Chapter-VI

FINDINGS, CONCLUSIONS, IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

Based on the analysis of data and interpretation of results, a set of findings and conclusions can be drawn and on the basis of their discussion, a wide range of implications and suggestions need also to be focused on for further research in the field related to this study. Some of the significant possibilities and provisions in terms of findings of this piece of research may be as follows.

6.1 FINDINGS OF THE STUDY

(1) The results arrived during this study show that the post-test achievement means scores of experimental group and control groups, matching on their intelligence and socio-economic status, differ significantly in favour of the experimental group. This implies that the students who were taught using ICT method of teaching show significant improvement in their achievement in Mathematics than the students who received instruction through the traditional method. It suggests that ICT used teaching method contributes towards raising the achievement of students in Mathematics.

(2) A significant difference has been observed between the mean achievement pre-test scores and the post-test scores of control group related to their academic achievement.

(3) A significant difference has been observed between the mean achievement of pre-test scores and the post-test scores of experiment group related to their academic achievement.

(4) The group of students taught through ICT-used method show significantly higher means gain in achievement than the group of students taught through traditional method.

(5) The results arrived at during this study also show that the post-TCLAQ scores of experimental group and control groups, matching on their intelligence and socio-economic status, differ significantly in favour of the experimental group, that is students who are taught using ICT method of teaching show significant improvement in their confidence level in answering the test questions than the students who received
instruction through the traditional method. It suggests that ICT used teaching method contributes towards raising their confidence level in answering questions in Mathematics. 

(6) A significant difference has been observed between the mean Pre-TCLAQ scores and the Post-TCLAQ scores of control group related to their confidence level in answering the test questions.

(7) A significant difference has been observed between the mean Pre-TCLAQ scores and the Post-TCLAQ scores of experimental group related to their confidence level in answering the test questions.

(8) The group of students taught through ICT-used method show significantly higher means gain in confidence level in answering the test questions than the group of students taught Mathematics through traditional method.

(9) The results show that there are significant positive correlations between the post-tests achievement scores and post-TCLAQ scores for both the experimental and the traditional groups. The correlation between post-tests achievement scores and post-TCLAQ scores of experimental group students was found to be higher than that of the control group students.

6.2 RETENTION OF HYPOTHESES

It may be concluded from the above findings that ICT used method significantly improves students’ performance on the achievement test and their confidence level in answering the questions to prove that learning through ICT used method proves more meaningful and effective than the traditional classroom strategy. Expressed in terms of their global importance for educational purposes vis-à-vis the tested hypothesis of the study, prime-facie, the main focus of the study addresses the multi-sensorial approach of the innovative learning process and its impact on education for sustainable development of each and every individual learner in a school situation which is deemed to be a miniature technology-based society in itself. The fundamental variables of the study included: (1) The learning strategy, especially ICT used strategy; (2) the learning outcomes in terms of performance-Achievement; (3) the confidence level in answering the test questions.

The retention of all the three hypotheses of the study namely $H_1$: The students’ achievements in mathematics are significantly higher in those who are taught using ICT
than those who are taught using traditional method of teaching; $H_2$: The students' confidence level in answering the test questions in mathematics is significantly higher in those who are taught using ICT than those who are taught using traditional method of teaching; and $H_3$: There is a relation between students' achievements and their confidence level in answering the test items in both groups of students does prove the superiority of the ICT-used teaching method over the traditional teaching method, which indeed has been the growing demand of the fast changing educational scenario today, making schooling a playful endeavour for all practical purposes of sustainable development and joyful learning, especially at the secondary school level.

6.3 EDUCATIONAL IMPLICATIONS

The present research shows that in changing from a traditional ‘chalk and talk’ method to an ICT-used teaching method not simply enriches classroom teaching, it also significantly improves their achievement. It implies that ICT used teaching method proves to be more tangible in its effectiveness on achievement than the traditional classroom approach. It seems more practical and is widely acceptable to students. It also reduces individual differences and enables all types of students to perform better. It has many other advantages.

- ICT can be used as a substitute for almost anything in the class: pencil, book, TV, encyclopaedia, map, library and many more.
- ICT can be used as a supplement in a large group classroom teaching. It is easier to monitor students in ICT than in the traditional classroom setting.
- ICT can be used individually, in small or large groups, or by the teachers with the whole class.
- ICT suggests a new role for the teacher. A teacher accustomed to being the sole source of information for teaching the passive learners in the classroom, has to change to be a facilitator in the learning process to actively encourage the students to:
  - help each other and learn from each other.
  - participate in discussions.
  - encourage in problem solving in a free democratic way.
• The teacher can closely monitor the involvement of all kinds of students, high achievers, average and lower level achievers and motivate them to perform better.

• ICT can be used to enhance aspects of teaching through presentation of information in different ways and in different forms. Pupils can manipulate and make changes to information on computers so that they can develop understanding of the relationship between different types of information or through the process of changing that information dynamically.

• ICT used learning sessions in class may act as a source of edutainment (education plus entertainment) as well. The sessions may include games, recreational activities like solving puzzles and riddles, holding group discussions on some general topics related to current affairs to create more interest among students. So, teacher becomes more resourceful.

• Important skills such as critical thinking, creative problem solving and synthesis of knowledge can easily be accomplished through ICT used learning in the class.

• Findings of the study indicate that ICT can be perceived as a big change agent for education, and there is a lot of scope for research in this field. ICT used teaching can revamp the traditional teaching process and make it more effective. The finding suggest that ICT can play a vital role in teaching of Mathematics, so, educationists need to develop more sophisticated understanding of the conditions, circumstances, means and mechanisms through which ICT can be closely connected to the young learners and their mathematics classroom.

6.4 CONCLUSION

The study provides potential inputs for teacher education. Given the current widespread use of ICT at all levels and for all subjects, it is imperative that pre-service teachers should learn the new technology. Besides pre-service training of teachers in the making, in-service training may also be given to the existing teachers to refurbish their acumen for teaching, that is teaching effectively and meaningfully.
6.5 EMERGING ROLE OF TEACHER EDUCATION

The set of 40 lessons, demonstrated and transacted through power point presentations duly enriched and supplementary a heavy dose of technological interventions like CD ROMS, graphics, pictures, animated presentations etc. in the classroom, as part of the study, not only indicated the vast horizons of information and technology that can be exploited for educational purposes but also for boosting the quality of human life in a knowledge oriented society that the contemporary generation seeks to create and at least dream of through the process of education, supported by the humane face of technology.

Quite in the past, stray efforts have been made to orient and educate teachers on a country wide scale through Satellite communication in programmes like SOPT(Special Orientation of Primary Teachers) and PMOST (Programme for Mass Orientation of Teachers) by Apex level national institution like NCERT for qualitative improvement of school education through technology–based professional development of teachers. The NCERT; CLASS project and the concept of SMART SCHOOLS too address the same cult of computer and information technology for quality schooling and of late, the launching of EDUSAT, a Satellite exclusively meant for Education is a landmark development in the field of exploiting potential, information of technology for quality schooling and sustainable growing of school education in particular and of teacher education in general. The central institute of Educational Technology in the NCERT is also squarely engaged in backing and presenting up the use of information and technology in its typical way to promote the cause of quality schooling and teacher education by producing a whole lot of technology based instructional materials for teachers, teacher educators and school education in specific.

Another Apex level national organisation popularly known as NCTE(National Council for Teacher Education) has also focused its attention on exploiting information and technology to promote technology-based instructions in Teacher Education to sustain its quality and standards in Teacher Education institutions through organizing work shops for teacher educators, teacher, teacher trainees to make them use ICT in their teaching–learning processes and practices, besides giving them on–the–spot training in
computer technology as such based on a set of CD ROMS produced and freely distributed to all recognized Teacher Education institution for this purpose.

In short, cyber technology seems to be gradually growing a loft to provide anchorage to prop up the process of schooling in quite a big way. It is high time for the teachers, teacher educators and the teaching–learning community to make the best use of technological inputs, as available, to improve the quality of schooling at all levels and in turn raise the quality of life of the people in knowledge society.

6.6 SUGGESTION FOR FURTHER RESEARCH

- The study could be replicated to explore how ICT affects the students of various abilities on cognitive, emotional and motivational dimensions.
- There is need to compare ICT-used teaching method with other methods of instructions at different grade levels.
- The study could be replicated on a large sample for validation and for a longer duration to examine the effects on non-cognitive variable like social skills or some personality variables which take more time to bring about a change.
- There is need to study the integrated effect of ICT-used method with other institutional treatments.
- Research is needed to study the effect of ICT on special groups of children such as gifted, the learning disabled and other mildly handicapped students.

Power point programme can be developed for other classes and research may be conducted to study the impact of power point programme on students’ learning in various subjects/levels, i.e.; for subjects other than Mathematics and for various levels as well, as also to determine the extent to which it could be used with in the exiting conditions and parameters in schools and other educational institutions.