CHAPTER III

METHODOLOGY

3.1 The Subject
3.2 Criterion Measured
3.3 Research Design
3.4 Instruments Used for Collecting Data
3.5 Reliability of Data
3.6 Experimental Protocol
3.7 Procedure for Collecting Data
  3.7.1 For Basketball Shooting
  3.7.2 For Forward Defense in Cricket
3.8 Statistical Tools Used for Analysis of Data
Chapter - III

METHODOLOGY

The process with particular type of manipulation pointed out toward logical influence of the present investigation has been planned and portrait in this chapter. Subject, criterion measure, research design, instruments used, procedure followed to collect data and statistical tools used for analysis of data have been described here.

3.1 THE SUBJECT

One hundred fifty six school boys of standard VIII within the age ranged from 12 to 14 years were selected as subjects for the present study. They were divided into 3 equal sized groups of 52 subjects each. Among them the first group was identified as massed practice group (Gr-1), second group was as the distributed practice group (Gr-2) and third group was as the control group (Gr-3). The subjects were from rural areas of Birbhum district of West Bengal. They were from lower socio-economic group of families. They were day scholars. They had physical education classes twice in a week in the school. They did not have any experience of learning and practice of basketball and cricket. Personal data of the subjects viz. age, weight and height have been shown in Appendix-A.

3.2 CRITERION MEASURED

Learning of free throw shooting in basketball and forward defense in cricket was the criterion for measurement in this study. The
efficiency in learning was assessed by the number of successful baskets from ten (10) attempts. The second criterion measure for this study was the retention ability of the above skills. This was also measured by the number of successful execution from ten (10) chances. In addition to these, the age, weight and height were also measured.

3.3 INSTRUMENTS USED FOR COLLECTING DATA

In order to collect relevant information for investigation following instruments and materials were used

(a) Basketballs for practicing free throw shooting skill of basketball.

(b) Cricket playing instruments like bats, balls (tennis balls), stumps, bails etc. were used for practice and assessment of the forward defense skill.

(c) Measuring tape graduated in centimeter was used.

3.4 RESEARCH DESIGN

Multiple group design has been used for the present study. The subjects were divided into 3 equal sized groups namely massed practice (Gr. I), distributed practice (Gr. II) and control group (Gr.III) for analysis of the effect of two specific skills parallely.

3.5 RELIABILITY OF DATA

For scientific work, the collected data must be reliable. In the present study, reliability of data was ascertained by confirming the reliability of tester and of the instruments used. All the measurements
of times, counts, lengths and weights were taken by the two assistants and the researcher himself. Reliability of the two assistants was tested by computing co-efficient of correlation (r) between their measures and the measurements of the expert. The values of r for different testers were within the range of statistical limits of acceptance. The reliability of instruments were tested by computing co-efficient of correlation following test-retest method and were found to be within the range if statistical acceptance limit.

3.6 EXPERIMENTAL PROTOCOL

The present study was basically an experimental research by nature. There were two experimental groups, each of which was given specific exercise treatment. Group - I was massed practice group. This group was trained for two days in a week for two hours in each day. This treatment was continued for six weeks. The practice schedule of this group -

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Schedule</th>
<th>Total duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday</td>
<td>3 - 5 PM</td>
<td>Warm-up:- 10 Min. General warm-up:- Aerobic exercise, loosening exercise, streaching exercise. Teaching of skills - 50x2 min= 100 min:-</td>
<td>2 Hours</td>
</tr>
</tbody>
</table>

Table - III - A

Weekly schedule for Massed practice group
The second experimental group was distributed practice group (II). This group was trained for 4 days in a week 1 hour in each day. This treatment was continued for six weeks. The practice schedule of this group —

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Schedule</th>
<th>Total duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>3 - 4 PM</td>
<td>Warm-up:- 5 Min.</td>
<td>1 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General warm-up:- Aerobic exercise, loosening exercise, stretching exercise.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teaching of skills - (10+15)x2 min= 50 min:-</td>
<td></td>
</tr>
</tbody>
</table>
### 3.7 PROCEDURE FOR COLLECTING DATA

In the present study, data for different variables (skills) were collected following the procedure mentioned bellow:

#### 3.7.1 Free Throw Shooting In Basketball

It is the ability of the subject to put the ball into the basket ring.

It is considered as an important basketball skill.
Subjects stood behind the three metre distance from the centre of basketball ring horizontally. The subjects tried one by one to put the basketball into the basketball ring. Ten chances were given each of them to put the ball into the basket.

Scoring: It was the number of proper basket out of ten attempts.
3.7.2 Forward Defense in Cricket

Forward defense is an important skill in cricket.

One subject stood before the stumps with bat for practicing forward defense skill in cricket and one assistant bowled with a tennis ball. Here pitch length was 15 yards. Each subject was given 10 chances for forward defense skill.

Scoring- It was the number of proper forward defensive execution out of 10 attempts.

3.8 STATISTICAL TOOLS USED FOR ANALYSIS OF DATA

Collected data were analyzed using a statistical method. Arithmetic mean was computed for assessing the central tendency and standard deviation for the dispersion of the data. To compare the significance of the difference among the means, statistical "F-Test" was
used. For statistically significant "F" value "t-test" was used as posthoc test.

For this purpose, following formulae were applied.

I. Arithmetic Mean \( \bar{x} = \frac{\sum x}{N} \) where \( x \) = scores, \( \sum \) = sum of scores, \( N \) = number of subjects

II. Standard deviation \( \sigma (\frac{\sqrt{\sum (x-x^2)}}{N}) \)

III. \( t \) ratio \( = \frac{(m_1 - m_2)}{\sqrt{\frac{\sigma_1^2 + \sigma_2^2}{N}}} \)

IV. For F test, following steps were used for analyzing of variance

   a. Correction factor \( C = \frac{\sum x^2}{N} \) (\( \sum x \) = The grand total of the scores, \( N \) = Total number of subjects)

   b. Total sum of squares \( (SS_t) = \sum A_1^2 + \sum A_2^2 + \sum A_3^2 - C \) (\( \sum A \) = Sum of squares of the scores)

   c. Sum of squares between groups \( (SS_b = \frac{(\sum A_1^2 + \sum A_2^2 + \sum A_3^2) - C}{n} \) (n = number of scores in each group)

   d. Sum of squares within groups \( (SS_w = SS_t - SS_b) \)

   e. Preparation of analysis of variant table

<table>
<thead>
<tr>
<th>Source of variance</th>
<th>df</th>
<th>Ss</th>
<th>Ms</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between the groups</td>
<td>a-1 = 3-1 =2</td>
<td>SS_b</td>
<td>SS_b/2 = MS_b</td>
<td>F = MS_b/MS_w</td>
</tr>
<tr>
<td>Within the groups</td>
<td>N-a = 156-3 = 153</td>
<td>SS_w</td>
<td>MS_w = SS_w/153</td>
<td></td>
</tr>
</tbody>
</table>

[Table value of "F" within Df (2,153) at 0.05 level = 3.05 and at 0.01 level = 3.75]