CHAPTER V
INTRODUCTION

Education is considered to develop the potentials of the learner but recent trends in education aims at releasing the higher potentials in the learner converting them into dynamic one. These can be done in the schools by ways of systematic planning of instruction.

The investigator envisaged that teaching biology through various instructional methods at the higher secondary level could motivate the students to change their attitude and practices towards attaining their goal for higher education. Also this would help to analyze the efficacy of different ‘methods’ of instruction, hence the present investigation entitled “Effectiveness of the Computer Assisted Instruction and Cooperative Learning in Biology for Standard XI Students”.

OBJECTIVES OF THE STUDY were:

To

1. Develop a learning module in biological science for standard XI.
2. Find out the effectiveness of Computer Assisted Instruction on achievement in Biological science among XI standard students.
3. Find out the effectiveness of Co-operative learning method on achievement in Biological science among XI standard students.
4. Find out the impact of gender, locality and type of school on the effectiveness of Computer Assisted Instruction method, cooperative learning and conventional learning.
5. Compare the effectiveness of using Computer Assisted Instruction and Co-operative learning with conventional method of teaching on achievement in Biological science.

**METHODOLOGY**

The investigator selected 720 students from different types of schools in Salem. The students were selected from government and government aided schools from rural and urban area. The 720 students were divided into three groups. Each group comprising of 240 students were given different treatments namely Computer Assisted Instruction, Co-operative Learning and Conventional learning.

The investigator selected three lessons from the unit morphology. Lessons were suitably prepared to teach the three groups of students using three ‘methods’ of teaching and the programme was conducted for twenty hours of duration for each group.

The investigator used achievement tests (pre test and post test) as tools of evaluation. From the scores obtained by the students the relative merits of the different instructional ‘methods’ and the relationship between the learning processes were evaluated.

**FINDINGS**

1. When the pre test and post test scores of the three methods were compared, it is found that pupils performed better when instruction was Computer Assisted than the other two methods. Through Computer Assisted Instruction when ‘Root, Stem and Leaves’ was explained, the students performed better than Cooperative learning.
The ‘t’ value of 34.475 in Computer Assisted Instruction bears evidence to this.

2. When the pre test and post test scores were compared, computer assisted instruction is found to have a significant impact (P<0.01) on the XI standard students.

3. The findings indicate that the government school students exposed to Computer Assisted Instructional learning (P<0.01) have commendable scores. It may be because computer assisted instruction has the inherent advantage of learning at one’s own pace.

4. The analysis of mean scores through comparisons of the variable ‘methods’ indicated that there is significant difference between the experimental group and the control group.

5. It is found that the significant difference (P<0.01) is noted between the pre test and post test scores of the government aided school students in Cooperative learning. Both Computer Assisted Instruction and Cooperative learning results are significantly greater than Conventional teaching. This denotes that Conventional learning method and Conventional teaching (other wise known as ‘chalk and talk’ method) are not very popular among the pupils.

6. It is quite evident that rural school students have scored better in Computer Assisted Instruction (The ‘t’ value in Computer Assisted Instruction is 19.385); it is also clear that there is not much difference between Cooperative and Conventional methods this also suggests that added advantage of learning with comprehension and instant
feedback are the two big advantages of Computer Assisted Instruction.

7. When the pre test and post test scores of the urban students are compared the result again reinforces the fact that Computer Assisted Instruction (28.442) makes full use of aural, oral and visual media; therefore Computer Assisted Instruction is more serviceable to learners than any other method.

8. Computer Assisted Instruction had much more significant impact on the urban school students than the rural school students.

9. The ‘t’ value of Computer Assisted Instruction is 25.568 which indicates that Computer Assisted Instruction is more beneficial than Cooperative Learning and Conventional method of teaching. This result reiterates the fact that Computer Assisted Instruction caters to all types of learners and all styles of learning.

10. The post test scores of the boys in Computer Assisted Instruction score (76.38) is higher than the girls and this indicates that Computer Assisted Instruction had a greater impact upon the boys.

11. By comparing the mean gain scores of the government school and the government aided school, it can be concluded that the government school (34.47) performed better than the government aided (30.89) school in computer assisted instruction. It is quite palpable that Computer Assisted Instruction provides the scaffolding that is essential for all learners.

12. The result establishes quite clearly that Cooperative Learning is almost on par with Computer Assisted Instruction in government
aided school pupils (65.50). It may be because of the opportunities provided in these schools for both Computer Assisted Instruction and Cooperative Learning.

13. The results indicate that in both government (60.21) and government aided schools (60.15), conventional teaching enjoys similar respect as Computer Assisted Instruction. It may be because of a few exceptional teachers who put in tremendous efforts.

14. It is found that Computer Assisted Instruction had a greater impact on urban school (76.34) students than the rural school (70.39) students. The results reinforce the fact which is already established that Computer Assisted Instruction as a method of teaching is more effective than any other method.

15. By comparing the mean gain scores of the rural and urban school, the rural school students (28.10) have performed better than the urban (25.94) school students in Cooperative learning. This makes it clear that in rural schools, Cooperative Learning is quite popular. It may be because rural school classrooms are not so overcrowded as urban school classrooms. Therefore, teachers can divide the class into manageable groups.

16. By comparing the mean gain scores of the boys and the girls, the girls (34.32) performed better than boys (32.23) in computer assisted instruction. It is found that Computer Assisted Instruction has similar impact on both boys and girls. It is evident from the results that Computer Assisted Instruction is free from any gender bias.
17. It is found that Cooperative Learning had similar impact on both boys (63.80) and girls (65.66). When Cooperative Learning as a method of learning was tried on both boys and girls, it had equal impact on both boys and girls.

18. It is found that Conventional teaching had similar impact on both boys (59.35) and girls (61.03). When conventional teaching was also tried as a method of learning, it had similar effect on both boys and girls.

19. It is found that Computer Assisted Instruction had more significant impact on government school students than the other two methods.

20. As expected, when Computer Assisted Instruction was given along with other methods of learning, Computer Assisted Instruction is found to be more effective due to its inherent features of learning at one’s own pace, instant feedback and catering to different learning styles.

21. In government aided schools, it is found that Computer Assisted Instruction (P<0.01) is the most preferred method of teaching as it incorporates the features of aural and visual learning materials.

22. It is found that Computer Assisted Instruction (F=12.738) has stronger impact on rural school students than the other two methods in their post test scores. This result makes it obvious that in rural schools too, pupils prefer Computer Assisted Instruction to any other method as Cooperative Learning and Conventional method have several demerits that are ruled out to a certain extent in Computer Assisted Instruction.

23. It is found that Computer Assisted Instruction has far greater impact on urban school (F=61.146) students than the other two methods. The
ANOVA result emphasizes the fact that Computer Assisted Instruction has several built-in features which enhance learning among pupils.

24. It is found that Computer Assisted Instruction had resulted in the highest pre test mean scores (41.07) followed by co-operative learning (38.06) and conventional teaching (34.41). The difference between the Computer Assisted Instruction and Cooperative learning is found to be significant. From the analysis it is revealed that the pre test mean scores of Computer Assisted Instruction is significantly greater than the scores of Cooperative learning and Conventional teaching. Among all three methods of teaching Computer Assisted Instruction enjoys the highest popularity and preference as it makes learning joyful, creative and multimodal.

25. It is found that Computer Assisted Instruction had resulted in the highest post test mean scores (74.35) followed by Cooperative learning (64.72) and conventional learning (60.18). The difference among the Computer Assisted Instruction, Cooperative learning and the Conventional teaching is found to be significant. Though in the pre test the cooperative learning students and the conventional teaching students have the same knowledge, they differ in their post test after the treatment given to them. It is quite clear that conventional teaching is losing its popularity among pupils as they find it monotonous and repetitive.

26. F value obtained from the comparison of post test scores (P<0.01) of the government (28.073) and government aided school students (57.813) among the three groups reveals that there is significant
difference among the mean gain scores of the three groups. Hence the three groups differ significantly from each other.

27. F value obtained from the comparison of post test scores (P<0.01) of the rural (12.738) and urban school students (61.146) among the three groups reveals that there is significant difference among the mean gain scores of the three groups. Hence the three groups differ significantly from each other.

RECOMMENDATIONS

Many studies have proved that the application of computer assisted instruction improve the achievement of learners. The list of findings of the present also reveals that the students can perform better through computer assisted instruction than the Cooperative Learning method and conventional method. When the three methods are compared, Computer Assisted Instruction shows greater effectiveness than the other two methods. Based on the findings of the present study the investigator suggests the following recommendations to bring about the changes in the conventional mode of learning process which is commonly being practiced in the educational institutions.

1. Computer Assisted Instructional material can be prepared for all the subjects where there is lack of teachers.

2. When compared to conventional learning, it is recommended that Computer Assisted Instruction strategy can be used as an alternative method in classroom teaching.
3. More software packages for the whole syllabus in different subjects should be developed which may help students to learn at their own pace.

4. Educational institutions should be provided with Computer Assisted Instructional materials for teaching in secondary and higher secondary classes for different subjects.

5. Heads of the institutions and teachers should be oriented with effective use of different ‘methods’ of teaching through short term and refresher courses.

6. A Computer Assisted Instructional material for different lessons in biological science should be prepared to help the teachers while teaching in high and higher secondary schools of rural and urban areas.

7. Conferences and workshops may be organised to train the teachers, teacher trainees, teacher educators and computer experts to develop such instructional packages in an intended way.

8. In cooperative learning method when proper guidance is given to the students, creativity and effectiveness can be developed in them easily.

SUGGESTIONS FOR FUTURE RESEARCH

Following are some of the areas in which future research is suggested.

1. An action research may be undertaken among the higher education students through various instructional ‘methods’.
2. A comparative study could be carried out on the views of the learners and the teachers towards the use of computer assisted instruction and other instructional 'methods'.

3. The study may be replicated for various standards and for different content areas in other subjects

4. Effectiveness of instructional materials for different levels may be tested.

5. Cooperative learning method can be undertaken in all subjects in the high school level also.

6. Cooperative learning method can be undertaken when there is lack of teachers as well as when there is lack of laboratory facilities in rural area schools.

CONCLUSION

One of the most significant roles of a teacher is communication at all levels of teaching. In the present study, the investigator has studied the efficacy of different 'methods' for the students. Through this study it was proved that Computer Assisted Instruction could be used as an effective strategy for teaching biological science. It is concluded that the new concerns for the individual learner and the new ways of presenting information using appropriate media, would certainly help the teachers create a conducive classroom situation and an effective design for instruction leading to effective learning.

This study has thrown light on the effect of different 'methods' of teaching biological science for the higher secondary students. Conventional
method of teaching may be replaced by Computer Assisted Instruction and Cooperative Learning methods.

Education is in a transitional phase right now as radical changes are taking place; whatever that was once considered sacrosanct is being discarded now as obsolete due to technological revolution. To break the monotony and rigidity in the classroom, it is rather imperative to bring in dynamism and variety to facilitate learning. The new paradigm shift in education places greater emphasis on learning than teaching; the present study has highlighted the effectiveness of computer assisted instruction as a distinct mode of learning where the learner is self directed and self motivated in the process of learning.

The intention of the study is not to undermine Cooperative Learning and Conventional Teaching learning method but to bring out the effectiveness and efficiency of Computer Assisted Learning. The Success lies in the design, layout, implementation and evaluation of the learning module. The present study has successfully brought to the spotlight the emergence of Computer Assisted Instruction as a pragmatic, flexible and individualized learning method.

This study suggests that, even in very large classes and with minimal personnel, it is possible to implement cooperative learning activities and that students find groups enjoyable and useful. However, additional studies are necessary in order to determine if these activities improve student engagement relative to a traditional lecture format. Cooperative learning activities are proposed to encourage a deeper understanding of course material and promote higher-level thinking skills. Future experiments that examine cooperative learning should
address this issue by incorporating questions that more effectively measure higher-order thinking skills into the assessments used.

Cooperative activities are most likely to promote learning gains when students are rewarded for their participation and when group performance is measured as the sum of each member's individual performance rather than through a single group product.

The group activities we used may have had a more significant impact if rewards for cooperative work were based on the average of each member's individual performance rather than on a consensus answer. This would have provided a greater incentive for group members to explain the concepts to one another and help each member perform to his or her maximum ability. One potential problem with this approach, however, is that it may also lead to greater dissatisfaction among some students because their personal grades would become partially dependent on the performance of others.

Another way in which the cooperative learning approach used in this study might be improved is to provide students with training in effective group interactions and learning strategies.