CHAPTER -I INTRODUCTION

1.1.0 Introduction

ICT (Information and Communication Technologies) are defined as all devices, tools, content, resources, forums, and services, digital and those that can be converted into or delivered through digital forms, which can be deployed for realizing the goals of teaching learning, enhancing access to and reach of resources, building of capacities, as well as management of the educational system. These will not only include hardware devices connected to computers, and software applications, but also interactive digital content, internet and other satellite communication devices, radio and television services, web based content repositories, interactive forums, learning management systems, and management information systems. The integration of Information and Communication Technology (ICT) in education has provided more variation in the process of teaching and learning. The function of ICT in systematic teaching and learning in Biology is to achieve the objectives of teaching and learning science at secondary level. i.e. At the secondary stage the students should be engaged in learning science as a composite discipline, in working with hands and tools to design more advanced technological modules than at the upper primary stage, and in activities and analysis on issues surrounding environment and health. Systematic experimentation as a tool to discover/verify theoretical principles, and working on locally significant projects involving science and technology are to be important parts of the curriculum at this stage.

ICTs provide an array of powerful tools that may help in transforming the present isolated, teacher-centred and text-bound classrooms into rich, student-focused, interactive knowledge environments. To meet these challenges, schools must embrace the new technologies and appropriate the new ICT tools for

learning. They must also move toward the goal of transforming the traditional paradigm of learning.

Todays age of 21st Century and it is also the age of information and technology (IT). Every aspects of life are related to science and technology. Huge flow of information is emerging in all fields throughout the world. Now information and technology is popularly using in educational field for making teaching learning process successful and interesting for students and teacher both. In 1998, UNESCO World Education report refers about student and teachers must have sufficient access to improve digital technology and the internet in their classroom, schools, teacher educational institutions. Teachers must have the knowledge and skills to use new digital tools to help all students achieve high academic standard. According to UNESCO (2002) "ICT is a scientific, technological and engineering discipline and management technique used in handling information, its application and association with social, economic and cultural matters". Educational systems around the world are under increasing pressure to use the new information and communication technologies (ICTs) to teach students the knowledge and skills they need in the 21st century. The 1998 UNESCO World Education Report,Teachers and Teaching in a Changing World, describes the radical implications the new information and communication technologies have for conventional teaching and learning. It predicts the transformation of the teach-ing-learning process and the way teachers and learners gain access to knowledge and information.

1.2.0 Technology in the Biology classroom

There are various types of technologies currently used in traditional Biology classrooms. They are,

Computer in the classroom: Computer is a device improves teaching learning process easier. It is a essential tool for integrating ICT in the classroom. Here, teachers are able to demonstrate a new lesson, illustrate and show new websites.

• Class website: It is easiest way to display project work and assignment for students. Once we designed this web page, we provide classroom works, homework assignments, famous quotations, games. Nowadays, children know how to use the computer and internet. So, most schools provide teacher webpages that can easily be viewed through the school website.

• Class blogs and wikipedia: There are a variety of Web 2.0 tools are currently being used in the classroom. Wikipedia is a website to allow multiple members to edit a single document. Finally they create a truly collaborative and carefully edited file.

• Wireless classroom microphones: Classrooms are very noisy in our daily occurrence with the help of microphones for students' clear understanding. Children learn better when they hear the teacher clearly. • Mobile devices: Mobile devices like clickers or smartphone can be used to enhance the learning experience of the students in the classroom . Finally we may get feed-back from them.

• Interactive Whiteboards: An interactive whiteboard has given opportunity to touch control of computer applications. These enhance the teaching-learning experience in the classroom through computer screen. This not only aids for visual

learning, it is also interactive and the students can draw, write, or manipulate images on the interactive whiteboard.

• Digital video: LCD projector like equipments equipped our teaching learning process as proper as possible. DVD players also help us instead of LCD projector.

Online media: Streamed video websites can be utilized to improves a classroom lesson by using internet E.g. United Streaming, Teacher Tube.

• Online study tools: Tools that are motivate to studying by making studying more fun or individualized instruction for the student. E.g. Study Cocoa

• Digital Games: Games like educational games and serious games has been growing significantly. The digital games are being provided as tools for the classroom and have given positive feedback, i.e. motivation for students. There are many other tools being utilized depending upon the school boards like state or central and also funds available in the institution. These may include: digital cameras, video cameras, interactive whiteboard tools, document cameras, or LCD projectors.

1.3.0 Need for integrating ICT in teaching learning process

• To use ICT as a tool for designing new learning environments for their own subject-specific purposes to help their future students to use ICT.

• To provide the student-teacher with the knowledge, skills and attitudes to better use technology in their research, communication, problem solving, and continuing professional development.

• To critically apply the pedagogical principles of ICT integration in science education.

• To develop and facilitate ICT-based learning activities in the context of teaching Biology.

• To analyse and evaluate appropriate content and context for the use of ICT in Biology teaching.

• To use appropriate and varied communication and multimedia tools (emails, websites etc) in teaching and learning Biology.

• To use ICT efficiently in research, problem solving and project-based learning in Biology.

• To integrate ICT appropriately into Biology curriculum activities that will foster students ownership of their ICT-rich learning environment.

1.4.0 Role of ICT in biology teaching

Biology as a subject has both theoretical and practical components. ICT has opened new avenues like visual learning, online learning, e-learning, e-coaching, e-journal etc. It has provided opportunities for the learner to use maximum senses to get the information. Learning Biology is made easier by integrating ICT tools in instructional strategies for teaching biology. For example, structure and functioning of organ systems, pictures of cells and tissues, osmosis and diffusion processes in cells, etc can be easily explained. Drawing on the board and explaining the concepts along with the usage of ICT will make the concepts clear and have long term memory. Generally, cells and tissues are shown as slides in labs but, all cannot be shown and few like cold virus, E.coli, cells of the body, functioning of complex tissues in plants etc. can be shown using a projector, which gives great aspect of learning and satisfaction. Modern branches of biology like

genetics, biotechnology, topics like endocrine system, reproduction can be well explained using ICT.

The vast syllabus of biology makes children feel exhaustive and difficult to learn, this can be made easy by giving a few concepts in the form of flow charts (e.g.- Taxonomy, bio-geo chemical cycles), tabular form (e.g.- cell organelles & their functioning), concept mapping, etc.

By framing 'mnemonics', many concepts in biology can be learnt easily like the four stages of Mitosis can be remembered in the order like "p-mat"(prophase, metaphase, telophase & anaphase),human skull bones can be recollected as "stepof"(sphenoid, temporal, ethnoid, parietal, occipital & frontal), hierarchy of classification is "kpcofgs"(kingdom, phylum, classification, order, family, genus, species) etc. and students can be encouraged to frame their own mnemonics to have long term memory.

ICT simplifies the part of teaching as a visual presentation. We learn 80% of the learning through visual. So, the visual presentations of the particular topic could be easily understood by the student teachers. It will be more effective of the student teachers gain knowledge of integrating ICT in their classroom instruction. The use of ICT in higher education level, the information can be delivered very easily and helps the students to understand the particular topic with proper visualisation and enjoy the new learning experiences.

1.5.0 Criteria for implementation of ICT in Biology teaching

Some of the students felt that Biology as a tough subject, because of the theory part. Learning of Biology can be made easier and more comfortable by integrating ICT tools in instructional strategies for teaching Biology. For this, the teacher education programme should give more emphasis on ICT training for the student

teachers to apply ICT in their instruction. The curriculum of the teacher education programme should be revised by incorporating the innovative technological equipments for the dissemination of knowledge. Future teachers should be though with all these instructional technologies. So, that the learning process is made easier and students will be more benefited. Integrating ICT pedagogy will lead for quality higher education. The process of teaching- learning process should be modified according to the needs of the changing technology enabled education. ICT directly improves the quality of education and indirectly improves the economy of the country.

1.6.0 RATIONALE OF THE STUDY

The scenario of the classroom is changing. There is a technological gap between the progress of the society and instructional activities of the teacher in the classroom. If we see in our society on the one hand technology has revolutionized our society and on the other hand the teaching learning activities at school level have remained so far away from technology. In our classroom the knowledge is imparted by the teacher in an ancient way, a teacher centric mode which is most of the time boring and not to gain interest to the student. But present 21st Century's education is student centric education. Students learn from multi sources and for this reason use of ICT & Multimedia is very much essential in educational field and simultaneously. So, present study has great need and significance because this study shows the application of ICT in teaching biology and its effectiveness on the student's achievement and interest.

1.7.0 STATEMENT OF THE PROBLEM

Effectiveness of ICT pedagogical tools among class 9 students in terms of their achievement and interest.

1.8.0 OBJECTIVES OF THE STUDY:

(I) To compare the mean scores of Achievement in Biology at Pretest/Posttest stages of group taught through ICT pedagogical tools.

(II) To study the magnitude of effect of relationship between achievement and ICT pedagogical tools.

(III) To find out

1.9.0 HYPOTHESES OF THE STUDY

RESEARCH HYPOTHESIS

The research hypothesis is the actionable hypothesis that will be formulated at the 0.05 level of significance as well as at 0.01 level of significance.

HR1.- There will be a significant change in achievement scores and interest of the students after the requisite intervention and treatment is given.

NULL HYPOTHESIS

The null hypothesis provide an approximate description of the phenomena to have rational statement. It is used to test the association between the variables based on rejection or acceptance of the null hypothesis. In inferential statistics, the null hypothesis is a general statement or default position that there is no relationship between two measured phenomena, or no association between variables.

The null hypothesis will be formulated at the 0.05 level of significance.

H01- There will be no significant change in the achievement score and interest of the learners after the requisite intervention and treatment is given.

1.10.0 DELIMITATIONS OF THE STUDY

1. The study was delimited to class 9 students only. The study will be confined to a particular chosen school of urban setup based in Bhopal.

2. The study was done taking consideration of the prescribed syllabus suggested for secondary school education of class 9.

3. The study was also delimited to the collection of student's feedback on interest through a questionnaire.