in poorer countries. Widespread use of the Internet has opened up a substantial amount of knowledge to a much broader range of people than ever before.  

The Internet is the largest set of computer networks that use the Internet Protocol. The invention and development of the Internet was the biggest discovery by mankind in the 20th century that led to a revolution. Today, the Internet is used by more than 50% of the world population, as its applications are found in nearly every
fields of life, be it communication, knowledge, news, shopping, marketing, entertainment, education, etc. So, how exactly does the Internet technology benefit students for education?

1.6.1 Use of the Internet in Education

The fast and relatively low-cost access is one of the major benefits of Internet to people and students all over the world, as getting an Internet connection are easy. Communication and information are the two basic uses of the Internet. Information available on websites can be updated or modified at any time and for any number of times, which helps in learning and better understanding.

i) Using Multimedia

Arguably, it is believed that visual data has a greater impact on learning and memorizing than plain text. Therefore, images, graphics, animation, pictures, slides, documentaries, etc., have a greater appeal than a plain textbook. Using multimedia and Internet provides an opportunity for children to gain knowledge about a particular subject in depth. Students can now see the actual photographs of rare bird species, or see animated graphics of a volcanic eruption to understand the concept in detail.

ii) Online Learning

Another positive effect of Internet in education is the onset of distance education or online education (internet-based training (IBT) or web-based training (WBT)). With this facility, you can take up short-term courses with the course material available online, attend virtual classes, learn, and appear for exams. One of the benefits of online learning is that people from any part of the world can gain knowledge on different subjects, complete courses, etc.

iii) Easy Contact

Students can contact other students or their teachers via the e-mail if they have queries about any information. Sharing of information, discussions on a particular subject, etc., can be easily carried out using the Internet. At the same time, teachers can also contact parents and guardians easily using Internet.

iv) School/College Projects

Using the Internet can be very useful for completing projects in schools and colleges. As the Internet is an ocean of information, covering nearly
all subjects known to man, one can find information, research work, etc., required for one's projects. Going through the information on the Internet is definitely faster than reading an entire book on the subject. Completing homework is also easier with the help of the Internet.

v) **Encyclopedia**

Sometimes, an encyclopedia may not always be available to students and they may have difficulty in gaining access to the books in the library. In that case, the encyclopedia of various subjects available on the Internet can be helpful. This is more useful for students who belong to communities not having English as their mother tongue. Kids and younger children can also be benefited by the Internet by using the pictures, videos, etc.

vi) **News**

All the latest news are constantly updated on the Internet on news websites. Students learning politics, can have an access to all the current affairs through the Internet. Historical accounts like speeches, biographies, archive videos and photographs, etc., are also easily available on the Internet in detailed and accurate versions.

vii) **Affordable Knowledge**

Investing in research material may be tedious and unaffordable for some. But, now, thanks to the Internet, we have content websites, web encyclopedias, and dictionaries whenever we want them. Today, able as well as less-able students can be benefited to the sea of knowledge through the Internet. University courses and learning is now easy for people belonging to all strata of the society with the help of online courses.

viii) **Easy Education System**

Not only gaining knowledge, but, every part of the education system is simplified because of the Internet. You can now view your prospective educational institute, look up for courses, enroll to online courses, take classes, research, see your results, and even look for job prospects on the Internet. Therefore, the scope of Internet in education is very wide and equal to all.

ix) **Enhanced Lessons**

Teachers can make use of the Internet by giving students extra resources and material from the Internet, such as interactive lessons and educational
games. Many college courses use a "hybrid" model where many lessons are done online, requiring fewer in-class meetings. This saves students from having to commute to campus with their heavy textbooks every day. Tests, homework, collaboration with students and research can all be done from any computer with Internet access. Even for non-hybrid classes, the Internet is used as an addition to normal studies.

x) **Study and Research**
The Internet contains a wealth of knowledge that is available instantly upon any search. Because of this, the Internet has superseded libraries as a source for information gathering and research. Many teachers will now ask students to visit specific websites to study from home, and online encyclopedias provide masses of knowledge on almost every topic imaginable. The variety of sources allows students to pursue subjects in much greater detail rather than being limited to whatever the teacher sends home.

xi) **Communication**
It used to be that students that forgot work, missed a lecture or couldn't remember an assignment were out of luck until talking face to face with a teacher or a classmate. However, the Internet allows instantaneous connection to your classmates and teachers. Improving communication between students and teachers allows teachers to assist students without having to stay after class. It also allows for students to have greater efficiency when working on projects with their peers when everyone cannot attend or asking for clarification when something is unclear.

xii) **Accessibility**
A number of universities have opened up free courses on a variety of subjects that are accessible to anyone for free. These typically come in the form of lectures on video, but some also have notes attached. This means there is easy access to plenty of free lectures without emptying your bank account to pay tuition. The Internet also makes education accessible to impoverished communities. The "Granny Cloud," for example, made use of Skype as a number of volunteers, mostly retired teachers, read stories aloud over Skype to children in India to teach them how to read.
1.7 SIGNIFICANCE OF THE STUDY.

In the Indian context the development of multimedia can be traced from the past fifty years. Study at Center of Advance Study in Education (CASE); MS University Baroda, as reported in the All India Educational Survey provide ample evidence in this direction. Studies under taken by Ravindranath M, J. R. Govinda, SS Krishnan, M. M Mukhopadya, But V.D, M B Menon, the worth mentioning. The UNESCO work of Prof S.S. Kulkarni in this direction on development of software material in Educational Technology set a path way in this direction. The modules prepared under its UNESCO project provide details of multimedia material development with scientific approach.

Studies undertaken by Krishnan using OHP and audio tapes was initiation towards use of hardware. Mukhopadhya used slide and tape as an progressive technology in this direction. The UNESCO work of Prof. Kulkarni is standard multimedia material with slides, tapes, text material and PLM. With the advent of computer the expertise from the computer discipline has dominated the field and works of educationist are sidelined been presented. Ample reachers are available ware in hardware part is considered as major aspect and methodology of content processing and educational principles as parasitic. Such development has hampered the growth of CAI with scientific methodology based on the principles of educational technology.

There is need to take up researcher that can take the principles of educational technology at the front end in the research. The role of teacher as instructional specific (pedagogist) cannot be undermined. The pedogogist participates in multimedia approach at two levels. During the development of material he predominates in providing analysis of subject content to be used, the sequence of content to be placed as material of teaching and selection of appropriate multimedia for a given context. He also is a major decision maker in designing the overall approach to the curricular transaction and experience creation. The computer programmer and hardware specific are the supporter to the system and can be at the center of activity. At an overt format through they appear in for front in maintenance, the finalization by the teacher as counselor, for guide monitoring the local instructional situation needs be underlined.

The present study is an effort to re-orient the multimedia programmes. Where in the teacher is as the prime manger of instruction and learner is the center of instruction.

The material analyzed in the present study provides a plat form where all the available multimedia from verity of scores can be systematically stored and made available through a contingent of arrangement as per the prescribed content of learning text. The role of researcher is to develop the software which can be used by teacher to systematically store, edit resources and use through a single window in systematic form. The material is systematically organized by one expert teacher may be used by any teacher through mass media.

The present study is an effort to evolved a software that can support the teacher to a mass multimedia for each of the text units that he has to transact and use it in class as well provide to learner as self learning support material.

1.8 STATEMENT OF AIM

Development of Multimedia Learning Programme linked with website learning facility at school level for History subject
1.9 OBJECTIVES OF STUDY
1. Development of multimedia programmed learning generic software
2. To find out the effectiveness of developed software in terms of learning outcomes
3. To find out the effectiveness of material in terms of development of competencies for using CAL web by learners.
4. To find the effectiveness of CAI in terms of teacher acceptance for the integration of software for classroom teaching.
5. To find out the opinion of teachers, students and teacher educators towards MMLP software in terms of user friendliness and flexibility and acceptance.

1.10 RESEARCH HYPOTHESES
1. The multimedia programmed learning software is effective in terms of user friendliness, flexibility and acceptance by users namely learners, teachers and teacher educators.
2. The multimedia programmed learning software is effective in terms of achievement scores when used in classroom teaching.
3. The multimedia programmed learning software is effective in terms of developing computer assistance learning capacity in the learners.
4. The multimedia programmed learning software is effective in terms of teachers’ acceptance for school instruction.

1.11 OPERATIONAL DEFINITIONS OF TERMS USED
1. Computer Assisted Learning (CAL) – Material: - This is a software which will have the facility to input school subject content on any topic (Mughal dynasty) for learning. The software will have facility for the learner to make choice of content subunits; objectives of his choice from given set and learn on his own using multimedia. The software will have the facility to use as classroom instruction material as well. The software will provide systematically arranged material on the learning unit to move freely from any one point to any other point without passing through any predefined sequence. The multimedia will have different
modes of learning material such as text PPT, Audio, Audio video, Graphics evaluation and web site links references pictorial gallery, and summary, note page with additional exercises. The learner will have the choice to make move as per his needs and learn the content.

2. **User friendliness:** It is the capacity of the software to reach the needs of different competency-based student community to use the software with flexibility. In other words, it is the capacity of the software program to provide multimedia programmed learning material interface benefits between the content and the learner.

3. **Flexibility:** It is the ability to provide i) freedom to the learner to make choice of the content point he desires to learn and switch to its specification instantaneously and ii) freedom of making choice by the learner to use the media of his interest viz text, PPT, Audio, Pictures, Internet by web cites, with ease to the learner as per his needs.

4. **Usability:** It is the scope of the software to use with various types of content, to use on various computer platforms, to use with different computer processor and with varied resolution oriented monitors, to use with different age group learners and teachers.

5. **Computer Assisted learning competency** - It is the skills required to access information from the various sources of digital media and internet by a learner for a given set of learning objectives.

6. **School Subject:** The prescribed subject as per syllabus of the state government for secondary school learning as represented in the textbook prepared by the SERT of the state that are taught for annual achievement examination.

### 1.12 SCOPE AND LIMITATION OF STUDY

The study will have the scope for using the developed multimedia for any subject since it falls under generic software. The multimedia will not only be self-instructional material but also is class room instructional material. The material can have learning material in multi language with addition of a pdf file inclusion facility.

Teachers at large and students of the state schools do not have attitude and competencies for learning with computer based material. Further, the schools are not fully equipped to use such material.

The study will have the scope for using the developed multimedia for any subject since it falls under generic software. The multimedia will not only be self-instructional material but also is class room instructional material. The material can have learning material in multi language with addition of a pdf file inclusion facility.
Large number of teachers and students of the state schools do not have attitude and competencies for learning with computer based material. Further the schools are not fully equipped to implement computer based instruction in the learning and teaching process.

1.13 OVERVIEW OF THE REPORT

The first chapter deals with introduction. The researcher studied about the multimedia development, multimedia building blocks, Multimedia development before computer came into existence, Multimedia development after digital concept, Programmed learning, Computer Assistance Instruction (CAI), online/internet programme, Statement of Aim, Significance of the Study, Objectives of Study, Research Hypotheses, Operational Definitions of Terms Used, Scope and Limitation of Study.

The second chapter deals with review of related literature. In this chapter reviews are studied on CAI, Multimedia in India and at abroad.

The third chapter deals with Design of the study. In this chapter the researcher has discussed phases of research design. In the first phase development of multimedia learning software, second phase is internal validation of the software and the last phase external validation of the software.

The fourth chapter deals with Nature of multimedia learning programme through web learning software.

The fifth chapter deals with data analysis and interpretation. In the chapter students achievement test are analysed on pre and post test scores. Teachers, students and teacher educators’ response scores are analysed with graphical representation and percentage analysis.

The sixth chapter deals with summary, conclusion and findings of the present investigation. The last pages contained bibliography, appendices, and Screen shots of MMLP software.
CHAPTER – II

REVIEW OF RELATED LITERATURE

2.0. Introduction

2.1. CAI - Computer Aided Instruction

2.2. Multimedia Effects in Teaching MMLP
   2.2.1 Indian Studies
   2.2.2 Foreign Studies

2.3 Summary of Foreign Studies

2.4 Multiple Intelligence
CHAPTER – II

REVIEW OF RELATED LITERATURE

2.0. INTRODUCTION

Any researcher wants to learn about previous knowledge related to this research problem. Review of literature is the basic information to proceed towards solution.

Review of related literature is an important path of any research. Knowledge acquired through generation is well displayed in books and web-site and it arranged in libraries’ and internet etc. Each new generation of human being make use of accumulated knowledge as foundation for building up for further knowledge. The study of literature is necessary in any field of enquiry.

In the field of education as in other fields too, the researcher needs to acquire up-to-date information about the area of research. Review of adequate information and to be with familiarity, are unavoidable to researcher. It helps the investigator to decide whether the evidence already available solves the problem adequately without further investigation and thus avoid risk of duplication.

The literature provides ideas, theories explanation etc, valuable in formulating and methods of research appropriate to it. Koul 1996 states “research takes the advantage of knowledge which has accumulated in the past as a result of human endeavor” It can never be undertaken in isolation of the work that has already been done on the problems. A careful review of the research journals, books, dissertation and other sources of information on the problem to be investigated is one of the important steps in planning of any research work. In other words research do not begins in vacuum. The related literature is worthwhile for an effective research.

In the present study the researcher reviewed and has categorized them in to three phases:

- CAI-computer Aided Instruction.
- Multimedia effects in teaching MLP.
- Multiple Intelligence
2.1. CAI-COMPUTER AIDED INSTRUCTION

A large number of studies both in India and abroad are available in this category. Computer being used some of the related reviews are detailed below;

1. Mary (2002); conducted a study to examine the Pedagogical reasoning: Issues and solutions for the teaching and learning of ICT in secondary schools. It is cleared from the analysis of the pedagogical reasoning process in relation to teaching ICT that the lack of ICT content knowledge of some ICT teachers is only a small part of the problem. The other categories of knowledge where deficiencies have been identified; pedagogical content knowledge, subject specific aspects of general pedagogical knowledge, knowledge of learners and curriculum knowledge, will require an extensive collaborative effort involving teachers and researchers.

2. Debra and Hayes (2005); Focused on ICT and learning: Lessons from Australian classrooms. Results revealed that ICT is largely being integrated in ways that support and supplement existing classroom practices. The results are often unsatisfying for both teachers and students because of the limited availability and varying functionality of ICT. These conditions suggest that teachers need support to develop new approaches to teaching and greater access to reliable technology before the powerful ICT learning environments that have been heralded are realized.

3. Nwachukwu prince (2006); Concluded that varieties of techniques are needed for teachers to effectively utilize ICT instructional materials in the teaching and learning process. It was also revealed that there are significant differences in the effectiveness between professionally trained teachers and untrained teachers in their ICT instructional material utilization competencies. Kin, James and Ian (2005) have done a study enhancing teachers' incorporation of ICT in classroom teaching. This study focused on determining the effectiveness of a school-based, on-site, and ongoing professional development program conducted in a primary school in Hong Kong. There were training sessions conducted by fellow teachers, and
participatory action research groups to share resources and experience in incorporating ICT in teaching. Teachers’ incorporation of computers in teaching was significantly increased in the first year of intervention but showed fluctuation in the second year. A number of explanations were offered by teachers in their interviews for these changes.

4. **Romina, Protector, Paul, Glenn and Watson (2006)**; Found that male teachers report significantly higher levels of confidence in using ICT with students for teaching and learning and the students of male teachers or confident teachers use ICT more frequently to both enhance and transform the curriculum. Further there was no significant relationship between years of teaching experience and teacher confidence but experience did impact on the level of ICT use that teachers prefer their students to demonstrate, with teachers who have had least experience preferring their students to use ICT more to both enhance and transform the curriculum.

5. **Nachimuthu and Vijayakumari (2007)**; Did research on “Modern ICT trends in teaching technology”. They pointed out most of the teacher educators are not able to use the media technologies due to lack of training. He suggested that the teachers have to be equipped with the skills and abilities from time to time to handle the latest technology as the quality and competence of teachers affect instruction with a strong impact on student learning.

6. **TanerAltun (2007)**; Studied on “ICT in initial teacher education”. These vital factors were; ICT infrastructure and physical resources, curriculum and policy development, training lecturers and pedagogical training of teachers in ICT. ICT has the potential to contribute to the improving of students critical thinking, decision making, problem-solving skills and generating ideas with its integration into classroom activities. The teacher’s role at this point is crucial.

7. **Boakye and Banini (2008)**; Conducted a case study approach to assess the Teacher ICT Readiness in Ghana by using a quantitative and qualitative data were gathered to understand the use of ICT in the selected schools. Results
obtained were 71% of teachers do not use ICT in classrooms, 49% of teachers use ICT to prepare lesson notes, 55% of teachers have some knowledge of web browsing, 71% use email, and 78% try to make an effort to learn how to use the computer. Despite the limited use of computers by teachers in their teaching, many agree that the computer has changed the way students learn. And 24% of teachers have received some form of training in the use of computers, with quite minimal training in the pedagogical integration of ICT.

8. Kmalanayan (2008); Designed a study on “Implications of Information Technology for teacher education and research”. It was pointed out that information technology in education is created the need for all teacher education faculties to be proficient in the use and integration of ICT into mainstream teacher education programme delivery.

9. Nimavathi and Gnanadevan (2008); Did a research to examine on “Effectiveness of Multimedia programme in teaching science”. Results were found that multimedia programme prepared by the researcher is more effective for the achievement in science of ninth standard students. The students learning through multimedia programme are found to be better than the students learning through the conventional method of teaching.

10. Yasemin (2008); Did a study on “ICT usage in Higher Education: A case study on pre-service teachers and instructors”. Results revealed that teacher education programs fail to provide appropriate instructional technologies and computer facilities for both in and out of class activities. Furthermore, three factors that appear to have a significant influence on the effective use of technology were found to be:
   i. The quantity and quality of the lessons addressing technology in the curriculum,
   ii. Incompetent teachers/lack of in-service training, and
   iii. Insufficient technology.

11. Anil Ambasana (2009); Conducted a research on “Utilization of computer technology in remedial instruction”. Results concluded that computer –
assisted instruction programme in remediation task was found to be successful as the students were able to overcome the difficult points in the content. Hence they were able to increase their achievement significantly. Utilization of computer technology in remedial instruction was found effective.

12. Rafeedali (2009); Carried out a study on “Computer based technology and its pedagogical utility”. The study revealed that higher secondary school teachers were unable to utilize the opportunities of information technology resources in education and they were observed to be comfortable with traditional teaching methods and materials and also pointed out secondary school teachers could not use the ICT resources in the classroom interaction. Only 13 percentage of higher secondary school teachers are using power point presentation in the classroom.

13. Yuksel, Soner and Zahide (2009); Conducted to examine the “Teacher educators ICT competencies, usage, and perceptions”. The data were collected from 111 teachers and interviewing with 6 teachers. The results indicated that most of the participants expressed positive perceptions about the integration of ICT into teacher education programs. Generally, their ICT competency was completely sufficient. They use the Internet as a supportive tool to their courses, and particularly search engines used by them.

14. Farahiza (2010); Conducted a study on “The effectiveness of using internet as a principal information resource in teaching and learning activity in higher educational institutions in Malaysia”. Majority of the previous researchers indicated that there are significant relation between the internet and the student and also the lecturer in using the internet as a principal information resource in teaching and learning activities. This study showed that internet is a technology that considered brought benefits to the student and lecturer in teaching and learning activities as well as the applications provided by the internet.

15. Krishnaveni and Meenakumari (2010); Focused on “Usage of ICT for information administration in higher education institutions”. Results revealed
that a comprehensive set of functional areas of information administration. It was found that current level of usage indicated a clear integration of ICT for managerial or information based administration in higher education institutions. Enhancing the usage of ICT on these functional areas and especially for general administration will enable enhancement of overall information administration in higher education institutions of global environment. It is serving as a base for education planers to deploy technology based administration in higher education institutions.

16. Neeraj and Anitha (2010); Did a study on “Computer and Internet awareness in school going students”. The study found that the required level of awareness about computer and the internet is not there. The real power of the computer is revealed in Philip, Oluwatolani and Oluwaranti (2010); Did a study on an evaluation of the impact of ICT diffusion in Nigeria higher educational institutions”. They found that ICT is becoming a driving force for educational reforms and those ICTs become an integrative part of national education policies and plans in Nigerian tertiary institutions.

17. 18. Queen (2010); Studied on ICT in participatory development of teaching and learning English as a global language in Nigeria. Results indicated that there Is improvement in the quality of language teaching through the diversification of contents, methods, and as well promoting experimentation, innovation and obtaining and sharing of information. There is wide-range of language learning reforms, hence the need to; (I) Increase access to teacher’s knowledge and development through interactive technology (II) Increase the people’s awareness on the importance of technology (III) Increase access to instructional resources, increase flexibility in what to learn, how to learn and when to learn (iv) Train teacher to improve the competence in using the new technologies in the instructional activities (v) Increase governmental support in technological programmes and funding in the tertiary institutions. (vi) Adherence to these needs will help to realize more positive results in the application of technology in language teaching and learning in Nigeria. But the penetration of computer and internet is still far from desired.
18. Rachmawati and Johancynthia (2010); Conducted on ICT based learning schools to assess the challenges on implementation. Results indicated that ICT based learning the role of teachers were significantly changed from transferring of knowledge into facilitating of learning, from a main source person to be a manager of learning. Other challenge is also addressed to head teachers in encouraging teachers to implement ICT based learning in order to improve students capability and skills.

19. Rajakumaran, Soureche and Viswanathan (2010); Examined a study to assess the “Role of ICT in teaching and learning Mathematics”. It was found that ICT enable the students to manipulate diagrams dynamically and it encouraged them to visualize the geometry as they generate their own mental images. It is also enhanced opportunity for students to be introduced to interesting problems and associated mathematical subject matter much earlier than before possible.

20. Rebecca and Porter (2010); The findings of the study indicated that the strongest predictors that are positively associated with computer use are training on excel and the need for ongoing support for the inclusion of technology in mathematics teaching. This paper concluded with recommendations as to how school leaders can support mathematics teachers to fully adopt computer technology use in teaching and learning.

21. Rosnaini and Ismail (2010); Examined the “Impact of training and experience in using ICT on in-service teachers” basic ICT literacy”. The study found that majority of the teachers had moderate basic ICT knowledge and skills, and perceived ICT positively. Formal ICT training and ICT experience influence the teachers” knowledge, skills and attitude. Therefore, teachers especially the older ones and normally with more teaching experience need to be identified, and provided with specially designed training programs, in various forms of ICT courses and workshops.

22. Viswanathan (2010); Conducted a predictive study on secondary schools to examine the educator” s pedagogy influencing the effective use of computers
for teaching purposes in classrooms in South Africa. Results revealed that educator pedagogies were the highest predictors on the use of computers in the classroom. Although the quantitative analyses for educator support, training and attitude were the lowest predictors on the use of computers, the qualitative analysis, nevertheless, found sufficient support for it. Educationists and policy-makers must include all principals and educators when technological innovations are introduced into schools. All these role-players need to be cognizant of the implications if innovations are not appropriately implemented. Including the use of computers in educator training programs is important so that pre-service educators can see the benefits of using the computer in their own teaching.

23. *Wanjala, Elizabeth. K and Mukwa (2011)*; Found that few teachers are using ICTs to manage the classroom and to integrate technology into several of the content areas. Professional development options were varied. They pointed out the most teachers use trial and error, learn through course work taken at colleges or universities, and support others or receive personal or expert support as significant methods of learning how to use Information Communication Technologies.

2.2. MULTIMEDIA EFFECTS IN TEACHING MMLP

The major issues of using multimedia in terms learner difficulty, sequencing of content appropriateness of media are study during last fifty year with and without computer assistance. The knowledge gained on these studies provides insight to deal the research problems. Important studies are detailed here with

2.2.1 INDIAN STUDIES


The main purpose of the study was to make an appraisal of the relative effectiveness of multimedia programmed instruction and programmed class-teaching
on the criteria of immediate achievement and retention of group of subjects at three levels of ability.

The specific objectives of the study were:

- To develop instructional materials for the strategy of programmed class teaching and to study its effectiveness.
- To develop the programmed learning materials on light in school physics in four different styles—semi-programmed, linear programme, branching programme, and hybrid programmed.
- To develop a multimedia programme package using each style of programme in conjunction with audio-visual media.

The sample consisted of 400 learners of standard IX which comprised an equal number of boys and girls. The tools used were A Group Test 01 Intelligence B.EP.T.T. in Bengali, the Entry Level Tests, and criterion on referenced Tests I, II and III. Five treatment groups were T-1 having programmed lessons, teachers resource book and guide, students study guide for class room demonstration.

The following were the findings of the study:

- There was a significant difference among the different strategy means on the criterion on overall achievement.
- The strategies of multimedia programmed instruction enabled learners to reach the level of mastery learning (mean score varied between 80 C) and 856.00 out of 100).
- It was found that a significant difference exited in the achievement through the different strategies due to differences in ability.


- To compare the achievement of students of class VII in social studies when taught through three different approaches, viz., radio-vision, modular and conventional.
- To compare the achievement of students in geography when taught through these three approaches.
The study was conducted at the final study stage and at the confirmatory stage. The sample of the final study comprised 20 students in each of three different schools. The students were selected on the basis of their intelligence scores. In total there were 90 students. The sample of the confirmatory study comprised 90 students belonging to one school.

The findings of the study were:

- The students achieved highest knowledge achievement scores in geography when taught through radio-vision.
- High intelligent students scored highest knowledge achievement scores in geography when taught through radio-vision.


The main objective of the investigation was to study the organization and utilization of Education Television (ETV) Programme. The organization of ETV was studied in Delhi, Maharashtra, Srinagar, Jaipur, Raipur and Muzaffarpur. The utilization of ERTV was studied in Maharashtra state.

The date was collected from the producers of ETV programmes and academic staff of the educational technology (ET) cells, directorate of Education, through questionnaires and interviews information was also called from official documents.

The major findings of the study were:

- In 1983-84, Doordarshan Kendra (DDK), Delhi used to telecat 16 programmes per week out of which 13 programmes were to secondary students, two for elementary pupils and one for teachers. In Maharashtra, there were three school TV (STV) programmes, one each for students of Class, V, VI and Class-VIII. In Srinagar there were years Delhi was producing six programmes per week for classed V to XI for the schools of Jaipur, Raipur and Muzaffarpur.
- In Delhi, TV handbooks were distributed to all TV viewing schools in – Maharashtra, TV hand books and other support material were distributed to all schools but they did not reach the schools in time. In Srinagar, Jaipur; Raipur and Muzaffarpur, Support material was not supplied to teachers.

The objectives of the study were:

- To create awareness among teachers and head masters of secondary schools about the importance of audio-visual aids.
- To help in raising the academic standard in secondary schools of Thane District.

The tools of investigation were questionnaires to schools, head masters and teachers to assess the availability and use of audio-visual aids in schools, interviews to supplement the information available through questionnaires and visits and observation.

Some of the important findings of the study were:

- Schools were situated in urban areas and the ones which were conducted by rich societies possessed audio-visual aids.
- Only a few teachers used audio-visual aids in teaching.
- Teachers who were trained in the use of audio-visual aids were inadequate in number.
- At many places the audio-visual aids were in a broker down codition and awaited repairs.


The major objectives of the study were:

- To develop a multimedia package for teaching a course on audio-visual educational for the instructor training programme.
- To find the effectiveness of the multimedia package in terms of achievement of trainees and change in attitude of the instructor trainees and change in attitude of the instructor trainees towards the multimedia package.

To attain the above objectives, a single group design was evolved. As many as 127 instructor trainees enrolled during the year 1981-82 at the Central
Training Institute for Instructors, Madras was treated as the sample of the study. The instructional strategy was prepared in modular form. There were five modules containing the full course units.

The major findings of the study were:

- Ninety-eight percent of the trainees obtained more than 80 percent of the marks on the final post-test.
- The mean percentages of the post-test scores varied from 81.41 to 90.46.
- The mean gain in the total scores for all the modules was found to be significant at 0.01 level.


The objectives of the study were:

- To collect background information on primary school teachers, parents / guardians and TV schools.
- To assess the opinion of school teachers, head masters and parents about the effective use in education.

The samples of study were: 48 TV schools selected at random from two western educational districts of Orissa during 1983, 50 TV user teachers, 41 head masters, 211 children studying in selected schools and 85 parents / guardians of some of the children studying in the selected TV schools. The questionnaires, interview schedules and one moral development tool of the Kohlberg type were used for data collection.

The major findings of the study were:

- About 88 percentages of the teachers had not received any training in teaching before joining the service.
- The TV sets were installed in the upper primary level, and to some. Extent in the upgraded middle primary schools in that order.

7. Wad, V., A study of the scope of communication Media such as Raido, ion in Education at High School Level in Maharashtra State, Ph.D. Edu. U., 1984.
The main objectives of the inquiry were:

- To study the effectiveness of educational television in terms of educational utility to students and teachers.
- To study the attitude and views of parents about educational programmes on radio and television as far as they’re growing children were concerned.

The study employed the descriptive survey method using documentary analysis and library research. Order to collect the relevant data, the investigator critically referred to various encyclopedias, directories, thesis, research studies, reproofs, periodicals and journals and analyzed them in view of the specified objectives.

The main conclusions of the study were:

- The school TV programmes were liked by children for the variety, their authenticity and as change in the learning process.
- Children were more influenced by the entertainment TV programmes than the school TV programmes.
- School broadcasts programmes, which were excellent in their content and standard. They were useful in increasing the span of attention of school–going children.

8. Thillaka and Pramilla (2000) conducted and experimented quantitative method to examine the influence of computer-based multimedia programme on achievement in maths among high school students and to find out the difference in achievement in maths between high achievers and low achievers from both relative retention of learning in mathematics.

Sample; A Sample of 62 was collected from IX Class students.

The main findings of the inquiry were:

- It was observed from the results that there is no influence of computer based multimedia programme on the achievement in mathematics among high school students.
- There is no significant change in their attitude towards mathematics after learning trigonometry through computer-based multimedia and text-based self-study material.
There is no significant difference in achievement of mathematics between high achievers and low achievers for both experimental and control groups.

There is no significant difference in the retention of learning in mathematics between the experimental group and control group. Three references were cited in the study.

9. Vardhini (1983); “Conducted an experiment to test the developed multimedia verses instructional strategy for teaching science at secondary level.”

The experiment was conducted for an academic year to cover 19 units of the subjects chosen for study. Results revealed that

- Almost all the units indicated average and high level of performance of the total test.
- The strategy was found valid against the criterion of scientific attitude in that significantly higher performance was noted for the group in the post test over the pre-test.
- Validity of the strategy was established from reactions expressed by students for its continuance and also their improvement in science achievement. (iv) Programmed material and discussion sequence were equally effective on the total test.
- The strategy was found feasible when seen in terms of its reproducibility and the cost management by individual’s schools.

10. KANADE, H.M., Trends in CIET’s Educational Television Programmes over a Four- Year Period, 1982-86, CIET Project, NCERT, 1987,

The objectives of the project were to study;

- the total number of ETV programmes produced in CIET during 1982-86,
- programmes produced for 5-8 year old children under different series during 1982-86,
- programmes produced for 9-11 year old children under different series during this period,
- thrusts of the teachers’ programmes and subject-wise classification of programmes.

Data were collected from official records and monitoring reports. They were analysed in descriptive forms.
The main findings of the study were:

- In all, 321 programmes with an overall duration of 100 hours were produced in the CIET during the four-year span. Out of these, 132 programmes were for the 5-8 year age groups, 140 for the 9-11 year age groups, and the rest for teachers.
- These programmes were prepared in different phases spreading over four years' time.
- The ET cell had produced adequate length of material for transmission. As far as the children's programmes were concerned, no programme was to be repeated at least within the same year.
- Some of the listed programmes had become technically unusable or content-wise outdated. 5. Three important series, viz. story time series, BalJagat and Our Body and Health were dominant ones among the 5-8 year age group programmes.
- Three important series, viz. Air, Story of Man, and Delhi Our Capital, ran for a considerable period of time for the 9-11 age group children.
- The programmes classified under different categories were: Knowledge (73.5 per cent), Attitude (25.4 per cent), and the rest under Skill. In most cases stories were integrated with biographies to strengthen the moral base.
- Among the teachers' programmes the major thrust had been on low cost teaching aids and experimentation, population education, and on programmes dealing with concepts of science and mathematics.

11. MENON, M.B., Evolving a Multimedia Approach to Teaching at Post-graduate Level, Ph.D. Edu., MSU, 1984,

The major objectives of the study were
- to develop a multimedia strategy in organizing a course in educational technology for postgraduate and research students,
- to validate the strategy in terms of students' performance in criterion tests and discussion sessions, and their attitude towards the strategy,
- to study the relationship between achievement and intelligence, and achievement and English reading comprehension,
- to study the feasibility of the strategy.
A single group design was worked out for carrying out the investigation over a long period of time. The sample for the validation study consisted of 21 M.Ed. students, 15 M.Sc. Home Science students and eight research students of Education during the 1977-78 session and a combined group of 22 students from M.Ed. and M.Sc. (Home) students of the 1978-79 session. The instructional inputs of the strategy were PLM, structured lecture, team teaching, seminar, slide-tape commentary, work-book presentation, discussion, library work, assignment, feedback session, practical work and summary. The tools used for the study were the criterion test, an observation schedule, and an attitude scale prepared by the investigator, Govinda’s English Reading Comprehension and Raven’s Standard Progressive Matrices. Descriptive statistics, F-test, partial correlation and product-moment correlation techniques were used for analysis of data.

- The findings of the study were:
  - In the initial year, around 90 per cent Ph.D. students and M.Sc. students scored 60 per cent and above marks on the Comprehensive Criterion Test, and more than 50 per cent M.Ed. students scored 60 per cent and above marks.
  - In the subsequent year around 90 per cent students scored 75 per cent and more marks.
  - An improvement trend was witnessed with regard to discussion sessions.
  - At different stages of implementation of the strategy, the students’ attitude towards the multimedia approach went on increasing in a favourable direction.
  - During the period of try-out of the strategy for two years, the relationship between intelligence and academic achievement was found not significant. The relationship between English comprehension and academic achievement was found significant at 0.01 level.
  - The unit cost varied from Rs. 47/- to Rs.32/- for a range of 25 to 50 students if software suitable to be presented through hardware was to be incorporated. The strategy worked within prescribed periods of time.
  - The educational implication of the study is that the validated multimedia strategy, with suitable software material can be used to provide instruction in ‘educational technology’ of one semester duration to postgraduate students in education and related disciplines.

12. PILLAY, G.S., Educational Television Programme-an Assessment, Dept. of Education, MKU, 1987,
The objectives of the study were

- To find out the average time spent by Madurai Kamaraj University students on television programmes,
- To identify the types of ETV programmes the students like,
- To find out the students' assessment of India-made ETV programmes, and
- To identify the students' different likings of the TV programme services.

All the M.Phil. students of Madurai Kamaraj University admitted in university departments during 1986-87 formed the subjects of the present study. For the purpose of data collection, an interview schedule was developed. The students of the Department of Education conducted the interviews. They were given sufficient orientation for the conduct of the structured interview. The data were analysed through the use of percentages.

- The major findings were:
  - Of all the M.Phil students admitted in the Madurai Kamaraj University during 1986-87, 28 per cent possessed TV set in their homes. Of them 16 per cent were men and 12 per cent were women students.
  - Among the students who had TV in their home, nearly 40 per cent spent on an average between thirty and sixty minutes on viewing TV programmes. Nearly 27 per cent spent between sixty and 120 minutes and nearly 17 per cent of the M.Phil students spent more than two hours.
  - Of those who saw TV in hostel and places other than home, nearly 41 per cent of the M.Phil students spent less than thirty minutes daily on an average on TV viewing. About 43 per cent of them used to spend between thirty and sixty minutes on TV programme. Hardly 16 per cent of them spent more time on it.
  - Only 48 per cent of the students reported that they used to see ETV programme.
  - About 56 per cent of the M.Phil students who expressed their liking for ETV would like to see programmes of a general nature. Science and humanities programmes were liked by 30 per cent and 14 per cent of them respectively.
  - About 69 per cent of the M.Phil students found Indian produced programmes satisfactory or equally good as imported ones but to 31 per cent of the M.Phil students, Indian programmes were poor when compared with the foreign programmes.
More than half of the M.Phil students expressed that the production of Indian TV programme was not attractive and the content not sufficient. For 25 per cent of the students presentation was not good and appropriate and for 17 percent commentary was not good.

The most liked TV item for the M.Phil students was sports and games and the least liked item was the ETV.

Students possessing TV in their home were more in science disciplines.

Science students, spent relatively less time on seeing TV programmes.

There was a significant difference in time spent on viewing TV among those who possessed TV at home and hostel inmates and among the science and social science students.

Science students were more interested in seeing ETV programmes.

There was significant difference among the students of humanities, science and social science in their liking for the science, humanities and the general programmes of the ETV.

Students observation in rating the quality of the Indian produced ETV programmes was independent.


The objectives of the study were;

- to find out the present position of the audio-visual Equipment and materials in the secondary schools of East and West Godavari districts of Andhra Pradesh,
- to determine the factors hindering the effective use of audio-visual equipment and materials in classroom teaching, and
- to ascertain the attitude of the respondents towards the factors influencing the effective use of audio-visual equipment and materials in classroom teaching.

The study was conducted on a sample of eight schools by mailing four types of questionnaires for the availability of audio-visual equipment and materials and their effective use in classroom teaching. The following tools were developed by the investigator for the purpose of data collection:
- questionnaire on the availability of audio-visual equipment,
- questionnaire on the availability of audio-visual materials,
- questionnaire on the effective use of audiovisual equipment in classroom teaching,
- questionnaire on the effective use of audio-visual materials in classroom teaching.

The major findings were:

- The position of the audio-visual equipment in the schools was poor.
- There was a significant relationship between the availability of the equipment and the type of the management of the school.
- There was association between the availability of the equipment in the schools and their locality.
- There was a relationship between the availability of the audio-visual equipment and the age of the schools.
- There was a relationship between the availability of the audio-visual equipment and the type of school.
- There was no positive association between the availability of audio-visual equipment and the strength of the school.
- There was no positive association between the effective or ineffective use of audiovisual equipment in classroom teaching and the type of management.
- There was no significant relationship between the effective use of audio-visual equipment in classroom teaching and the locality of the schools.
- There was no relationship between the effective use of audio-visual equipment in classroom teaching and the strength of the schools.
- Most of the respondents checked the factor, 'Absence of sufficient equipment and materials' as the first and foremost hindering factor for the effective use of audiovisual equipment and materials. The other factors hindering the effective use of audio-visual equipment and materials, given in order of importance, were: 'Heavy work load on the part of the teacher', 'Lack of accommodation', 'Lack of funds', 'Lack of trained personnel', 'Lack of time for the teacher' and 'Very expensive.'

14. **JYOTI RAINA**; “Perspectives in Learning and Cognition from History of Epistemology”
When perspectives in learning and cognition are articulated, their epistemological and ontological assumptions are not made explicit. Even if they are explicaded they are not sufficiently detailed. This theoretical essay seeks to establish such links between learning and its epistemological roots. It addresses the under asked question How do current learning and cognition theories relate to the history of epistemology? It examines some of the modern theories in learning and cognition with reference to the epistemological underpinnings derived from Plato’s theory of knowledge. A case is made that the label Platonism may or may not apply meaningfully to a learning theory.

15. Malik and A. Agarwal; “Use of Multimedia as a New Educational Technology Tool–A Study”.

Multimedia has dig up its own kind of space in some or the other way as a tool of educational technology. Multimedia has overcome the barriers of time and space and provides evidence to be accepted as an anytime and anywhere tool for educating multi-disciplinary masses. The process of knowledge acquisition becomes more efficient when the learners experience an event through a multimedia simulation. Multimedia technology empowers the educational process by means of increased interaction between teachers and the students. Apart from the fact that multimedia can provide educators and students with endless possibilities of quality teaching and learning, taking vital considerations of the pedagogical strengths and limitations of Multimedia, it can be used to its fullest potency, and reach the eminence.

16. Dr. Pratibhasharma; (2013); “Role of interactive multimedia for enhancing students' achievement and retention”

Objective; The major objective of this research paper is to find out the effectiveness of interactive multimedia Programme and conventional direct method of teaching English at secondary level, in relation to student’s achievements and retention of acquired knowledge. Methodology; The present study is a quantitative research where an analytical comparison of two methods of teaching by using data. Where we will compare the effectiveness of “Interactive Multimedia programme to conventional direct method of Teaching”, in understanding of English language. The nature of this study is experimental; therefore experimental method with pre-test, post-test, randomized group design has been used. Findings & conclusions; When the English
language were taught to the students of class VII students through either conventional direct & interactive multimedia method, in both the cases remarkable differences were found between their pre-test & post-test achievement scores. Overall if we compare both the methods with respect to the marks achieved by them through post-test, it was evident that students performed better on post-test in comparison to their pre-test marks when they were taught through interactive multimedia method. Also, more consistency was found between the significant difference of pre-test & post-test achievement marks in case of multimedia method. Hence, it is concluded that both the method taken under this study are quite effective for teaching the English language to class VII students but however, out of these two methods, interactive multimedia method was found more suitable with respect to the marks achieved by them in English. When achievement of students of class VII students in English was compared on post-test taught through conventional direct method of teaching and interactive multimedia International Women Online Journal of Distance Education July,

17. Dr. C.V. Satyaprakasha and YaspalSudhanshu; International Journal of Education and Psychological Research (IJEP) Volume 3, Issue 1, March 2014,

The term ‘Multimedia instructional systems’ refers to the user of appropriate and carefully selected verities of learning experiences which are presented to the learner through selected teaching strategies which reinforce and strengthen one another so that the learner will achieve predetermined and desired behavioural objectives. In the present study attempt has been made to find out the effect of Multi Media Teaching on achievement in biology.

Objectives of the study were;

- to find out the effectiveness of Multi Media Teaching on achievement in biology .
- to find out the effectiveness of Multi Media Teaching on achievement in biology among boys and girls in experimental group.

Hypotheses of the study were;

- Multimedia teaching would promote achievement in biology.
- the attainment of different objectives of achievement in biology would be same among boys and girls in experimental group.
For the present study, two sections of 9th standard consisted of 38 and 39 students of Samhitha High School, Kurabrahalli, Bangalore have been chosen as the sample. Cluster and random sampling procedure was employed in the selection of the sample. Achievement Test in Biology developed by the investigator has been used for the collection of data.

The major findings of the study were:

- Multi Media Teaching significantly promoted achievement with respect to knowledge, understanding, application and total achievement in biology in comparison to conventional method.
- Different objectives like knowledge, understanding, application and total achievement in biology were significantly attained by both boys and girls in experimental group.

Effect of Multi Media Teaching on Achievement in Biology

18. Ashvinijoshi; (2014); “Multimedia: A Technique in Teaching Process in the Classrooms”

One of the techniques to improving the students’ meets the academic needs and helps them developing English language skills is providing multimedia during the process of teaching and learning in the classroom. Multimedia classroom provide the students chances for interacting with diverse texts that give them a solid background in the tasks and content of mainstream college courses. The writing aims to find out some advantages of the use of multimedia in the classroom. Also, the involvement of technology in the classroom cannot denied giving positive point to improving the quality of teaching and giving more various techniques in teaching a foreign language. The research uses a qualitative method giving a deeply description using multimedia in the classroom. The difference between a traditional classroom and multimedia classroom has been drawn in this writing. The writing shows that there are some advantages in teaching English using multimedia as a technique in teaching process in the classroom. Through the media the teacher could give more opportunity to students to express their opinions and enjoy during the course. The highly presence and motivation also bring positive aspects to students so that they can improve their skills. Evaluation and Findings: At the end of implementation phase, all data and information, which was collected through semi structured interviews and
questionnaires and observations, were saved and stored in a filing system for analysis in the evaluation phase. Technological evaluation: Interview and questionnaire results indicated that teachers were satisfied with the technical aspects of the software.

They responded that the design elements and layout were clean, simple, consistent and well structured. “I think the look and presentation is very professional and all my students found it very easy to use.” Year 3 teacher. “Like the clean layout structure of the software and available features, it is interactive and engaging. Teachers thought that it had been possible to present multiple representations of mathematics concepts creatively and clearly through the use of the multimedia components in the application.

(a) Teachers using the tools in mathematics classrooms,

(b) Students using the tools independently,

(c) Some examples activities created in the Student Activity software,

(d) Student using the tools in pair or small group.

19. Kumar, K.S. Kiran (2011); conducted a study Teaching Grammar through Multimedia to Rural Secondary School Students. Research evidenced indicates that the Multimedia presentation can improve student’s performance; therefore Multimedia presentation being an innovative approach to teaching-learning process endless drill and practice without repetition, and provides immediate feedback to the learner on his/her progress.

20. Singh, Y. G. (2010); conducted A Study of Effectiveness of Multimedia Programme in Teaching Biology. The study was conducted to develop a multimedia programme for the teaching of Biology, and experimenting the same with a set of students studying in the XIIth standard and finding out its effectiveness over the traditional method of teaching. Pre-test and Post-test

21. Jing, Liu (2010); carried out An Experimental Study on the Effectiveness of Multimedia in College English Teaching. Based on empirical research and qualitative analysis, this paper aims to explore the effectiveness of multimedia assisted methods in college English teaching. It seems and has been proved by some studies that
multimedia assisted methods can effectively promote students’ English learning. But the results of this study do not positively contribute to the previous hypothesis.

22. Acha, J. (2009); conducted a study The effectiveness of multimedia programmes in children's vocabulary learning. The present experiment investigated the effect of three different presentation modes in children's vocabulary learning with a self-guided multimedia programmes In this study, 135 3rd and 4th grade students were shown a short English language story, presented on a computer program. Twelve previously unknown words (key words) were embedded within the story. Students were presented with verbal annotations (written translation), visual annotations (picture representation), and a combination of the two to assist in their understanding of the twelve key words. Recall of word translations was highest for students who received verbal annotations only. These findings suggest a challenge for the effectiveness of self-learning multimedia programs in second language vocabulary acquisition.


24. Desai, Beena Y. (2004); 12 conducted A Comparative Study of the Efficacy of Teaching through the Traditional Method and the Multimedia Approach in the Subject of Home Science. It is an experimental study which has employed experimental group and control group design. The sample of the study is constituted of 98 students of B.A. first year home science (2001-2002) of Smt. J.P. Shroff Arts College, Valsad. The students were found to have favourable opinions towards the multimedia approach. The study has found the relative efficacy of teaching through
the traditional method and the multimedia approach in the subject of Home Science, particularly, Prote

25. **Pushpa Repswal:** Enroll. No.: IISU/2010/150 Under the Supervision of Dr. Sunil Khurana Head of the Department Department of Education, The IIS University, Jaipur April, 2012

**Objective of the study:** To compare the effectiveness of teaching through the traditional and the multimedia approach on academic achievement of the upper primary school level student. a.i. In context to subjects viz. Science, Social sciences and Mathematics a.ii. In context to classes sixth, seventh and eighth.

**Achievement test:** An Achievement test of Science, Social sciences and Mathematics will be prepared for classes sixth, seventh and eighth.

**Statistical Technique:** The data will be analyzed by using statistical technique t-test and graphical representation.

**Delimitations of the study:** 1. To study the effectiveness of teaching, only academic achievement of the students will be measured. 2. Academic Achievement test will cover only three subjects namely Science, Social Sciences and Mathematics. 3. Schools having multimedia approach to teaching are only those schools which are having smart classes or digital classrooms. 4. The study will be confined to schools of Jaipur having CBSE affiliation.


27. **Jadal, M. M. 4 (2011):** carried out a study Efficiency of using computers in teaching English. It was found that experimental group students, due to the usage of computer in English teaching, learnt effectively.

28. **T. Enok, Joel 5 (2011):** undertook a study Influence of Multimedia in Enhancing Attitudes towards Computer Science at Higher Secondary Level. Multimedia package has influence on the attitude towards Computer Science. It is observed that method of teaching with modern tools matters to develop attitude among students.

2.2.2 **FOREIGN STUDIES:**
A large number of studies are conducted, focusing in the use of text along pictorial, animation, personalised audio, animated audio and there combination. The results are varied nature. Usually pictorial presentation done simultaneously with text is found to be effective in an sequencing one after another. The personalised audio narration is found to be effective composed to the animated text or impersonalised text reading. The structure from West do not provide the exact details of research conducted on the secondary data is available in large quantity. The researcher reviewed the following authors studies.

1. **Eric Jamet, Monica Gavota, Christophe Quaireau**; “Attention guiding in multimedia learning”. 2007,

   The present study examined the effects of two types of attention-guiding means (color change or step-by-step presentation of diagram elements synchronized with a spoken explanation) on multimedia learning. These attention-guiding means were expected to facilitate selection of the illustrated information that corresponded to the spoken explanations. The results indicated positive and in some cases additive, effects on attention task and on the perceived ease of learning but not on a transfer task.

2. **Stephan Dutkea, Mike Rinckb**; “Multimedia learning: Working memory and the learning of word and picture diagrams”. 2006,

   From them cognitive model of multimedia learning proposed by [Schnotz, W.,& Bannert, M.(2003). Construction and interference in learning from multiple representation. Learning and Instruction, 13, 141-156], two hypotheses regarding the learning of spatial arrangement soft objects were derived: the integration hypothesis and the multiple source hypothesis. In the experiment, ninety-six participants first studied spatial arrangements of five objects each. The complete arrangements had to be inferred from pairs of objects, because participants were shown either word pairs or picture pairs depicting adjacent objects. After wards, they were tested using either object pairs or complete arrangements, and the test items consisted either of words or of pictures. In addition the participants were divided into four groups according to their verbal and visual spatial working memory capacity. The results showed that integrating pairs of objects into
complete spatial arrangements required more working memory resources than evaluating the pairs, irrespective of the objects represented by words or pictures, (b) that integration of elements from different sources (verbal descriptions and pictorial depictions) required more working memory resources than integrating only depictive elements. The results yield evidence for the proposed internal structure of Schnotz and Bannert’s model. The results are discussed with regard to individual differences in working memory capacity, cognitive load and the design of multimedia-supported learning tasks.

3. **BillieEilam Yael Poyas**; “Learning with multiple representations: Extending multimedia learning beyond the lab”. 2006

   The present study extended multimedia learning principles beyond the lab to an ecologically valid setting (homework). Eighteen information cards were used to perform three homework tasks. The control group students learnt from single representation (SR) cards that presented all information as printed text. The multiple representation (MR) group students received the same information, but each card contained their printed text or an information ally equivalent graphic such as a chart or graph. The MR group students performed better than the SR group students on accuracy of their homework answers and on subsequent post test retention and transfer, and used more information cards while learning. The improved MR group students’ performance is discussed in relation to two alternative possible explanations e the nature of the information sources and students’ motivation to learn.


   We examine design factors that may evoke positive emotions in learners and investigate the effects of these positive emotions on learning. Recent research showed that the emotional design of multimedia learning material can induce positive emotions in learners that in turn facilitate comprehension and transfer. We sought to replicate these results with a different population and
different mood induction procedure and examine individual emotions, and to decompose the effects of the design elements of colour and shape. Study 1 showed that well-designed materials induced positive emotions and facilitated comprehension, though transfer performance was not affected by emotional design. Study 2 found that round face-like shapes both alone and in conjunction with warm colour induced positive emotions. Warm colours alone, however, did not affect learners’ emotions. Comprehension was facilitated by warm colour and round face-like shapes, independently as well as together. Transfer was facilitated by round face-like shapes when used with neutral colours.

5. AzarPakdamanSavoji aHamidrezaHassanabadib,ZahraFasihipourc;” The modality effect in learner-paced multimedia learning”. 2011,

A total of 80 girl 8th-grade students viewed a short computer-based multimedia presentation consisting of 16 slides explaining lightening formation. They studied instructions set up interactivity level with system either low (pause and play buttons) or high (with 2 more buttons of backward and forward) and using either on-screen text or narration accompanying animations and took on cognitive load and performance. The results showed that narrative group spend less time and more mental effort than on-screen text group, while the low interactivity group outperformed the high interactivity group on tests of retention and transfer with spend less time. On findings performance is higher when behavioral activity during learning is lower and the interactivity level is not interacting with text modality.


How can learners build their own knowledge, which is precisely tailored to their needs and background? This is the question which this paper attempts to answer by providing a framework for a flexible object-based e-learning environment. The paper recognizes that, in order to properly address learners’ requirements, instructional technologies must be more adaptive and use a variety of media. In its attempt to build an adaptive learning system, this paper highlights the role of learning objects and actually provides an implementation of such objects as well as an algorithm which constructs a
learning path customized to each learner to root out the learning deficiencies of individual learners

7. **Roxana Moreno; Richard E. Mayer:** “Verbal Redundancy in Multimedia Learning: When Reading Helps Listening”. 2002,

Three studies investigated whether and under what conditions the addition of on-screen text would facilitate the learning of a narrated scientific multimedia explanation. Students were presented with an explanation about the process of lightning formation in the auditory alone (non-redundant) or auditory and visual (redundant) modalities. In Experiment 1, the effects of preceding the non-redundant or redundant explanation with a corresponding animation were examined. In Experiment 2, the effects of presenting the non-redundant or redundant explanation with a simultaneous or a preceding animation were compared. In Experiment 3, environmental sounds were added to the non-redundant or redundant explanation. Learning was measured by retention, transfer, and matching tests. Students better comprehended the explanation when the words were presented auditory and visually rather than auditory only, provided there was no other concurrent visual material. The overall pattern of results can be explained by a dual-processing model of working memory, which has implications for the design of multimedia instruction.

8. **Richard E. Mayer; Roxana Moreno;** “Nine Ways to Reduce Cognitive Load in Multimedia Learning.” 2003,

First, we propose a theory of multimedia learning based on the assumptions that humans possess separate systems for processing pictorial and verbal material (dual-channel assumption), each channel is limited in the amount of material that can be processed at one time (limited-capacity assumption), and meaningful learning involves cognitive processing including building connections between pictorial and verbal representations (active-processing assumption). Second, based on the cognitive theory of multimedia
learning, we examine the concept of cognitive overload in which the learner's intended cognitive processing exceeds the learner's available cognitive capacity. Third, we examine five overload scenarios. For each overload scenario, we offer one or two theory-based suggestions for reducing cognitive load, and we summarize our research results aimed at testing the effectiveness of each suggestion. Overall, our analysis shows that cognitive load is a central consideration in the design of multimedia instruction.

9. MyintSweKhineAtputhasamyLourdusamy; “Blended learning approach in teacher education: combining face-to-face instruction, multimedia viewing and online discussion” 2003,

Students learned about electric motors by asking questions and receiving answers from an on-screen pedagogical agent named Dr.Phyz who stood next to an on-screen drawing of an electric motor. Students performed better on a problem-solving transfer test when Dr.Phyz's explanations were presented as narration rather than on-screen text (Experiment 1), when students were able to ask questions and receive answers interactively rather than receive the same information as a non interactive multimedia message (Experiments 2a and 2b), and when students were given a pre-question to guide their self-explanations during learning (Experiment 3). Deleting Dr.Phyz's image from the screen had no significant effect on problem-solving transfer performance (Experiment 4). The results are consistent with a cognitive theory of multimedia learning and yield principles for the design of interactive multimedia learning environments.

10. Harvard Business School, Boston, USA; “E–Learning in Hong Kong: comparing learning outcomes in online multimedia and lecture versions of an introductory computing course.” 2002,

This paper evaluates the effectiveness of Web–based, highly interactive, and multimedia–rich e–learning materials by comparing students’ learning outcomes in the lecture and online versions of an introductory
computing course. The course versions differed only in that face-to-face lectures were replaced with e–learning modules in the online course; the other course elements (laboratory sessions, use of computer–mediated communications, examinations) were the same. The e–learning trial took place at the Hong Kong University of Science and Technology, where the first author taught the lecture course to 105 students, and the online course to 180 and 129 students in the following semesters. The lecture and online students achieved comparable factual learning outcomes and the online students outperformed the lecture students in applied conceptual learning. Findings suggest that the use of carefully designed interactive e–learning modules fosters higher–order learning outcomes.

11. **Tse-Kian Neo (Ken); Mai Neo;** “Classroom innovation: engaging students in interactive multimedia learning”. 2004,

With the infusion of the multimedia technology into the education arena, traditional educational materials can be translated into interactive electronic form through the use of multimedia authoring tools. This has allowed teachers to design and incorporate multimedia elements into the content to convey the message in a multi-sensory learning environment. The focus in education is thus moving towards using multimedia as the instructional media and a platform in teaching and learning. This paper focuses on using the multimedia design process to enable educators to re-design their educational curricula into an interactive and media-rich learning environment. This multimedia educational design process will reinforce and strengthen the traditional instructional communication process and foster a number of innovative methods to communicate knowledge to the learners. In this context, there is a need to adjust the educator's approach to teaching, preparing content and delivering learning materials.

12. **Moreno, Roxana; Durá n, Richard;** “Do Multiple Representations Need Explanations? the Role of Verbal Guidance and Individual Differences in Multimedia Mathematics Learning” 2004,
Elementary school children, some of whom were nonnative speakers of English, learned to add and subtract integers in a discovery-based multimedia game either with or without verbal guidance in English or optionally in Spanish (Groups G--verbal guidance and No-G--no verbal guidance, respectively). Group G members chose to listen to verbal explanations in their first language and showed larger posttest scores than Group No-G. High-computer-experience students in Group G outperformed the rest of the students on training session scores and a transfer test. Longer latencies to respond to practice problems affected all learning measures positively. Results support the use of verbal guidance for discovery-based multimedia games and show that multimedia games may not be equally effective for all learners.

13. Daniel Bodemer Rolf Ploetzner Katrin Bruchmüller Sonja Häcker; “Supporting Learning with Interactive Multimedia through Active Integration of Representations” 2005,

Learners explore dynamic and interactive visualizations they are often not able to interact with them in a systematic and goal-oriented way. Frequently, even supporting learners in processes of discovery learning does not lead to better learning outcomes. This can be due to missing pre-requisite knowledge such as the coherent mental integration of the pictorial and symbolic sources of information. In order to support learners in this process, we encouraged them to interactively and externally relate different static sources of information to each other before exploring dynamic and interactive visualizations. We evaluated the benefit of this instructional support in two experimental studies concerning the domains of statistics and mechanics. It revealed that the active integration of static representations before processing dynamic visualizations resulted in better performance and can provide a basis for a more systematic and goal-oriented experimentation behavior during simulation-based discovery learning.