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Effectiveness of Multimedia Learning Package on the Science Achievement

Prakash H. S.[1]* Dr. Kalavathi B. K.[2]

[1] Research Scholar, School of Social Science and Humanities, CMR University, Bengaluru

[2] Faculty, School of Social Science and Humanities, CMR University, Bengaluru

Abstract – Multimedia Technology has paved the new avenues for implementation of instructional and educational ideas. It presents information in an effective way and offers an opportunity to students to structure and learn exercise at their own pace. The idea of multimedia innovation is wide and it has limitless utilization fields; it is a significant component as an educational innovation notwithstanding its utilization in medicinal and statistical areas and in setting up databases. In this study the focus is on the types and benefits of multimedia, evolution of multimedia and multimedia instructional packages in education and Scope of Multimedia Resources and Instructional Packages in Science Education.

Keyword: Multimedia Technology, Multimedia Learning Package, Science Education, Science Achievement

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1. INTRODUCTION:

Today, education encounters difficulties in all parts of social, economic and cultural existence of a person. Scarcity of prepared technical and skilled instructor is one of them. Technological development and broad communications are assuming a significant job in teaching and learning by supplanting traditional homeroom framework.

Presently the understudy has chance to learn whenever and at each spot. In this way, the instructors need to figure out how to deal with the utilization the modern teaching advances to make their teaching smooth and viable. To improve the educational profitability, the teaching staff should standard innovation inside education, creating traditional techniques and utilizing new educational strategies. Mainstreaming the technological media in education is classified "Multimedia" which prompts endless applications of PC advancements. The idea of this multimedia innovation became effective with appearance of sound cards, conservative circles, utilization of digital camera and afterward the video which made PC an essential educational device.

The idea of multimedia innovation is wide and it has limitless utilization fields; it is a significant component as an educational innovation notwithstanding its utilization in medicinal and statistical areas and in setting up databases. Additionally, the excitement division is one of the segments that have the lion's offer in utilizing this innovation. Connection is the principle component in multimedia innovation as a large portion of its applications is portrayed by cooperation. Subsequently, multimedia projects may give a more powerful and more influential examination than utilizing every innovation independently.

Goel (2006)1 in his paper exhibited at the National Seminar on Educational Technology, 2006 abstracted 54 contemplates on Media and Computer Assisted learning Material which were directed in India from 1998 onwards. The investigations establish the effectiveness of Computer Assisted Learning Material (CALM) on an assortment of subjects, for example, Hindi, English, Physics, Chemistry and Math. Survey of the examinations uncovers that there is a significant increase through interaction with the CALM and CAL It can be derived through practically each one of those investigations that computer is an effective mode for instruction. The examinations additionally establish the way that the interaction mode has been observed to be more effective than the discussion back mode.

Kannan (2008)2 led a Study of Effectiveness of utilization of Computer Technology in teaching the concepts of Physics at Senior Secondary level and found that the 54 computer assisted teaching is the best method to show the concepts of material science at senior optional level. The investigation reasoned that there was significant contrast between computer-assisted teaching method (bunch 1) and method of learning by getting to the computer technology without the

guide of the educator (bunch 2). Be that as it may, there was no significant distinction between method of learning by getting to the computer technology without the guide of the instructor (bunch 2) and traditional method of teaching (bunch 3).

Rai (2009)3 depicted the utilization of multimedia, brings creativity as well as incorporates all fields of education through text, illustrations, and moving pictures, sound and music with the assistance of computers. As indicated by Rai, multimedia is worldwide term and includes introduction utilizing numerous media, including computer based multimedia introduction.

Nidhi (2010)4 in her investigation of Developing and Validating a Multimedia Learning Package in Educational Technology for B.Ed. Students, detailed that Multimedia Learning package helps in improving the achievement of B.Ed. students and the two instructors just as understudies demonstrated positive response towards utilizing multimedia learning package.

Dhar P. (2006)5 Studied the effectiveness of Computer Assisted Instruction for Remedial Teaching in Zoology at Higher Secondary Education Level with the target of creating remedial test for realizing the issues looked by the Higher Secondary understudies in learning Zoology and development and evaluate the CAI program on meiosis and nuclei acid unit of Zoology subject. Sample selected was 150 understudies from three schools. Understudies were similarly isolated into three equivalent gatherings. One was experimental and other two were replication gatherings. It was discovered that understudies face trouble in learning a few units of Zoology. The program was discovered effective for learning the selected units.

2. MULTIMEDIA IN EDUCATION

The world where we live is changing rapidly and the field of education is encountering these adjustments specifically as it applies to Media Services. The past times of an educational establishment having an isolated broad media division are a distant memory! The development being used of multimedia inside the education segment has accelerated lately, and looks set for proceeded with expansion later on. Instructors primarily expect access to learning resources, which can bolster idea development by learners in an assortment of approaches to meet individual learning needs.

The multimedia innovations that have had the best impact in education are those that increase the current educational programs, permitting both immediate improvement and empowering further educational programs development. For instance, the www fills in as a storage facility of data that singular learners can scan for topic content that explicitly accommodates their learning plans. Multimedia applications for PCs have been created for single registering platforms, for example, the PC.

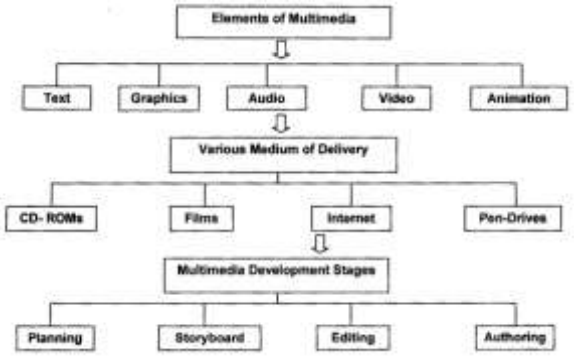

Figure 1: Concept of Multimedia

3. TYPES OF MULTIMEDIA

Linear - Early multimedia was linear in nature. In linear multimedia, the end client gets a program, which plays a sequence of sound, video and images with no control over the introductions content.

Non-Linear as opposed to linear, if the program gives the client a chance to control the sequence by choosing various choices, it is called Interactive Multimedia (IMM) or Non-linear multimedia.

Multimedia has a variety of meanings, and definitions change contingent upon the specific circumstance. With regards to class education, intuitive multimedia might be characterized as any bundle of materials that incorporates a blend of writings, graphics, still images, animation, video and audio. These materials are packaged, coordinated and linked together so that offers and examines ordering highlights with ability to make great teaching-learning condition. The most evident advantage of intuitive multimedia is that "a virtually limitless cluster of resources can be fused into the exercise plan, giving learning encounters that generally would be inaccessible to understudies" (Lamb 1992). Multimedia is skilled to convey expansive measure of material in different structures in a coordinated domain that enables the understudies to have the superb perusing, tuning in and seeing knowledge. By enabling clients to control the sequence and the pacing of the materials, multimedia packages encourage extraordinary individualization in learning. Multimedia enables understudies to continue at their very own pace in a tailored learning condition. Besides, multimedia can be a powerful learning and teaching apparatus since it connects with numerous faculties.

Presently a day's Multimedia Programs are developed on different subjects. The development

of multimedia bundle includes posting of the ideas/sub ideas, program briefs and substance plots. Making arrangements for the pre-production incorporates planning of story board, development of the content, orderly gathering, the making of the graphics and after that the genuine production including 2-D/3-D animation/graphics programming with the sound and visual chronicles on the PC and in conclusion testing and scattering with the objective gatherings. Infrequently TV camera shots are likewise added to the PC graphics coming about into the virtual marriage of the TV with the PC for better outcomes. All media programs whether audio, video or PC helped by and large originate from a given topic of a point which is the essential advance in arranging and production. The topics or ideas are handled and refined altogether and extended further as the program plot or a program brief. Today, Multimedia is considered as the consistent digital integration of content, graphics, animation, audio, still images and motion video such that gives great experience to the client. The evolution of Multimedia is an account of the rise and assembly of these advancements.

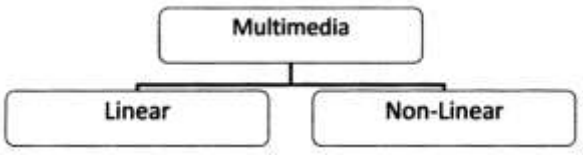

Figure 3: Types of Multimedia

4. BENEFITS OF MULTIMEDIA IN THE CLASSROOM

Multimedia is no more a major issue, since PCs today come officially equipped with all that we need, for example, speakers for sound, distinctive shading, the capacity to play video cuts, and even inside CD-Rom drives. It is having an extraordinary effect in the development of Multimedia Learning Package in the field of Education.

- **Benefits to the teacher**

Various investigations have demonstrated that understudy's academic accomplishment improved when educated through multimedia approach (Patil, C., & Hadley, C. 2008). As indicated by Capper and Copple (1985)8 the clients of PC helped guidance learned as much as 40 percent quicker than those getting traditional instructor coordinated guidance. Different explanations have been advanced with respect to the psychological benefits given by the utilization of different communications innovations in getting ready multimedia learning bundle for upgrading understudy's calculated comprehension.

Multimedia helps the learners in understanding the ideas quicker, makes premium, expands their support, makes study halls energetic and supports their accomplishment. Multimedia is extremely helpful for understudies with uncommon necessities, since it has multi-sensorial methodology.

- **Benefits to the teacher**

The magnificence of Multimedia is that it gives educators an inventive medium without requiring them to be ensured "geeks". "With modem easy to understand PCs, it is so natural to utilize multimedia that instructors don't require a great deal of technical preparing" Marsh (2007) says. Instructors can deal with it with no cutting edge preparing. Multimedia offers the instructor numerous benefits including: fulfilling educational destinations, expanding understudies understanding, exhibiting occasions, appearing, directing analyses which would somehow or another be incomprehensible.

5. MULTIMEDIA AS A SOURCE OF EDUTAINMENT

Edutainment is a casual term used to portray combining education with excitement, particularly multimedia amusement. It gives moderately equivalent accentuation on happiness and learning. In times to come, PC will supplant the genuine classrooms. Multimedia based education will significantly enhance and improve education by giving the educator's another role of facilitator, and with the chance of individual consideration, and enabling understudies to move at their very own pace. So the multimedia won't engage yet additionally advance and enhance the present dull and dreary education framework which is in desperate need of revival. So multimedia will demonstrate as an extraordinary wellspring of edutainment for understudies.

6. EVOLUTION OF MULTIMEDIA AND MULTIMEDIA INSTRUCTIONAL PACKAGES IN EDUCATION

Throughout the years Multimedia guidance has been advanced as solid methods for conveyance of instructions in different subjects at different dimensions. During the 1950s, Skinner's "teaching machine" began another time of utilizing mechanical gadgets as educational apparatuses. As the multimedia popularized and set up as an educational device, an expanding number of inquires about were coordinated towards the investigation of differing possibilities of multimedia in the field of education. At that point huge pools of learning packages utilizing multimedia were being developed. Multimedia Learning Packages are "those that coordinate essential elements or objects of multimedia, for example, content, graphics, video, animation, and sound to speak to and pass on information as per the learning goals. Multimedia Learning Packages can be utilized as

powerful guides for complex themes where there is a need of visual explanation.

- **Science Education**

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- **Multimedia in Science education**

In the contemporary Science education the term Multimedia is ending up increasingly more well known term. Multimedia upheld instructions have enhanced the scope and impact of Science teaching and it has been demonstrated as a substitution of customary strategy in different schools over the globe. The adventure of PCs as an educational instrument has gained its supremacy with the approach of multimedia. Through their examinations different analysts have recommended that multimedia innovation has complex focal points over traditional guidance in Science subjects as pictures, sound and animations all on the whole stimulate the learners' faculties and it is anything but difficult to grasp the idea.

7. SCOPE OF MULTIMEDIA RESOURCES AND INSTRUCTIONAL PACKAGES IN SCIENCE EDUCATION

Science is a significant piece of school educational modules. Barely can, some of complex substance in Science be successfully instructed to learners hypothetically. Science ideas being dry and dynamic dependably need important visual aids or bolster material with the goal that the learners can get it. Understudies' poor academic exhibition can be ascribed to an expansive degree to the strategy for teaching that educator are utilizing. In this information age still a few educators lean toward utilizing the 'chalk and talk' technique in Science teaching as they can cover increasingly more prospectus in less time.

As this new approach pointing towards digital education plainly shows the significance and utility of Multimedia Modules for self-learning of the learners and as a guide for the instructor to make his exercises progressively powerful. Keeping in view the colossal capability of PC innovation Government of India has started different undertakings, which have been referenced before, for school just as for advanced education level. So it is surely known that in the present age where Science and innovation has demonstrated its impact in each circle of classroom guidance, ordinary technique isn't sufficient to actuate enthusiasm among the learners. Additionally it can't cook the mental, emotional and scholarly needs of the understudies in the new thousand years. At least one hour address, which comprises simply of a verbal introduction, is only sometimes powerful in holding consideration, invigorating interest or urging understudies to examine, assess and think fundamentally.

- **Characteristics of effective multimedia packages**

It perceives that working memory has constrained space or limit with regards to preparing information. It takes benefit of both the channels i.e., sound-related and visual in working memory to convey content. By the utilization of numerous channels we can expand the general measure of information that the cerebrum can process. It perceives that long haul memory arranges information into important parts called diagrams.

- **Functions of multimedia packages**

It Activates Learner's Mind: Multimedia packages additionally trigger the learners' brain and promotes, learning through all faculties as it is a mix of numerous media. It Promotes Self-Learning: Multimedia packages being nonlinear and intelligent in nature empower self-learning. It Encourages Flexible Learning: Multimedia learning promotes flexible learning dependent on the psychological dimension and pace of the student. It Improvement in Quality of Education: Multimedia packages are upgrading learning just as improving the nature of education.

- **Multimedia Learning (Mayer's Cognitive Theory of Multimedia Learning (CTML)**

Rechard, E. Mayer and others have popularized the term Multimedia Learning which is a Cognitive Theory of Learning. It is otherwise called Cognitive Theory of Multimedia Learning (CTML). Mayer states that better learning happens when the information is displayed as a combination of words and pictures as opposed to words alone. The hypothetical establishment for the CTML depends on a few cognitive hypotheses like; Baddeley's hypothesis of working memory (1986), Paivio's

double coding hypothesis (1986) and Sweller's cognitive burden hypothesis (1988,1994). As indicated by Mayer (2001) "The procedure of multimedia learning can be seen as information obtaining (in which multimedia messages are information conveyance vehicles) or as knowledge construction (in which multimedia messages are aids to detect making)".

► **Process of Multimedia Learning**

• **Three Principles from the Learning Sciences**

Dual-Channel Assumption: based on Baddeley's hypothesis of working memory and Paivio's double coding hypothesis, CTML assumes that working memory has double channels viz., auditory and visual.

• **Three Store Structure of Memory**

CTML favors that there are three memory stores known as sensory memory, working memory, and long haul memory. As indicated by Sweller (2005) "Sensory memory is the cognitive structure that licenses us to see new information, working memory as the cognitive structure in which we deliberately process information, and long haul memory as the cognitive structure that stores our knowledge base".

• **Five Cognitive Processes Required For Meaningful Learning:**

Mayer further clears up that the understudy must be busy with five cognitive strategies for a significant learning from the words and pictures. These cognitive techniques in working memory pick about the information which must be dealt with or looked over the pool of information acquainted with the understudy, which knowledge must be recovered from whole deal memory and joined with as of late picked information so as new knowledge can be constructed.

• **Principles of multimedia instruction**

Mayer (2009) demonstrates the Science of direction as "development of evidence based standards for helping people learn" or unravels it as the "coherent examination of how to enable people to learn" (Mayer, 2010). There are distinctive explores identified with multimedia direction. In such way Mayer solidly asserts that the examination must be speculation grounded and verification based. Here, "theory grounded implies that each rule, system and idea is gotten from a speculation of multimedia learning.

• **Applying the cognitive theory of multimedia instruction**

CTML is essentially an understudy centered theory which truly advocates the central spot of the understudy at any learning endeavor. These standards should be seen as principles that can be balanced by the intended gathering of spectators, the objectives and destinations of the guidance, and competency measurement of the understudy.

8. PRESENT SCENARIO IN TEACHING OF SCIENCE

Focuses on present position of teaching science are not yet finished unpredictably, anyway the educators of science anyway qualified to demonstrate the subject, generally stick to address methodology or chalk-and-talk system or what we call it as the traditional procedure. Need of teaching science with the help of audio-visual and other learning help is neglected in a manner of speaking. Time factor at move in an academic year restricts the amount of field-trips, educational visits and voyages. Lack of required workplaces in the schools and the required knowledge by the educators to prepare the subject limits the scope of teaching science effectively. Grievously, it doesn't have a foundation set apart by being all around taught or instructed with excitement for children.

In the present universe of hyper-advancement, where change drives the life, there is a need to obtain some extraordinary changes the way wherein the knowledge of science is being allowed to the adolescents, has ended up being dire. Understudies must be introduced to new strategies and methods of insight to trade the knowledge of science for them to grasp the science ideas appropriately. They furthermore attempt to cripple redundancy learning and the upkeep of sharp cutoff points between different parts of knowledge. The techniques used for teaching and evaluation will similarly choose how powerful course perusing demonstrates for making adolescents' life at school an energetic encounter, instead of a wellspring of stress or exhaustion. With respect to suggested perusing material as a sole reason of examination is one of the key reasons why various sources and districts of learning are slighted. Tallying creativity and action is possible if we see and treat adolescents as dynamic individuals in learning, and not as isolates recipients of fixed collection of knowledge.

CONCLUSION

In this study the types and benefits of multimedia, evolution of multimedia and multimedia instructional packages in education and Scope of Multimedia Resources and Instructional Packages in Science Education were studied. The

multimedia innovations that have had the best impact in education are those that increase the current educational programs, permitting both immediate improvement and empowering further educational programs development. For instance, the www fills in as a storage facility of data that singular learners can scan for topic content that explicitly accommodates their learning plans.

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Corresponding Author

Prakash H. S.*

Research Scholar, School of Social Science and Humanities, CMR University, Bengaluru