CHAPTER - I

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"There is of course, one thing about which we feel no doubt or hesitation : education science based and in coherence with Indian cultures and values can alone provide the foundation as also the instrument for the nation's progress, security and welfare".

- Indian Education commission.

Science is one of those human activities that man has created to gratify certain human needs and desires. Disinterested curiosity has been the greatest motive power of scientific research the 'search' for the truth became the dominant motive in the prosecution of science.

Teacher's main job is to teach there is not a method or the methods of teaching science which could suit in all the situations. Children differ from family to family and from locality to locality even in respect of their mental and physical development. Thus a teaching method is largely governed by these three factors – environment, teacher and pupil.

In the present study the researcher has tried to compared two methods of teaching science i.e. traditional method and multimedia based teaching approach.

Traditional method is one of the most popular methods of teaching in our schools. This is a teacher structured method and the students are just passive listeners most of the time very few teachers allow questions during teaching, though some of them give some time to their students to ask questions after the lecture.

Knowledge in the present century is expanding at a tremendous pace.

Scientific knowledge is said to double itself every decade. Simultaneously part of the old knowledge becomes obsolete. This phenomenon has a direct influence on the syllabi, curricula text books etc. in the formal educative system.

Teaching method in order to become scientific have to be supplemented with scientifically innovated martial aids (progresses) utilized in scientific manner to ensure objectivity in pedagogy. Thus any type of teaching practice not programmed by teaching programmatically is far away from becoming scientific because such methods utterly held to serve objectivity which is the need of the day.

Multimedia Programmes are the most effective variety of aids the evolution of television and computer has further diversified the utilizes of multimedia programmes far and wide without being deviated from the primary focus of objectivity. Today the utilization of multimedia in disseminating knowledge either inside the class room or beyond that is so much wide spread and versatile that the other form of indoor teaching aids are slowly moving towards their virtual extinction.

1.1.2 Multimedia

In the early days calculator was magic and that magic was not allowed in the classroom, the apprehension of those orthodox teachers was that it may turn the child's creativity for learning mathematics and which may hamper his power of imagination and computational skills in long run.

The first computers were cautiously being accepted. In fact some new curricula began to appear centered around programming. Programming was going to be used to leach logic*& logic was something that everyone needed, programming shifted from being on obscure college class to 'the state of the art' in elementary schools but for some reason mainstream teachers were slow to adopt it. They wanted some thin more. In-service classes were held; trying to convince teachers that programming could used in most subject area.

1.1.3 Guide line of NCF- 2005

According to guidelines of NCF- 2005 generally technology has been use as a medium to disseminate information and as a way of addressing the scarcity of good teachers, usually the consequence of poor recruitment and defective recruitment policies at the state level ET, which is used to redress the problem of quality of teaching can only exacerbate the disillusionment of the teachers with teaching. If ET is to become a means of enhancing curriculum reform it must treat the majority at teachers and children not merely as consumers but also as active producers. There must be widespread consultation regarding use of technology during development and implementation.

ET facilities need to be used at all levels of schools, cluster and blocks resource centers, district state & national level institutions in order to provide hands on experience if using educational software along with hardwares. Such experiences provided to children, teachers and teacher educators, which could include something as simple as the audio recording of all interview with a village elder, to making a video film or a video game providing children more direct access to multimedia.

Practical knowledge and skills of using Information and Communication Technology (ICT), along with various hardwares allowing them to mix and make their own productions and to present their own experiences which could provide them with new opportunities to explore their own creative imaginations.

Such an experience of ET production rather then only watching and listening to programmed in a passive way, can lay the foundation for far better utilization of the country's existing enormous ET facilities Interactive Net—enabled computers, rathers than only CD-based computer usage would facilitate a meaning full integration of computers and remote areas by increasing connectivity and enhancing access to ideas and information. Such two-way interactivity rather than one–way reception through T.V programmers minimizes the broad and potential use of ICT for its effective utilization in the classroom.

Rather than trying to reproduce and mimic classroom situations, by teaching the textbooks or teaching the textbook content, or animating lab experiments. ET could realize far better potential if topics are – taken up but developed into non-did active explorations, leaving learners free to relate to the knowledge web progressively and learn at their own levels of interest such access to knowledge in regional languages is still very limited as is one of the main reason for the persistent and growing divide between learners from urban and rural schools, and learners from regional language and English medium schools. The potential of such encyclopedias and documentaries for children is still underdeveloped. Materials such as textbooks, workbooks and handbooks for teachers can be designed with the awareness of existing stocks of good quality, audio or video material and sites where extra resources are available on the Net. Classics of cinema need to be made accessible through such measures. For instance, a child studying about village life should have easy access to Satyajit Ray's Classic. Pather Panchali, either as a CD to be borrowed from the CRC or to be viewed on a nationally managed website future textbooks need to be conceptualized and designed in a ways that night integrate knowledge in different subjects and experiences, thus facilitating the assimilation of knowledge.

Integration of knowledge and experience along these lines would take away the sense of burden and boredom, that our present day education induces. In science and mathematics, and in teaching children with disabilities the potential of ET. It is widely appreciated. It is important to realize this potential in achieving curricular goals, with more age-specific planning on the use of ET.

1.1.4 Multimedia: Meaning and Definition

Multimedia (Lat. Multum + Medium) is media that uses multiple forms of information content and information processing (e.g. text audio, graphic, animation, video, interactivity) to inform or entertain the (user) audience. Multimedia also refers to the use of electronic media to store and experience multimedia content. Multimedia

is similar to traditional mixed media in fine art craft, puppets, role play but with a broader scope. The term 'rich media' is synonymous for interactive multimedia.

1.1.5 Types of Multimedia

Multimedia has been broadly classified into two types

I   Linear

II   Non-linear

Multimedia may be broadly divided into linear and non lineal categories. Linear active content progresses without any navigation control for the viewer such as a cinema presentation. Non-linear content offers user interactivity to control progress as used with a computer game or used in self-paced computer based training. Non-linear content is also known as hyper media content.

Multimedia presentations can be live or recorded. A recorded presentation may allow interactivity via a navigation system. A live multimedia presentation may allow interactivity via interaction with the presenter or performer.

1.1.6 History of the term

In 1965 the term multi-media was used to describe the Exploding plastic Inevitable, a performance that combined live rock music, cinema experimental lighting and performance art.

In the intervening forty years the word has taken on a different meanings. In the late 1970's the term was used to describe presentations consisting of multi projector slide shows timed to an audio track. In the 1990's it took on its current meaning. In common usage the term multimedia refers to an electronically delivered combination of media including video, still images, Audio text in such a way that can be accessed interactively. Much of the content on the web today falls within this definition as understood by millions.

1.1.7 Multimedia Education :

It is quite well observed that, well within the lifetimes of today's students, it will be commonplace for almost all educated people to create multimedia, as well as use multimedia information that others prepare. This multimedia will either be for stand alone play back as in a CD on a PC or for distribution over the web. The advantages of learning or acquiring information for knowledge or entertainment by employing multiple sensory modalities hardly need restating. However, it is important to emphasize the advantages of actively creating multimedia in addition to passively using others creation. This means that student prepared book reports become multimedia book reports, lab reports include video observations & audio annotations, and the traditionally written Spanish home work becomes not just text but also includes audio, graphics & even video. It means that business people routinely add media to their memos, E- mail and reports. Creating & making effective use of multimedia will substantially enrich peoples personal lives not just school lives and business lives. Few can doubt the enjoyment that multimedia E-mail delivers to their grandparents that live remotely to their grandchildren. Many of today's students will work actively is some capacity with interactive digital information, in jobs that promise excitement similar to present excitement. The other vital areas where use of such multimedia programmes can further find –their importance are :-

- Qualitative response to the sensory perception of the pupil by fully or partially substituting the traditional practice of verbal teaching.
- Liberation of pupils front the compulsion of utilizing maximum time for curricular activities.
- Elimination of psychological alienation of pupils from the subject matters of school curriculum because of baring pedagogy like verbal teaching.
- Minimization of difference among high medium and low achievers in particular class.

This is why it is worth nothing a popular saying that :

"If I listen , I forget

If I see, I remember and

If I do I understand".

The saying signifies that pupils excel in an opportunity of doing things for themselves because of proper sense perception. While only exhibition or display of things to them during teaching is still productive the so called 'chalk and talk method' proves to be of no use at all this is the importance of multimedia & more particularly the multimedia programmes.

1.1.8 Educational Multimedia Programmes and Teaching

Strictly speaking, multimedia programmes are the essential components of all methods of teaching. They are must in methods like demonstration, observation, project experimentation, dramatization, and discussion etc. while in method like lecture and problem solving, they all felt optional.

So far as the conventional method like lecture and problem solving techniques are concerned use of multimedia programmes should not be optional at primary level & secondary level because the verbal delivery of lecture by teacher often becomes like a constant hammering the students & fails to respond or convince the sensory manipulative capacity of the children. Today children are compelled co invest maximum time for better understanding of different subject matters which would have been easier and less time consuming had they been taught with the help of multimedia. Because of this children are bound to give up many extra curricular and recreational activities which are essential for the total growth of their body & brain.

Absence or no use of multimedia in conventional methods of teaching over the time also separates the children psychologically from the subject matter of the school curriculum because without multimedia the pedagogy often becomes boring and burden some to them.

Again teaching without multimedia programmes often produces differential impact on the children, even in the same class. It may be beneficial to the high achievers while it is to the medium and low achieve. Thus children of the same class are divided into groups according to then mental potential. There cannot be good sharing among them selves under such circumstance. Uses of multimedia programmes not only solve the problem up to 90% but it can certainly minimize the difference to a great extent.

Today institutions where use of multimedia programme is an official culture of study, the children are found to excel over others in all curricular and extracurricular aspects. The demands of such schools among the Parents are very high.

Intensive use of multimedia programmes in school strictly speaking is not a matter of cost as much as it is not a matter of keen efforts by the teacher community the school administration and after all the governing policy for this.

1:1.9 Importance of educational Multimedia Programme

Rapid change in the sphere of society economy, polities, science and technology are the characteristic feature of the modern world. This first change is most likely to catch a teacher in its sweep for which it is hardly possible to retain all up-to-date information minutely. Therefore, a teacher cannot be expected to become the fountain of all relevant knowledge in a given matter always.

The other factors which contain a teacher in becoming a perfect substitute of a treasure of information that can be effectively shared with all his pupils are continuous.

- Explosion of knowledge ideas and approaches in always all fields and emergence of newer subjects and concepts of teaching following researches on affective teachings.
- Over crowded classrooms which is a characteristic feature of India schools.

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- Vastness in the diversities related to particular topic of global level.

- Lack of scope and opportunity to include all new development in the text books which are considered to be primary institutional materials in our country.

- Develop self-confidence, creativity among the student at all level of elementary schools. In order to overcome the aforesaid obstacles a teacher must be equipped with proper communication aids widely selected and carefully divided to cater the challenges of teachings in the modern era. Multimedia programmes can provide the best answer to such a problem.

1.1.10 Classification of educational Multimedia Programmes

All the multimedia programme can be broadly clubbed into six groups i.e the theoretical part, animation, graphical representation, activities related to subject mater, quizzes dealing with exercise, model question paper ete. all these multimedia components are in audiovisual form.

- The theoretical parts in multimedia include all the subject matter related to topic and this mater process through activity example- matter based actively, animation in audio-visual form.

- The animation parts in multimedia include all activities in movable form.

- The graphical representation include all diagrammatic part in graphical form to develop specific creativity among the students.

In classroom students are more interested to see different type of question. For this purpose model question paper is also given in multimedia programmed.

1.1.11. General Advantages of multimedia in education

It should not be thought of that multimedia programmes occupy the place of teachers. Teacher's role is indispensable in teaching-learning process. Hence multimedia programmes are effective means for achieving desirable goals in teaching and learning. As an effective means their function is great and a teacher should be

aware of their functions in order that he may use them as per need, purpose and situation. A few of them are discussed here.

1. **Educational multimedia programmes motivate students and create interest**

   Multimedia programmes are motivators and it can be said that they are the "energizers" of teaching learning process. They stimulate interest of pupils to gain further knowledge. Interest is not on end in itself interest that has been created by means of an audio-visual aids must act as a springboard for lunching the students into a wide variety of learning activities. A teacher can use variety of programmes. For making his teaching interesting clear and dynamic because multimedia programmes not only classify the concepts, ideas, points of a topic, but also bring home the perceptual panorama into the classroom. This itself is sufficient is motivate students.

2. **Educational multimedia programmes modify attitudes**

   Attitudes are said to be learned dispositions to react to our environment in certain ways. Multimedia programmes create the desirable environment in the classroom so as to have the student attitude to react favorably to the lesson. Multimedia programmes modify the attitudes in various ways. The ways may be operant conditioning or information feeding of logical thinking or effective cosmological thinking or effective communication. Multimedia programmes do all these functions effectively.

3. **Educational multimedia programme provide variety of teaching.**

   Traditional teaching creates drudgery in the classroom. It is monotonous. Change is the law of nature and thus everyone enjoys variety. Teaching with different multimedia provide to classroom activities. Students, See, hear and experience varieties in teaching by which their readiness to learn is evoked.

4. **Educational multimedia programmes provide integrated experiences varying from abstract to concrete**

Multimedia programme materials supply a concrete basis for conceptual thinking giving rise to meaningful. Multimedia technology presents abstract information to the learners in various forms on many occasions teachers have to prepare the students for experiences which are normally beyond the scope of their comprehension. Teachers in this complex age should be able to guide them to the vest reservoir of knowledge by making use of additional resources like animation, activities related to topic, graphical representation, charts in audio visual form globes in audio visual form, maps quizzes dealing with exercise, model question paper, computer. All these resource enhance clarity of communication and increase the speed of comprehension.

5. **Educational multimedia programmes provide substitutes for direct contract of students with environment.**

Multimedia programmes material enables to cut through the physical limit of time and space. A teacher may take his class by means of an appropriate motion picture or animation to any distant place & to meet the people who live there & to observe places and things. Search media may serve as a carpet for providing needed experiences. Motion picture, computers and carefully prepared other activities sequences would be particularly valuable. These stimulate pupil interest.

6. **Educational multimedia programme material helps generalization.**

From study of individual facts generalizations are made texts become one sided. But when textual facts are either accompanied activities through multimedia or through direct experiences, generalization takes place. Generalization to a process of remembering & multimedia (animation) helps in a great deal.

7. **Educational multimedia programme materials results in greater acquisition of knowledge.**

The use of multimedia ensures greater acquisition knowledge of facts and ensures longer retention of the information gained. Multimedia programme materials provide first hand experiences in a variety of ways and sometimes makes the pupils actively participate. Multimedia technology provides pupils with meaningful source of experience visual sources as well as many additional resources.

8. **Educational multimedia programme provides opportunity to students in manipulative skills.**

Multimedia programmes can be handled by the students very easily if they have a small knowledge of computer. During the handling of computer student experience the facts in multimedia and manipulate a animation, activities, quizzes. Pictures, map in audio visual form. By this their natural desire and curiosity is satisfied.

9. **Educational multimedia programme brings a change in classroom atmosphere.**

During the use of multimedia in the classrooms students are very often feel at ease. They talk, laugh, move about, question, comment upon and do mutually as they do outside. Besides students activities atmosphere of the classroom from the traditional is new one. Changed atmosphere bring change in attitudes of students towards learning and activity.

1.1.12 Role of educational multimedia in science education

Children in today's technologically advanced society are growing up in an educational environment that is struggling to overcome the teachers centered classroom in which student's achievement is based on a system of memorization and recitation of material contained in a single content area text book. In order for students

to succeed in today's competitive society they must be given the opportunity & the guidance to develop not only knowledge level skills, but they should graduate from high school with the ability to use that knowledge in "real world" situations.

Teachers are slowly realizing that traditional methods of teaching are no longer capable of providing students with an education foundation that is strong enough to withstand the pressures of such a technologically dependent society. Traditionally, text books have been the focal point for most of the instructions that students incur during class lectures or others related educational activities. Whether listening to classroom discussion or working on class assignments most students either use their textbooks exclusively & copy word or they simple ignore the book because they feel it is too complicated or confusing.

Many teachers, who feel the pressure of covering a certain amount of specific material in a given amount of time, often view this static one-way instructional system involving textbooks as an efficient way of covering material. However, what teachers make up for in material covered & time save, their students lose in comprehension and relevance. One way educators are striving to improve instructional teaching methods by organizing classroom activities around central themes or concepts called thematic units.

In an effort to reform science education, educators have begun to focus on effective science teaching. Schools and districts all over the United State are searching for ways to revise current science curriculums to reflect a more student centered and meaningful approach to science instruction. Most educators are using views such as the ones above to develop a classroom atmosphere that will create a partnership between students, teachers, and technology that will build on student curiosity and creativity emphasize quality of understanding rather than quantity of information. Expose students to concepts in a variety of contexts and make students aware of the social and historical influence of science & technology.

There are many applications for multimedia technology in the science classroom. Teachers are discovering ways to spark students interests and motivate them to discover by incorporating a wide variety of software designed classroom presentation that are visually descriptive and relevant to the content material. Student are also becoming more involved in the learning process by exploring multimedia such as CD-ROM based textbooks, tutorials & laboratory experiments, as well as a diverse arena of internet based telecommunications and online experiments & research. The possibilities seem limited only by imagination & determination of the teachers and students involved. Integrating multimedia technology in educational thematic units seems to be a solution to the problem of student's motivation & involvement in science that in relative to their own interaction with society.

Science simulation allows students to observe and manipulate multiple aspects of complex micro worlds. Data base software provides students with a tool for gathering information in different ways. Across all of these applications; the technology itself poses a problem solving challenge as students learn to master the features of the tool to accomplish their desired good. Further the computer tasks are often done in collaboration with peers, which in turn adds a new layer of complexity through the feedback and the communication requirements that working with other entails.

1.2 Need and significance of the study

The main function of educational research is to improve the educational procedure though the refinement and extension of knowledge. Each research is taken to improve the existing educational process & system.

By this study suitable suggestion can be made for improving the teaching of general science in schools multimedia teaching procedures can be suggested for effective as well as corrective learning of various important basic skills.

In today's concern teaching is child centered so as to minimize the gap between student and teacher. Multimedia – leaching is very useful. Multimedia improve the teaching leaning process & also gives us a chance for the better communication with the child. All the activities in multimedia are in accordance of the students need so it make teaching as well as learning very interesting for the child.

1.3   Statement of The Problem :

A comparative study of the effectiveness of traditional and multimedia approach to teaching science on secondary school student's achievement attitude and self efficacy

1.4   Operational definitions of the key terms used

1.   Traditional Teaching Approach-

Methods and techniques of teaching as auto merrily used by regular teachers. It is some what use of lecture method.

2.   Multimedia based teaching approach It is the use of various media techniques like T.V films radio programmes, programmed learning material, news papers, modules etc.

Multimedia word is related to educational technology educational technology means the application of the laws of science to the process of education laws and recent discoveries of science as well as technology of science are applied to the educational process.   •   .

3.   Achievement in Science :

In this study the science achievement is operationally defined as the score obtained by the students on the science achievement test developed by the investigator.

4. Self-Efficacy :

Self – efficacy is a belief that one can perform adequately in a particular salutation. It is the set of believes that one can perform adequately in a particular situation.

5. Attitude towards science it includes six basic variables, rationality, curiosity open mindedness, aversion to superstition, objectivity, intellectual, honesty and suspended judgment.

6. Interagency – the capacity to profit from experience and to go beyond the given information about the environment.

1.5   OBJECTIVES OF THE STUDY

1. To compare the effectiveness of multimedia based teaching approach and traditional approach on science achievement.

2. To compare the effectiveness of multimedia based teaching approach and traditional approach on self-efficacy.

3. To compare the effectiveness of multimedia based teaching approach and traditional approach on attitude towards science.

4. To study the fact of intelligence on learning science using traditional and multimedia approach.

5. To study the significance between attitude & achievement among the students.

1.6   Hypothesis :

- There is no significant difference in mean achievement of score between the students studying through traditional approach and multimedia based teaching approach.

- There is no significant difference in mean self efficacy between the students studying through traditional and multimedia based teaching approach.

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- There is no significant difference in mean science attitude score between the students studying through traditional and multimedia based teaching approach.

- There is no significant partial correlation between academic achievement and intelligence among students of multimedia group significant.

- There is no significant correlation between attitude & achievement among the students.

1.7 Delimitations of the study

Depending upon the focus of the study the present study has following delimitations:

1. The study was limited to one school only.
2. The study was limited to VIII standard only.
3. The study was limited to a public school only.
4. The study was limited to English medium only.
5. Sample size was small that is of 41 only.
6. Purposive sampling was used in the present study.