Chapter II

REVIEW OF LITERATURE

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2.1 INTRODUCTION

Review of related literature must precede any well planned research study. Researchers cannot avoid work observation which has already been done on the problems which are directly or indirectly related to the study proposed by the researcher. A careful review of research, journals, books, thesis (P.hd work) & other sources of information. Review help researcher to delimits & define his problem by review of related literature. The researcher can avoid useless, unimportant, unfruitful areas because of review replication of study problem will be avoided. Review help new researcher about problem selection, depth of problem, utility of problem which design tool & statistics should be used in research.

2.2 Study Related To the Achievement in Science

Singh(2009) in "a study of effectiveness of multimedia program in teaching biology". Conducted pretest and posttest and concluded that, the students learning with the help of multimedia program is better in Biology than the students learning through the traditional method, the multimedia program has helped the students to score more marks in the post test and the traditional method of teaching will not help the students to score more marks in the post test.

Jyothi(2007) "Chemical bond for 9th standard students of chemistry & compare the effectiveness of their instruction module with conventional teaching method". The main objectives of this study were:

a) To prepare a self-instructional module on the topic "chemical bond" for class 9th chemistry.

b) To compare the effectiveness of this self-instructional module with conventional teaching method.
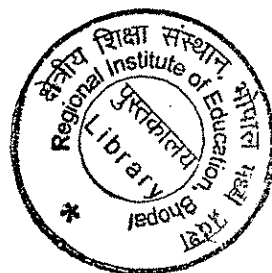
Major findings were:

i. The study revealed that the self- instructional module prepared by the teacher through PowerPoint presentation could show immense impact on learning of chemistry.

ii. Students are better motivated & interestingly participated in computer based learning. They did not hesitate to clarify their doubts through computer based learning.

iii. There were significant difference in score achievement of control & experimental groups.

. **Subramanian & Meera(2002)** "Relative effectiveness of different mode of computer based instructions in teaching biology". The main objectives were

a) To find out whether there is any significant difference among the different mode of computer assisted instructional strategies viz.tutorial, drill, and practice in realizing the instruction objective in biology at standard 11th.

b) To develop a criterion reference test in the content areas being instructed to subjects of control and experimental groups.

c) To develop syllabus based computer based instructional packages in different mode viz. tutorial, drill, and practices and simulations for the selected content areas.

The major findings were:

i. The result of the study have proved that CAI in drill and practice is most effective than tutorial and simulations modes in teaching biology at stad.11th

ii. More software packages can be developed for the whole syllabus which will help the students to learn at their own pace.

iii. The CAI package in biology should be planned developed evaluated and implemented with the help of team of expert constituting curriculum planner, educational technologist, computer expert and biology teachers.it will be helpful in development of quality packages in the teaching and learning of biology.

Gaude(2012)conducted a comparative study of multimedia approach and traditional approach on the achievement in science of grade 8th student with different learning styles.

Objective of the study was

a) To compare the achievement in science of grade 8th student taught through multimedia and traditional approach
b) To compare the achievement in science of grade 8th boys taught through multimedia and traditional approach
c) To compare the achievement in science of grade 8th girls taught through multimedia and traditional approach.
d) To compare the achievement in science of grade 8th visual learner taught by multimedia and traditional approach

Finding was that the achievement of students taught through multimedia approach got higher score than the students taught through traditional approach.

Padmanabham(2005) studied the effectiveness of constructivist approach 2005 on the science achievement and problem solving ability in science of VII grade students. Her study shows positive effect on the achievement of student in science

Switzer and shriner,(2000). Mimicking the scientific process in the upper division laboratory. Bioscience, in this article two professor of an introductory biology courses discuss the implementation and assessment of inquiry based learning strategies in their large lecture classroom and associated labs. They present an argument that supports claims of researcher who suggested thet the inclusion of such strategies aids student understanding of course content

Black and McClintok(1999) stress the importance of interpretation as being central to cognition and learning. Their design of study supported environment based on constructivist design principles called interpretational construction design fouused mainly on the interpretive construction ao authentic artifacts in the context of rich

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background materials, and spanning across different fields of study. Their study showed that in addition to learning specific content, student were able to acquire generalizable interpretation and argumentation skills.

Lord,(1998).cooperative learning the really works in biology teaching: using constructivist Based activities like use of multimedia to challenges student team. The American Biology Teacher, 60(8),580-588. This paper offers the guidance in the development of the constructivist multimedia , inquiry based activities with in the class utilizing tem learning. A review of relevant literature offers advice regarding the use of constructivist approach for teaching in Biology, cooperative learning the development of useful inquiry sensitive curricula, the management of cooperative learning and the grading of cooperative learning task.

2.3 Other Studies Related To The Effectiveness Of Multimedia Approach

Malik et al(2012) in "Use of Multimedia as a New Educational Technology Tool–A Study" In their paper, a study has been carried out to analyze the reverence of multimedia in various disciplines of current education system. From the review of literature in reference with a variety of university approaches, it has been learnt that multimedia has enormous potential to impart flexible, multi-modal, life-long education to heterogeneous mass learners. The Multi-disciplinary nature of multimedia makes it increasingly popular among people from diverse domains. The literature study clearly demonstrates its qualifications as a vast source of customized learning environments, to accommodate varied behavioral problems like confidence building and stress reduction. Multimedia used in right direction has also succeeded in psychomotor development and strengthening of visual processing of the intended users.

Mishra,(2004) in "Interactive Multimedia in Education and Training" they studied in education and training settings, interactive multimedia packages have been found to be used as library-based multimedia resources for teachers and students; as supplementary curricular material for a specific course; as a tool for teaching and reinforcing analytic and reading skills and for building an entire course around the use and creation of
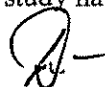
multimedia materials (Bass, n.d.). In the modern society, where computer and Net technologies are becoming indispensable, the learning technologies are found to be deployed in all sectors: schools, colleges, universities, and industries. The emergence of the knowledge and educational content industry, the emergence of virtual campuses of learning, the availability of new learning and training tools, and the deployment of such tools to meet the diverse needs of learners have greatly influenced education and training systems. The needs for lifelong learning, just-in-time training, and retraining led to the development of widely accessible and reusable digital multimedia content and learning repositories. As the contributors of this book point out, the advantages are multifarious: increased interoperability, reusability, and individualization of digital learning materials. The learners are benefited in terms of increased quality, relevance, and contextualization of their learning.

Reiser and Dempsey (2007) define "rich media as learning products that incorporate high-end media such as video, animation, sound, and simulation" (p. 312). One such commercial product that fulfills this definition is TechSmith's Camtasia Studio--a screen capture program that records mouse movements and screen shots and allows the user to record narration plus incorporate animation to accentuate what has been recorded. This tool, which is often used in commercial training programs, has already been tested in academic areas. The preliminary results have shown that multimedia can have positive effects on students' retention of knowledge. At Liverpool John Moores University, a longitudinal study of six years was conducted to see the effects of multimedia instruction on an undergraduate plant science module. With the integration of multimedia usurping traditional lecture for this particular science module, pass rates for the test went from a low of 52% to a high of 87% at the end of the six year study (Sneddon, Settle, & Triggs, 2001). The data depicted a sharp increase in pass rate, from 63% to 87%, when the multimedia lecture was introduced (Sneddon et al., 2001).

Nimavathi & Gnandevan (2009) "Developing study habits through multimedia programme". The aim of this study was to find out the impact of multimedia on the development of study habits of secondary students. The sample consist of secondary school students of 9th standard. The pre-test & post-test equivalent group design was

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followed for this study. The data has been subjected to descriptive & differential analysis. The study shows that the students learning with the help of multimedia proved better in their study habits than the students learning through conventional methods. The major finding of study was:

a) There was no significant difference between the experimental & control group in their study habits in pre-test.
b) There was a significant difference between the experimental & control group in their study habits score of post-test.
c) There was a significant difference between the mean study habits score of pre-test & post-test for experimental group.
d) There was no significant difference between the mean study habits score of pre-test & post-test for control group.

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Chang, Sung& Hou,(2006) "Web based tools for designing & developing teaching material for integration of information technology into instruction". Educational technology & Society, 9(4), 139-149 Educational software for teachers is an important yet usually ignored, link for integrating information technology into classroom instruction. This study builds a web based teaching material design & development system. The process in the system is divided into four stages- analysis, design, development & practice. Eight junior high school science teacher participated in the evaluation of the system through expert's review & content analysis of their instructional material & interview, they found that instructional material produced using the system appear to be more coherent & systematics, provide deeper & broader information for learning, apply more adequate teaching strategies & lessons, the design & development on teacher.

Rafeedail(2009) "Computer based technology & its pedagogical utility". This study aims at finding out teacher's basic computer knowledge, purpose of using computer & extent of use of computer in teaching learning, the investigator finds that most of the teachers have basic computer knowledge & that most of the teacher use computer for educational purposes. The higher secondary school teachers are far behind in utilizing

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the opportunities of I.T resources in the field of education & their life as well. They are now comfortable with traditional teaching materials & sleeping with old methods of teaching. Higher secondary school teacher should try to adopt & accommodate information technology in their professional life. It will improve the quality of education.

Gertner.(2011)"The effect of multimedia technology on learning". The research conducted on e-reader devices and the effect they hold on learning. Also, the literature has demonstrated that there are more negative implications to using e-text in learning than there are positive. Understanding the role of e-reader devices in comprehension and transfer is a crucial component of expanding the literature. The goal of this study was to assess the effects of e-text, specifically on the iPad, on reading comprehension and transfer learning. Sixty nine students enrolled in an Introductory Psychology course read from textbooks and e-text and completed assessment measures in comprehension and transfer learning. Overall, the findings of this study provided support for the notion that there is a positive relationship between learning and reading on an e-text transfer scores when compared to traditional text. Additionally, scores for reading comprehension were similar between both groups.

Reiss(2007)"video-based multimedia design: A research study testing learning effectiveness" conducted a research on three computer-based video models' effectiveness for learning based on memory and comprehension. In this quantitative study, a two-minute video presentation was created and played back in three different types of media players, for a sample of eighty-seven college freshman. The three players evaluated include a standard QuickTime video/audio player, a QuickTime player with embedded triggers that launched HTML-based study guide pages, and a Macromedia Flash-based video/audio player with a text field, with user activated links to the study guides as well as other interactive on-line resources. An assumption guiding this study was that the enhanced designs presenting different types of related information would reinforce the material and produce better comprehension and retention. However, findings indicate that the standard video player was the most effective overall, which suggests that media designs able to control the focus of a

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learner's attention to one specific stream of information, a single-stream focused approach, may be the most effective way to present media-based content.

Tausend(2010)'' Effects of Interactive Multimedia in E-Learning on Learners and Developers". Conducted a study on e-learning and the study reveals that The e-learning, or electronic learning, field creates a dynamic environment that stimulates learners through self-directed training. The e-learning field applies theories of constructivist learning, action-orientation, McGregor's theory Y, and activity theory. E-learning accomplishes self-directed learning by utilizing animation authoring tools to develop interactive multimedia. Interactive multimedia is media that uses multiple forms of information content and information processing to inform or entertain the user. The use interactive multimedia in e-learning affects both the learners and the developers. Learners are affected positively because interactive multimedia promotes motivation that accelerates learning, enables knowledge transfer through retention, and provides manipulative experiences unavailable in a normal training environment.

JUNAIDU(2008)" Effectiveness of multimedia in learning & teaching data structures online" conducted a study that Online electronic education is now being widely accepted as a major viable component of higher education. This is fuelled by the emergence of worldwide information and computer communications technologies. However, online education is not being adopted in science and engineering subjects as widely as in other fields because of the idiosyncrasies of some science and engineering-based courses. For online engineering education to be broadly accepted and utilized, the quality of online courses must, amongst other things, be comparable to or better than those of traditional face-to-face classroom education. This paper explores and reports on the importance of creating multimedia-rich course content and the important role that animations can play in creating a successful online learning experience.

Results of the study on an online data structures course over five years offerings show that students consistently perform much better in questions requiring application of material taught in carefully animated algorithms. These results should carry over to other educational environments.

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Herrington(1997) "Authentic learning in interactive multimedia environments" The purpose of the study was to investigate the way students learn from an interactive multimedia package and learning environment based on a situated learning model. The learning environment comprised an interactive multimedia program on assessment in mathematics, together with recommended implementation conditions in the classroom. Specifically, the research sought to investigate the way preservice teachers used interactive multimedia based on a situated learning model, how they responded to the critical elements of the situated learning environment, what types of higher-order thinking they used as they worked with the program, and whether learning transferred to their professional teaching practice in schools.The research took the form of an interpretive, qualitative study. The major methods of data collection were videotaping of preservice teachers using the interactive multimedia program, observation, and interviews with both the preservice teachers and their supervising teachers in schools.

Findings suggest that the use of the situated learning model was a successful alternative to the system models frequently used for the development of interactive multimedia, and that enabled students to freely navigate a complex resource.

2.4 Critical Appraisal

Several studies have been conducted to verify the effectiveness of multimedia approach for learning in the classroom as mentioned in the review of related literature . It has been observed that teaching & learning through multimedia approach is not only effective but also one of the most appropriate methods of teaching.

The approach contributes to the removal of varied behavioral problems like confidence building and stress reduction. Multimedia instruction also succeeded in psychomotor development and strengthen of visual processing of the student studied by **Malik(2012),**Multimedia help to increased interoperability, reusability and individualization of digital material observed by **Mishra(2004),**they also concluded that the learner were benefited in term of increased quality, relevance, and contextualization of their learning. The student learning with the help multimedia

proved better in their study habit than the student learning through conventional methods concluded by **Nimavathi and Gnandevan**(2009). The impact of multimedia habit on the development of study habit was seen on the second secondary school student. **Subramanian and Meera (2002),** studied the effectiveness of computer assisted instructional strategies in teaching biology and the result of the study have proved that CAI in drill and practice is most effective than tutorial and simulation models in teaching biology at higher class student.

The self-instructional module prepared by teacher through PowerPoint presentation shows immense impact on learning of chemistry, the student were better motivated and interestingly participated in computer based learning and they did not hesitate to clarify their doubts through computer based learning concluded by **Jyothi(2007)**

The use interactive multimedia in e-learning affects both the learners and the developers. Learners are affected positively because interactive multimedia promotes motivation that accelerates learning, enables knowledge transfer through retention, and provides manipulative experiences unavailable in a normal training environment this study concluded by **Tausend(2010).**

There is a positive relationship between learning and reading on an e-text transfer scores when compared to traditional text. scores for reading comprehension were similar between both groups as concluded by **Gertner.(2011)** Lord,(1998) observed that using constructivist Based activities like use of multimedia to challenges student team development, inquiry based activities with in the class utilizing team learning.

Looking at the review of the researches it can be observed that the effectiveness of multimedia was studied by several researches in teaching of science as well as other disciplines also

2.5 Conclusion of Review of Related Literature:

By studying the above researches gets clear that though studies have been conducted in the field of multimedia especially at higher level in a broad sense. There are many researches which have been conducted to see the effect of different teaching methodology on the achievement of the students. Hence above mentioned researches were the bases for the present study. All the researches which had been conducted in the field multimedia had shown positive impact on student Achievement and Retention student enjoy the learning environment which will enhance the student's capabilities and ability to perform the tasks. The gape which I had found after the review of those studies as mentioned in my report was that very few studies were conducted in elementary level therefore I had decided to see the effect of multimedia on VII class. In this chapter many review have been given which are directly or indirectly related to present study.