Influence of Physical Education on the Physical Fitness of the Boys in the High Schools of Manipur:

ANALYSIS AND INTERPRETATION OF RESULTS
INFLUENCE OF PHYSICAL EDUCATION ON THE PHYSICAL FITNESS OF THE BOYS IN THE HIGH SCHOOLS OF MANIPUR

The influence of physical education on the physical fitness of the boys in the Schools of Manipur has been investigated to an extent by adopting different tools and techniques as described in the preceding pages. In this chapter, an attempt is being made to analyse and interpret the results.

Analysis and Interpretation of Results:

1. All the scores of the initial and final Test items were converted into standard scores and a composite score for each subject was obtained.

2. The performance of students' fitness in the Test series was statistically analysed and their co-rel relation was found out (Appendix-I).

3. Scores of the subjects on the Tests for the selected variables were recorded (Appendix - II to XV).
PRESENTATION OF THE ANALYSIS OF THE TEST SCORES, 
SCHOOL-WISE, ITEM-WISE

The final Test-Scores are presented as follows:-

1. Test-Scores of Noirangkhom Junior High School 
    Item-wise Analysis :

Item No. 1 : 100 metres.

Mean (M) = 14.223 sec.

Standard Deviation (σ) = 0.409 sec.

Co-efficient of Variation (C.V.) = \( \frac{\sigma}{\bar{X}} \times 100 \)

\[ = \frac{0.409}{14.223} \times 100 \]

\[ = 2.88 \text{ sec.} \]
Interpretation:

Training imparted to students during the periods of testing is effective. The performance of the students during the initial and final test is highly comparable to each other, and it is seen that the performance is consistent.

Item No. 2: Long jump

Mean (M) = 14.910 ft

Standard Deviation (σ) = 0.559 ft.

Co-efficient of Variation (C.V.) = C.V. = \( \frac{\sigma}{M} \times 100 \)

\[ = \frac{0.559}{14.910} \times 100 \]

\[ = 3.75 \text{ fts.} (1.143 \text{ m.}) \]
Interpretation:

The training imparted to Students during the period of testing is effective. The performance of final test is more consistent than those of initial testing. However, there is no reason to reject the performance of initial test because of the value of C.V. which is low.

Item No. 3: Shot put:

Mean (M) = 26.063 ft.

Standard Deviation (σ) = 1.523 ft.

Co-efficient of Variation (C.V.) = C.V. = \( \frac{\sigma}{M} \times 100 \)

= \( \frac{1.523}{26.063} \times 100 \)

= 5.84 ft.s. (1.781 m.).
Interpretation:

Training given to Students during the period of testing is effective. The performance of final test is more consistent than those of initial test. However, there is no reason to reject the performance of the initial test for, the co-efficient of variation is low. It is well within the limit of acceptance.

Item No. 4: Garrving a Weight equal to One's own Weight.

Mean (M) = 350 yards.

Standard Deviation (δ) = 27.625 yards.

Co-efficient of Variation(C.V.) = \( \frac{\delta}{M} \times 100 \)

\[ = \frac{27.625}{350} \times 100 \]

\[ = 7.89 \text{ yards.} \quad (7.215 \text{ m.}) \]
Interpretation:

Training given to students during the test period is effective. There are slight variations in the performance of first and second tests.

**TABLE NO. 1**

The **Final Test Result of all the Items of Moirangkhom Junior High School**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Name of the Test</th>
<th>Mean (M)</th>
<th>Standard Deviation (σ)</th>
<th>Co-efficient of Variation (C.V.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>100 m. race</td>
<td>14.223 sc.</td>
<td>0.409 sec.</td>
<td>2.88 sec.</td>
</tr>
<tr>
<td>2.</td>
<td>Long Jump</td>
<td>14.910 ft.</td>
<td>0.559 ft.</td>
<td>3.75 ft. (4.546 m) (0.170 m) (1.143 m)</td>
</tr>
<tr>
<td>3.</td>
<td>Shot Put</td>
<td>26.063 ft.</td>
<td>1.523 ft.</td>
<td>5.84 ft. (7.946 m) (0.464 m) (1.780 m)</td>
</tr>
<tr>
<td>4.</td>
<td>Carrying a Weight equal to One's Weight</td>
<td>350 yds.</td>
<td>27.625yds.</td>
<td>7.89 yards (320.043 m) (25.2606m) (4.2147 m)</td>
</tr>
</tbody>
</table>
From the above Table No. 1, it is revealed that the results of the performances in the first and second Tests of all the items indicate slight variations in respect of Noirangkhom Junior High School. However, the overall results show positive increase in the performance of the final test over the initial test. But the training given to students during the test period is effective. The performance of the final test is more consistent than that of the initial test. However, there is no reason to discredit the performance of initial test.
(2) Test Scores of Raja Dumbra Singh High School:

Item-Wise Analysis:

Item No. 1: 100 metres race

Mean ($M$) = 13.94 sec.

Standard Deviation ($\sigma$) = 0.6432786 sec.

Co-efficient of Variation (C.V.) = $\frac{\sigma}{M}$ x 100

= 4.80 sec.

Interpretation:

Training imparted to students during the period of testing is effective. The performance of initial test is more consistent than that of final test. However, there is no reason to discredit the performance of final test.
Item No. 2: Long Jump

Mean ($\bar{X}$) = 14.524 ft.

Standard Deviation ($\sigma$) = 0.9463418 ft.

Co-efficient of Variation (C.V.) = $\frac{\sigma}{\bar{X}} \times 100$

= $\frac{0.9463418}{14.524} \times 100$

= 6.51 ft. (1.985 m.).

Interpretation:

Training imparted to students during period of testing is effective. The performance of students in both test is comparable and may be accepted as consistent.
Item No. 3: Shot put

Mean (M) = 25.73 ft.

Standard Deviation (δ) = 1.6030295 ft.

\[ \text{Co-efficient of Variation (C.V.)} = \frac{\delta}{M} \times 100 \]

\[ = \frac{1.6030295}{25.73} \times 100 \]

\[ = 6.23 \text{ ft. (1.899 m.)}. \]

Interpretation:

Training imparted to students during the period of testing is effective.

Performance of students for both the tests is comparable with each other. However, the performance of students of initial test is more consistent than that of the final test. Both the results may be accepted.
Item No. 4: Carrying a Weight Equal to One's Own Weight.

Mean (M) = 364.667 yards.

Standard Deviation (σ) = 31.899959 yards.

Co-efficient of Variation (C.V.) = \( \frac{\sigma}{M} \times 100 \)

= \( \frac{31.899959}{364.667} \times 100 \)

= 8.75 yards (8.001 m.).

Interpretation:

Training imparted to students during the period of testing is effective.

However, the performance of students in both the testing is comparable and it is consistent.
**TABLE NO. 2**

The Final Test Result of all the Items of

Raja Dumbra Singh High School

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Name of the Test</th>
<th>Mean (M)</th>
<th>Standard Deviation (σ)</th>
<th>Co-efficient of Variation (C.V.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>100 m. race</td>
<td>13.94 sec.</td>
<td>0.6432786 sec.</td>
<td>4.80 sec.</td>
</tr>
<tr>
<td>2.</td>
<td>Long Jump</td>
<td>14.52 ft.</td>
<td>0.9463418 ft.</td>
<td>6.51 ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.427 m)</td>
<td>(0.289 m.)</td>
<td>(1.985 m)</td>
</tr>
<tr>
<td>3.</td>
<td>Shot Put</td>
<td>25.73 ft.</td>
<td>1.6030295 ft.</td>
<td>6.23 ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.845 m)</td>
<td>(0.489 m.)</td>
<td>(1.899 m.)</td>
</tr>
<tr>
<td>4.</td>
<td>Carrying a Weight equal</td>
<td>364.667 yds.</td>
<td>31.899959 yds.</td>
<td>8.75 yds.</td>
</tr>
<tr>
<td></td>
<td>to One's Weight</td>
<td>(333.455 m)</td>
<td>(29.169 m.)</td>
<td>(8.001 m.)</td>
</tr>
</tbody>
</table>

Table No. 2 gives the relative performance of the students of Raja Dumbra Singh High School in all the items in terms of statistics. The results indicate that the C. V. value is high except in item No. 1. The possible reason for the low scores in item No. 2 - 4, may be that the training given was not satisfactory.
Item-Wise Analysis:

Item No. 1: 100 meters race:

Mean (M) = 14.93 sec.

Standard Deviation (δ) = 0.4360045 sec.

Co-efficient of Variation (C.V.) = \( \frac{δ}{M} \) x 100

= \( \frac{0.4360045}{14.93} \) x 100

= 2.92 sec.

Interpretation:

Training imparted to students between the first and final tests is effective. That is to say, students are irresponsive to training imparted.

As far as performances of students during the initial and final tests are concerned, their programmes are consistent.
**Item No. 2 :** Long Jump

Mean (M) = 13.892 ft.

Standard Deviation (δ) = 0.382 ft.

\[
\text{Co-efficient of Variation (C.V.)} = \frac{\delta}{M} \times 100
\]

\[
= \frac{0.382}{13.892} \times 100
\]

\[
= 2.75 \text{ ft. (0.838 m.)}
\]

**Interpretation:**

The training imparted between the initial and final tests to the students as irresponsive.

As far as the performance of the students during initial and final test periods is concerned, the performances of the students are consistent as indicated by the low value of co-efficient of variation.
**Item No. 3:** Shot Put

Mean ($M$) = 24.024994 ft.

Standard Deviation ($\delta$) = 1.695 ft.

Co-efficient of Variation (C.V.) = \( \frac{\delta}{M} \times 100 \)

\[ \frac{1.695}{24.025} \times 100 \]

\[ = 7.06 \text{ ft. (2.152 m.)} \]

**Interpretation:**

Training imparted to students during the period between initial and final test is irresponsive to the performance of the students. In other words, training imparted to the students is ineffective.

As far as the performance of the students during either tests periods is concerned, the performance of the students is consistent as indicated by the low value of co-efficient of variation.
Item No. 4: Carrying a Weight Equal to One's Own Weight.

Mean ($\bar{M}$) = 282.9 yards.

Standard Deviation ($\sigma$) = 47.557229 yards.

Co-efficient of Variation (C.V.) = $\frac{\sigma}{\bar{M}} \times 100$

= $\frac{47.557229}{282.9} \times 100$

= 16.81 yards (15.371 m.).

**Interpretation:**

The training imparted to students between the training period (i.e. initial and final test) is ineffective.

As far as the performance of the students is concerned, the variance of performances is seen during either tests periods. However, the C.V. lies below the limit of rejection of performances in either cases.
**TABLE NO. 3**

The Final Result of the Test Scores of Maibam Pali Junior High School

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Name of the Test</th>
<th>Mean (M)</th>
<th>Standard Deviation (σ)</th>
<th>Co-efficient of Variation (C.V.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>100 m. race</td>
<td>14.93 sec.</td>
<td>0.4360045 sec.</td>
<td>2.92 sec.</td>
</tr>
<tr>
<td>2.</td>
<td>Long Jump</td>
<td>13.892 ft.</td>
<td>0.382 ft.</td>
<td>2.75 ft.</td>
</tr>
<tr>
<td>3.</td>
<td>Shot Put</td>
<td>24.024994 ft.</td>
<td>1.695 ft.</td>
<td>7.06 ft.</td>
</tr>
<tr>
<td>4.</td>
<td>Carrying a Weight equal to One's Own Weight</td>
<td>282.0 yds.</td>
<td>47.557229 yds.</td>
<td>16.81 yds.</td>
</tr>
</tbody>
</table>

Table No. 3: Gives the final result of the Test scores of the students of Maibam Pali Junior High School in all the test items. From the data, it is revealed that the performances of the students are consistent, except in item No. 4 in which case the C.V. value is high.
(4) Test Score of Heibong Makhong High School:

Item-Wise Analysis:

Item No. 1: 100 metres race

Mean (M) = 14.274 sec.

Standard Deviation (σ) = 0.5606246 sec.

Co-efficient of Variation (C.V.) = \( \frac{\sigma}{M} \times 100 \)

= \( \frac{0.5606246}{14.275} \times 100 \)

= 3.51 sec.

Interpretation:

Test imparted to students during the period of testing is ineffective. The performance of the students during either tests periods is consistent as shown by the low value of co-efficient of variation.
**Item No. 2: Long Jump**

Mean (M) = 15.156 ft.

Standard Deviation (\( \sigma \)) = 0.9022988 ft.

Co-efficient of Variation (C.V.) = \( \frac{\sigma}{M} \times 100 \)

\[ = \frac{0.9022988}{15.156} \times 100 \]

\[ = 5.95 \text{ ft.}(1.814 \text{ m}). \]

**Interpretation:**

Training imparted to the students during the periods of testing is effective. The performance of students during either test periods is consistent as indicated by the low value of co-efficient of variation (C.V.).
**Item No. 3:** Shot Put

Mean (M) \[24.552 \text{ ft.}\]

Standard Deviation (\(\sigma\)) \[= 2.8753892 \text{ ft.}\]

Co-efficient of Variation (C.V.) \[= \frac{\sigma}{M} \times 100\]

\[= \frac{2.8753892}{24.552} \times 100\]

\[= 11.71 \text{ ft. (3.570 m.).}\]

**Interpretation:**

Training imparted to the students during the periods between initial and final test-periods is irresponsible to the performance of the students. In other words, training imparted to the students does not make any progress in their performance.
As far as their performance during the test periods is concerned, their performances are constant, as indicated by the low value of Co-efficient of Variation.

**Item No. 4**: Carrying a Weight equal to One's Own Weight.

Mean (M) \(= 312.1875\) yards.

Standard Deviation (\(\bar{s}\)) \(= 42.901368\) yards.

\[
\text{Co-efficient of Variation(C.V.)} = \frac{\bar{s}}{M} \times 100
\]

\[
= \frac{42.901368}{312.1875} \times 100
\]

\[
= 13.74\text{ yards}(12.564\text{ m.}).
\]
Interpretation:

Training imparted to the students during the period of training is ineffective.

As far as performance of the students during either tests periods is concerned, it is seen that there have been variations in performances. These, however, did not favour to discredit the performances. This is because the degree of variation of performances is under the limit of acceptable limit.
TABLE NO. 4

The Final Result of the Test Scores of Heibong Makhong High School

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Name of the Test</th>
<th>Mean (M)</th>
<th>Standard Deviation (σ)</th>
<th>Co-efficient of Variation (C.V.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>100 m. race</td>
<td>14.274 sec.</td>
<td>0.5606246 sec.</td>
<td>3.51 sec.</td>
</tr>
<tr>
<td>2.</td>
<td>Long Jump</td>
<td>15.156 ft.</td>
<td>0.9022988 ft.</td>
<td>5.95 ft. (4.621 m.)</td>
</tr>
<tr>
<td>3.</td>
<td>Shot Put</td>
<td>24.552 ft.</td>
<td>2.8753892 ft.</td>
<td>11.71 ft. (7.485 m.)</td>
</tr>
<tr>
<td>4.</td>
<td>Carrying a Weight equal</td>
<td>312.1875 yds.</td>
<td>42.901368yds.</td>
<td>13.74 yds. (285.466 m.)</td>
</tr>
</tbody>
</table>

Table No. 4 gives the final result of Test scores of the students in all the items concerning Heibong Makhong High School. From the Table, it is revealed that the training imparted to the students is effective, except in item number 3 in which case, the value of Co-efficient of Variation (C.V.) is high.
(5) Test Scores of Ilrong Junior High School:

Item-Wise Analysis:

Item No. 1: 100 metres race

Mean ($M$) = 13.497 sec.

Standard Deviation ($\delta$) = 0.725 sec.

Co-efficient of Variation(C.V.) = $\frac{\delta}{M} \times 100$

= $\frac{0.725}{13.497} \times 100$

= 5.37 sec.

Interpretation:

The training imparted to the students during the period of training is effective.

The performance of students during the initial test period is more consistent than that of final test period.
However, the performance of either tests may be accepted as compatible.

**Item No. 2 :** Long Jump

Mean ($\bar{M}$) = 15.55 ft.

Standard Deviation ($\sigma$) = 0.529 ft.

Co-efficient of Variation(C.V.) = $\frac{\sigma}{\bar{M}} \times 100$

= $\frac{0.529}{15.55} \times 100$

= 3.64 ft.(1.10 m.).

**Interpretation :**

Training imparted to students during the period of training is effective.

When the performance of students is compared, it is found that more consistency is indicated in the final test performance than that of the initial test.

However, there is no reason to reject the performances of the initial test.
Item No. 3: Shot Put

Mean (\( \bar{M} \)) = 27.91 ft.

Standard Deviation (\( \delta \)) = 1.34 ft.

Co-efficient of Variation (C.V.) = \( \frac{\delta}{\bar{M}} \times 100 \)

\[ = \frac{1.34}{27.91} \times 100 \]

\[ = 4.80 \text{ ft.}(1.453 \text{ m}). \]

**Interpretation:**

Training imparted to students during the period of testing is effective.

When the performance of the students is compared, it is seen that the final test performance shows more consistency than that of the initial test.

However, there is no reason to disregard the performance of student in initial test.
**Item No. 4**: Carrying a Weight Equal to One's Own Weight.

Mean (N) = 385.75 yards.

Standard Deviation (\(\sigma\)) = 14.771 yards.

Co-efficient of Variation(C.V.) = \(\frac{\sigma}{N}\) x 100

= \(\frac{14.771}{385.75}\) x 100

= 3.83 yards (3.502 m).

**Interpretation**:

Training imparted to students during the period of testing is effective.

While comparing the performance of the either tests, the performance of final test is seen to be more consistent. However, there is no reason to disregard the performance of initial test.
# TABLE NO. 5

The Final Result of the Test Scores of Irong Junior High School

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Name of the Test</th>
<th>Mean (M)</th>
<th>Standard Deviation (σ)</th>
<th>Co-efficient of Variation (C.V.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>100 m. race</td>
<td>13.497 sec.</td>
<td>0.725 sec.</td>
<td>5.37 sec.</td>
</tr>
<tr>
<td>2.</td>
<td>Long Jump</td>
<td>15.55 ft.</td>
<td>0.529 ft.</td>
<td>3.64 ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.741 m.)</td>
<td>(0.161 m.)</td>
<td>(1.110 m.)</td>
</tr>
<tr>
<td>3.</td>
<td>Shot Put</td>
<td>27.91 ft.</td>
<td>1.34 ft.</td>
<td>4.80 ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(8.509 m.)</td>
<td>(0.409 m.)</td>
<td>(1.463 m.)</td>
</tr>
<tr>
<td>4.</td>
<td>Carrying a Weight equal to One's Own Weight</td>
<td>385.75 yds.</td>
<td>14.771 yds.</td>
<td>3.83 yds.</td>
</tr>
</tbody>
</table>

From the analysis of data given in Table No. 5, in respect of the Irong Junior High School, it is seen that there is consistency in performance, indicating that the training imparted was effective.
Test Scores of Adimjati High School:

Item-Wise Analysis:

Item No. 1: 100 metres race

Mean (M) = 13.537467 sec.

Standard Deviation (σ) = 0.4938758 sec.

Co-efficient of Variation (C.V.) = \( \frac{\sigma}{M} \times 100 \)

= \( \frac{0.4938758}{13.537467} \times 100 \)

= 3.65 sec.

Interpretation:

Test imparted to the students between the test period is effective.

The performance of the students during either tests period is consistent as shown by the low value of co-efficient of variation (C.V.)
Item No. 2: Long Jump

Mean (M) = 15.568667 ft.

Standard Deviation (σ) = 0.72709 ft.

Co-efficient of Variation (C.V.) = \( \frac{\sigma}{M} \times 100 \)

\[ = \frac{0.72709}{15.568667} \times 100 \]

\[ = 4.67 \text{ ft.}(1.424 \text{ m}). \]

Interpretation:

Training imparted to students during the period of testing is effective. It makes to increase the efficiency in the final test.

As far as performance of the students during either tests periods is concerned, the performance of the students is consistent as indicated by the low value of co-efficient of variation (C.V.).
**Item No. 3**: Shot Put

Mean (M) \[= 27.834 \text{ ft.}\]

Standard Deviation (\(\sigma\)) \[= 1.0112402 \text{ ft.}\]

Co-efficient of Variation (C.V.) \[= \frac{\sigma}{M} \times 100\]

\[= \frac{1.0112402}{27.834} \times 100\]

\[= 3.63 \text{ ft.}(1.107 \text{ m.}).\]

**Interpretation**: 

Training imparted to students during the period of testing is effective.

The performance of students during initial testing period is seen to operate a slight degree of variation. However, each nature of variation does not permit to reject the performance because of the position of C.V. which is far below the limit of rejection.

The performance of students during the final test is seen to be more consistent than that of the initial test.
Item No. 4: Carrying a Weight Equal to One's Own Weight.

Mean (M) = 389 yards

Standard Deviation (σ) = 21.694853 yards.

Co-efficient of Variation (C.V.) = \( \frac{\sigma}{M} \times 100 \)

= \( \frac{21.694853}{389} \times 100 \)

= 5.58 yards (5.102 m.).

**Interpretation:**

Training imparted to the students during the period of testing is effective. The performance of the students during initial test is seen to operate slight degree of variation. However, such nature of variation does not permit to reject the performance of students because of the position of C.V. which is lying far below the limit of rejection.

The performance of the final test is improved as indicated by low value of co-efficient of variation as compared with the first test.
TABLE NO. 6

The Final Result of the Test Scores of Adimjati High School:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Name of the Items</th>
<th>Mean (M)</th>
<th>Standard Deviation (δ)</th>
<th>Co-efficient of Variation (C.V.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>100 metre race</td>
<td>13.537467sc.</td>
<td>0.4938758sc.</td>
<td>3.65 sec.</td>
</tr>
<tr>
<td>2.</td>
<td>Long Jump</td>
<td>15.568667ft.</td>
<td>0.72709 ft.</td>
<td>4.67 ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.747 m.)</td>
<td>(0.221 m.)</td>
<td>(1.424 m.)</td>
</tr>
<tr>
<td>3.</td>
<td>Shot Put</td>
<td>27.834 ft.</td>
<td>1.0112402ft.</td>
<td>3.63 ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(8.486 m.)</td>
<td>(0.003 m.)</td>
<td>(1.107 m.)</td>
</tr>
<tr>
<td>4.</td>
<td>Carrying Weight equal to Own's</td>
<td>389 yds.</td>
<td>21.694853yds.</td>
<td>5.58 yds.</td>
</tr>
<tr>
<td></td>
<td>Own Weight</td>
<td>(355.71 m.)</td>
<td>(19.838 m.)</td>
<td>(5.102 m.)</td>
</tr>
</tbody>
</table>

Table No. 6, gives the comparative result of the initial and final test of the test scores of the students of the Adimjati High School. Since the C.V. value is low, it is thus interpreted that the training imparted to the students was effective.
(7) **Test Scores of M.B.C. School**

**Item-Wise Analysis:**

**Item No. 1:** 100 metres race

Mean ($\bar{x}$) = 14.0153 sec.

Standard Deviation ($\sigma$) = 0.47846 sec.

Co-efficient of Variation (C.V.) = \( \frac{\sigma}{\bar{x}} \times 100 \)

= \( \frac{0.47846}{14.0153} \times 100 \)

= 3.41 sec.

**Interpretation:**

Test is significant, that is, the difference of means between first and final test is significant, indicating effectiveness of training imparted between the intervals of the two tests.

Consistency is maintained in both the tests as shown by the low value of co-efficient of variation.
**Item No. 2**: Long Jump

Mean (\( \bar{m} \)) = 15.154 ft.

Standard Deviation (\( \delta \)) = 0.437282 ft.

Co-efficient of Variation (C.V.) = \( \frac{\delta}{\bar{m}} \times 100 \)

\[ \frac{0.437282}{15.154} \times 100 \]

= 2.89 ft. (0.831 m.).

**Interpretation**: Test is significant indicating that the training imparted between the group of initial and final tests is effective.

Performances of both the tests is consistent as shown by the low value co-efficient of variation.
Item No. 3: Shot Put

Mean (M) = 26.774 ft.

Standard Deviation (δ) = 1.8129683 ft.

Co-efficient of Variation (C.V.) = \( \frac{\delta}{M} \times 100 \)

= \( \frac{1.8129683}{26.774} \) x 100

= 6.77 ft. (2.064 m.).

Interpretation:

Test is significant, i.e. the training imparted between the two testing periods is effective.

So far as the nature of testing is concerned, the process is consistent as in shown by the low value of co-efficient of variation.
Item No. 4: Carrying a Weight Equal to One's Own Weight.

Mean (M) = 370 yards.

Standard Deviation (σ) = 32.237954 yards.

Co-efficient of Variation (C.V.) = \( \frac{\sigma}{M} \times 100 \)

\[ \frac{32.237954}{370} \times 100 \]

= 8.71 yards (7.965 m.).

Interpretation:

Test is significant i.e. the pattern of training imparted to students between the tests periods is effective.

Performance of the students during initial and final tests remains consistent as indicated by the low value of C.V.
TABLE NO. 7

The Final Results of the Test Scores of M.B.C. School:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Name of the Items</th>
<th>Mean (M)</th>
<th>Standard Deviation (σ)</th>
<th>Co-efficient of Variation (C.V.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>100 m. race</td>
<td>14.0153 sec.</td>
<td>0.47846 sec.</td>
<td>3.41 sec.</td>
</tr>
<tr>
<td>2.</td>
<td>Long Jump</td>
<td>15.154 ft.</td>
<td>0.437282 ft.</td>
<td>2.89 ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.620 m.)</td>
<td>(0.133 m.)</td>
<td>(0.881 m.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(8.163 m.)</td>
<td>(0.552 m.)</td>
<td>(2.064 m.)</td>
</tr>
<tr>
<td>4.</td>
<td>Carrying Weight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>equal to One's</td>
<td>370 yards</td>
<td>32.237954 yds.</td>
<td>8.71 yds.</td>
</tr>
<tr>
<td></td>
<td>Own Weight</td>
<td>(338.332 m.)</td>
<td>(29.479 m.)</td>
<td>(7.965 m.)</td>
</tr>
</tbody>
</table>

Table No. 7, gives the overall result of the Test scores (initial and final) of the students of the M.B.C. School. Although the final results indicate slight variations, there is positive trend of increase in the performance.
From the overall final test, item-wise analysis of results the following conclusions are drawn:

1. **100 metres race**:

   Mean result of performance is improved. It is seen that the training imparted to the participants during the period of interval between the first and second test is responsive to competitors. However, the degree of response is not uniform. This is evident from the following calculation:

   Mean (M) = 14.73 sec.

   Standard Deviation (σ) = 0.2668749 sec.

   Co-efficient of Variation (C.V.) = $\frac{\sigma}{M} \times 100$

   $\frac{0.2668749}{14.73} \times 100$

   = 18.119 % sec.
2. **Long Jump**:

Result of Long Jump for final test is improved in respect of mean performance and degree of responsiveness corresponding to the training or instruction imparted to competitors between the period of interval between initial and final test. This is proved by the following analysis:

\[
\text{Mean (M)} = 14.2 \text{ ft.}
\]

Standard Deviation (\( \sigma \)) = 0.421637 ft.

Co-efficient of Variation (C.V.) = \( \frac{\sigma}{M} \times 100 \)

\[
= \frac{0.421637}{14.2} \times 100
\]

\[
= 2.9672 \text{ ft. } \% (0.905 \text{ m. } \%)
\]
3. **Shot Put**:

Performance in Shot Put seems to have been improved in respect of mean performance and reduction in variation of performance. The following calculation indicates this fact:

Mean (\(i\)) \[= 24.6 \text{ ft.}\]

Standard Deviation (\(\bar{z}\)) \[= 1.72884 \text{ ft.}\]

Coefficient of Variation (C.V.) \[= \frac{\bar{z}}{\text{Mean}} \times 100\]

\[= \frac{1.72884}{24.6} \times 100\]

\[= 7.0278 \text{ ft.}\%\]

\[(2.143 \text{ m.}\%).\]
4. *Carrying a Weight Equal to One's Own Weight*:

Endurance capacity shown by the competitors in the final test is found to have been improved. There is, however, variation in response to the training imparted to the competitors between the period of testing. This is evident from the following analysis:

Mean (M) = 299 yards.

Standard Deviation (\(\delta\)) = 54.252496 yards.

Co-efficient of Variation (C.V.) = \(\frac{\delta}{M} \times 100\)

\[= \frac{54.252496}{299} \times 100\]

\[= 18.14464 \% \text{ yards}.
(16.592 \% \text{ m}).\]
INTERIM DISCUSSION OF RESULTS

The composite analysis of results and conclusions drawn thereon are as follows :-

**Item No. 1** : 100 metres race

The difference in the mean and co-efficient of variation (C.V.) between the initial and final Tests of performances of trainees in respect of the 7 (seven) Schools, during six months exposition has been presented in Table No. 1, above.

From the Table, it will be seen that there is significant improvement in the performance of the 100 metres race in the final test.

The results of the performance in 100 metres race are depicted in Fig. 43.
TABLE NO. 8

M and C.V. difference between the Initial and Final Test in the performance of 100 metres race:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of School</th>
<th>MEAN (M) Initial Performance</th>
<th>MEAN (M) Final Performance</th>
<th>CO-EFFICIENT OF VARIATION (C.V.) Initial Performance</th>
<th>CO-EFFICIENT OF VARIATION (C.V.) Final Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Moirangkhom Junior High School</td>
<td>14.64</td>
<td>14.22</td>
<td>2.83</td>
<td>2.88</td>
</tr>
<tr>
<td>2.</td>
<td>Baja Dumbra Singh School</td>
<td>14.08</td>
<td>13.94</td>
<td>3.32</td>
<td>4.80</td>
</tr>
<tr>
<td>4.</td>
<td>Heibong Makhong High School</td>
<td>14.60</td>
<td>14.28</td>
<td>3.16</td>
<td>3.51</td>
</tr>
<tr>
<td>5.</td>
<td>Irong Junior High School</td>
<td>14.28</td>
<td>13.50</td>
<td>4.26</td>
<td>5.37</td>
</tr>
<tr>
<td>6.</td>
<td>Adim Jati High School</td>
<td>14.58</td>
<td>13.54</td>
<td>3.75</td>
<td>3.65</td>
</tr>
<tr>
<td>7.</td>
<td>MBC School</td>
<td>14.33</td>
<td>13.63</td>
<td>2.87</td>
<td>3.41</td>
</tr>
</tbody>
</table>
The analysis of results further indicates that there is positive response to the training imparted to the trainees during the gap between the initial and final test. However, the response of the trainees of the Raja Dumbra Singh School is less than the general trend of response. The response of the trainees of the School of Kaibam Pali Junior High School is almost negligible. Maximum response comes from the trainees of Adim Jati High School (Fig. 43). The non-uniformity in the responses of the trainees may be due to the -

i) mode of training;

ii) lack of initiative from trainees; and

iii) diet given to trainees during the period of training.

The cause for fluctuation in response may have to be found out. It may be possible to get positive and uniform response from the trainees by introducing certain measures such as health awareness programme under the guidance of able instructors, providing sufficient diet to the trainees in particular, and enforcing strict supervision on them.
### TABLE NO. 9

**M and C.V. difference between the Initial and Final Tests in the performance of Long Jump:**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of School</th>
<th>MEAN (M) Initial Performance</th>
<th>Final Performance</th>
<th>CO-EFFICIENT OF VARIATION (C.V.) Initial Performance</th>
<th>Final Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Noirangkhom</td>
<td>14.43'</td>
<td>14.91'</td>
<td>5.59'</td>
<td>3.75'</td>
</tr>
<tr>
<td></td>
<td>Junior High</td>
<td>(4.399m)</td>
<td>(4.546m)</td>
<td>(1.704m)</td>
<td>(1.43m)</td>
</tr>
<tr>
<td>2</td>
<td>Raja Dumbra</td>
<td>13.93'</td>
<td>14.52'</td>
<td>5.91'</td>
<td>6.51'</td>
</tr>
<tr>
<td></td>
<td>Singh School</td>
<td>(4.247m)</td>
<td>(4.427m)</td>
<td>(1.802m)</td>
<td>(1.985m)</td>
</tr>
<tr>
<td>3</td>
<td>Maibam Pali</td>
<td>13.60'</td>
<td>13.89'</td>
<td>3.60'</td>
<td>2.75'</td>
</tr>
<tr>
<td></td>
<td>Junior High</td>
<td>(4.146m)</td>
<td>(4.235m)</td>
<td>(1.098m)</td>
<td>(0.838m)</td>
</tr>
<tr>
<td>4</td>
<td>Heibong Makhong</td>
<td>14.63'</td>
<td>15.16'</td>
<td>5.47'</td>
<td>5.95'</td>
</tr>
<tr>
<td></td>
<td>High School</td>
<td>(4.460m)</td>
<td>(4.622m)</td>
<td>(1.668m)</td>
<td>(1.814m)</td>
</tr>
<tr>
<td>5</td>
<td>Irong Junior</td>
<td>14.52'</td>
<td>15.55'</td>
<td>4.20'</td>
<td>3.64'</td>
</tr>
<tr>
<td></td>
<td>High School</td>
<td>(4.427m)</td>
<td>(4.741m)</td>
<td>(1.281m)</td>
<td>(1.100m)</td>
</tr>
<tr>
<td>6</td>
<td>Adim Jati</td>
<td>14.49'</td>
<td>15.57'</td>
<td>4.06'</td>
<td>4.67'</td>
</tr>
<tr>
<td></td>
<td>High School</td>
<td>(4.418m)</td>
<td>(4.747m)</td>
<td>(1.238m)</td>
<td>(1.424m)</td>
</tr>
<tr>
<td>7</td>
<td>MBC School</td>
<td>14.20'</td>
<td>14.84'</td>
<td>4.23'</td>
<td>2.89'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.329m)</td>
<td>(4.524m)</td>
<td>(1.290m)</td>
<td>(0.880m)</td>
</tr>
</tbody>
</table>
A cursory glance at Table No.9 will indicate that there is significant improvement in the performance of long jump in the Final Test. The results are depicted graphically in Fig. 45.
Fig. 2: Performance of Long Jump.
From the graphic representation of responses of trainees, it is also obvious that the highest response comes from the trainees of the Adim Jati High School and Irong Junior High School. But, the response is negligible. However, there is consistency in the performance of the participants.
TABLE NO. 10

M and C.V. difference between Initial and Final Tests in the performance of Shot Put:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of School</th>
<th>Initial Performance</th>
<th>Final Performance</th>
<th>Initial Performance</th>
<th>Final Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Moirangkhom Jr. High School</td>
<td>24.72'</td>
<td>26.06'</td>
<td>7.35'</td>
<td>5.84'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.537m.)</td>
<td>(7.945m.)</td>
<td>(2.241m)</td>
<td>(1.781m)</td>
</tr>
<tr>
<td>2.</td>
<td>Rajendra Duma Singh School</td>
<td>24.89'</td>
<td>25.73'</td>
<td>4.54'</td>
<td>6.23'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.588m.)</td>
<td>(7.845m.)</td>
<td>(1.384m)</td>
<td>(1.899m)</td>
</tr>
<tr>
<td>3.</td>
<td>Maibam Pali Jr. High School</td>
<td>23.55'</td>
<td>24.03'</td>
<td>7.74'</td>
<td>7.06'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.179m.)</td>
<td>(7.326m.)</td>
<td>(2.359m)</td>
<td>(2.152m)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.738m.)</td>
<td>(7.485m.)</td>
<td>(2.741m)</td>
<td>(3.573m)</td>
</tr>
<tr>
<td>5.</td>
<td>Irong Jr. High School</td>
<td>25.98'</td>
<td>27.91'</td>
<td>5.32'</td>
<td>4.80'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.921m.)</td>
<td>(8.510m.)</td>
<td>(1.622m)</td>
<td>(1.463m)</td>
</tr>
<tr>
<td>6.</td>
<td>Adim Jati High School</td>
<td>25.71'</td>
<td>27.83'</td>
<td>5.54'</td>
<td>3.63'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.838m.)</td>
<td>(8.485m.)</td>
<td>(1.689m)</td>
<td>(1.107m)</td>
</tr>
<tr>
<td>7.</td>
<td>MBC School</td>
<td>24.98'</td>
<td>27.21'</td>
<td>7.29'</td>
<td>6.77'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.296m)</td>
<td>(2.296m)</td>
<td>(2.223m)</td>
<td>(2.664m)</td>
</tr>
</tbody>
</table>
The analysis of the Mean (M) and Co-efficient of Variation (C. V.) in the Test item as given in Table No. 10 reveals that there is significant gain on the part of the trainees from all the Schools except that of the performance of the trainees from Heibong Makhong High School.

So far as the Test is concerned the response of the trainees is positive as a whole with slight variations among the groups of participants. The response of the trainees of the Maibam Pali Junior High School is below the general trend of response. The response of the trainees of the School of Heibong Makhong High School is almost negligible (Fig. 45). The highest response is seen among the trainees of Irong Junior High School.
Figure 3: Performance of Short Put
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of School</th>
<th>MEAN (M) Initial Performance</th>
<th>Final Performance</th>
<th>CO-EFFICIENT OF VARIATION (C.V.) Initial Performance</th>
<th>Final Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Noirangkhom Junior High School</td>
<td>321.15</td>
<td>350.00</td>
<td>11.52</td>
<td>7.89</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(293.663m)</td>
<td>(320.044m)</td>
<td>(10.534m)</td>
<td>(7.215m)</td>
</tr>
<tr>
<td>2.</td>
<td>Raja Dumbra Singh School</td>
<td>353.70</td>
<td>364.67</td>
<td>7.77</td>
<td>8.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(323.427m)</td>
<td>(333.458m)</td>
<td>(7.105m)</td>
<td>(8.001m)</td>
</tr>
<tr>
<td>3.</td>
<td>Naibam Pali Junior High School</td>
<td>268.80</td>
<td>282.90</td>
<td>17.02</td>
<td>16.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(245.794m)</td>
<td>(258.687m)</td>
<td>(15.563m)</td>
<td>(15.371m)</td>
</tr>
<tr>
<td>4.</td>
<td>Heibong Makhong High School</td>
<td>295.00</td>
<td>312.19</td>
<td>13.13</td>
<td>13.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(269.751m)</td>
<td>(235.47m)</td>
<td>(12.006m)</td>
<td>(12.564m)</td>
</tr>
<tr>
<td>5.</td>
<td>Irong Junior High School</td>
<td>326.75</td>
<td>385.75</td>
<td>1.66</td>
<td>3.83</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(298.784m)</td>
<td>(352.734m)</td>
<td>(1.518m)</td>
<td>(3.502m)</td>
</tr>
<tr>
<td>6.</td>
<td>Adim Jati High School</td>
<td>337.67</td>
<td>389.00</td>
<td>9.22</td>
<td>5.58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(308.769m)</td>
<td>(355.705m)</td>
<td>(8.431m)</td>
<td>(5.102m)</td>
</tr>
<tr>
<td>7.</td>
<td>MBC School</td>
<td>325.10</td>
<td>378.79</td>
<td>9.21</td>
<td>8.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(297.275m)</td>
<td>(346.369m)</td>
<td>(8.422m)</td>
<td>(7.965m)</td>
</tr>
</tbody>
</table>
From the Table No. 11, it is revealed that there is a significant improvement in the performance of carrying a weight equal to one's own weight in the final test as shown in the analysis of the mean and co-efficient of variation of the performance in the initial test.
Fig. 4: Performance of Carrying a Weight Equal to One's Own Weight.
Results indicate that the response of the trainees in this item of carrying a weight equal to one's own weight is having positive response. There is a general trend of increase from the initial Test to the Final Test. The highest improvement is in the trainees of the Heibong Makhong High School, Maibam Pali Junior School, Raja Dumbera Singh School and Moirangkhom Junior High School as revealed from the Fig. 46.