

CHAPTER VI

DISCUSSION OF THE FINDINGS OF THE STUDY

THIS CHAPTER PRESENTS DISCUSSION OF THE FINDINGS OF THIS STUDY.

6.1 EFFECTIVENESS OF THE SOFTWARE PACKAGE IN TERMS OF ACADEMIC ACHIEVEMENT :

It was found that the experimental group achieved significantly higher than the control group. There are several studies which have reported effectiveness of CAI package in terms of students' achievement. Studies conducted by Shayer (1970) and Swetman (1972) have found that the use of computers in instructional process at school level enhances the learning process. The studies conducted by Crockett (1980), Romero (1980), Knerr (1983) and Bennett (1986) have found that CAI had a significant effect on the academic gains of students when considered in conjunction with the grade level, ability level, socio-economic status. Studies conducted in India at secondary stage about the effectiveness of CAI by Pravakar (1989), Bharadwaj (1990), Adhikari (1992), Stella (1992) and Mahapatra (1994) have also found effectiveness of CAI over traditional method and as an effective individualised instructional technique. The above mentioned studies support the findings of the present study that CAI is effective in terms of academic achievement of the students. Although all these studies were conducted at secondary stage covering different subject matters, there are some studies conducted in the area of teaching of Chemistry

through CAI. Studies conducted by Koltz (1980), Tauro (1981), Slick (1990), Mahapatra (1991), Douglas (1992), Williamson (1992) and Waddick (1994) at the higher secondary level and have found that CAI programmes in Chemistry is an effective mode of instruction. CAI was found to be effective in terms of achievement as compared to the traditional method of teaching. Thus, the studies conducted in the area of teaching of Chemistry through CAI also support the findings of the present study. It can, therefore, be concluded that the developed CAI package helped the experimental group to achieve higher in Chemistry.

6.2 EFFECTIVENESS OF SOFTWARE IN TERMS OF INSTRUCTIONAL TIME

It was found in the present study that the CAI was time effective. As has been reported in chapter V, the students of experimental group required lesser time to learn three chapters of standard XI Chemistry text-book in comparison to the students of control group. This was due to the reason that the learning through the software was more interesting due to the presence of graphs and figures in the software, learning became more quicker and clear with regard to understanding of some basic concepts. The findings of the present study was found to be consistent with the findings of other researchers viz., Parry et. al. (1985). They reported from the survey on the use of computers that CAI results in saving of instructional and learning time. Whereas Gibbs

(1992) found that instructional time increases with self-evaluation as learners were forced to interact more with CBI lesson. Waddick (1994) reported that the use of computer based instruction reduces the instructional time. It can be seen from these studies that the findings of Parry et. al. (1985) and Waddick (1994) support the finding of the present study. It can therefore be concluded that the use of computer based instruction on CAI helps in reducing the instructional time.

6.3 STUDENTS' ACADEMIC ACHIEVEMENT IN RELATION TO THE IQ, ACADEMIC MOTIVATION AND ATTITUDE TOWARDS THE CAI PACKAGE :

It was found that the academic achievement of students of experimental group was very much affected by the variables like IQ, academic motivation and attitude. It was found that attitude of the student does not effect the academic achievement of the students. This finding is supported by the finding of Meyer (1986), where in he found that there was no significant difference in the academic achievement and attitude scores of control and experimental group. Further Wilson (1995) reported that learning through CAI occurs regardless of student's attitude towards CAI. It was also found that IQ and motivation as separate variable also affect the academic achievement of students but their interaction does not have any effect on the academic achievement of students.

The studies conducted by Agarwal (1973), Singh (1983), Deshpande (1984), Sween (1984) and Mehrotra (1986) have found that there was positive relation between academic motivation and academic achievement.

Further it was also found that IQ and Attitude as well as motivation and Attitude together also had significant effect on students academic achievement. The three variables together also had combined effect on student's academic achievement. So the present study, reveals that there is a significant relationship among attitude IQ motivation and academic achievement of students. Therefore, it can be concluded that variables like IQ, academic motivation and attitude together helps for higher academic achievement.

Further studies conducted by Crockert (1980), Tauro (1981) Bobbert (1983), Slick (1990), have shown that attitudinal changes does help in improving academic achievement through Computer Assisted Instruction. Therefore it can be concluded that CAI was found to be an effective mode of instruction and CAI programmes in chemistry increased their enthusiasm for the study of chemistry. Working with the Computer Assisted Programme was found to be useful and satisfying educational experience. Since it was for the first time the students were exposed to a CAI package particularly in Chemistry.

6.4 ATTITUDE OF STUDENTS AND TEACHER REGARDING SOFTWARE PACKAGE :

It was found that majority of the students of experimental group had favourable attitude about various aspects of software package. With regard to the presentation of content, students found that it was nicely developed and the terms were explained clearly. They also said that the logical sequencing was properly maintained among different sub-units in the software. Language was found to be easy to understand certain concepts, by majority of the students. Some students found that the illustrations and examples were not sufficient. Similarly, although majority of the students liked the test items, some students opined that the test should not have only multiple choice items. But on the whole the students had favourable attitude about the software package and this seems to have led to higher academic motivation and positive attitude towards the package which ultimately has resulted in higher achievement for majority of the students in experimental group. On the whole, performance of the experimental group was found better than the control group. With regard to the Chemistry teacher's attitude, it was found that the teacher had positive attitude about the various aspects in the software package and the teacher observed a significant positive difference in the behaviour of students to learn the Chemistry subject at standard XI.

6.5 EDUCATIONAL IMPLICATIONS OF THE STUDY :

As it was found that the students learn in a limited time at their own pace and achieve better as compared to the students who learned through the traditional method. This implies that such packages should be developed and used in all the schools at higher secondary level. Moreover, in all the school subjects there is a possibility of developing CAI packages which are not available today. For the development of such packages both subject teachers and software experts should be involved. It is felt that there is some inhibition from the subject teachers for using such packages and therefore they should be oriented to use CAI package.

As the students can learn at their own pace, it is expected that all the students will attain mastery level. However, it is seen that computer laboratories are not accessible to the students when they require it. The implication that can be derived from this is that students should have access to the computer laboratory and should be allowed to use it as per their requirement. For this the mode of operation and charges can be worked out.

As the classrooms today are becoming overcrowded there is a need of alternative system of education in addition to the open school education. As computer technology is coming up in a big way students can learn complicated topics by being at their own. Therefore, there is a need to train teachers in the teachers training colleges to use such packages in alternative system of education.

6.6 SUGGESTIONS FOR FUTURE STUDIES :

1. Software package needs to be developed for some other units of Chemistry at standard XI from CBSC text book.
2. Software needs to be developed in other Science subjects like Physics and Biology.
3. Software package needs to be developed for training of teachers to teach various Science subjects.
4. Since the computer education is going to be important in teacher education institution also, the software packages needs to be developed for training of teacher educators.

CONCLUSION :

The present study conducted by the investigator has very clearly revealed that the software package developed by the investigator for the three chapters in standard XI Chemistry text book of Gujarat State Text-book Board was found to be effective. The effectiveness was found in terms of academic achievement of students and instructional time. It was also found that majority of the students and the Chemistry teacher had positive attitude about the various aspects of the software package. It was also found that the academic achievement was affected by IQ and academic motivation and attitude. From major findings of the study, it can be inferred that the software packages has great utility because of their effectiveness. Not only this but learning

through software is also interesting and motivating for students. This was in consistency with the findings of the studies conducted by Romero (1980), Agrawal(1973), Patil (1984), Singh (1986) who found that students' interest had contributed towards their academic achievement positively. This shows that the softwares package is useful to achieve objectives related not only to cognitive domains but also to affective domains as it promotes self-learning among students in long term. Such packages would help the students to develop some metacognitive abilities like thinking to think, critical thinking etc. At the same time the finding of the study have shown that there is a positive relationship between academic motivation and academic achievement therefore it is necessary to develop academic motivation among student . Looking at the findings of the study, investigator would like to opine that in future more number of such packages need to be developed for different subjects.