

## Chapter V

# SUMMARY, FINDINGS AND SUGGESTIONS

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### 5.1 INTRODUCTION

The most important aim of education is to make the teaching-learning process an enjoyable and memorable one. The modern system of education encourages the development of different learning strategies so as to enhance the learning potential of the learners. A more organized and systematic form of instruction is the need of the hour to fulfil this educational aim.

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 Physics is to achieve the objectives of teaching and learning science at secondary level.

The investigator realized the fact that teaching Physics through ICT integrated method at the secondary level would enable the students to change their attitude and practices towards attaining their goals in higher education. So, the present study has great need and significance because this study shows the application of ICT in teaching Physics and its effectiveness on the student's achievement.

### 5.2 STATEMENT OF THE PROBLEM

Effectiveness of ICT Integrated Teaching in Achieving Learning Outcomes in Physics of Grade 9<sup>th</sup> Students.

### **5.3 OBJECTIVES OF THE STUDY**

The study has the following objectives:

- 1) To know the effect of ICT integrated and traditional teaching method in achieving learning outcomes of grade 9<sup>th</sup> students.
- 2) To compare the effectiveness of ICT integrated and traditional teaching method in achieving learning outcomes in Boys of grade 9<sup>th</sup> students.
- 3) To compare the effectiveness of ICT integrated and traditional teaching method in achieving learning outcomes in Girls of grade 9<sup>th</sup> students.
- 4) To compare the effectiveness of ICT integrated teaching in achieving learning outcomes in Boys and Girls of grade 9<sup>th</sup> students.

### **5.4 HYPOTHESIS OF THE STUDY**

The study has the following null-hypotheses:

- 1) There is no significant difference in the learning outcomes of students taught through ICT integration and traditional method.
- 2) There is no significant difference in the learning outcomes among Boys taught through ICT integration and traditional method.
- 3) There is no significant difference in the learning outcomes among Girls taught through ICT integration and traditional method.
- 4) There is no significant difference in the learning outcomes between Boys and Girls taught through ICT integration method.

### **5.5 SAMPLE**

In this study, the researcher purposively selected the students of grade 9<sup>th</sup> of **Demonstration Multipurpose School (DMS), Bhopal**. Researcher randomly selected 40 students of grade 9<sup>th</sup> of Demonstration Multipurpose School (DMS), Bhopal, out of which 20 students of the section-A were selected for control group and 20 students of the section-B were selected for experimental group. Thus, the sample size was 40 students of this class.

## **5.6 RESEARCH TOOL**

Achievement test was used by the researcher for data collection. The achievement test was comprised of 40 marks. The questions were based on knowledge, understanding, application, analysis and evaluation.

## **5.7 RESEARCH METHODOLOGY**

Experimental Research Design is used for the present study. In this study the effect of ICT integrated teaching (Independent variable) was observed on the achievement test in Physics (Dependent variable), where the ICT integrated teaching was manipulated through treatment or intervention, and the effect of these interventions were observed on achievement test in Physics. The effectiveness of methods of teaching (independent variables): (1) ICT integrated teaching method (2) Traditional teaching method was required to be checked on dependent variable (achievement), thus the researcher used 'Post-test only Control Group Design'.

The 20 students of section-A of grade 9<sup>th</sup> were taught the topics of "Force and Laws of Motion" by traditional teaching method. Traditional teaching program included Classroom teaching and demonstration in the classroom. The classroom teaching was discussion and questioning based. The other 20 students of section-B of grade 9<sup>th</sup> were taught the topics by ICT integrated teaching method. The investigator created a Computer Assisted Instruction package on the concepts of force. The Computer Assisted Instruction comprised of a "Power Point Presentation" that was a slide show with interactive sessions. The investigator had also used simulation and animation for the CAI to provide instruction on the selected content.

After providing the intervention, achievement test was conducted to see the learning outcomes in Physics in both the sections of grade 9<sup>th</sup>. The test was administered parallel to both the groups and evaluated by the researcher. The marks were given to each answer paper and the data was collected. The various statistical techniques such as mean, standard deviation and T test are employed in the study.

## 5.8 FINDINGS OF THE STUDY

This study was conducted to investigate the effect of ICT integrated teaching in achieving learning outcomes in Physics of grade 9<sup>th</sup> students. The major findings of the study as revealed from the analysis of data are given below-

1. There is no significant difference between mean achievement scores of learners taught through the ICT integrated teaching and learners taught through the traditional teaching approach. As the mean difference is not significant it can be concluded that ICT integrated teaching and traditional teaching methods are similarly effective to achieve the learning outcomes.
2. There is no significant difference between mean achievement scores of boys taught through the ICT integrated teaching and boys taught through the traditional teaching approach. As the mean difference is not significant it can be concluded that ICT integrated teaching and traditional teaching methods are similarly effective to achieve the learning outcomes.
3. There is no significant difference between mean achievement scores of girls taught through the ICT integrated teaching and girls taught through the traditional teaching approach. As the mean difference is not significant it can be concluded that ICT integrated teaching and traditional teaching methods are similarly effective to achieve the learning outcomes.
4. There is no significant difference between mean achievement scores of learners taught through the ICT integrated teaching approach between boys and girls. As the mean difference is not significant, it can be concluded that ICT integrated teaching is equally beneficial for boys and girls to achieve the learning outcomes.

However, the other studies show that ICT integrated teaching is more beneficial as compared to traditional teaching to achieve the learning outcomes. In the present study, the sample chosen by the investigator was just promoted to the grade 9<sup>th</sup> after passing their previous class exams and also the academic session of the school was about to finish in the month of April, due to which the students of the selected grade were not available in their full strength and the upcoming summer vacation impacted their interest and attitude in learning. The effect of ICT integrated

teaching was not observable as expected due to lack of time of intervention and preparedness of students towards ICT. The above mentioned reasons along with several intervening and uncontrolled variables negatively impacted the study and the researcher was not able to achieve the intended result.

## **5.9 EDUCATIONAL IMPLICATION**

The development of ICT Integration in all sectors of social life has led to the development and enhancement of digital literacy. Technology has the power and potential to improve many aspects of our daily lives. It is absolutely sure that technology increases engagement of the students and their learning outcomes. In the science and technology and that to in Physics, ICT literacy plays a significant role. Integration of ICT enriches education and encourages deep and valuable learning. In recent times, science has focused on the need for ICT literacy. This shift occurred when the students and other teaching staff became dependent more on the use of information and communication technology.

### **5.9.1 FOR STUDENTS**

- **With the help of ICT**, the students will have the new and updated knowledge and information to compete in this present time of technology. Even in the time of immediacy, this can be very helpful with quick time response to access the information needed.
- **Positive impact of use of ICT as pedagogical tool** in education indicates that teaching-learning process can be more effective in the classroom aided with ICT. Positive impact is more likely when linked to pedagogy. It is believed that specific uses of ICT can have positive effects on student achievement when ICTs are used appropriately to complement a teacher's existing pedagogical philosophies.
- **Students should aware of ICT utilization in learning Physics.** As ICT integrated teaching enhances students learning of Physics and develop their creative skill and problem-solving skills.
- **ICTs are used differently in different school subjects.** Uses of ICTs for simulations and modeling in Physics shown to be effective.
- **Users believe that ICTs make a positive difference.** In studies, that rely largely on self-reporting, most users feel that using ICTs make them more effective learners.

- If they are taught Physics through ICT then they will be able to link Physics with their day-to-day life easily.

### **5.9.2 FOR TEACHERS**

- With the integration of ICT, varieties of learning resources and materials can be accessed by the students as well as by the teachers. It will enhance the teacher's competencies and skills that will help them to deliver a chapter in an efficient way.
- The role of teachers is very important for ICT Integration because the use of ICT in the classroom depends upon the teacher's attitudes.
- Integration of Information and Communication Technology (ICT) will assist teachers to the global requirement to replace traditional teaching methods with a technology-based teaching and learning tools and facilities.
- Teachers need sufficient ICT skills to implement the technology and to have high confidence level to use it in a classroom setting. Besides, teachers require insight into the pedagogical role of ICT in order to use it meaningfully in their instructional process (Hennessy et al., 2005).
- Teachers' role is getting more important especially in usage of ICT in pedagogy which could increase the achievement and interest of the students.

### **5.10 RECOMMENDATIONS FOR FUTURE RESEARCH**

Some of the following areas are suggested by the researcher in which the research can be performed:

- ❖ Comparative studies could be carried out on the views of the learners, teachers and parents towards the use of technology-based teaching and Computer Assisted Instruction.
- ❖ The effect of television channels like Discovery Channel, National Geographic, Science Direct channel in explaining various Physics concepts can be studied.
- ❖ The study may be replicated for various standards in schools and for different content areas in other subjects.
- ❖ Effectiveness of instructional materials for different levels of education may be tested.
- ❖ ICT-based teaching methods can be undertaken in all subjects in the primary and higher secondary levels in different locality.
- ❖ The study may be replicated for the large sample with more resources and time.

- ❖ The researcher may opt more languages as medium of instruction and to prepare the achievement test.

## 5.11 CONCLUSION

Quality education has become a huge challenge in the field of education. ICT Integration is the key to improve the challenges of quality of education in the classroom and teaching-learning process. The availability of ICT tools provides a grand opportunity to assist teachers in teaching well and in improving the learning experiences of the students. It allows the teachers to conduct more activities and projects that include expansion, exploration, investigation and modelling and as a result ICT may enhance student's development of essential competencies, better attitudes toward learning and stimulate wider vision of the education. In education, ICT tools are used to create, communicate, store and manage information.

From the findings of this study, the researcher concluded that ICT integrated teaching and traditional teaching method are equally effective in teaching-learning Physics with reference to the student's achievement score in the achievement test. In the present study, the sample chosen by the investigator was just promoted to the grade 9<sup>th</sup> after passing their previous class exams and also the academic session of the school was about to finish in the month of April, due to which the students of the selected grade were not available in their full strength and the upcoming summer vacation impacted their interest and attitude in learning. The above mentioned reasons along with several intervening and uncontrolled variables negatively impacted the study and the researcher was not able to achieve the intended result. But, the review of related literature suggested the researcher that the use of ICT enhances the students' learning abilities, their knowledge skill, logical abilities and creativity, which is limited in lecture or traditional method. ICT integrated teaching makes the class more interesting, collaborative, interactive, effective over traditional lecture method.

Last but not the least, it was a learning experience for the researcher and as a newbie to this field of research, the researcher learned a lot starting from the review of literature to the data analysis. The researcher is concluding this study with the hope that this study could be beneficial for the future researchers and will encourage students, teachers and administrators to use the ICT in teaching different subjects in future.