Chapter - VII

Summary

The labour of writing is reduced if the thought is in condensed form.

-C.C.Crawferd
CHAPTER VII
SUMMARY

7.0.0 INTRODUCTION :-

As a result of grand achievements in the field of 'Information Technology', which are now-a-days considered as just oxygen is for life, 'Information Technology' has become an integral part of school curriculum. Throughout most of the world's educational history, the methods of teaching have been the central feature. From the ancient period, philosophers have contributed significantly to teaching methodology. More significance to methods of teaching was given after the emergence of various theories of learning and their impact upon human behaviour. The modern approaches to instructions have been influenced by cognitive, behaviouristic and humanistic psychological orientation (Singh & Jemini, 1989). Earlier the classroom instructions were mainly content based, but the tremendous explosion of knowledge in all spheres of educational curricula have resulted in learner based instructions. The modern teachers realises it to teach, to nourish or cultivate the growing child. Thus the new approaches and techniques of teaching which are replacing the traditional methods have emerged.

Elton (1977) identified the mass communication instructions, individualised learning and group learning as the main fields of development. The introduction of 'Information Technology' in the form of Hardware and software approach has also brought significant changes on the teaching-learning scenario. Various researchers have made attempt in the direction on finding out the relevance of different methods or approaches or instructional systems. Now as the 'Information Technology' has been influencing our life and its impact on our society is quite remarkable, a need arises to look for an effective mode of imparting scientific information to the learners. It will be quite appropriate to search for instructional technology which enhances the insight of pupils to explore the basic knowledge of 'Information Technology' so that the problems related to science and technology, social studies, mathematics, music, computer in various fields of education can be controlled for making better life.
The investigator in this study found out the effectiveness of three instructional systems i.e. Audio-Video instructional system, multimedia instructional system and Conventional instructional system. The purpose of investigation was to study the effect of these three instructional systems on the achievement of secondary students in 'Information Technology'. These three instructional systems were selected because these can be used independent of each other and can be conducted in actual class room situations for teaching 'Information Technology'.

7.1.0 STATEMENT OF THE PROBLEM

A COMPARATIVE STUDY OF THE EFFECTIVENESS OF COMMUNICATION TECHNOLOGY FOR TEACHING 'INFORMATION TECHNOLOGY'

7.2.0 OBJECTIVES

The Study envisages the following objectives

(1) To compare the effectiveness of Audio-Video Instructional System, Multimedia Instructional System and Conventional Instructional System in terms of achievement for teaching 'Information Technology'.

(2) To study the relative retention in "Information Technology" in learning through Audio-Video Instructional System, Multimedia Instructional System and Conventional Instructional System.

(3) To study the Interaction effects in terms of achievement in "Information Technology" having three instructional system and two levels of intelligence.

(4) To study the Interaction effects in terms of achievement in "Information Technology" having three instructional system and two levels of sex.

(5) To study the Interaction effects in terms of achievement in "Information Technology" having different levels of intelligence and sex factor.

(6) To study the Interaction effects in terms of achievement in "Information Technology" having three instructional system, two levels of intelligence and two levels of sex.

(7) To develop Audio-video instructional system on selected content of "Information Technology".
(8) To develop Multimedia instructional system on selected content of "Information Technology".

(9) To develop the Conventional Instructional System on selected content of 'Information Technology'.

(10) To construct achievement test on selected content to study the effectiveness.

7.3.0. HYPOTHESIS

In order to realise the objectives of the study, the following hypothesis will be formulated for testing.

H-1 There is no significant difference between the mean achievement scores of secondary school students in "Information Technology" receiving instructions through Audio-Video Instructional System, Multimedia Instructional System and Conventional Instructional System.

H-2 There is no significant difference in the mean achievement scores of secondary school students in "Information Technology" in relative retention of receiving instructions through Audio-Video Instructional System, Multimedia Instructional System and Conventional Instructional System.

H-3 There is no significant interaction in terms of mean achievement of secondary school students learning through Audio-Video Instructional System, Multimedia Instructional System and Conventional Instructional System at high and low level of intelligence.

H-4 There is no significant interaction in terms of mean achievement of secondary school students learning "Information Technology" through three instructional systems at male and female sex level.

H-5 There is no significant interaction in terms of mean achievement of secondary school students learning "Information Technology" through two levels of intelligence and two levels of sex.

H-6 There is no significant interaction in terms of mean achievement of secondary school students learning "Information Technology" through three instructional systems, two levels of intelligence and two levels of sex.
7.4.0. METHOD AND PROCEDURE

It will include the experimental research method and the procedure is mentioned below.

METHODOLOGY

Experimental research method will be adopted in the present investigation.

7.5.0 DESIGN

In the present study, effect of three instructional systems viz. Audio-Video Instructional System, Multimedia Instructional System and Conventional Instructional System was studied regarding the achievement of secondary school students in 'Information Technology'. To achieve the objectives of investigation pre-test, post-test group design was employed. The design comprised of three different secondary schools. Forty students of IX the class were selected from each school. Achievement in 'Information Technology' was the dependent variable whereas three instructional systems were the independent variable. The intervening variables were controlled either statistically or administratively. The students of all the three groups (I, II, III) were administered intelligence test so as to obtain three equal groups on the basis of their score in intelligence test matched with respect to intelligence. The scores of intelligence test, and pre-achievement were the control variables which were adjusted statistically. The study was conducted in four stages:

1) Pre-test stage
2) Experimental treatment stage
3) First post-test stage
4) Second post-test stage

An achievement test developed by the investigator himself was administered before experimental treatment (pre-test stage) and after experimental treatment (first post-test stage) and after one month of experimental treatment (second post-test stage)
7.6.0 SAMPLE:

The population of the present investigation consisted of all the 9th class students of Bhiwani District Public schools affiliated with CBSE. There are total five schools in Bhiwani. Out of these five schools only three institutions were taken out randomly. Only those students were taken, who offered "Information Technology" discipline. Three sample institutions belong to same catchment area. The standard of staff and students are almost similar. Total 120 students were selected randomly, out of these 40 students were selected for one treatment. Thus three groups of students from three secondary schools constituted the sample for the present investigation.

7.7.0 TOOLS USED:

Two types of tools were used in the present investigation namely-instructional tools and measuring tools. The instructional tools in the form of Conventional Instructional System, Audio-video Instructional System & Multimedia Instructional System were prepared. With the help of these instructional tools, students were taught through three different instructional systems. The measuring tools employed were an achievement test, intelligence test etc. The achievement test was developed by investigator himself whereas the Standardised Intelligence Test "A group intelligence test for children (2/70)" by Dr. R.K, Tandon. was taken for the study.

Instructional material was developed in the form of Conventional Instructional System, Audio-video instructional System & Multimedia Instructional System to teach the students. The students were taught 'Information Technology' based on these Instructional Systems. The contents of 'Information Technology' subjects for the ninth (IXth) class were used for teaching through three instructional systems as mentioned above.

7.8.0 EXPERIMENTAL TREATMENT

After administration of the achievement test, the three different groups were provided experimental treatment. One group was taught through Audio-Video Instructional System. Second group was taught through Multimedia Instructional System. Third group was taught through conventional Instructional System A school period of forty minutes was utilised for teaching. Three lessons in total were taught during the experimental treatment.
7.9.0 CONTROLS USED

It was felt necessary to identify and control all those variables that may affect the dependent variable. The dependent variable was the achievement of the students. The variables like intelligence, prior score of the subject etc. were controlled either statistically or administratively.

7.10.0 STATISTICAL TECHNIQUES USED

To interpret the data collected, analysis of variance (ANOVA) was employed as the statistical measure for testing the significance of difference of the mean achievement scores of secondary school students in 'Information Technology'. For significant F-ratio, 't' test was applied taking two treatments at a time. Factorial design of (3x2x2) was used for testing the interaction effects.

7.11.0 FINDINGS

The statistical data of the present study revealed the following findings.

(I) A significant difference was observed between the mean achievement score of Multimedia instructional system, Audio-Video Instructional and Conventional Instructional system. From the analysis variance table on gain achievement scores, the obtained F value is 28.29 from Table No. 5.2 which is more than the table values 4.80 at 0.01 (1%) level of significance with df (2,117). The null hypothesis is rejected and there is a significant difference among three instructional systems.

(a) A significant difference was observed between the mean achievement score of Multimedia Instructional system and Audio-Video instructional system. 't' value between Multimedia Instructional system and Audio-Video instructional system was found to be 4.10 with df=78 was greater than table value i.e. 1.66 at 0.05 level indicating thereby that these two methods differ significantly. This indicates a significant difference between the mean gain achievement scores of secondary school students in 'Information Technology' taught through Multimedia Instructional system and Audio-Video instructional system. The mean gain achievement score of Multimedia instructional system i.e. 50.55 is higher than mean gain achievement score of Audio-Video instructional system i.e. 47.5. This indicates that the achievement of secondary school students when taught through Multimedia
instructional system is significantly higher than the students taught through Audio-Video instructional system.

(b) A significant difference was observed between the mean achievement score of Audio-Video instructional system and Conventional instructional system. From 't' value between Audio-Video instructional system and Conventional instructional system, 't' was found to be 4.12 with df=78 was greater than table value i.e. 1.66 at 0.05 level indicating thereby that these two methods differ significantly. This indicates a significant difference between the mean gain achievement scores of secondary school students in 'Information Technology' taught through Audio-Video instructional system and Conventional instructional system. The mean gain achievement score of Audio-Video instructional system i.e. 47.5 which is greater than the mean score of Conventional instructional system i.e. 44.5. This indicates that the achievement of secondary school students when taught through Audio-Video instructional system significantly higher than the students taught through Conventional instructional system.

(c) A significant difference was observed between the mean achievement score of Multimedia Instructional system and Conventional instructional system. From 't' value between Multimedia Instructional system and Conventional instructional system was found to be 6.52 with df=78 was greater than table value i.e. 1.66 at 0.05 level indicating thereby that these two methods differ significantly. This indicates a significant difference between the mean gain achievement scores of secondary school students in 'Information Technology' taught through Multimedia Instructional system and Conventional Instructional System. The mean gain achievement score of Multimedia instructional system i.e. 50.55 is higher than mean gain achievement score of Conventional instructional system i.e. 44.5. This indicates that the achievement of secondary school students when taught through Multimedia instructional system is significantly higher than the students taught through Conventional instructional system.

(II) On retention, a significant difference was observed between the mean achievement score of Multimedia instructional system, Audio-Video instructional and Conventional system. The obtained 'F' value from table No. 5.5 was found to be 25.31 with df = (2,117)
which was more than the table value at both the levels of significance i.e. 4.80 at 0.01 (1%) level of significance with df (2,117). The null Hypothesis is rejected and it may be stated that there is a significant difference among three methods on retention.

(a) On retention, further, 't' value between Audio-Video instructional system and Multimedia instructional system was found to be 5.09 with df = 78, which was greater than table value i.e. 1.66 at 0.05 level indicating that these methods differ significantly. Further, it is also evident that 'Information Technology' taught to secondary school students through Multimedia instructional system got mean score i.e. M = 4.00 which is less than the mean score 6.25, when 'Information Technology' is taught through Audio-Video instructional system on retention. Hence, it can be interpreted that the students learn better by multimedia instructional system than Audio-Video instructional system on retention.

(b) On retention, further 't' value between Audio-Video instructional system and Conventional instructional system was found to be 3.06 with df = 78 was greater than table value which is 1.66 at 0.05 level indicating thereby that these methods differ significantly. Further, it is also evident that 'Information Technology' taught to secondary school students through Audio-Video instructional system got mean score 6.25, which is less than the mean score 8.50, when 'Information Technology' taught to secondary school students through Conventional instructional system on retention.

From this discussion, it may be interpreted that the students have better retention by Audio-Video instructional than Conventional instructional system. Hence, the former is more effective than the later.

(c) On retention, further 't' value between Multimedia instructional system and Conventional instructional system was found to be 6.62 with df = 78 was greater than table value which is 1.66 at 0.05 level indicating thereby that these methods differ significantly. Further it is also evident that 'Information Technology' taught to secondary school students through Multimedia instructional system got mean score i.e. M=4.0, which
is less than the mean score i.e. M=8.50 when 'Information Technology' taught to secondary school students through Conventional instructional system on retention. From this discussion it may be interpreted that the students have better retention by Multimedia instructional system. Hence, the former is more effective than later.

In summing up the interpretations, we may conclude that the mean score of students taught 'Information Technology' through Multimedia instructional system on retention was 4.00, which is less than mean score of students taught Audio-Video instructional system which is 6.25 and mean score of students taught 'Information Technology' through Conventional instructional system which is 8.50. Hence it can be interpreted that the students learn best by Multimedia instructional system having low mean score i.e. M=4.00 because method is more effective on retention as compared to a method having higher mean score i.e. Audio-Video instructional system having M = 6.25 and Conventional instructional system having M=8.50.

(III) A significant interaction between teaching methods and level of intelligence was observed. The obtained $F_{AB}=45.37$, from Table No. 5.9 which is greater than the table value i.e 4.83 with df (2,108) even at 0.01 level of significance. So hypothesis is rejected. Therefore the interaction of teaching methods and intelligence level is significant. Hence, it may be concluded that when three instructional system (A) and two level of Intelligence (B) taken jointly, they do effect the dependent variable i.e. Achievement scores of students in 'Information Technology'

(IV) The interaction between three teaching methods and two levels of sex is not significant. In factorial design (3x2x2), the obtained $F_{AC}=0.008$ from Table no. 5.9 which is lesser than the table value i.e. 4.83 with df=(2,108) even at 0.01 level of significance. So hypothesis is accepted. Therefore interaction of teaching methods with levels of sex is not significant. It may be concluded that there will be no any difference while learning 'Information Technology' by male and female secondary school students. When three instructional system (A) and level of sex (C) taken jointly, they do not effect the dependent variable i.e. Achievement scores of students in 'Information Technology'

(V) The interaction effects between two levels of intelligence and two levels of sex is
significant. In factorial design (3x2x2), the obtained $F_{bc} = 19.01$ from Table No. 5.9 which is greater than the table value i.e. 6.9 with df (1.108) even at 0.01 level of significance, so hypothesis is rejected. Therefore the interaction of different levels of intelligence and different levels of sex is significant. When two level of intelligence (B) and two level of sex (C) are taken jointly, they do effect the dependent variable i.e. Achievement scores of students in 'Information Technology'.

VI) The interaction between teaching methods, two levels of intelligence & two levels of sex is significant, In factorial design (3x2x2), the obtained $F_{ABC} = 20.48$ from Table No. 5.9 which is greater than table value at 4.83 with df (2.108) even at 0.01 level of significance. It may be concluded that there is significant interaction between teaching method, level of intelligence & levels of sex. When three instructional systems (A), two levels of intelligence and two levels of sex (C) are taken jointly, they do effect the dependent variable i.e. Achievement scores of students in 'Information Technology'.

7.12.0 CONCLUSIONS

On the basis of these findings, the following conclusions have been drawn:

1) Multimedia instructional system was found to be the best instructional system than two instructional systems i.e. Audio-Video instructional system and Conventional instructional system. Audio-Video instructional system was better than Conventional system.

2) The relative comparison of three instructional systems on retention by using the assumption that a method lower on mean score i.e. mean score of Multimedia instructional system would be termed as more effective on retention as compared to a method having higher mean scores i.e. Audio-Video instructional system and Conventional instructional system on retention

3) In factorial design (3x2x2), the interaction of teaching methods and intelligence level is significant. There is an interaction between teaching methods and intelligence levels. The high and average level of intelligence learn differently interacting with three instructional systems. It may be concluded that when three instructional system (A) and two levels of intelligence are taken jointly, they do effect the dependent variable i.e. Achievement scores of students in 'Information Technology'
4) In factorial design (3x2x2), the interaction of three teaching methods with two levels of sex is not significant. There is no any interaction between teaching methods and sex levels. The male and female secondary school students have no difference in learning through three different teaching methods. It may be concluded that when three instructional system (A) and two levels of sex (C) are taken jointly, they do not effect the dependent variable i.e. Achievement scores of students in 'Information Technology'.

5) In factorial design (3x2x2), the interaction of two levels of intelligence and two levels of sex is significant. There is an interaction between two levels of intelligence and two levels of sex. It may be concluded that when two levels of intelligence (B) and two levels of sex (C) are taken jointly, they do effect the dependent variable i.e. Achievement scores of students in 'Information Technology'.

6) In factorial design (3x2x2), the interaction of three instructional systems (A), two levels of intelligence (B) and sex factor (C) is significant. There is an interaction between three instructional systems, two levels of intelligence and two levels of sex. It may be concluded that when three instructional system (A), two levels of intelligence (B) and two levels of sex (C) are taken jointly, they do effect the dependent variable i.e. Achievement scores of students in 'Information Technology'.

7.13.0 Educational implications

The findings of the study have their implications for students, teachers, teacher educators, curriculum planners, media persons, administrators and education policy makers. The findings have special relevance to the 'Information Technology' teachers who are teaching 'Information Technology' and computers to secondary school students.