CHAPTER IV

RESULTS AND DISCUSSIONS

4.1 OVER VIEW

The analysis of the data and the results of the study have been discussed in this chapter. This study was designed to find out the effect of computer assisted instruction, traditional instruction and combined instruction on dribbling, passing and Kicking among soccer players. To achieve the purpose of the study, seventy five students were selected randomly as subjects. The selected subjects were divided into three experimental groups and no step was taken to equate the group in any manner. Group I underwent computer assisted instruction, Group II underwent traditional instruction, Group III underwent combined instruction on three alternate days in a week for a period of twelve weeks. The dependent variables selected for this study were dribbling, passing and Kicking. All the subjects were tested prior and immediately after the experimental period on the selected dependent variables.

The obtained data from the experimental groups before and after the experimental period were statistically analyzed with dependent 't'-test and the analysis of covariance (ANCOVA). Whenever the F-ratio for adjusted post test means was found to be significant, the scheffe's test was applied as post-hoc test to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases to find out the significance.

4.2 TEST OF SIGNIFICANCE

This is the crucial portion of the dissertation in arriving at the conclusion by examining the statistical hypotheses and either by accepting the null hypotheses or

rejecting the same in accordance with the results obtained in relation to the level of significance fixed by the investigator.

4.2.1 LEVEL OF SIGNIFICANCE

The probability level below which we reject the hypotheses is termed as level of significance. The F ratio obtained by one way analysis of covariance and the "t" ratio were compared to 0.05 level of significance which was considered adequate.

In using analysis of covariance, F ratio of 3.98 was needed for significance at 0.05 level with the degrees of freedom 2 and 71 and the table value required for significance at 0.05 level for "t" test with df 24 is 2.06.

If the obtained value at 0.05 level is more than the required value the null hypothesis will be rejected and if the obtained values are less than the required value at 0.05 level, the hypothesis will be accepted to the effect that there existed no significant difference the means of the groups under study.

4.3 ANALYSIS OF THE DATA

The influences of independent variables on each criterion variables were analyzed and are presented below.

DRIBBLING

The analysis of dependent 't'-test on the data obtained in dribbling in the pre-test and post-test of the computer assisted instruction, the traditional instruction and the combined instruction groups have been analyzed and are presented in Table III.

TABLE III

THE SUMMARY OF MEAN AND DEPENDENT 't'-TEST FOR THE PRE AND POST TESTS ON DRIBBLING OF EXPERIMENTAL GROUPS

Mean	Computer Assisted Instruction Group	Traditional Instruction Group	Combined Instruction Group
Pre test mean	28.23	30.45	28.99
Post test Mean	27.98	29.54	27.22
't'test	**8.47***	**9.41***	**20.02***

*Significant at 0.05 level

(Table value required for significance at 0.05 level for 't'-test with df 24 is 2.06)

Table III shows that the dependent 't'-test values between the pre and post test means of computer assisted instruction, traditional instruction and combined instruction groups 8.47, 9.41, 20.02. Since the obtained 't'-test value of experimental groups are greater than the table value 2.09 with df 24 at 0.05 level of confidence, it is concluded that computer assisted instruction, traditional instruction and combined instruction groups had a significant improvement in dribbling.

The analysis of covariance on dribbling of the computer assisted instruction, the traditional instruction and the combined instruction groups have been analyzed and are presented in Table IV.

TABLE IV

ANALYSIS OF COVARIANCE ON DRIBBLING OF EXPERIMENTAL GROUPS

Adjusted post test Mean			Sources Of Variance	Sum of Square	df	Mean Squares	F-ratio
Computer assisted instruction	Traditional Instruction	Combined Instruction					
28.95	28.34	27.44	Between	28.89	2	14.45	99.96*
			Within	10.26	71	0.145	

(Dribbling scores are in Seconds)

(The table value required for significance at 0.05 level with df 2 and 71 is **3.98**)

From the table IV, it is seen that the adjusted post test mean values of dribbling for the computer assisted instruction, the traditional instruction and the combined instruction groups are 28.95, 28.34, and 27.44 respectively. The obtained F-ratio of 99.96 for adjusted post test mean was more than the table value of 3.98 for df 2 and 71 required for significance at 0.05 level of confidence.

The results of the study indicate that there is a significant difference among the adjusted post test means of the computer assisted instruction, the traditional instruction and the combined instruction groups on the improvement in dribbling. To determine which of the paired means had a significant difference, the scheffe's test was applied as post hoc test and the results are presented in Table V.

TABLE V

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST TEST PAIRED MEANS IN DRIBBLING

Adjusted post test means			Mean Difference	Confidence Interval
Computer Assisted Instruction	Traditional Instruction	Combined Instruction		
28.95	28.34	27.44	0.61*	0.30
28.95		27.44	1.51*	0.30
	28.34	27.44	0.91*	0.30

* significant at 0.05 level

Table V shows that the adjusted post test mean difference on dribbling between the computer assisted instruction and the traditional instruction groups, the computer assisted instruction and the combined instruction groups, the traditional instruction and the combined instruction groups are, 0.61, 1.51, and 0.91 respectively. The values are greater than the confidence interval value 0.30, which shows a significant difference at 0.05 level of confidence.

It may be concluded from the results of the study that there is a significant difference in dribbling between the adjusted post test means of the computer assisted instruction and the traditional instruction groups, the computer assisted instruction and the combined instruction groups, the traditional instruction and the combined instruction groups. However, the improvement in dribbling is significantly higher for the combined instruction group than the computer assisted instruction group and the traditional instruction groups.

It may be concluded that the combined instruction group is better than the computer assisted instruction group and the traditional instruction group in dribbling.

The mean values of the computer assisted instruction, the traditional instruction and the combined instruction in dribbling are graphically represented in figure I.

The adjusted post test mean values of the computer assisted instruction; the traditional instruction and combined instruction in dribbling are graphically represented in figure II.
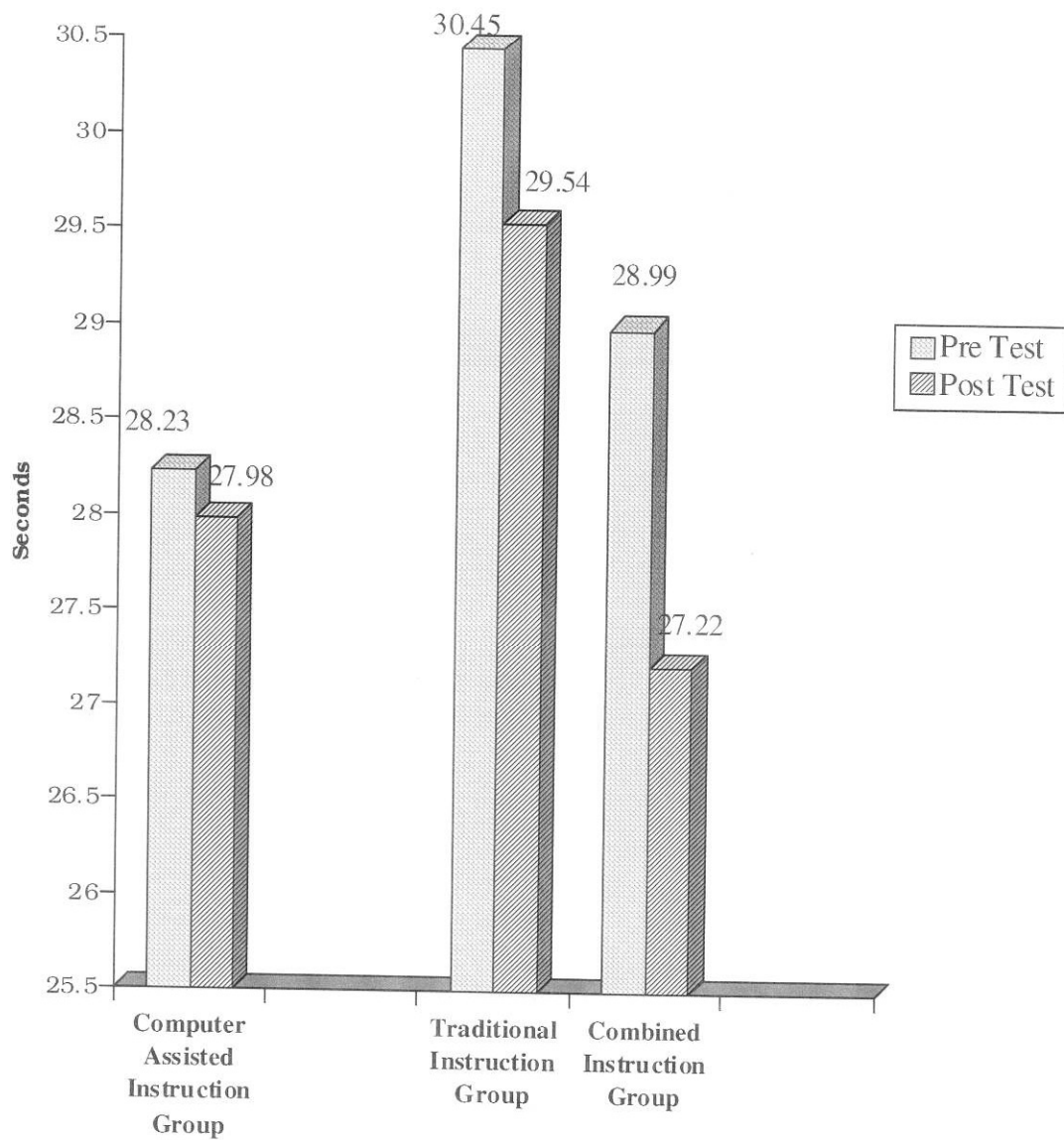
**FIGURE I: MEAN VALUES OF COMPUTER ASSISTED INSTRUCTION AND
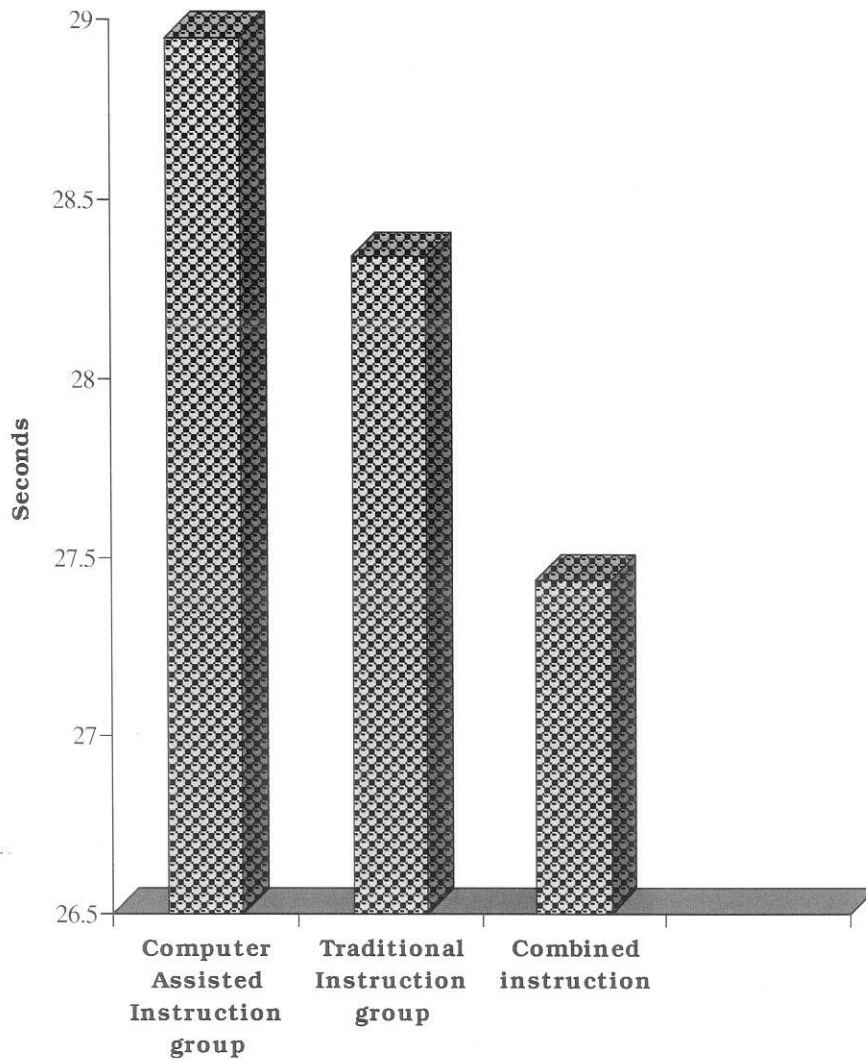TRADITIONAL INSTRUCTION GROUPS IN DRIBBLING**

FIGURE II: ADJUSTED POST TEST MEAN VALUES OF COMPUTER ASSISTED INSTRUCTION, TRADITIONAL INSTRUCTION AND COMBINED INSTRUCTION IN DRIBBLING

PASSING

The analysis of dependent 't'-test on the data obtained in passing from the pre-test and post-test of the computer assisted instruction, the traditional instruction and the combined instruction groups have been analyzed and are presented in Table VI.

TABLE VI

SUMMARY OF MEAN AND DEPENDENT 't'-TEST FOR THE PRE AND POST TESTS ON PASSING OF EXPERIMENTAL GROUPS

Mean	Computer Assisted Instruction Group	Traditional Instruction Group	Combined Instruction Group
Pre test mean	3.92	5.08	4.28
Post test Mean	5.60	6.48	9.00
't'test	11.23*	9.89*	28.01*

*Significant at 0.05 level

(Table value required for significance at 0.05 level for 't'-test with df 24 is 2.06)

Table VI shows that the dependent 't'-test values between the pre and post tests means of the computer assisted instruction, the traditional instruction and the combined instruction groups are 11.23, 9.89, 28.01. Since the obtained 't'-test value of the experimental groups are greater than the table value 2.06 with df 24 at 0.05 level of confidence, it is concluded that the computer assisted instruction, the traditional instruction and the combined instruction groups had a significant improvement in passing.

The analysis of covariance on passing of the computer assisted instruction, the traditional instruction and the combined instruction groups have been analyzed and are presented in Table VII.

TABLE VII
ANALYSIS OF COVARIANCE ON PASSING OF
EXPERIMENTAL GROUPS

Adjusted post test Mean			Sources Of Variance	Sum of Square	df	Mean Squares	F-ratio
Computer assisted instruction	Traditional Instruction	Combined Instruction					
5.66	6.15	9.08	Between	157.83	2	78.91	227.11*
			Within	24.67	71	0.35	

(The table value required for significance at 0.05 level with df 2 and 71 is 3.98)

From table VII, the adjusted post test mean values of passing for the computer assisted instruction, the traditional instruction and the combined instruction groups are 5.66, 6.15, and 9.08 respectively. The obtained F-ratio of 227.11 for adjusted post test mean is more than the table value of 3.98 for df 2 and 71 required for significance at 0.05 level of confidence.

The results of the study indicate that there is a significant difference among the adjusted post test means of the computer assisted instruction, the traditional instruction and the combined instruction groups on passing. To determine which of the paired means had a significant difference, the scheffe's test was applied as post hoc test and the results are presented in Table VIII.

TABLE VIII

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST TEST PAIRED MEANS IN PASSING

Adjusted post test means			Mean Difference	Confidence Interval
Computer Assisted Instruction	Traditional Instruction	Combined Instruction		
5.66	6.15		0.29*	0.47
5.66		9.08	3.22*	0.47
	6.15	9.08	2.93*	0.47

* significant at 0.05 level

Table VIII shows that the adjusted post test mean difference on passing between the computer assisted instruction and the traditional instruction and combined instruction, traditional instruction and the combined instruction are 0.29, 3.22 and 2.93 respectively. The values are greater than the confidence interval value 0.47, which show a significant difference at 0.05 level of confidence.

It may be concluded from the results of the study that there is a significant difference in passing between the adjusted post test means of the computer assisted instruction and the traditional instruction, the computer assisted instruction and the combined instruction, the traditional instruction and the combined instruction groups. However, the improvement in passing is significantly higher for the combined instruction than the computer assisted instruction and the traditional instruction groups.

It may be concluded that the combined instruction group is better than the computer assisted instruction and the traditional instruction in improving passing.

The mean values of the computer assisted instruction, the traditional instruction and the combined instruction groups in passing are graphically represented in figure III. The adjusted post test mean values of the computer assisted instruction, the traditional instruction and the combined instruction groups in passing are graphically represented in figure IV.
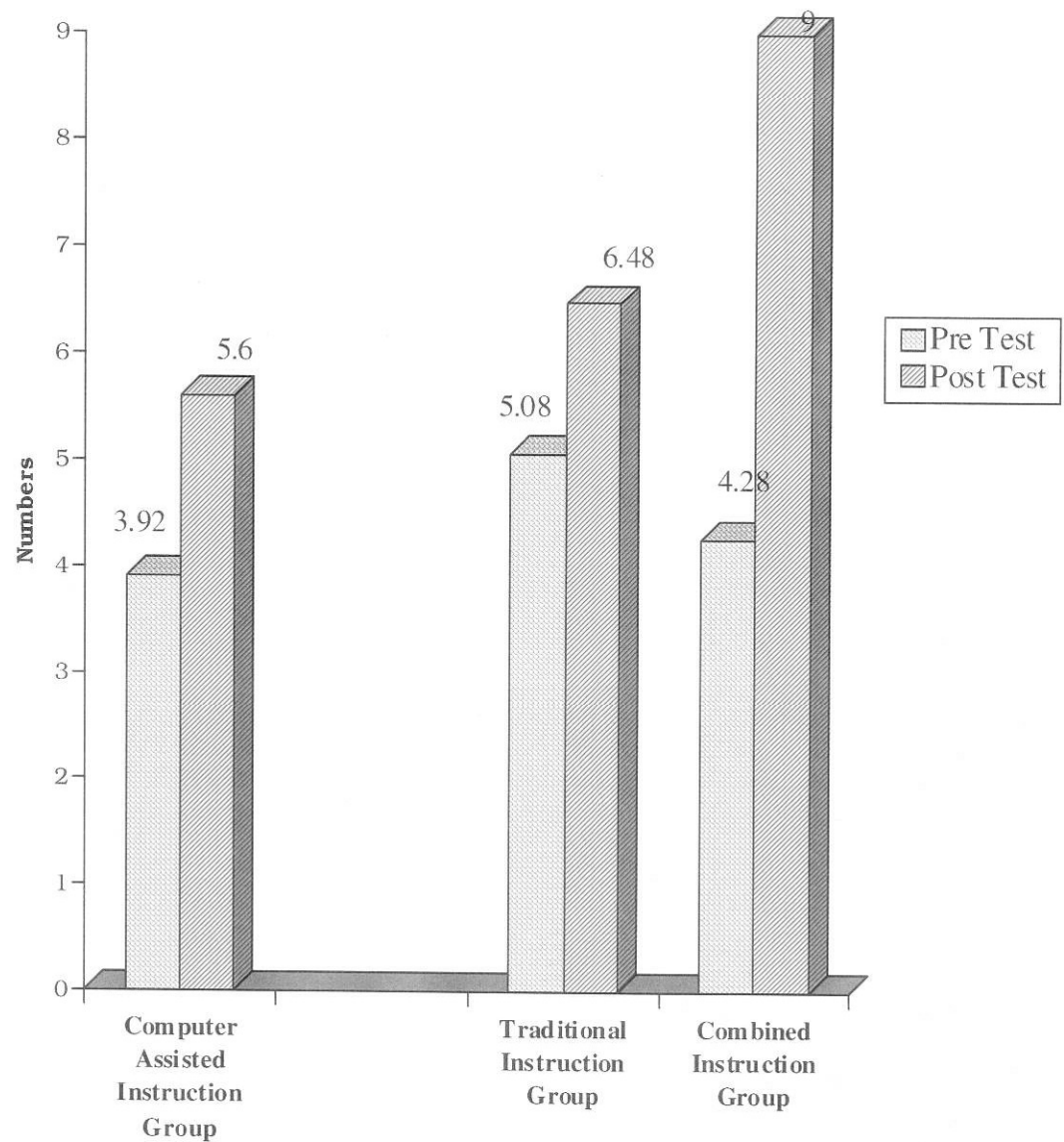
**FIGURE III : MEAN VALUES OF COMPUTER ASSISTED INSTRUCTION
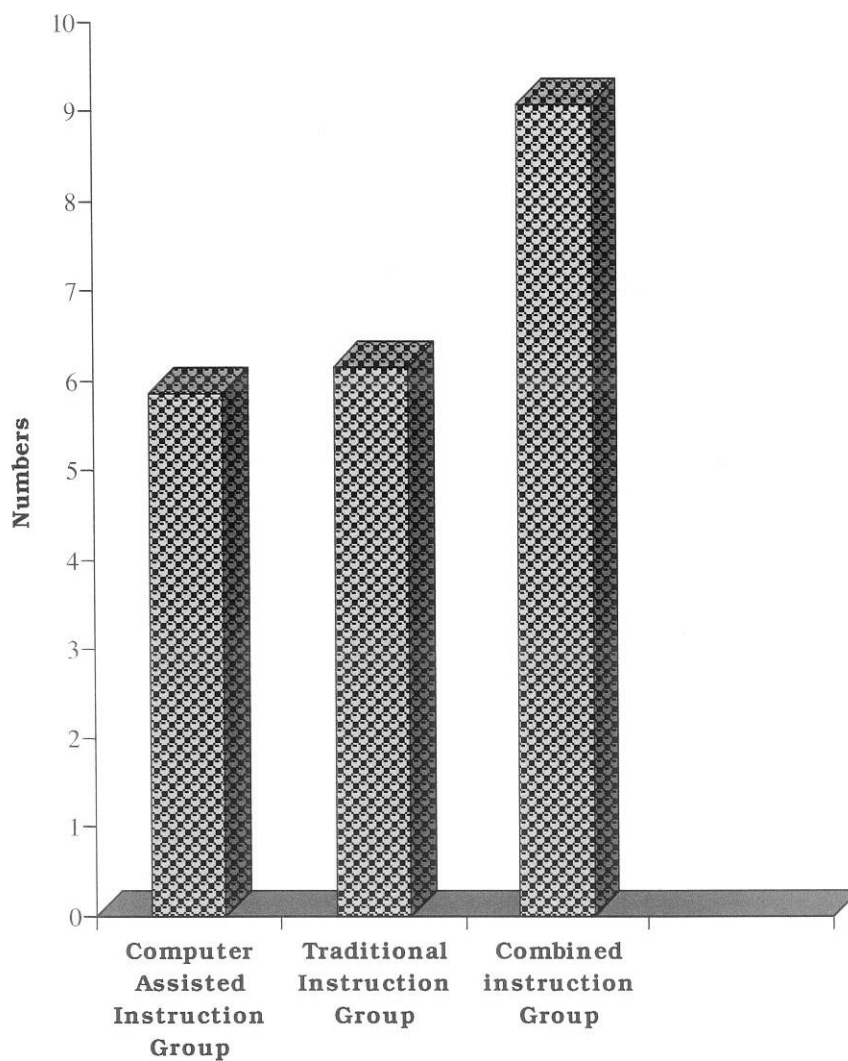AND TRADITIONAL INSTRUCTION GROUPS IN PASSING**

FIGURE IV: ADJUSTED POST TEST MEAN VALUES OF COMPUTER ASSISTED INSTRUCTION, TRADITIONAL INSTRUCTION AND COMBINED INSTRUCTION IN PASSING

KICKING

The analysis of dependent 't'-test on the data obtained in kicking from the pre-test and post-test of the computer assisted instruction, the traditional instruction and the combined instruction groups have been analyzed and are presented in Table IX.

TABLE IX

SUMMARY OF MEAN AND DEPENDENT 't'-TEST FOR THE PRE AND POST TESTS ON KICKING OF EXPERIMENTAL GROUPS

Mean	Computer Assisted Instruction Group	Traditional Instruction Group	Combined Instruction Group
Pre test mean	66.40	64.96	68.56
Post test Mean	68.96	67.92	75.04
't'test	**11.82***	**12.63***	**30.99***

*Significant at 0.05 level

(Table value required for significance at 0.05 level for't'-test with df 24 is 2.06)

Table IX shows that the dependent 't'-test values between the pre and post tests means of the computer assisted instruction, the traditional instruction and the combined instruction groups are 11.82, 12.63 and 30.99. Since the obtained 't'-test values of experimental groups arc greater than the table value 2.06 with 24 at 0.05 level of confidence, it is concluded that the computer assisted instruction, the traditional instruction and the combined instruction groups had a significant improvement in kicking.

The analysis of covariance on kicking of the computer assisted instruction, the traditional instruction and the combined instruction groups have been analyzed and presented in Table X.

TABLE X

ANALYSIS OF COVARIANCE ON KICKING OF EXPERIMENTAL GROUPS

Adjusted post test Mean			Sources Of Variance	Sum of Square	df	Mean Squares	F-ratio
Computer assisted instruction	Traditional Instruction	Combined Instruction					
68.19	69.56	73.16	Between	237.34	2	118.67	102.22*
			Within	82.42	71	1.16	

(The table value required for significance at 0.05 level with df 2 and 71 is 3.98)

From table X, it is seen that the adjusted post test mean values of kicking for the computer assisted instruction, the traditional instruction and the combined instruction groups are 68.19, 69.56 and 73.16 respectively. The obtained F-ratio of 102.22 for the adjusted post test mean is more than the table value of 3.98 for df 2 and 71 required for significance at 0.05 level of confidence.

The results of the study indicate that there is a significant difference among the adjusted post test means of the computer assisted instruction, the traditional instruction and the combined instruction groups on the improvement of kicking. To determine which of the paired means had a significant difference, the scheffe's test was applied as post hoc test and the results are presented in Table XI.

TABLE XI

SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST TEST PAIRED MEANS ON KICKING

Adjusted post test means			Mean Difference	Confidence Interval
Computer Assisted Instruction	Traditional Instruction	Combined Instruction		
68.19	69.56		0.37*	0.86
68.19		73.16	3.97*	0.86
	69.56	73.16	3.60*	0.86

* significant at 0.05 level

Table XI shows that the adjusted post test mean difference on kicking between computer assisted instruction and traditional instruction group, computer assisted instruction and combined instruction group, and traditional instruction and combined instruction groups are 0.37, 3.97 and 3.60 respectively. These values are greater than the confidence interval value 0.86, which shows a significant difference at 0.05 level of confidence.

It may be concluded from the results of the study that there is a significant difference in kicking between the adjusted post test means of the computer assisted instruction and the traditional instruction groups, the computer assisted instruction and the combined instruction groups, and the traditional instruction and the combined instruction groups. However, the improvement in kicking was significantly higher for the combined instruction than the computer assisted instruction and the traditional instruction groups.

It may be concluded that the combined instruction is better than the computer assisted instruction and the traditional instruction in improving kicking.

The mean values of the computer assisted instruction, the traditional instruction and the combined instruction in kicking are graphically represented in the figure V.

The adjusted post test mean values of the computer assisted instruction, the traditional instruction and the combined instruction in kicking are graphically represented in figure VI.
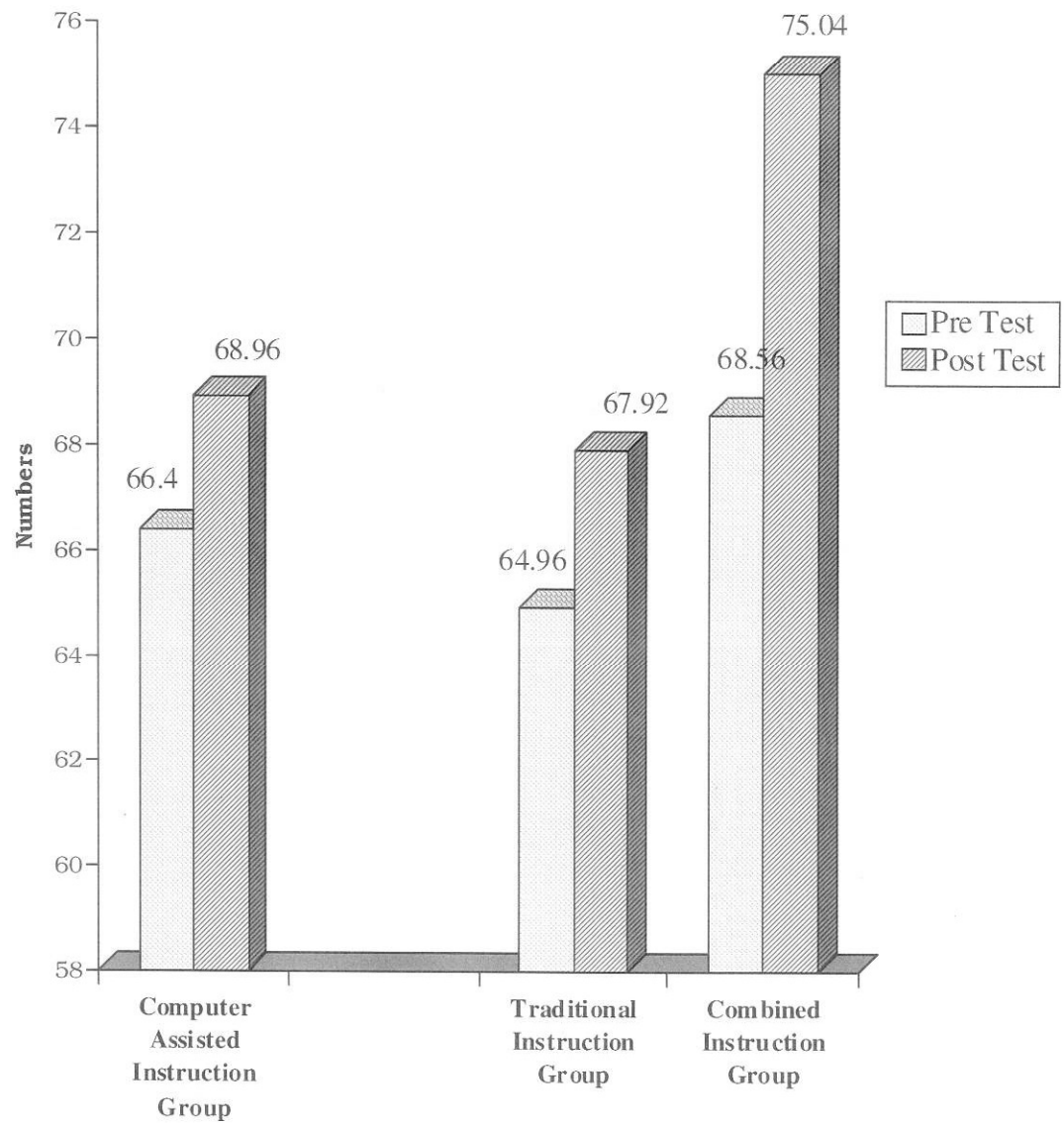
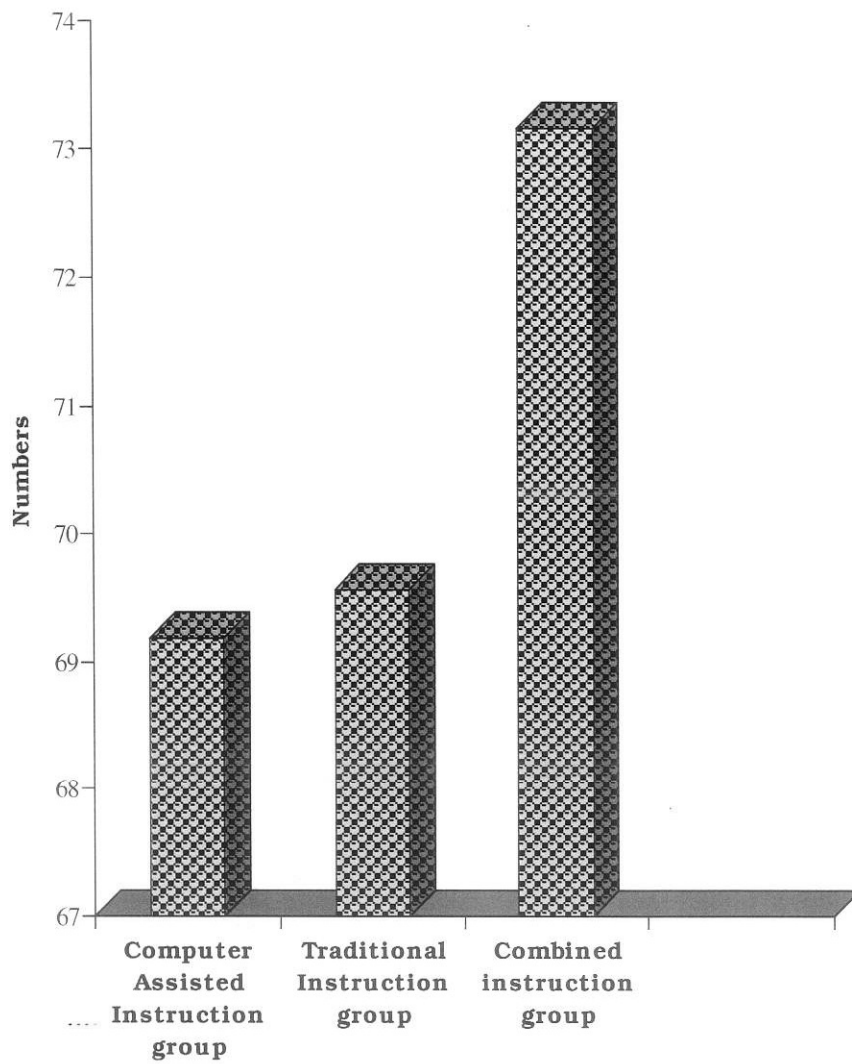**FIGURE V : MEAN VALUES OF COMPUTER ASSISTED INSTRUCTION AND TRADITIONAL INSTRUCTION GROUPS IN KICKING**

FIGURE VI: ADJUSTED POST TEST MEAN   VALUES OF COMPUTER
ASSISTED INSTRUCTION TRADITIONAL INSTRUCTION
AND COMBINED INSTRUCTION IN KICKING

4.4 DISCUSSION ON THE FINDINGS

The result of the study indicates that the experimental groups namely the computer assisted instruction group and the traditional instruction group and the combined instruction had significantly improved the selected dependent variables namely dribbling, passing and Kicking. It is also found that the improvement caused by the combined instruction group was better than the computer assisted instruction and the traditional instruction groups.

Takabayashi et al (1999) produced computer-assisted instruction (CAI) software for bronchial asthma patients to assist in self-management and avoid asthmatic attacks and death. Results show that CAI is feasible for most patients, and through active self-learning CAI can improve motivation for self-management as well as supplement the physician's instructions.

Vichitvejpaisal et al (2001) developed both a computer-assisted instruction (CAI) multimedia program and a textbook on arterial blood gas interpretation with the same content as formal didactic instruction. Students in the text group seemed to fulfill their assignments and improved their scores post-test better than those in the CAI group. After 3 weeks, the final test scores of both groups demonstrated a significant decrease, but showed an insignificant difference between the two groups. Text-based learning seems to be a convenient method of education where time is limited. However, with more time available, use of software may be as good as the conventional learning method and can be an alternative tool. The computer-assisted instruction program seems to enhance the learning process.

Bosseler et al (2003) developed and evaluated a computer-animated tutor, Baldi, to teach vocabulary and grammar for children with autism. Baldi was implemented in a Language Wizard/Player, which allows easy creation and presentation of a language lesson involving the association of pictures and spoken words. The research indicates that children with autism are capable of learning new language within an automated program centered around a computer-animated agent, multimedia, and active participation and can transfer and use the language in a natural, untrained environment.

Issenberg et al (2003) described the adoption and integration within the curriculum in one United Kingdom (UK) medical school of 'Harvey', the Cardiology Patient Simulator, and the Medic multimedia computer-based cardiology curriculum - resources developed in a medical school in the USA which is described by 3 teachers actively involved in the cardiology curriculum of the UK Learning resources, in the form of simulators and computer-based learning modules, developed in one country can be successfully adopted and implemented by another. The successful use of simulators such as Harvey requires the presence of a 'champion', a clinician educator and a supporting administrative staff who ensure the simulator's appropriate use.

Messecar et al (2003) developed a statistics CD-ROM tutorial program to replace a classroom course with several self-study modules. Ratings for the CD-ROM were compared with those of a Web-based course taught the prior year. Mean satisfaction ratings of Web-based delivery of content were low due to technical problems with the Internet courseware used. Overall satisfaction with the

CD-ROM for students who used all the components was improved substantially, compared to the Web-based delivery method.

Mohen et al (2003) report that mental preparation strategies namely relaxation and imagery along with field training improved agility, speed, strength, endurance and cricket playing ability among University level cricketers.

Results showed that ability, self-efficacy, goal-setting, and goal commitment were predictors of performance at the various stages of the experiment. Personal goal setting was affected by level of ability, as well as by perceived self-efficacy and satisfaction. Self-efficacy and goal commitment were direct as well as indirect determinants of performance.

It is inferred from the above literature and from the results of the present study that systematically designed computer assisted instruction, traditional instruction and combined instruction develops the performance standard, as the selected dependent variables are very important qualities for better performance in almost all sports activities and scientifically designed computer assisted instruction, the traditional instruction and the combined instruction may be given in training programmes of all the disciplines in order to achieve maximum performance.

From the results of the present investigation, it is also concluded that a significant difference exists between three experimental groups in developing all dependent variables.

4.5 DISCUSSION ON THE HYPOTHESES

It was hypothesized at the beginning of the study that there would be a significant improvement on the selected dependent variables due to the effects of skill training with and without visual practice and combined practice. The result of the present study is in accordance with the hypothesis. Hence, the first research hypothesis of the investigator is held true and the null hypothesis is rejected.

In the second hypothesis, it was hypothesized that there would be a significant difference among the three experimental groups in improving the selected independent variables. The findings of the study are similar to the hypothesis. Hence, the second hypothesis of the investigator is accepted.