C H A P T E R VI

TOOLS OF STUDY, THEIR USE AND CALCULATIONS

Introduction

For the comparative assessment of achievements of basic and traditional school - children viz. scholastic achievement, personality and character traits, physical development, manual dexterity, social adjustment, the following tools are used and techniques of administration, etc., are fully discussed. The calculations and results are subjected to the test of significance for difference of means by means of t-test (paired).

1. Standardised Achievement Tests- Baroda Studies in Mental Measurements
2. Physical Education Tests - Dr.N.N.Shukla
3. Minnesota Manual Dexterity Test - Baroda Studies in Mental Measurement.
4. Personality Rating Sheet - University Experimental School, Baroda.
5. Adjustment Inventory - Mr.H.S.Asthana, Lucknow.
6. Group Intelligence Tests - Faculty of Education and Psychology,M.S.University of Baroda.

Factors controlled

The socio-economic level of the family and educability of the school children as determined by their level of intelligence are the fundamental factors that determine the achievements of school-children together with the method of education. Adjustment is, therefore, made for these factors in order to have two equivalent and comparable groups of pupils from basic and traditional schools.

Matched groups

1. Socio-economic level of the family :

The children of both the schools were interviewed and rated on a five - point scale :

54

1	2	3	4	5
Low	Below Average	Average	Above Average	High

Means of ratings were found and noted for comparison.

2. Intelligence:

The most important factor to be controlled, so far as academic attainment is concerned, related to the children's level of intelligence or their potential ability. The group test of intelligence prepared by the Faculty of Education and Psychology, M.S.University of Baroda,was used for this purpose (see Appendix2).

(i) The test: This group test is constructed on the assumption that intelligence is a general ability which comprises of three simple abilities: (1)

1. The ability to discover one's own mental process,
2. The ability to discover essential relations between items of knowledge and
3. The ability to educe correlates when a relation between the items is known.

(ii) Final form of the test:

The final form of the test consists of 8 sub - tests with 117 items, with good discriminating indices and with a wide range of

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(1) Baroda Studies in Mental Measurement pp.1-6

difficulty values, norms, reliability and validity of the test for the age group 11 + to 17 +

Sub - test	No.of items
1. Synonyms	15
2. Antonyms	15
3. Classification	12
4. Word Analogy	20
5. Mixed sentences	14
6. Reasoning problems	12
7. Figure completion	14
8. Number Series	15

(iii) Norms, Reliability and Validity of the Test

The norms for the age groups 11+to 17+ have been determined. The sample on which the norms are calculated and the age-wise norms are as under:

Age groups	Sample (N)	Norm
11+	1432	17
12+	1947	23
13+	2413	29
14+	2656	35
15+	2880	41
16+	2098	47
17+	832	55

The reliability of the test has been found by the test re-test method. The test has been validated against Shri K.G.Desai's Group Test of Intelligence. The coefficients are as follows:

Age Group	Reliability	Validity against Desai's test
11+	0.827	0.30
12+	0.787	0.07
13+	0.653	0.66
14+	0.813	0.68
15+	0.849	0.74
16+	0.885	0.85

(iv) Scores :

This test has separate test - booklets and answer sheets. The total score of a testee is to be calculated after the answer sheet is valued. Each correct response in each sub-test corresponds to one numerical score.

(v) I.Q. :

After determining the mental age, I.Q. was worked out by the usual formula :

$$\text{I.Q.} = \frac{\text{Mental Age}}{\text{Chronological Age}} \times 100$$

PARALLEL GROUPS

TABLE NO.3

	BASIC VIII		TRADITIONAL VIII	
	2 Socio-Economic level (Mean of ratings)	3 Intelligence quotient	Socio-Economic level (Mean of ratings)	Intelligence quotient
1.	2.6	90	2.6	94
2.	2.6	96	2.6	96
3.	3.6	98	2.6	99
4.	2.3	90	2.3	92
5.	3.3	102	3.3	102
6.	3.6	98	3.6	100
7.	2.6	99	2.6	98
8.	3.3	102	3.3	101
9.	2.6	92	2.6	93
10.	3.6	104	3.6	104
11.	3.0	88	3.6	90
12.	2.3	90	2.6	88
13.	2.6	92	2.3	94
14.	3.0	96	2.6	97
15.	3.3	98	3.3	98
16.	2.6	101	2.6	99
17.	3.3	96	3.0	96
18.	2.3	94	2.3	96
19.	3.6	99	3.0	98
20	3.3	101	3.0	100

	B A S I C VII		T R A D I T I O N A L VIII	
	Socio-Economic level	Intelligence quotient	Socio-Economic level	Intelligence quotient
21.	3.0	101	3.0	100
22.	3.3	101	3.3	102
23.	2.6	98	2.6	97
24.	2.3	97	2.3	99
25.	3.6	102	3.6	102
26.	2.6	98	2.3	99
27.	3.0	102	3.0	102
28.	3.6	108	3.6	109
29.	2.6	99	2.6	102
30.	3.6	106	3.3	106
31.	2.6	98	2.6	98
32.	3.3	100	3.3	101
33.	3.6	99	3.3	99
34.	3.3	98	3.3	95
35.	3.3	96	3.3	99
36.	2.6	95	2.6	98
37.	3.3	101	3.3	101
38.	3.3	102	3.6	102
39.	3.6	102	3.6	102
40.	3.0	100	3.6	100

	B A S I C VIII		T R A D I T I O N A L VIII	
	Socio-Economic level	Intelligence quotient	Socio-Economic level	Intelligence quotient
41.	3.6	90	3.6	92
42.	3.0	103	3.0	103
43.	3.0	102	3.0	104
44.	2.6	98	2.6	100
45.	3.3	99	3.3	99
46.	3.6	102	3.3	102
47.	3.6	102	3.6	103
48.	3.6	103	3.3	103
49.	3.0	102	3.3	101
50.	2.6	98	2.6	98
51.	2.6	110	2.6	110
52.	2.6	98	2.6	98
53.	2.6	96	2.6	98
54.	2.0	99	2.3	98
55.	3.3	100	3.0	100
56.	4.0	100	4.0	100
57.	4.3	99	4.3	100
58.	3.3	100	3.0	99
59.	2.3	99	2.3	100
60.	3.3	102	3.3	102

	B A S I C VIII		T R A D I T I O N A L VIII	
	Socio-economic level	Intelligence quotient	Socio-economic level	Intelligence quotient
61.	4.3	100	4.3	100
62.	3.6	102	3.3	101
63.	4.3	102	4.3	102
64.	3.6	100	3.3	100
65.	3.6	102	3.6	102
66.	3.0	96	3.0	99
67.	2.6	98	2.6	98
68.	2.6	100	2.6	100
69.	3.0	100	3.0	100
70.	3.3	102	3.3	102
71.	4.0	100	4.0	100
72.	3.3	99	3.3	101
73.	3.0	99	3.3	100
74.	3.3	102	3.6	101
75.	4.0	103	4.0	105
76.	3.6	100	3.3	98
77.	2.6	97	2.6	98
78.	4.0	99	4.0	99
79.	3.3	101	3.3	101
80.	2.6	96	2.6	99

B A S I C VIII

	Socio-economic level	Intelligence quotient
81.	4.3	104
82.	3.3	101
83.	4.0	102
84.	3.3	99
85.	3.0	104
86.	4.3	102
87.	3.6	102
88.	3.3	100
89.	3.0	90
90.	3.6	94

T R A D I T I O N A L VIII

Socio-economic level	Intelligence quotient
4.3	103
3.3	100
4.0	102
3.3	100
3.0	102
4.0	101
3.6	100
3.3	99
3.0	93
3.6	96

I. Socio - Economic level

Traditional VIII	Basic VIII
$x_1 = 282.0$	$x_2 = 286.4$
Mean:	
$\bar{x}_1 = 3.133$	$\bar{x}_2 = 3.182$
Sum of squares:	
$\Sigma x_1^2 = 907.76$	$\Sigma x_2^2 = 936.96$
S.D.	
$s_1^2 = \frac{1}{n_1}(\Sigma x_1^2 - \bar{x}_1^2)$	$s_2^2 = \frac{1}{n_2}(\Sigma x_2^2 - \bar{x}_2^2)$
$= .2705$	$= .2855$

Now $$t = \frac{\bar{x}_1 - \bar{x}_2}{s\sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Where $$s = \sqrt{\frac{n_1 s_1^2 + n_2 s_2^2}{n_1 + n_2 - 2}}$$

$$= \frac{\cdot 049}{\cdot 079}$$

$$= .62$$

2. Intelligence Quotient

Traditional VIII	Basic VIII
$x_1 = 8959$	$x_2 = 8890$
Mean	
$\bar{x}_1 = 99.54$	$\bar{x}_2 = 99.12$
Sum of Squares	
$\Sigma x_1^2 = 893622$	$\Sigma x_2^2 = 885642$
S.D.	
$s_1^2 = \frac{1}{n_1}\left(\Sigma x_1^2 - \bar{x}_1^2\right)$	$s_2^2 = \frac{1}{n_2}\left(\Sigma x_2^2 - \bar{x}_2^2\right)$
$= 20.9217$	$= 15.6922$

Now $$t = \frac{\bar{x}_1 - \bar{x}_2}{s\sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Where $$s = \sqrt{\frac{n_1 s_1^2 + n_2 s_2^2}{n_1 + n_2 - 2}}$$

$$= \frac{.42}{.6402}$$

$$= 0.656$$

TABLE NO. 4

Mean for the controls, the difference between the means of basic and traditional school children :

Controls	Basic	Traditional	Difference
1	2	3	4
Socio-economic level	3.182	3.133	0.049
Intelligence	99.12	99.54	0.42

TABLE NO.5

Significance of difference between the basic and traditional school children with respect to the controls.

Controls	Basic	Traditional	Df.	t at 5% level
Socio-economic level	3.182	3.133	0.049	0.62 (not significant).
Intelligence	99.12	99.54	0.42	0.656 (not significant).

Following conclusions can be drawn from Table No.5 :

1. The Socio-economic level of the children is the same in basic and traditional types because the obtained difference is 0.049 which is quite insignificant.
2. The average intelligence of the samples from both the types of schools is the same because the obtained difference is 0.42 which is quite insignificant.
3. The samples are comparæble with respect to physical environments, socio-economic level and intelligence.

TOOLS OF STUDY

1. Standardised Achievement Tests :

(Baroda Studies in Mental Measurement)

The research department of the Faculty of Education and Psychology, M.S.University of Baroda, has standardised achievement tests for all subjects of Standard VIII in 1958 and published all these tests under the name of the Baroda Studies in Mental Measurement. The procedure this department followed can be studied from the manual prepared by this department.(2)

2. A Manual for administering Achievement Tests for Std.VIII of secondary schools in Gujarat. Orient Longmans, Bombay, 1961.

(i) Introduction :

These tests are constructed and standardised by research workers working under a project financed by the Ministry of Education, Government of India, under the scheme of encouraging research in Training Colleges. The tests are framed in Gujarati and are meant for the Gujarati speaking pupils of Class VIII of Gujarat.

(ii) Purpose of the tests :

The primary purpose of designing these tests is to provide reliable and valid tools to measure pupils' achievements. Incidentally, the tests will prove useful aids to teachers for educational guidance of pupils.

(iii) What the tests measure :

The tests are based on the syllabus prescribed by the Education Department of the former Bombay State for the pupils of Class VIII.

(iv) Objectives :

The general objectives for all subjects decided by the Education Department of the former Bombay State were more or less as those decided by the Education Department of the State of Saurashtra for basic and non-basic schools. They are briefly as follows:(3)

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3. Revised Syllabus: Education Department, Bombay State.

(a) Language (Mother tongue)

In teaching the Mother tongue, the teacher has to keep the following main objectives before him:

(1) Reading with speed and recitation.

(2) To teach the child to compare what is said or read or written by others.

(3) To inculcate habits of correct thinking.

(4) To lead the child to appreciate clarity, force and beauty of thought and language.

(5) To teach the child to express his ideas clearly, logically and effectively, both orally and in writing and to develop the capacity to speak lucidly before an audience.

(6) To teach the child how to select and study and to use books as means of getting knowledge as well as pleasure.

(b) General Science

In teaching this subject the teacher has to keep the following general objectives before him:-

(1) To make children take a keen interest in the process of living.

(2) To make them appreciate something common to human beings, lower animals and plants.

(3) To make them feel that the process of living is facilitated by the physical contact with our environment through our senses.

(4) To study how man has, by scientific invention, increased the effectiveness of the vital activities in his own life.

(5) To inculcate in children the habits of observing things around him.

(c) Social studies (History and Geography)

In this subject either separately or in an integrated way the teacher has to keep the following general objectives before him:

(1) To help pupils realise that they are heirs to a rich social heritage.

(2) To give some idea of the origin and growth of civilization and culture.

(3) To create interest in the general reading of History.

(4) To enable the pupils to understand the world in which we live and to appreciate the regional relationships.

(5) To study the cause and effect, and to make the pupils realise how human activities are affected by geographical factors.

(6) To stimulate the power of observation.

(7) To encourage map-making and map-reading.

(8) Stories of life in other lands with reference to climate, vegetation and economic conditions.

(9)The study of the outlines of the geography of the world with special reference to those countries which are commercially or culturally connected with India.

(d) Arithmetic

In teaching this subject as one of the subjects in Elementary Mathematics, the teacher has to keep the following general objectives before him.

(1) To give the pupils the ability to understand, grasp and tackle with accuracy and confidence the problme of arithmetic connected with everyday life.

(2) To develop the pupils' intelligence and give them training in abstraction, judgement and reasoning.

(3) To impart knowledge and ability to continue the study of the subject at higher levels.

(v) How the tests are standardised:

(a) Item selection:

The test items included in each test are selected after a thorough statistical analysis. A number of items covering various objectives and content areas were assembled forming the 'try out' form of the test. This form was administered to about 400 pupils of class VIII, selected at random from about 40 different secondary schools of Gujarat. For item analysis the technique of selecting the extreme 27% groups and finding out the item-total test correlation for each item was adopted. The test items have been selected on the basis of the following three criteria.

(i) Discriminating value.

(ii) Difficulty value.

(iii) Content areas and the objectives: The items in each test have been so selected that generally 20% of the items are between 0.40% difficulty level, 20% lie between 60-100% difficulty level and rest 60% lie between 40-60% difficulty level. Care is also taken to see that all the content-areas are adequately represented in the final form of each test.

(b) Sample:

The sample of pupils on which the tests have been standardised is drawn from the secondary schools of Gujarat. The pupils are drawn from different schools situated in rural and urban areas. Each test has been administered to about 2000 pupils for standardisation.

(vi) Norms:

The percentile norms and standard score norms for each test have been also calculated. The formula used to convert the raw scores into standard scores is

$$Z = \frac{10(X - M)}{6} + 50$$ where

Z = Standard Score corresponding to raw Score X.
X = Raw score.
M = Mean score.
6 = Standard deviation of the distribution of raw scores.

(vii) Time limit :

On the basis of time fixed at the time of standardisation, 50 minutes are to be allowed for each of these tests.

(viii) Each test item that is correct may be marked with a tick ✓ and each wrong item with a cross ✗ . The scores made on each sub-test should be entered in the space provided on the title page. One mark is to be given for each correct answer.

(ix) Reliability :

The reliability of the tests is calculated by the method of Rational Equivalence

Reliability of Tests

Subject	Reliability Coefficient
Gujarati	0.93
Social Studies	0.91
Arithmetic	0.92
General Science	0.91

II. Results :

(1) Language (Gujarati)

This test was administered to basic and traditional school children. It has 118 items. The scores were as under :

TABLE NO.6

No	Basic VIII	Traditional VIII	No	Basic VIII	Traditional VIII
1	67	95	10	72	69
2	77	85	11	35	80
3	75	103	12	41	80
4	59	96	13	39	72
5	80	93	14	69	72
6	48	89	15	37	52
7	51	59	16	63	53
8	78	90	17	32	55
9	73	69	18	32	44

(Continued)

No.	Basic VIII	Traditional VIII	No.	Basic VIII	Traditional VIII
19.	62	83	37.	35	76
20.	36	34	38.	62	78
21.	78	90	39.	68	80
22.	80	82	40.	50	74
23.	82	72	41.	48	60
24.	78	70	42.	43	62
25.	82	64	43.	72	60
26.	39	76	44.	80	76
27.	42	52	45.	74	52
28.	74	40	46.	64	48
29.	72	42	47.	50	42
30.	60	32	48.	52	38
31.	58	80	49.	70	39
32.	57	76	50.	48	47
33.	56	100	51.	42	46
34.	47	90	52.	34	48
35.	42	82	53.	36	52
36.	34	80	54.	37	55

No.	Basic VIII	Traditional VIII	No.	Basic VIII	Traditional VIII
55.	40	50	73.	42	80
56.	42	60	74.	43	64
57.	52	70	75.	70	52
58.	62	82	76.	60	80
59.	72	81	77.	52	76
60.	80	72	78.	54	78
61.	78	80	79.	55	82
62.	70	86	80.	56	80
63.	60	72	81.	34	74
64.	50	80	82.	42	72
65.	72	52	83.	48	62
66.	80	48	84.	50	60
67.	52	38	85.	62	52
68.	42	32	86.	67	50
69.	38	42	87.	68	52
70.	34	44	88.	72	48
71.	30	46	89.	52	42
72.	36	72	90.	52	42

$\Sigma d_i = -882$

$\Sigma d_i^2 = 46611$

TABLE NO.7

Signifigance of difference between Means by means of t - test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-9.8	37967.40	194.85	4.50^{xx}

The tabulated value of t with 89 degrees of freedom is 2.362 at 1% level and the same is 3.416 at .1% level from Fisher and Yates' tables.

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t= 4.50 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

(2) Arithmetic :

This standardised test was administered to both the groups. It has 60 items. The scores are as under :

TABLE NO.8

No.	Basic VIII	Traditional VIII	No.	Basic VIII	Traditional VIII
1	2	3	1	2	3
1.	24	28	23.	34	10
2.	19	23	24.	24	20
3.	25	44	25.	22	24
4.	11	17	26.	26	26
5.	22	35	27.	33	25
6.	17	34	28.	21	14
7.	21	26	29.	18	18
8.	20	29	30.	12	20
9.	22	35	31.	30	22
10.	21	24	32.	28	12
11.	21	03	33.	30	10
12.	20	18	34.	14	08
13.	11	25	35.	16	07
14.	20	20	36.	22	06
15.	23	09	37.	24	13
16.	20	08	38.	26	14
17.	18	22	39.	23	15
18.	10	10	40.	28	20
19.	21	12	41.	30	22
20.	05	16	42.	19	24
21.	20	18	43.	22	26
22.	22	12	44.	20	30

1.	2.	3.	1.	2.	3
45.	24	32	68.	28	28
46.	23	34	69.	26	30
47.	30	36	70.	24	32
48.	32	48	71.	25	34
49.	28	22	72.	20	36
50.	26	20	73.	22	38
51.	25	21	74.	18	40
52.	24	20	75.	16	42
53.	23	22	76.	12	44
54.	22	26	77.	14	20
55.	20	28	78.	22	22
56.	18	18	79.	20	18
57.	16	20	80.	21	16
58.	22	22	81.	24	15
59.	24	12	82.	23	14
60.	26	10	83.	24	12
61.	28	08	84.	26	10
62.	29	14	85.	25	20
63.	31	16	86.	28	24
64.	32	18	87.	12	26
65.	34	17	88.	14	22
66.	32	25	89.	08	21
67.	36	26	90.	28	19

ARITHMETIC

$\Sigma d_i = 24$

$\Sigma d_i^2 = 11150$

TABLE NO.9

Significance of differenee between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
.27	11143.44	105.56	.203

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significant, the observed value of $t = .203$ for 89 degrees of freedom is not at all significant. Hence the difference between the means is insignificant.

3. Social Studies (History and Geography)

This standardised test was administered to both the groups. It has 170 items in all. The scores are as under:

T A B L E NO.10

No.	Basic VIII	Traditional VIII	No.	Basic VIII	Traditional VIII
1.	68	102	21.	80	50
2.	88	86	22.	70	62
3.	94	101	23.	62	100
4.	69	108	24.	60	92
5.	98	94	25.	54	90
6.	74	114	26.	48	82
7.	85	91	27.	90	84
8.	93	75	28.	88	78
9.	91	85	29.	82	68
10.	85	84	30.	80	70
11.	65	70	31.	76	100
12.	77	78	32.	72	84
13.	47	111	33.	70	78
14.	85	77	34.	60	82
15.	69	74	35.	40	84
16.	86	66	36.	42	87
17.	89	88	37.	48	78
18.	60	71	38.	50	80
19.	85	80	39.	52	68
20.	55	55	40.	54	54

No.	Basic VIII	Traditional VIII	No.	Basic VIII	Traditional VIII
41.	56	55	66.	60	84
42.	60	78	67.	75	86
43.	62	80	68.	80	78
44.	70	82	69.	90	80
45.	72	90	70.	92	82
46.	80	92	71.	98	80
47.	82	100	72.	76	76
48.	81	102	73.	70	77
49.	89	94	74.	80	74
50.	90	96	75.	82	73
51.	80	82	76.	78	82
52.	72	84	77.	62	67
53.	48	94	78.	64	59
54.	70	96	79.	78	81
55.	69	102	80.	70	70
56.	70	104	81.	82	72
57.	72	87	82.	50	82
58.	78	85	83.	48	84
59.	80	78	84.	62	85
60.	81	70	85.	60	62
61.	83	72	86.	76	96
62.	82	74	87.	77	100
63.	80	84	88.	78	72
64.	70	78	89.	80	85
65.	71	59	90.	82	60

SOCIAL STUDIES

Σd_i = [illegible] - 803

Σd_i^2 = 37155

TABLE NO.11

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-8.92	30002.0252	173.21	4.609^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 4.609 for 89 degrees of freedom is highly significant. Hence the differenee between the means is significant and cannot be considered as due to chance.

4. General Science:

This standardised test was administered to both the groups. It has 100 items. The scores are as under:

T A B L E NO.12

No.	Basic VIII	Traditional VIII	No.	Basic VIII	Traditional VIII
1	2	3	1	2	3
1.	32	69	21.	20	32
2.	42	48	22.	40	60
3.	43	69	23.	42	52
4.	30	59	24.	40	42
5.	41	64	25.	44	44
6.	39	63	26.	30	34
7.	39	55	27.	28	32
8.	45	54	28.	24	62
9.	42	54	29.	26	58
10.	37	53	30.	23	42
11.	29	38	31.	42	68
12.	43	46	32.	41	42
13.	23	47	33.	38	52
14.	35	42	34.	40	50
15.	23	43	35.	46	40
16.	38	44	36.	32	42
17.	35	38	37.	30	43
18.	33	38	38.	32	42
19.	34	31	39.	28	40
20.	23	37	40.	26	41

1	2	3	1	2	3
41.	30	42	66.	40	47
42.	42	60	67.	41	40
43.	40	58	68.	22	42
44.	38	62	69.	24	38
45.	40	70	70.	26	34
46.	22	87	71.	30	32
47.	24	57	72.	32	30
48.	26	58	73.	40	28
49.	27	52	74.	41	22
50.	28	41	75.	42	26
51.	41	42	76.	26	27
52.	40	44	77.	30	28
53.	39	40	78.	32	30
54.	40	38	79.	30	34
55.	36	36	80.	24	36
56.	20	37	81.	28	37
57.	22	31	82.	29	38
58.	24	32	83.	30	39
59.	18	48	84.	31	40
60.	20	49	85.	42	42
61.	22	60	86.	46	44
62.	26	62	87.	48	46
63.	28	52	88.	50	48
64.	20	50	89.	42	50
65.	32	48	90.	38	52

GENERAL SCIENCE

$\Sigma d_i = -1109$

$\Sigma d_i^2 = 29343$

TABLE NO.13

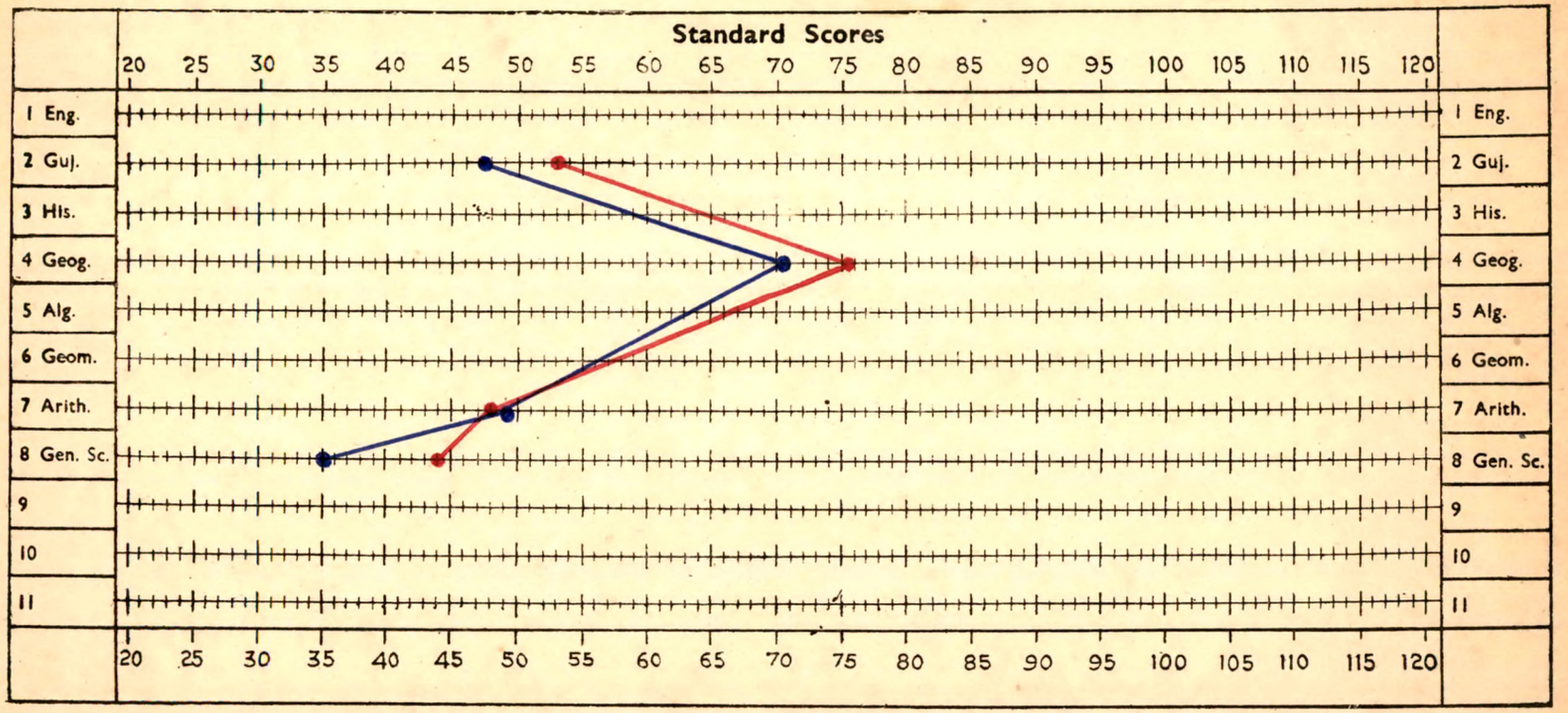
Significanee of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-12.32	15682.59	125.23	8.8^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t =8.8 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

PUPIL'S PROFILE CHART : ACHIEVEMENT TESTS

(Comparison of Basic No._____ and Traditional No._____ whose Scores in Intelligence Test are equal)



(——) Basic

(——) Traditional

Subject	Basic	Traditional
Language	47.2	52.9
Social Studies	70.2	75.4
Arithmetic	48.8	48.1
Gen.Science	35.1	43.9

APPRAISING PERSONALITY

Assessment :

There are a number of approaches to personality assessment :

1.Personality Rating Scale :

A rating blank scale or schedule is a formal set of questions asked of one person about another or self-rating form in which the individual checks certain questions about himself.

2.Personality Inventory:

A personality inventory is a questionnaire on which the subject checks his reactions to a number of ppecifically described situations.

3.Projective Techniques :

A projective technique involves a situation which is meaningless, ambiguous, amorphous or neutral. One of the easiest and most widely used projective techniques, the Rorscharch Test, presents a series of ink-blots. The subject is asked what he sees in them; what he reports is, obviously, a projection of himself. A cloud test, play techniques, free or creative writing,figure painting, working with play are other such projective techniques in vogue.

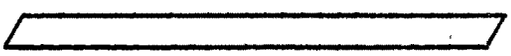
4. Anecdotal records, teacher-pupil conferences and staff-meetings are also informal approaches to personality evaluation.

Personality Rating Sheet :

The University Experimental school of Baroda University has prepared a personality rating sheet under the able guidance of Dr.Rice of Michigan University.This sheet is very often used by the local teachers and hence regarding its reliability and validity, it can be very cautiously said that there is a very high positive agreement in such ratings.

For the appraisal of following traits of character, pupils are to be rated on a five point scale. (Appendix 3)

1. Seriousness of purpose
2. Industry
3. Initiative
4. Responsibility
5. Emotional Stability
6. Self Confidence
7. Adaptability
8. Patience
9. Concentration
10. Dependability
11. Concern for others
12. Influence
13. Politeness
14. Mixes with others
15. Cheerfulness
16. Popularity
17. Neatness in doing things



Accordingly both the groups were rated by the school teachers and the following is the traitwise mean score for both the groups:-

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PERSONALITY RATING

TABLE NO.15

	TRADITIONAL VIII .. Traits ..					BASIC VIII .. Traits ..				
No.	1	2	3	4	5	1	2	3	4	5
1	2	3	4	5	6	7	8	9	10	11
1.	4.3	4.6	4.0	3.6	3.6	4.3	4.3	4.0	4.0	4.0
2.	4.0	4.0	4.0	3.3	3.3	4.0	4.0	4.0	5.0	3.6
3.	4.3	4.3	4.3	3.3	3.3	3.0	3.3	2.6	4.0	4.0
4.	3.3	3.3	3.0	2.3	3.0	4.0	4.3	3.6	3.0	3.0
5.	4.0	4.0	4.0	2.3	3.6	3.3	4.0	4.3	2.6	3.0
6.	4.6	4.0	4.0	3.3	4.0	4.0	4.0	4.3	3.6	3.3
7.	3.0	2.6	2.6	2.0	2.0	3.6	3.3	3.0	4.3	3.3
8.	3.3	3.3	3.3	3.0	3.0	4.0	4.0	4.0	3.0	4.3
9.	3.3	4.0	3.0	3.0	3.0	3.0	4.0	3.0	2.0	4.0
10.	3.3	3.3	3.3	3.0	2.3	4.0	3.0	2.6	3.3	4.0
11.	1.6	2.6	2.3	2.6	2.6	3.0	4.0	3.3	3.6	4.3
12.	2.3	2.3	3.0	3.0	2.0	3.6	2.6	3.3	4.0	3.6
13	3.0	3.0	2.6	3.3	2.3	4.0	4.0	4.0	3.6	4.3
14.	3.3	3.0	2.0	2.0	2.3	4.0	3.0	3.3	3.3	4.3
15.	2.3	2.3	2.6	2.0	3.3	3.0	4.0	4.0	3.0	4.6
16.	3.0	3.6	3.6	2.3	2.3	2.0	3.6	4.3	4.3	4.3
17.	4.0	4.0	2.6	4.0	2.3	3.0	3.0	4.0	4.0	3.0
18.	2.6	2.6	4.3	2.3	3.3	4.0	3.0	4.3	4.0	3.6
19.	4.3	4.0	2.3	4.0	2.3	3.0	4.0	3.6	3.0	4.3
20.	1.3	1.6	2.3	2.3	2.0	4.0	3.0	4.0	3.0	4.3

1	2	3	4	5	6	7	8	9	10	11
21	1.6	2.6	1.6	2.0	3.0	3.0	2.6	4.0	3.3	3.6
22	3.3	1.3	2.0	3.0	4.0	4.0	3.6	3.6	3.6	4.0
23	3.0	2.6	2.6	4.0	3.0	3.3	3.0	3.3	3.3	4.3
24	4.3	4.0	3.6	3.0	4.0	3.6	4.0	4.0	4.3	4.0
25	3.6	3.0	2.3	4.0	3.0	4.0	4.3	4.0	4.0	4.0
26	3.0	4.0	2.6	2.6	3.6	3.0	4.0	3.6	3.6	3.6
27	2.6	3.0	3.0	3.0	3.0	3.3	3.6	4.0	4.0	4.0
28	1.6	3.3	3.3	2.3	2.3	2.6	2.6	3.0	3.0	3.3
29	1.3	2.6	3.6	2.3	3.0	4.0	4.0	4.3	4.0	3.6
30	2.6	3.3	2.6	1.6	2.6	3.0	4.0	4.0	4.0	3.6
31	3.6	3.0	1.6	2.6	3.0	3.6	3.3	4.0	3.0	4.3
32	3.0	2.6	4.0	3.3	2.0	3.0	3.6	3.0	4.0	4.3
33	2.6	3.3	3.3	2.3	3.0	4.0	3.3	3.6	3.0	3.6
34	3.0	4.0	4.0	1.6	3.6	3.0	4.0	4.0	4.3	4.0
35	2.6	3.0	3.0	1.6	3.3	3.6	3.6	3.6	3.6	4.3
36	3.6	2.6	2.3	1.3	2.3	4.0	4.0	3.6	4.0	4.0
37	3.6	3.0	1.6	2.3	2.6	3.0	3.0	3.6	3.3	3.6
38	3.0	2.3	2.6	2.6	2.0	4.3	4.3	4.0	4.3	4.0
39	4.3	4.0	3.0	3.0	3.0	4.0	4.3	4.3	4.0	4.6
40	4.0	3.6	3.0	3.3	2.3	3.3	3.6	3.6	4.0	4.0
41	4.3	3.0	4.0	4.3	3.3	2.6	4.0	4.6	4.3	3.0
42	4.0	3.6	3.0	3.0	3.3	3.0	3.0	3.3	3.6	3.6
43	3.6	3.0	2.6	2.6	2.6	4.0	4.3	4.0	3.3	3.6
44	3.3	2.6	3.6	3.0	3.0	3.6	4.0	3.6	4.0	4.0
45	2.6	2.0	3.0	3.3	3.6	4.0	3.0	4.0	3.0	4.0
46	1.6	2.6	2.6	4.0	3.0	4.0	4.3	3.0	3.6	3.3
47	2.6	3.0	3.0	3.0	2.6	3.0	3.3	2.6	3.0	3.0

1	2	3	4	5	6	7	8	9	10	11
48	3.0	2.6	2.3	3.6	3.6	2.6	3.0	3.3	3.6	3.6
49	3.3	1.6	1.3	2.6	3.0	4.0	3.6	3.0	3.6	3.3
50	3.6	3.0	2.6	3.3	3.3	3.0	3.3	3.3	4.0	3.0
51	3.0	2.6	3.0	3.0	1.6	4.0	3.0	4.0	3.6	3.0
52	4.3	3.3	2.6	3.6	2.6	3.0	2.6	3.0	4.0	2.6
53	4.0	2.6	3.0	3.0	2.0	4.0	3.0	4.0	3.0	3.0
54	4.3	3.0	2.6	2.6	2.3	3.3	3.6	3.0	4.3	3.3
55	3.6	2.6	3.0	3.0	2.6	3.6	3.3	4.0	4.0	3.6
56	3.0	3.0	2.6	2.3	1.6	3.0	4.0	4.3	3.6	4.0
57	3.6	2.6	3.0	1.6	3.0	4.3	4.0	4.3	2.3	3.6
58	2.6	3.0	3.6	3.0	2.6	4.0	3.3	4.0	3.0	3.3
59	3.0	3.6	3.0	4.0	2.0	4.6	3.6	3.0	4.0	3.6
60	3.6	3.0	4.0	3.0	2.0	4.0	3.3	4.0	3.0	4.0
61	3.6	3.0	2.3	3.0	4.0	4.0	3.0	3.6	4.3	3.0
62	3.3	4.3	1.6	4.0	3.0	3.0	4.0	3.6	3.0	3.6
63	4.3	4.0	3.6	3.3	2.0	4.0	3.0	3.3	4.3	3.3
64	4.0	3.0	2.3	4.3	2.6	3.0	4.0	4.0	3.6	4.0
65	3.0	2.0	3.6	4.0	1.6	4.0	3.0	3.3	3.3	3.0
66	2.0	2.6	2.3	3.3	3.0	3.0	3.3	3.6	4.0	4.0
67	2.6	3.6	3.3	4.0	3.0	4.3	3.6	4.3	3.3	3.0
68	1.6	3.0	3.0	3.3	3.3	4.0	4.0	4.6	3.6	2.6
69.	3.0	2.0	4.0	3.6	3.6	3.6	3.3	3.3	3.6	3.0
70	2.6	2.3	3.3	3.0	4.0	3.0	3.0	3.0	3.6	4.0
71	3.0	3.3	3.6	3.3	3.3	3.3	4.0	4.0	3.0	3.6
72	4.0	3.6	2.6	2.6	4.0	3.6	3.0	3.3	3.3	3.6
73	3.6	4.0	1.6	2.0	3.0	4.0	3.0	3.3	3.3	3.3
74	3.3	4.3	2.6	3.0	2.0	3.3	3.6	3.3	4.0	3.6

1	2	3	4	5	6	7	8	9	10	11
75	2.6	4.6	3.0	3.6	3.3	4.0	3.3	4.0	3.0	4.0
76	4.0	4.0	2.6	3.0	4.0	3.0	4.0	3.6	3.6	4.0
77	3.6	3.6	1.6	2.6	3.0	4.0	3.0	3.0	4.0	3.0
78	3.3	3.0	2.6	1.3	3.3	4.3	4.0	4.0	3.0	4.0
79	4.0	3.0	2.3	2.0	2.6	3.6	3.3	3.3	4.0	3.6
80	3.0	4.0	3.0	3.3	3.3	3.0	4.0	3.6	3.6	3.0
81	3.0	4.0	3.0	2.3	3.3	3.6	4.3	4.0	4.0	3.6
82	2.0	3.0	3.3	3.6	2.6	4.0	4.0	4.3	3.6	4.0
83	2.6	2.0	3.6	3.0	3.6	3.0	3.3	3.6	3.3	3.3
84	2.6	2.6	2.6	3.6	3.6	4.3	4.0	3.6	4.0	4.3
85	2.0	3.3	3.3	3.0	3.0	4.0	4.3	4.0	3.6	4.0
86	3.3	4.0	4.0	3.6	4.0	3.6	4.0	3.6	3.0	3.6
87	4.0	3.0	3.6	3.0	3.0	3.6	3.6	3.3	4.0	3.6
88	3.3	3.6	2.6	3.0	3.6	4.0	3.0	4.0	3.6	3.3
89	3.0	2.0	2.3	3.0	3.0	3.0	3.6	3.0	3.6	4.0
90	2.6	2.0	2.3	3.6	4.0	4.0	4.0	4.0	3.6	4.3

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PERSONALITY RATING

	.. TRADITIONAL VIII ..						.. BASIC VIII ..					
	.. Traits ..						.. Traits ..					
No.	6	7	8	9	10	11	6	7	8	9	10	11
1	2	3	4	5	6	7	8	9	10	11	12	13
1	4.0	4.0	4.6	4.6	4.0	4.0	4.3	4.3	3.6	3.6	4.0	3.6
2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.3	3.6	4.0	3.6	4.0
3	4.0	4.3	4.0	4.3	4.0	3.0	3.6	4.0	4.0	3.6	3.3	4.0
4	3.0	3.3	3.3	3.6	3.6	4.0	4.3	3.6	3.6	3.3	4.3	4.0
5	3.6	4.0	4.0	4.0	4.0	3.6	4.3	4.0	4.0	4.0	4.3	4.0
6	4.0	4.3	4.3	4.3	4.0	3.6	3.6	4.0	4.3	4.6	4.0	3.0
7	2.6	2.3	3.3	3.3	3.3	3.6	3.6	4.0	4.0	3.3	4.0	4.0
8	3.3	3.3	3.3	3.3	3.3	3.0	3.0	3.3	2.6	4.0	3.0	3.6
9	2.3	3.6	4.6	3.6	3.6	3.6	4.3	3.6	3.3	4.3	4.0	4.6
10	2.6	3.3	3.3	4.0	3.3	3.0	3.0	4.3	4.0	3.6	4.0	4.3
11	2.0	2.3	2.3	2.3	2.0	3.3	4.0	2.6	3.6	4.0	3.0	4.6
12	3.0	3.6	3.0	3.0	2.6	2.6	4.0	4.6	4.0	4.0	4.0	4.3
13	2.6	3.6	3.0	3.0	2.6	2.6	4.0	4.6	4.0	4.0	3.6	2.6
14	3.6	2.6	3.0	3.0	3.6	2.3	4.0	4.6	3.0	4.0	3.3	3.6
15	2.3	2.0	3.0	3.0	2.3	3.0	3.3	4.3	3.6	4.0	3.6	4.0

1	2	3	4	5	6	7	8	9	10	11	12	13
16	3.0	3.3	3.6	3.0	3.0	3.0	4.0	3.0	2.0	4.0	3.6	4.0
17	4.0	4.0	4.0	4.0	2.3	4.3	3.6	2.6	4.0	3.0	4.0	3.0
18	2.6	3.0	2.6	2.6	4.0	3.0	3.6	2.6	4.0	3.0	4.0	3.0
19	4.3	3.6	4.0	4.3	2.3	4.0	4.3	4.6	3.0	4.0	3.6	3.0
20	2.0	2.3	2.3	2.3	4.0	3.0	3.6	3.0	4.6	3.3	3.3	4.0
21	4.0	3.6	3.0	2.6	1.6	1.3	4.0	3.6	4.0	4.3	3.6	4.0
22	3.6	3.0	3.6	3.0	3.6	2.3	4.3	4.0	3.0	3.3	3.6	4.0
23	3.0	2.6	3.0	3.3	3.3	2.6	4.0	3.3	4.0	3.3	4.0	3.6
24	4.0	3.3	2.3	2.6	1.6	3.6	3.6	3.6	3.0	4.0	4.3	4.0
25	2.6	3.0	2.0	3.0	4.0	3.0	3.3	3.6	4.0	3.0	4.0	3.6
26	1.6	2.0	3.0	3.3	3.6	3.0	4.0	4.0	4.0	3.6	3.6	4.0
27	1.3	3.0	4.0	3.0	2.0	1.6	4.3	4.3	3.6	3.3	4.6	3.6
28	2.3	4.0	3.0	4.0	3.3	3.6	3.6	4.0	4.0	3.6	4.0	4.0
29	3.0	3.0	4.0	3.0	3.6	3.6	4.0	3.6	3.0	3.3	3.3	3.6
30	2.3	2.0	3.0	2.0	1.3	1.6	4.0	4.0	4.0	3.6	4.0	3.6
31	4.0	2.6	4.0	3.0	2.0	2.3	4.6	3.0	4.0	3.0	4.0	4.3
32	3.0	2.0	3.0	4.0	2.3	3.3	4.0	3.0	4.0	3.0	3.0	3.6
33	2.0	3.0	2.0	3.0	2.6	3.6	3.3	3.6	4.0	4.3	4.0	3.3
34	3.3	3.3	3.3	2.0	3.6	3.6	4.0	3.0	3.0	3.3	4.0	3.6
35	3.0	3.0	4.0	2.3	3.3	3.3	3.6	4.0	4.0	3.6	4.0	3.6
36	3.3	2.6	3.6	4.0	4.6	3.6	3.6	4.3	3.3	3.0	4.0	3.3
37	2.6	2.3	1.3	4.0	4.0	3.0	4.0	4.0	3.6	4.0	2.6	3.0
38	2.0	1.3	1.6	3.6	3.3	4.3	4.3	3.6	4.3	3.0	3.6	3.0
39	3.0	1.6	3.6	3.0	4.0	4.0	4.3	3.3	4.3	2.6	3.3	2.6
40	3.3	3.0	3.0	4.0	4.0	3.6	4.6	4.3	4.0	4.0	3.0	4.0

1	2	3	4	5	6	7	8	9	10	11	12	13
41	2.6	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	3.6	4.0	3.6
42	3.0	2.0	3.0	4.0	3.0	2.0	4.6	3.0	4.0	3.0	3.0	4.6
43	2.0	2.6	2.0	3.0	4.0	2.0	4.6	4.0	3.6	4.0	4.3	3.3
44	2.6	1.6	2.6	4.3	3.3	1.3	4.0	3.3	3.3	3.0	4.3	3.6
45	1.6	2.0	2.6	2.0	3.0	4.0	4.0	3.6	4.0	4.0	4.0	4.0
46	3.0	2.6	3.6	3.0	2.0	3.0	4.0	3.3	4.0	4.3	4.0	3.6
47	2.6	3.0	2.6	2.0	4.0	3.0	3.6	4.3	4.0	4.0	3.0	4.0
48	2.0	2.3	3.6	3.0	3.0	4.0	3.6	3.3	4.0	3.0	4.0	3.6
49	3.0	3.3	2.3	4.3	2.0	2.6	3.3	3.6	3.0	4.0	3.0	3.3
50	3.0	3.0	1.6	3.6	3.0	3.6	4.0	3.3	4.0	3.0	4.0	3.6
51	2.6	2.6	3.0	3.0	3.3	3.3	3.3	3.6	4.0	3.0	3.6	3.3
52	3.0	3.6	2.6	2.6	3.6	3.0	3.3	3.3	3.6	3.3	4.0	3.6
53	2.0	3.0	2.0	2.0	3.0	2.6	4.3	3.0	3.3	3.0	4.3	3.6
54	2.0	2.0	3.0	3.3	4.3	1.6	4.0	4.0	4.3	4.0	4.0	3.3
55	3.0	3.0	4.0	2.0	3.0	2.6	3.0	3.6	4.0	3.0	3.0	4.0
56	2.6	3.0	3.0	2.6	4.0	3.0	2.6	3.0	3.6	4.0	4.3	3.6
57	2.0	2.0	2.0	1.6	3.0	2.6	3.0	3.3	4.0	3.0	3.3	2.6
58	2.6	2.6	2.6	2.0	2.0	3.0	3.6	4.0	3.0	4.0	3.6	2.6
59	3.3	2.3	1.3	3.0	3.3	3.6	3.3	3.6	4.0	3.0	3.0	3.0
60	3.0	3.0	1.6	4.0	3.6	3.0	4.3	3.3	3.0	4.0	4.3	4.0
61	4.0	3.3	4.0	3.6	3.0	3.3	3.6	3.0	3.3	3.6	4.0	3.0
62	3.0	4.3	3.0	3.3	4.0	3.3	4.0	3.6	4.0	3.0	3.6	4.0
63	2.0	4.0	3.0	2.0	1.6	2.6	3.6	3.3	3.0	4.0	3.0	3.0
64	2.6	3.0	4.0	2.6	2.6	4.0	3.6	4.0	3.0	3.0	4.0	4.0
65	2.6	2.6	3.3	3.6	3.0	3.0	3.0	3.0	4.0	4.3	4.0	3.0

1	2	3	4	5	6	7	8	9	10	11	12	13
66	3.0	3.3	4.0	3.3	3.3	2.6	4.3	4.0	3.6	4.0	3.0	4.0
67	3.6	4.0	3.0	2.6	2.0	2.6	4.0	3.6	3.0	3.6	3.3	3.6
68	2.6	3.0	4.0	3.0	3.0	3.0	3.6	3.3	3.6	3.0	4.0	3.3
69	3.0	2.0	3.0	2.0	2.0	2.6	3.3	3.0	3.0	4.3	3.3	3.6
70	3.3	2.6	2.0	2.0	2.6	2.6	4.0	4.0	3.6	4.0	4.0	4.0
71	3.0	2.6	2.6	2.3	3.3	3.0	3.6	3.6	3.3	3.6	3.3	3.3
72	4.0	3.3	3.0	3.3	3.6	3.3	3.3	3.3	3.6	3.0	4.0	4.0
73	3.0	3.3	3.0	1.6	2.6	3.0	3.0	3.0	4.0	3.6	3.3	3.6
74	2.0	3.0	3.0	2.6	1.6	2.6	3.6	3.6	3.0	3.3	3.6	3.3
75	3.0	3.3	3.6	2.0	2.0	2.0	4.3	4.0	4.0	4.3	3.3	3.6
76	3.3	3.6	3.0	3.3	3.0	2.0	3.3	4.0	3.0	3.6	3.0	4.0
77	3.6	3.3	3.0	4.0	2.6	2.6	4.3	3.6	4.0	4.3	4.3	3.0
78	3.0	3.0	4.0	3.0	2.0	2.3	4.0	3.6	3.0	4.0	4.0	4.0
79	2.0	4.0	3.0	2.0	2.6	3.0	3.0	3.0	4.3	3.0	3.3	3.0
80	2.6	2.6	2.0	2.6	3.0	4.0	4.0	4.3	4.0	4.0	3.0	2.6
81	3.0	3.6	3.0	2.0	4.0	4.0	3.0	4.0	3.0	3.6	3.3	3.3
82	3.0	3.6	4.0	3.0	2.0	3.3	3.6	4.3	3.6	4.0	4.3	4.0
83	2.6	3.0	3.0	2.0	4.0	3.0	4.0	3.6	3.3	3.6	4.0	3.0
84	3.0	2.6	4.0	3.0	2.6	2.0	3.0	4.0	4.3	3.3	3.6	4.0
85	2.6	2.0	3.0	2.6	2.3	3.3	3.6	3.6	4.0	3.6	3.0	3.3
86	3.0	2.0	4.0	3.0	3.6	3.0	4.0	4.0	3.6	3.0	4.0	2.6
87	2.0	2.6	3.6	3.0	3.3	4.0	3.6	3.6	3.6	3.3	3.0	3.0
88	2.0	3.0	3.3	2.0	2.6	3.0	3.3	4.3	3.6	4.0	4.0	4.0
89	2.0	4.0	3.6	2.6	3.0	3.0	4.3	4.3	4.0	3.6	3.0	3.6
90	3.0	2.0	3.3	3.3	3.0	4.0	4.0	4.0	4.3	4.0	3.6	4.0

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PERSONALITY RATING

	... TRADITIONAL VIII ...						... BASIC VIII ...					
	... Traits ...						... Traits ...					
No.	12	13	14	15	16	17	12	13	14	15	16	17
1	2	3	4	5	6	7	8	9	10	11	12	13
1	4.0	4.3	3.3	2.3	4.0	4.6	4.3	3.6	4.0	4.0	4.3	4.3
2	4.0	3.3	3.6	3.3	3.6	3.3	4.3	4.0	4.0	4.0	4.0	4.0
3	2.6	3.6	2.6	2.3	3.6	4.6	4.0	4.3	4.0	4.0	4.3	3.0
4	3.3	3.6	4.0	3.0	3.0	3.0	4.0	3.6	3.3	4.0	4.0	4.0
5	3.6	3.6	2.6	3.3	3.6	4.6	4.0	3.3	2.6	2.0	2.0	3.0
6	3.6	4.0	3.0	3.0	3.6	3.3	3.3	3.6	4.0	4.0	4.0	4.0
7	3.3	4.0	3.0	3.0	3.3	3.6	4.0	3.3	3.0	4.0	3.0	4.0
8	2.3	4.0	3.0	2.3	2.6	3.3	3.0	3.6	3.0	4.0	2.0	4.0
9	3.3	4.0	2.6	2.3	2.0	4.0	3.0	3.3	2.0	2.6	4.0	3.0
10	4.0	3.0	4.0	3.6	2.6	3.3	2.6	3.0	3.0	4.0	4.0	3.0
11	2.6	2.0	3.3	2.0	2.0	2.3	4.0	3.0	4.0	4.0	2.6	4.0
12	3.0	3.3	2.6	2.0	1.6	3.0	4.6	3.3	3.0	4.0	4.0	4.0
13	2.0	3.0	3.3	2.3	3.0	3.0	3.3	2.6	3.0	3.0	4.0	3.0
14	2.6	4.0	3.6	3.0	4.0	3.0	2.6	4.0	3.0	4.0	2.0	4.0
15	3.0	3.0	3.0	2.0	1.6	2.0	4.3	3.0	4.0	3.0	2.0	4.0
16	3.0	4.0	4.0	2.3	2.3	2.6	3.3	4.0	3.0	4.0	2.6	3.6
17	3.6	3.3	4.0	3.3	2.3	3.3	4.3	4.6	4.0	2.0	3.3	4.3
18	2.3	3.6	3.6	2.6	2.6	2.6	3.6	4.0	3.0	4.0	2.6	4.3
19	4.3	4.0	4.3	3.0	4.0	4.3	4.0	3.6	4.0	2.0	4.0	4.6
20	2.3	1.3	3.3	3.0	3.0	1.6	3.0	3.3	4.3	2.0	2.0	3.6

1	2	3	4	5	6	7	8	9	10	11	12	13
21	2.0	3.0	3.3	4.0	3.0	2.6	3.0	3.6	3.0	4.0	2.6	3.6
22	3.0	3.3	4.0	3.0	2.6	1.6	3.3	3.6	3.0	4.0	4.0	3.0
23	1.3	3.6	3.0	2.6	1.6	1.3	3.3	4.0	3.0	3.6	3.0	3.0
24	3.0	4.0	3.0	3.6	3.3	3.0	3.6	4.0	3.0	3.0	2.6	3.6
25	2.6	2.3	3.0	3.6	3.0	3.0	3.3	3.6	4.0	3.0	3.0	3.0
26	1.6	1.3	3.0	2.3	3.0	3.0	4.3	4.0	3.3	4.0	3.0	4.0
27	1.3	4.0	3.0	3.6	2.0	2.0	3.6	3.6	4.0	3.0	4.0	3.0
28	3.3	3.0	3.6	2.6	2.0	2.6	4.0	3.3	4.0	4.3	4.0	4.0
29	3.3	3.0	2.6	1.3	2.0	2.3	4.0	4.0	3.0	4.0	3.0	4.0
30	1.3	2.0	2.3	3.3	3.0	3.0	4.0	3.6	3.3	4.0	3.0	3.3
31	2.6	2.0	2.3	1.3	2.6	2.0	3.6	4.0	3.0	4.0	3.6	3.3
32	3.6	3.0	3.3	3.6	4.0	3.0	4.3	4.0	3.0	4.3	3.3	4.0
33	4.0	3.0	3.3	3.3	4.0	3.3	4.0	4.0	3.3	3.6	3.0	4.3
34	3.0	2.0	2.6	3.6	1.6	2.0	4.0	3.6	3.0	4.0	3.0	4.0
35	2.6	3.0	2.6	3.3	3.3	4.0	3.3	3.3	4.0	3.0	2.6	3.6
36	4.0	3.0	2.0	2.6	2.3	1.6	4.0	3.6	3.3	4.0	4.0	3.6
37	3.0	4.0	2.0	2.3	3.3	3.6	4.0	3.3	2.6	3.0	3.6	3.3
38	4.0	3.0	3.6	3.3	4.0	2.0	2.6	2.6	3.3	2.6	3.0	4.0
39	3.0	4.0	2.6	3.6	3.0	3.0	3.0	3.6	3.3	2.6	3.0	3.6
40	2.0	2.6	3.3	4.0	2.0	4.0	3.0	4.0	4.6	3.3	3.0	4.0
41	2.0	2.6	1.6	2.6	1.6	2.6	3.3	3.0	3.3	3.6	3.0	4.3
42	1.6	2.0	3.0	2.0	3.6	2.0	3.6	4.0	4.3	4.0	3.3	4.0
43	2.6	2.6	2.3	3.3	3.0	3.0	4.3	4.3	3.6	4.0	3.0	4.3
44	1.6	1.6	1.6	2.6	2.3	3.0	3.6	4.0	3.3	4.0	3.3	4.0
45	3.0	2.0	4.0	3.0	3.0	4.0	4.0	4.3	4.0	3.0	3.0	4.0

1	2	3	4	5	6	7	8	9	10	11	12	13
46	3.3	3.3	3.0	3.3	2.3	2.6	2.6	2.3	3.0	3.6	4.3	4.0
47	4.0	3.0	4.3	4.0	3.0	2.0	3.0	4.0	4.0	3.0	3.3	3.6
48	3.0	4.0	3.3	3.0	2.0	2.6	3.3	4.0	3.0	3.6	3.3	4.0
49	2.0	2.0	3.0	2.0	2.6	1.3	4.0	3.0	4.0	3.3	3.0	3.3
50	2.6	2.3	4.0	3.0	2.0	2.6	3.0	4.0	3.0	4.0	3.0	4.0
51	2.3	1.6	3.0	2.6	2.0	2.6	4.0	3.6	3.3	3.0	3.0	4.3
52	2.6	2.3	4.0	3.0	2.0	2.6	3.0	4.3	4.0	3.0	4.0	4.3
53	2.3	3.3	3.0	2.0	1.6	1.3	3.3	3.0	4.0	3.0	3.6	4.0
54	2.6	3.6	4.0	3.0	2.0	2.3	4.0	4.0	3.0	4.3	4.0	3.0
55	3.3	3.6	3.0	2.0	1.6	2.0	3.6	3.0	4.0	4.0	3.0	4.0
56	3.6	4.3	4.0	3.0	2.0	2.3	3.3	3.3	3.6	3.0	4.0	3.0
57	3.6	4.0	3.0	2.0	1.6	1.6	3.0	4.0	3.3	4.0	3.0	4.0
58	4.0	3.0	2.6	3.0	3.3	3.6	4.0	4.3	4.0	3.0	3.3	3.6
59	3.0	2.0	1.6	2.0	4.3	3.0	3.0	3.0	3.0	4.3	4.0	4.0
60	2.0	2.6	4.0	1.6	4.0	2.0	3.6	4.3	4.0	4.0	3.3	4.0
61	3.0	2.6	1.6	3.0	2.0	2.0	4.3	4.0	3.0	4.0	3.3	3.6
62	2.6	1.6	2.6	2.3	3.0	3.0	3.3	3.6	3.3	3.6	3.0	3.0
63	3.0	3.3	4.0	3.3	2.6	3.6	4.0	3.0	4.0	3.0	2.6	3.6
64	3.6	3.3	3.0	4.0	2.0	4.0	3.0	4.0	3.0	2.6	3.0	2.6
65	3.0	4.0	3.0	3.0	3.0	3.0	4.3	3.0	4.0	3.0	3.3	3.6
66	2.6	3.6	3.0	2.0	3.3	2.0	3.6	4.0	3.0	2.6	3.0	3.6
67	1.6	2.0	2.0	2.3	2.0	2.3	3.6	3.0	4.0	3.3	3.6	3.0
68	4.0	3.0	2.0	3.0	3.0	2.0	3.3	4.0	3.0	2.6	2.6	3.0
69	3.0	4.0	3.0	2.0	2.6	1.6	3.6	3.3	4.0	3.0	4.0	3.6
70	2.6	3.0	2.0	2.6	1.6	2.6	4.0	3.6	3.3	4.0	3.3	3.0

1 6	2	3	4	5	6	7	8	9	10	11	12	13
71	1.6	4.0	3.0	2.0	2.6	3.0	3.6	4.0	3.0	2.6	3.0	3.6
72	2.6	3.0	2.0	2.6	1.6	3.0	4.0	2.6	3.0	3.3	4.0	3.6
73	3.6	2.6	3.0	3.6	3.0	3.3	3.6	3.0	3.3	3.6	4.0	3.6
74	2.6	4.0	3.0	2.0	2.0	2.0	3.3	4.0	4.3	4.0	3.0	4.0
75	2.0	3.6	4.0	3.0	2.6	2.0	3.6	3.0	3.3	4.0	3.0	3.6
76	2.6	3.3	3.0	3.0	2.6	2.0	3.0	4.3	3.6	3.0	4.0	3.6
77	2.3	4.0	3.0	2.0	2.0	2.6	4.0	3.0	4.0	3.3	3.6	3.0
78	3.0	3.0	4.0	3.6	3.3	3.6	3.0	2.6	3.0	3.3	2.6	3.6
79	2.0	2.0	3.0	3.6	3.3	3.0	4.0	3.6	3.0	4.3	4.0	3.3
80	2.6	3.0	3.0	3.0	3.0	3.6	3.0	2.6	3.0	3.3	3.6	3.3
81	3.0	3.3	4.0	3.0	2.6	3.0	4.0	3.0	3.6	3.3	2.6	3.3
82	3.0	3.6	3.0	2.0	2.3	2.6	3.0	2.6	3.0	3.6	3.6	3.3
83	3.0	3.0	3.3	2.6	2.6	3.0	4.0	3.6	3.3	3.6	2.6	3.6
84	2.0	2.0	4.0	4.0	3.6	3.0	3.0	2.6	3.6	3.0	3.3	4.3
85	3.0	3.0	3.0	2.6	3.0	3.6	3.6	3.0	3.3	3.3	3.6	3.6
86	3.3	3.6	3.0	3.0	3.0	3.3	4.0	3.0	4.3	3.6	3.3	3.6
87	3.0	2.0	4.0	3.0	2.0	2.6	3.0	3.6	4.0	4.3	3.6	3.3
88	4.0	2.6	3.0	2.0	2.6	2.3	3.6	3.3	4.3	4.0	4.0	3.0
89	4.0	3.3	2.6	2.0	3.0	3.3	4.0	3.0	3.6	3.6	3.0	4.0
90	3.0	3.6	3.3	2.3	3.0	3.6	3.0	4.0	3.6	3.6	4.0	3.0

PERSONALITY TRAITS

TRAIT 1

Σd_i = - 35.20

Σd_i^2 = 94.38

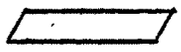
TABLE NO.16

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.39	80.69	8.98	3.84^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 3.84 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 2



$\Sigma d_i = -41.5$

$\Sigma d_i^2 = 74.37$

TABLE NO.17

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.46	55.33	7.43	5.54 xx

On consulting t-table from Fisher and Yates' tables, we find that at 1 % level of significance, the observed value of t = 5.54 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 3

$\Sigma d_i = -66.8$

$\Sigma d_i^2 = 113.93$

TABLE NO.18

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.74	64.65	8.04	8.23^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 8.23 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and nannot be considered as due to chance.

TRAIT 4

$\Sigma d_i = -59.7$

$\Sigma d_i^2 = 98.86$

TABLE NO.19

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
- .66	59.66	7.72	7.65^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 7.65 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 5

$\Sigma d_i = -68.6$

$\Sigma d_i^2 = 106.14$

TABLE No.20

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.76	54.16	7.35	9.25^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 9.25 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 6

$\Sigma d_i = 84.4$

$\Sigma d_i^2 = 126.55$

TABLE NO.21

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
.94	47.03	6.85	12.28^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 12.28 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 7

$\Sigma d_i = -61.4$

$\Sigma d_i^2 = 106.85$

TABLE NO.22

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.68	464.69	8.04	7.57 xx

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 7.57 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 8

$\Sigma d_i = -48.4$

$\Sigma d_i^2 = 102.82$

TABLE NO.23

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.54	76.576	8.75	5.523 xx

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 5.523 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 9.

$\Sigma d_i = -52.1$

$\Sigma d_i^2 = 107.36$

TABLE No.24

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-0.58	77.08	8.78	5.91 xx

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 5.91 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 10

$\Sigma d_i = -56.9$

$\Sigma d_i^2 = 97.84$

TABLE NO.25

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.63	62.1190	7.88	7.15^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 7.15 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 11

$\Sigma d_i = -48.8$

$\Sigma d_i^2 = 98.17$

TABLE NO. 26

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.54	71.93	8.95	5.4 xx

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 5.4 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 12

$\Sigma d_i = -64.9$

$\Sigma d_i^2 = 109.89$

TABLE NO.27

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.72	53.23	7.29	8.84 xx

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 8.84 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 13

$\Sigma d_i = -41.2$

$\Sigma d_i^2 = 98.11$

TABLE NO.28

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.46	79.07	8.89	4.63^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 4.63 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 14

$\Sigma d_i = -33.2$

$\Sigma d_i^2 = 63.60$

TABLE NO.29

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.37	.51.48	7.17	4.62^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 4.62 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 15

$\Sigma d_i = -64.9$

$\Sigma d_i^2 = 115.28$

TABLE NO.30

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.72	78.62	8.86	7.27^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 7.27 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 16

$\Sigma d_i = -54.7$

$\Sigma d_i^2 = 112.58$

TABLE NO.31

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.61	79.09	8.89	6.14^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 6.14 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

TRAIT 17

$\Sigma d_i = -75.8$

$\Sigma d_i^2 = 134.14$

TABLE NO.32

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-.84	70.64	8.4	8.75^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of $t = 8.75$ for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

III. ACHIEVEMENT TESTS IN PHYSICAL EDUCATION

These tests were standardised by Dr. N.N.Shukla, Faculty of Educationa and Psychology, M.S.University of Baroda. (4) The tests are selected from informal activities and are given to one boy at a time. The test items selected are as follows : (Appendix 4)

Ability	Test
1. Speed	Running 75 yards
2. Agility	Jump and reach
3. Arm - strength	Pull - up
4. Leg - Strength (and flexibility (jumping)	Standing broad jump
5. Endurance	Potato Race
6. Accuracy	Netting the Tennis Ball

Test Items :

1. Speed : Speed is measured by asking the subject to run a distance of 75 yards.

Two parallel straight lines 75 yards apart are drawn with slaked lime. A third line perpendicular to both these lines is also drawn with slaked lime. The subject is asked to stand behind one of these parallel lines, called the starting line, ready to run as fast as he can when he is given a signal. He is also instructed to run along the perpendicular

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(4) N.N. Shukla, Achievement Tests in Physical Education, Unpublished Ph.D. Thesis.

in a straight line and reach the finish line. The subject is not allowed to touch the starting line by any of his feet. He is neither allowed to keep his feet on it nor cross it, but stand behind it ready to run. He can stand with his knees bent and with one leg behind the other, ready to run.

The starting signal is given by shouting the word " GO ". Simultaneously a sharp downward movement of a white handkerchief is made. A stop-watch with the least count of one tenth of a second is used to record the time taken by the subject, to finish the run.

The time taken by the subject in finishing the running is recorded to the nearest tenth of a second.

2. Agility :

Agility is measured by the " Jump and Reach " test.

A circle with nine inches radius is drawn with a piece of chalk, near a wall on the floor in such a way that its circumference just touches that wall at a point.

The subject is asked to stand in the circle facing the wall, with feet together and toes touching the wall. With his nose touching the wall, he is asked to stretch his arms upwards without raising his heels on the wall with a piece of chalk.

The subject is then asked to take a good position in the circle and stand with his side to the wall. Then he is asked to bend a little low, to swing his arms vigorously and jump as high as he can and make a second mark on the wall with the piece of chalk in his hand.

The distance between the two marks is measured in inches to the nearest quarter of an inch. The subject is given three trials and the highest record is taken into consideration i.e. the best trial is his final record.

3. Arm-strength:

This is measured by what is known as " Pull Up ".

A horizontal single bar is fixed at such a height that when the subject hangs on the bar, his legs do not touch the ground.

The subject is asked to grasp the horizontal bar with his hands and legs fully extended. He is instructed that the arms and legs must be straight and the feet must be kept together. The hands are to be kept shoulder apart. He has to pull himself up till his chin is even with or over the bar; and then he has to lower himself and come back to his original position with his arms perfectly straight. This is counted as one pull-up.

The subject is asked to make as many pull-ups as he can. The total number of such pull-ups that the subject can make before he touches the ground is his score.

4. Leg-strength and Flexibility :

For measuring this, " Standing Broad Jump " test is used.

A straight line of about three feet in length is drawn on the ground with slaked lime. This line is the straight line.

The subject is made to stand on both his feet touching the straight line. He is then asked to take a jump forward to the best of his capacity. He is instructed that after landing, he should fall forward and walk forward. When he takes the jump the nearest point on the ground touched by any part of his body after the jump is marked carefully and the distance between the starting line and this point is measured in inches. The subject is given three trials and the best trial is taken as the final record of the subject.

5. Endurance :

This is tested by what is known as " Potato Race ".

A straight line about three feet in length is drawn with slaked lime. This is the starting line. From this starting line, a circle with a diameter of one feet is drawn on one side of the straight line. A distance of ten feet is kept between the starting line and the centre of this circle. Three more circles with the same dimensions are drawn on the same side of the starting line as the first circle. The distance between the centres of any two circles is kept the same i.e. ten feet. The circles are so drawn

that a straight line passing through the centres of these circles would be perpendicular to the starting line. A potato of about two inches diameter or a wooden ball of about the same size is put approximately in the middle of each of these four circles. A basket of about one foot in height or a waste-paper basket of the same size and made out of bamboo strips is kept behind the starting line, just touching it on the side opposite to the circles with potatoes or balls.

The subject is asked to stand behind the starting line ready to start. He can stand in the same manner as he stands before running 75 yards in the first test.

On hearing the signal " GO", the subject runs from the starting line to the nearest circle, picks up the potato and returns to the starting line; and puts the potato into the basket. He then runs to the second circle, returns again to the starting line and places it into the basket. He repeats the same thing with the potatoes in the third and the fourth circles respectively. After the fourth potato is put into the basket, he crosses the starting line.

The time that elapses from the utterance of the word " GO " to the instant the subject crosses the starting line at the end of the race is noted down and is taken as the subject's record.

6. Accuracy :

This is measured by what is known as " Throwing the Tennis Ball Test.".

An iron ring or a cane ring with a diameter of ten inches is taken. A net made of cotton strings of about one eighth of an inch thickness is knit in such a way that one of its sides is fixed round the above mentioned ring and the other side is closed. It is fixed at such a height that the ring of the net is in level with the hip of the subject.

Two parallel straight lines ten feet apart from each other are drawn on the ground with slaked lime. The net is fixed on one side of the above straight lines. It is on the side other than the other straight line. It is fixed in such a way that the perpendicular from the straight line just passes through the iron ring of the net.

The subject is asked to stand outside the other line. He cannot touch, cut or cross the line while giving the test. He is then given a tennis ball and is asked to throw it in such a way that it falls exactly in the loop of the net - the loop being approximately ten inches long. Thus the ball is to be netted.

In one trial the subject is asked to net ten balls and the number of balls he can net is his score. He is given three trials and the best performance is recorded for the final score.

7. Reliability of tests :

The tests were readministered to about five percent of the boys after a minimum period of one year. The scores obtained were correlated by the rank correlation method.

Correlation between the first scores and the second scores obtained by readministering the tests to 221 boys

Tests	Coefficient of correlation
1. Speed	.57
2. Agility	.62
3. Arm-strength	.66
4. Leg - strength	.72
5. Endurance	.84
6. Accuracy	.71

PHYSICAL ACHIEVEMENT TESTS

BASIC VIII

TABLE 33

	····· T E S T S ·····					
	1	2	3	4	5	6
	No.75 yds	J & R	P.Up	S.B.J.	P.R	N.T.B.
1	2	3	4	5	6	7
1	Sec. 11.2	Inches 4	12	Inches 62	Sec. 14	4
2	12	5	14	60	12	3
3	11.3	6	15	64	12	2
4	11.6	5	16	60	13	1
5	11.7	4.5	17	66	12	2
6	12.2	3.5	15	58	12	3
7	11.6	6	17	62	12	4
8	11	5	16	67	12	3
9	12	4.5	12	60	13	4
10	13	5	13	62	14	3
11	12.2	6	15	64	12	2
12	12.2	6	16	58	13	5
13	11.5	5	17	56	12	3
14	11	4	14	60	12	4
15	11.1	3.5	15	62	12	4

1	2	3	4	5	6	7
16	11.2	4	16	63	13	3
17	12	5	14	64	12	5
18	11.2	4.5	13	65	14	4
19	11.4	6	12	66	12	3
20	11	5	15	62	12	2
21	11	5	12	60	13	3
22	11.3	4.5	15	62	12	4
23	12	3.5	16	58	12	3
24	11.6	4	17	60	13	2
25	12	5	15	66	12	5
26	11.5	6	14	65	14	4
27	11.2	5.5	15	64	12	3
28	11.4	4.5	16	63	14	4
29	11	4.5	17	62	12	3
30	11.6	4	15	60	13	2
31	11.5	5	14	58	12	4
32	11	6	13	59	12	5
33	12	5	12	60	14	4
34	11.8	6	10	62	12	3
35	11.7	4.5	12	64	13	5
36	11.5	3.5	14	66	12	4
37	11.2	3	16	68	14	6
38	11	4	17	66	12	7
39	11.3	5	17	65	12	5
40	11.5	6	16	60	12	4

1	2	3	4	5	6	7
41	11.4	5	15	58	14	4
42	11.6	4	14	58	12	5
43	11.7	3	14	60	12	6
44	11.8	4	13	62	12	5
45	11	5	12	60	13	6
46	11	5	13	60	12	4
47	11.2	4	14	62	12	4
48	11.1	3.5	16	64	14	3
49	11.6	4.5	15	60	12	4
50	12	5	17	62	13	5
51	11.8	6	12	60	12	5
52	11.7	5.5	14	58	12	6
53	11.6	6	16	62	12	5
54	11	5.5	15	64	13	5
55	11.9	4.5	14	66	14	4
56	12	4.5	13	62	14	3
57	12	3.5	12	60	12	4
58	11.4	4	12	59	13	5
59	11	5	12	58	12	4
60	11.2	6	14	60	14	5
61	11	5	16	56	12	4
62	11	4	15	56	13	5
63	11.2	3.5	14	60	14	2
64	11.5	4.5	13	62	12	1
65	11.6	5	14	66	12	2

1	2	3	4	5	6	7
66	11	6	15	64	12	3
67	11.7	5.5	16	60	12	4
68	11.8	6	17	60	18	5
69	11.6	5	18	62	12	6
70	11.5	5	17	62	14	4
71	11	5	14	60	12	3
72	11.5	4	16	62	12	2
73	11.4	3	17	64	14	1
74	11.2	3	15	66	13	4
75	11.2	3	16	64	12	2
76	11.8	4	15	65	12	3
77	12	5	14	66	12	2
78	11.7	4	13	60	14	4
79	11.5	4.5	14	59	13	5
80	11.6	3.5	16	58	12	2
81	11.2	2.5	15	62	12	3
82	11.3	3	13	62	13	4
83	11	4	18	60	14	3
84	11	5	15	61	12	4
85	11.2	4.5	16	62	14	2
86	11.2	6	17	64	13	3
87	11.3	5	18	63	12	4
88	11	4.5	17	60	15	5
89	11.6	5	16	58	12	4
90	11.5	5	15	60	12	4

PHYSICAL ACHIEVEMENT TESTS

TRADITIONAL VIII

TABLE NO.34

	••• T E S T S •••					
	1	2	3	4	5	6
No.	75 yds	J & R	P.Up	S.B.J.	P.R.	N.T.B
1	2	3	4	5	6	7
	Sec.	Inches		Inches	Sec.	
1	12	3	12	55	14	2
2	12.2	3.5	13	56	12	3
3	12	3	12	57	13	2
4	12.5	3	13	58	14	3
5	11.7	4	14	52	13	1
6	12.2	3	15	56	12	2
7	12	3	12	55	12	2
8	12.1	3	13	60	13	2
9	11.9	2.5	14	59	14	2
10	12	2	12	60	15	2
11	12.2	3	11	52	16	3
12	12.2	4	10	55	12	4
13	12.3	3.5	12	56	14	2
14	11.7	3.5	14	54	15	5
15	11.6	3	15	52	16	2

1	2	3	4	5	6	7
16	12	3.5	12	56	17	2
17	12.3	4	12	54	13	3
18	12.4	3.5	13	52	12	2
19	12.6	3	14	56	12	2
20	12	3	13	55	14	2
21	11.7	3.5	12	56	14	3
22	11.8	3	12	58	12	2
23	11.9	4	12	60	12	2
24	12.5	3.5	11	61	13	2
25	12.2	3.5	12	60	12	2
26	11.2	4	12	60	18	3
27	11.6	3	14	56	16	2
28	12	2.5	13	55	15	1
29	12.1	2.5	12	54	14	4
30	12.2	3	14	59	13	5
31	12	3	13	62	12	2
32	12	3	14	61	12	1
33	11.9	3.5	15	60	14	2
34	12	4	16	52	15	x
35	12.3	3.5	12	50	12	2
36	12.3	3	13	52	12	2
37	11.7	3.5	14	54	14	3
38	11.6	2.5	13	55	12	2
39	12	2	14	56	14	4
40	12.3	2.5	12	58	13	3

1	2	3	4	5	6	7
41	12.4	3.5	14	59	12	2
42	12	3	13	60	16	2
43	12	3	12	62	15	1
44	12	3	14	50	17	2
45	12	3	15	52	12	3
46	12.3	3.5	16	54	14	4
47	12.4	3	12	56	12	3
48	12.5	3	14	52	12	2
49	12	3.5	13	54	14	3
50	12.2	3	12	52	13	2
51	11.5	3	14	60	14	3
52	12	4	13	58	13	4
53	12.2	3.5	12	60	12	3
54	12.3	2.5	12	62	15	2
55	12	2	14	60	16	-
56	12	3.5	13	58	17	2
57	12	2.5	12	57	12	4
58	11.8	2.5	15	56	14	5
59	12	2.5	16	54	15	4
60	12	3.5	17	52	16	6
61	12.2	4	12	50	12	5
62	11.7	3.5	14	52	14	4
63	11.6	5	15	54	13	3
64	11.5	2.5	12	55	12	2
65	12	3	14	60	14	2

1	2	3	4	5	6	7
66	12.2	3.5	15	61	13	3
67	12	3	16	62	12	4
68	12.3	4	12	55	12	3
69	12.4	3	13	56	12	2
70	12	4	14	57	14	1
71	11.9	3.5	15	58	14	2
72	12	2.5	16	56	14	4
73	12.2	3	12	55	13	5
74	12.3	4	13	54	14	6
75	12.6	3	14	52	14	3
76	12.5	2	14	52	15	2
77	11.8	2.5	15	55	14	4
78	12	2.5	15	56	13	3
79	12.2	2	16	60	12	2
80	12	3	14	61	14	4
81	11.6	5	16	62	17	5
82	12	4	15	60	16	3
83	12	3	14	60	15	2
84	12	4	12	60	14	2
85	12	3	13	62	13	2
86	12.2	3	14	61	12	4
87	11.8	3.5	13	59	12	3
88	11.9	2.5	13	58	12	2
89	12	3.5	13	57	14	3
90	12.2	4	12	56	14	4

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PHYSICAL ACHIEVEMENT TESTS

SCORES TURNED INTO MARKS @

BASIC VIII

TABLE NO.35

No.	75 yds.	J.& R	P. Up	S.B.J	P.R	N.T.B
1	2	3	4	5	6	7
~~1~~	(Marks)	(Marks)	(Marks)	(Marks)	(Marks)	(Marks)
1	54.5	10	64	50	80	40
2	59	15	72	48	90	30
3	54	20	76	52	90	20
4	52	15	80	48	85	10
5	51	12.5	84	54	90	20
6	47.5	7.5	76	46	90	30
7	52	20	84	50	90	40
8	56	15	80	55	90	30
9	49	12.5	64	48	85	40
10	42	15	68	50	80	30
11	47.5	20	76	52	90	20
12	48.5	20	80	46	85	50
13	52.5	15	84	44	90	30
14	56	10	72	48	90	40
15	55.5	7.5	76	50	90	40

1	2	3	4	5	6	7
16	54.5	10	80	51	85	30
17	49	15	72	52	90	50
18	54.5	12.5	68	53	80	40
19	53	20	64	54	90	30
20	56	15	76	50	90	20
21	56	15	64	48	85	30
22	54	12.5	76	50	90	40
23	49	7.5	80	46	90	30
24	52	10	84	48	85	20
25	49	15	76	54	90	50
26	52.5	20	72	53	80	40
27	54.5	17.5	76	52	90	30
28	53	12.5	80	51	80	40
29	56	12.5	84	50	90	30
30	52	10	76	48	85	20
31	52.5	15	72	46	85	40
32	56	20	68	47	90	50
33	49	15	64	48	80	40
34	50.5	15	56	50	90	30
35	51	12.5	64	52	85	50
36	52.5	7.5	72	54	90	40
37	54.5	5	80	56	80	60
38	56	10	84	54	90	70
39	54	15	84	53	90	50
40	56	20	80	48	90	40

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1	2	3	4	5	6	7
41	53	15	76	46	80	40
42	52	10	72	46	90	50
43	51	5	72	48	90	60
44	50.5	10	68	50	90	50
45	56	15	64	48	85	60
46	56	15	68	48	90	40
47	54.5	10	72	50	90	40
48	55.5	7.5	80	52	80	30
49	52	12.5	76	48	90	40
50	49	15	84	50	85	50
51	50.5	20	64	48	90	50
52	51	17.5	72	46	90	60
53	52	20	80	50	90	50
54	56	17.5	76	52	85	50
55	49.5	12.5	72	54	80	40
56	49	12.5	68	50	80	30
57	49	7.5	64	48	90	40
58	53	10	64	47	85	50
59	56	15	64	46	90	40
60	54.5	20	72	48	80	50
61	56	15	80	44	90	40
62	56	10	76	44	80	50
63	54.5	7.5	72	48	80	20
64	52.5	12.5	68	50	90	10
65	52	15	72	54	90	20

1	2	3	4	5	6	7
66	56	20	76	52	90	30
67	51	17.5	80	48	90	40
68	50.5	20	84	48	85	50
69	52	15	88	50	90	60
70	52.5	15	84	50	80	40
71	56	15	72	48	90	30
72	52.5	10	80	50	90	20
73	53	5	84	52	80	10
74	54.5	5	76	54	85	40
75	54.5	5	80	52	90	20
76	50.5	10	76	53	90	30
77	49	15	72	54	90	20
78	51	10	68	48	80	40
79	52.5	12.5	72	47	85	50
80	52	7.5	80	46	90	20
81	54.5	2.5	76	50	90	30
82	54	5	84	50	85	40
83	56	10	88	48	80	30
84	56	15	76	49	90	40
85	54.5	12.5	80	50	80	20
86	54.5	20	84	52	85	30
87	54	15	88	51	90	40
88	56	12.5	84	48	80	50
89	52	15	80	46	90	40
90	52.5	15	76	48	90	40

PHYSICAL ACHIEVEMENT TESTS

SCORES TURNED INTO MARKS @

TRADITIONAL VIII

TABLE NO.36

No.	75 yds.	J.& R	P.Up	S.B.J.	P.R	N.T.B
1	2	3	4	5	6	7
1	49	5	64	43	80	20
2	47.5	7.5	68	44	90	30
3	49	5	64	45	85	20
4	45.5	5	68	46	80	30
5	51	10	72	40	85	10
6	47.5	5	76	44	90	20
7	49	5	64	43	90	20
8	49.5	5	68	48	85	20
9	49	2.5	72	47	80	20
10	47.5	0	64	48	75	20
11	47.5	5	60	40	70	30
12	47	10	56	43	90	40
13	51	7.5	64	44	80	20
14	52	7.5	72	42	75	50
15	49	5	76	40	70	20

1	2	3	4	5	6	7
16	47	7.5	64	44	65	20
17	46	10	64	42	85	30
18	45	7.5	68	40	90	20
19	49	5	72	44	90	20
20	51	5	68	43	80	20
21	50	7.5	64	44	80	30
22	49	5	64	43	80	20
23	45.5	10	64	48	90	20
24	47.5	7.5	60	49	85	20
25	47.5	7.5	64	48	90	20
26	54.5	10	64	48	60	30
27	52	5	72	44	70	20
28	49	2.5	68	43	75	10
29	48.5	2.5	64	42	80	40
30	47.5	5	72	47	85	50
31	49	5	68	50	90	20
32	49	5	72	49	90	10
33	49.5	7.5	76	48	80	20
34	49	10	80	40	75	0
35	47	7.5	64	38	90	20
36	47	5	68	40	90	20
37	51	7.5	72	42	80	30
38	52	2.5	68	43	90	20
39	49	0	72	44	80	40
40	47	2.5	64	46	85	30

1	2	3	4	5	6	7
41	46	7.5	72	47	90	20
42	49	5	68	48	70	20
43	49	5	64	50	75	10
44	49	5	72	38	65	20
45	49	5	76	40	90	30
46	47	7.5	80	42	80	40
47	46	5	64	44	90	30
48	45.5	5	72	40	90	20
49	49	7.5	68	42	80	30
50	47.5	5	64	40	85	20
51	52.5	5	72	48	80	30
52	49	10	68	46	85	40
53	47.5	7.5	64	48	90	30
54	47	2.5	64	50	75	20
55	49	0	72	48	70	-
56	49	7.5	68	46	65	20
57	49	2.5	64	45	90	40
58	50.5	2.5	76	44	80	50
59	49	2.5	80	42	75	40
60	49	7.5	84	40	70	60
61	47.5	10	64	38	90	50
62	51	7.5	72	40	80	40
63	52	15	76	42	85	30
64	52.5	2.5	64	43	90	20
65	49	5	72	48	80	20

1	2	3	4	5	6	7
66	47.5	7.5	76	49	85	30
67	49	5	80	50	90	40
68	47	10	64	43	90	30
69	46	5	68	44	90	20
70	49	10	72	45	80	10
71	49.5	7.5	76	46	80	20
72	49	2.5	72	44	80	40
73	47.5	5	64	43	80	50
74	47	10	68	42	80	60
75	45	5	72	40	75	30
76	45.5	0	72	40	80	20
77	50.5	2.5	76	43	85	40
78	49	2.5	76	44	90	30
79	47.5	0	80	48	80	20
80	49	5	72	49	80	40
81	52	15	80	50	65	50
82	49	10	76	48	70	30
83	49	5	72	48	75	20
84	49	10	64	48	80	20
85	49	5	68	50	85	20
86	47.5	5	76	49	90	40
87	50.5	7.5	68	47	90	30
88	49.5	2.5	68	46	90	20
89	49	7.5	68	45	80	30
90	47.5	10	64	44	80	40

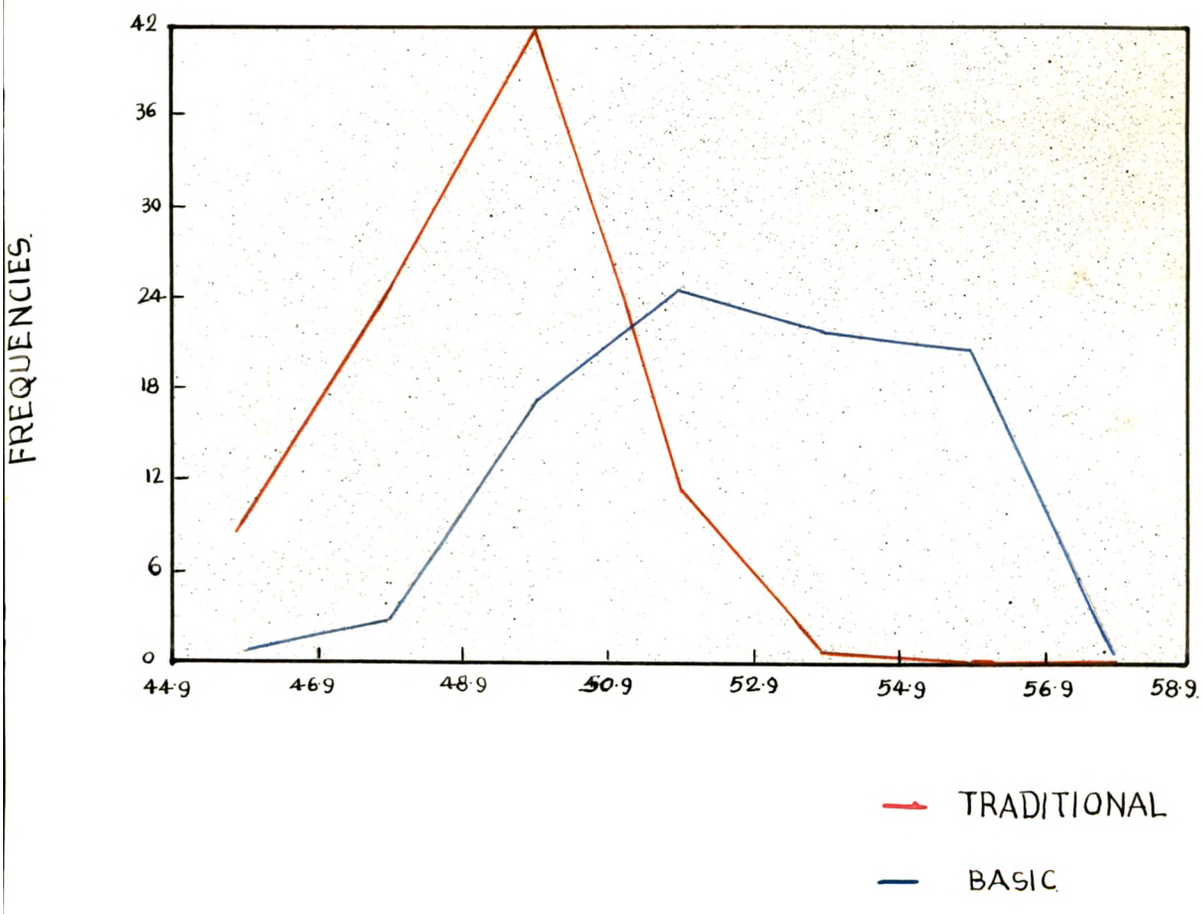
@(Reference: Dr.N.N.Shukla's Unpublished Ph.D. Thesis) pp.297-307

FREQUENCY GRAPH

(Physical Education Tests)

Graph - 1

75 YARDS



75 YARDS RUNNING

$\Sigma d_i = 37.5$

$\Sigma d_i^2 = 2384.50$

TABLE NO.37

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
4.17	819.50	28.63	13.03^{xx}

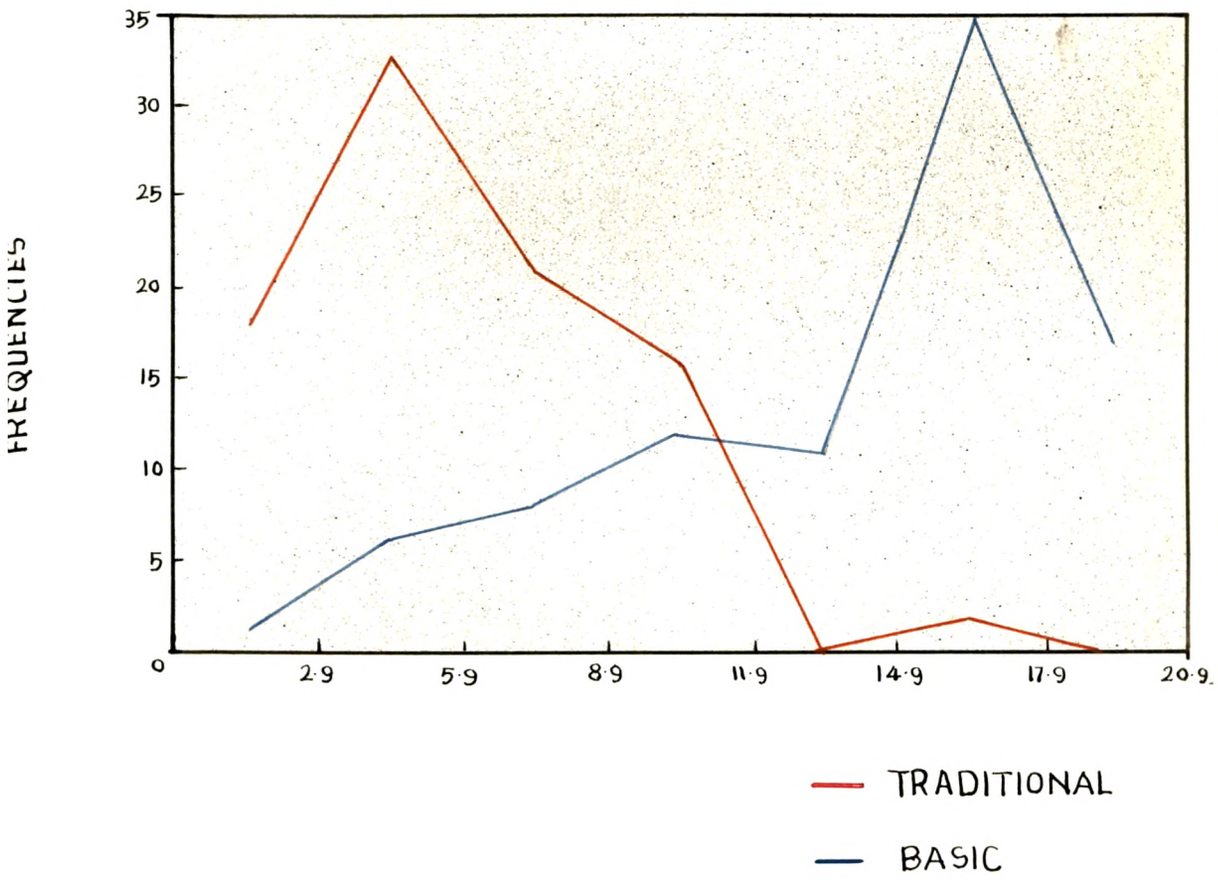
On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 13.03 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

FREQUENCY GRAPH

(Physical Education Tests)

Graph - 2

JUMP AND REACH



JUMP AND REACH

$\Sigma d_i = 653$

$\Sigma d_i^2 = 8226.75$

TABLE NO.38

Significance of difference between Means by means of t-test (paired).

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
7.25	3496.13	59.13	10.97^{xx}

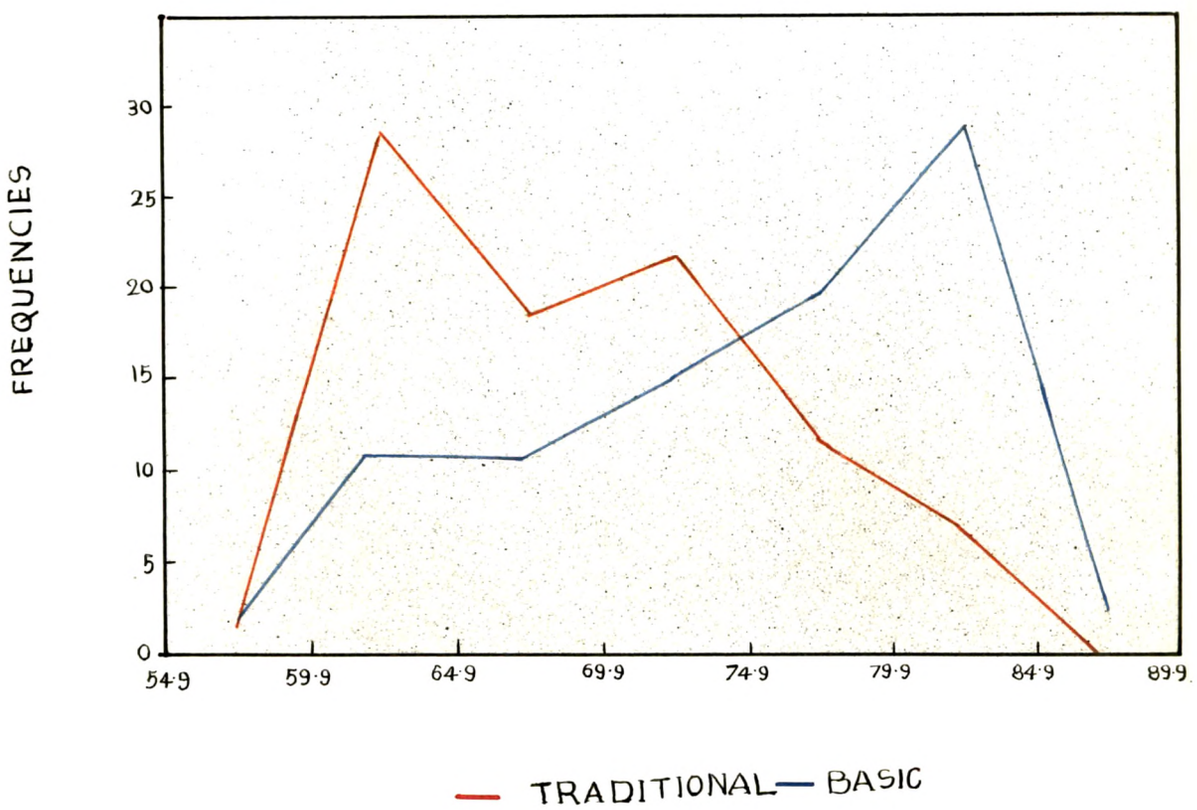
On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 10.97 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

FREQUENCY GRAPH

(Physical Education Tests)

Graph - 3

PULL - UP



PULL - UP

$\Sigma d_i = 516$

$\Sigma d_i^2 = 11728$

TABLE NO.39

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
5.733	8769.94	93.6438	5.479**

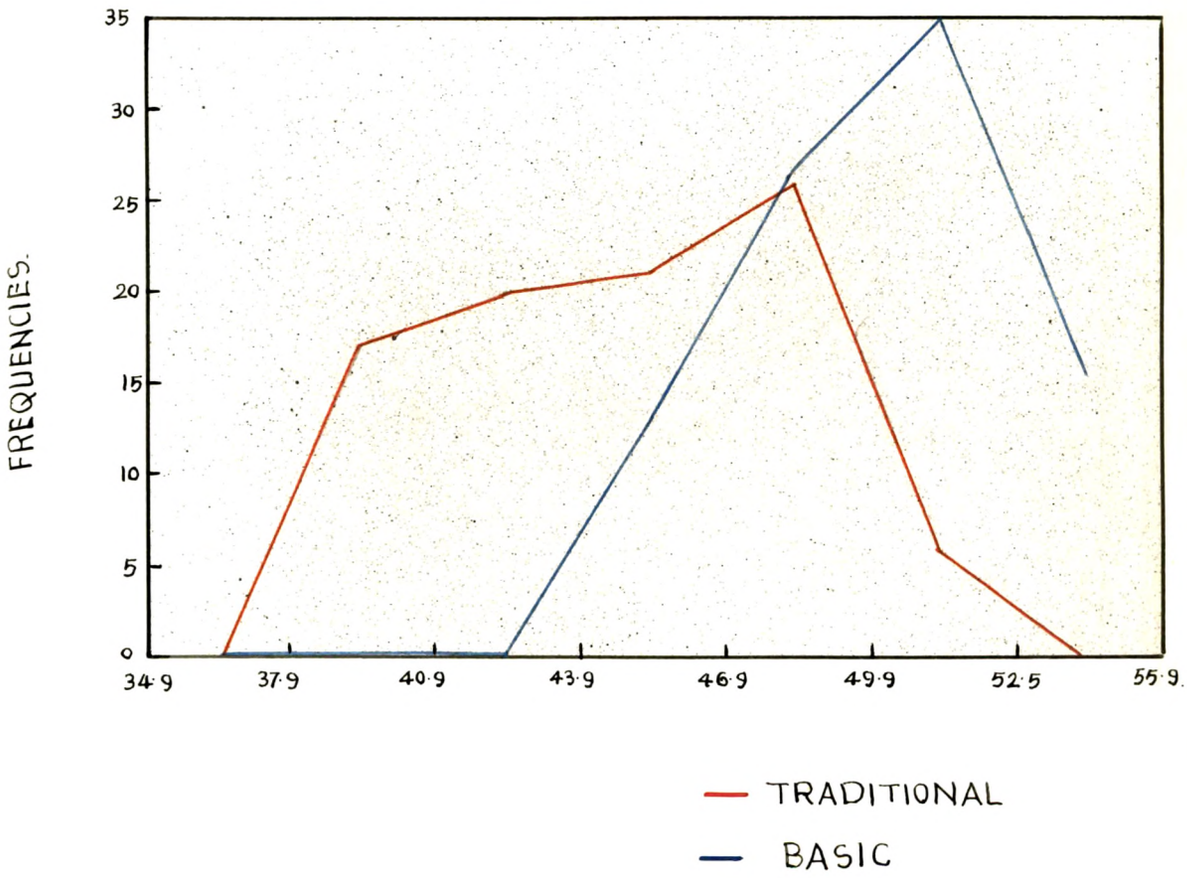
On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 5.479 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

FREQUENCY GRAPH

(Physical Education Tests)

Graph - 4

STANDING BROAD JUMP



STANDING BROAD JUMP

$\Sigma d_i = 438$

$\Sigma d_i^2 = 4190$

TABLE NO.40

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
4.87	2055.48	45.34	9.61 xx

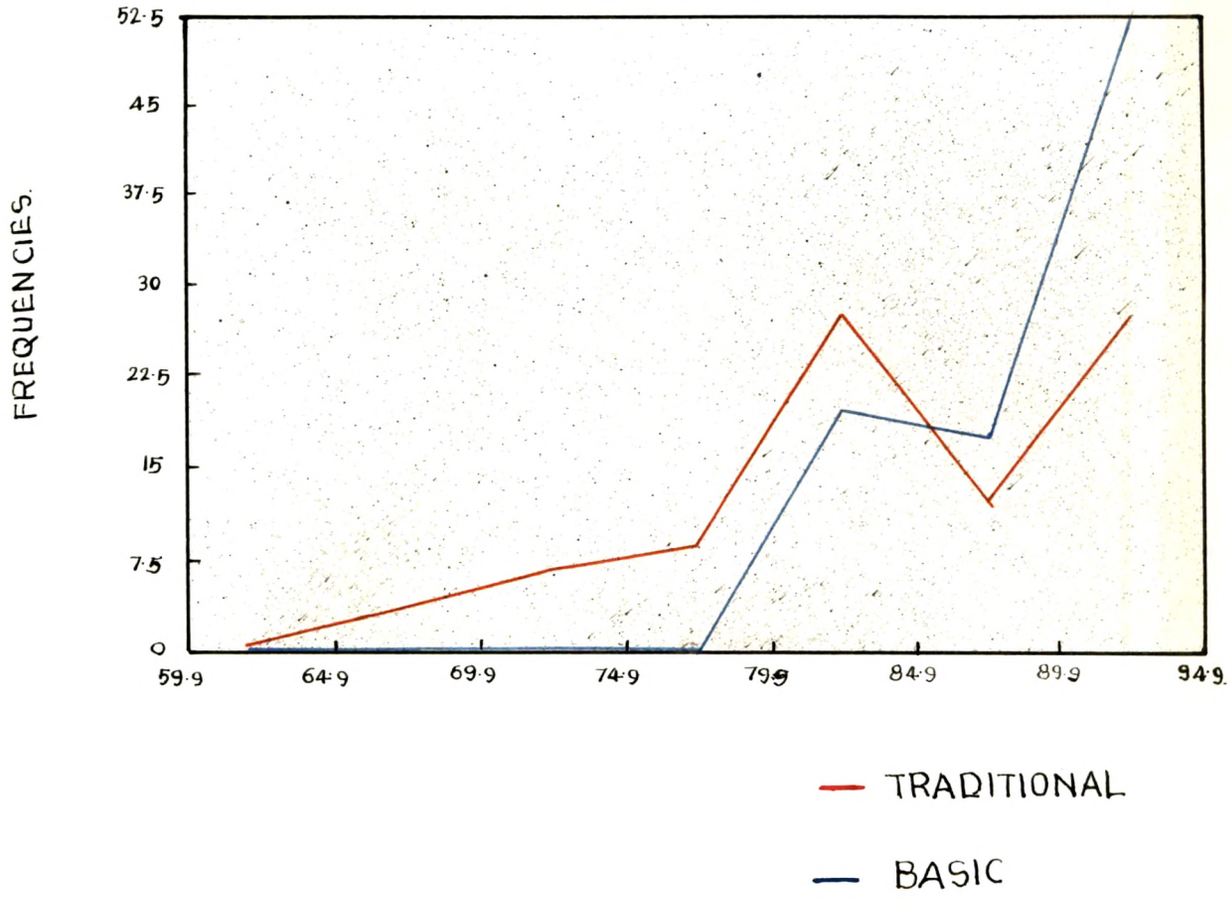
On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 9.61 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

FREQUENCY GRAPH

(Physical Education Tests)

Graph - 5

POTATO RACE



POTATO RACE

$\Sigma d_i = 460$

$\Sigma d_i^2 = 8250$

TABLE NO.41

Significance of difference between means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
5.11	5899.91	76.81	5.95^{xx}

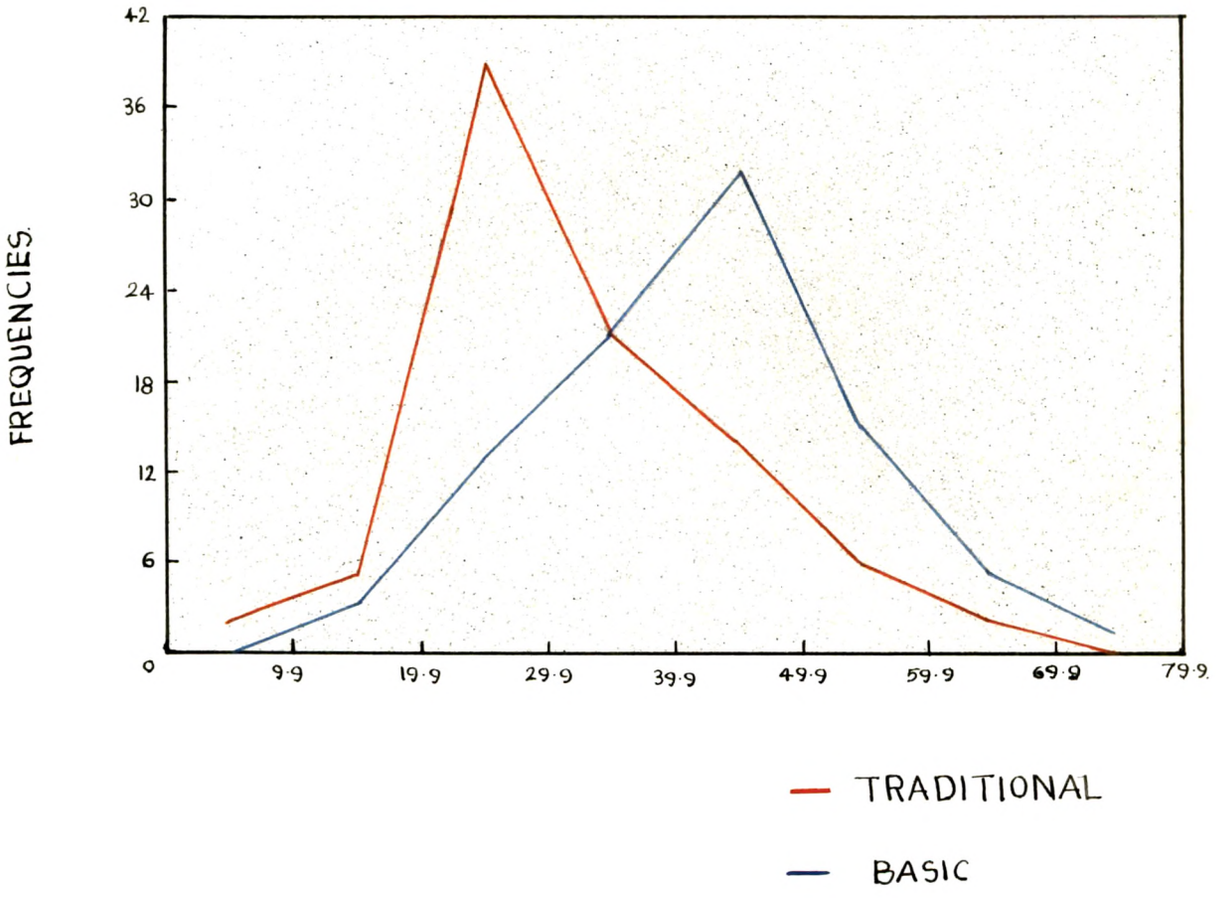
On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 5.95 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

FREQUENCY GRAPH

(Physical Education Tests)

Graph - 6

NETTING THE TENNIS BALL



$\Sigma d_i = 900$

$\Sigma d_i^2 = 36200$

TABLE NO.42

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
10	27200	164.92	5.4**

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 5.4 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

IV. SOCIAL ADJUSTMENT INVENTORY

1. Inventory:

Originally this is the inventory designed by Shri H.S.Asthana, University of Lucknow, for use with Hindi and Urdu knowing school and college students. The test seeks to segregate the normal from the poorly adjusted boys between ages 14 and 18 years. The Gujarati version of this inventory is used for both the groups - basic and traditional (Appendix 5)

Shri Asthana's inventory is based upon the well-known Personality Inventory of Thurstone.It has utilised the experimental findings of Mosier in selecting the more highly diagnostic items.(5)

2. Administration:

(1) The inventory is self-administering. To insure careful reading of the instructions, the examiner should read the instructions appearing at the top on the first page of the questionnaire while the testees are reading it silently along with him.

(2) The inventory is non-timed. It may take about thirty minutes to answer.

(3) The subjects are to interpret the questions for themselves.

3. Scoring:

A scoring key is in Appendix 6 for " Yes" and "no" separately. The total of these numbers is the score.

(5) H.S.Asthana, Manual for Adjustment Inventory, Student form 1955, University of Lucknow,Lucknow.

4. Norms : 152

The following table gives the tentative norms in percentiles for different scores.

TABLE NO.43

SCORES :	PERCENTILE
214	99.5
207	99
191	95
182	90
171	80
166	75
162	70
155	60
149	50
140	40
136	30
132	25
127	20
116	10
107	5

5. Reliability :

Coefficient of reliability was determined by split-half method correlating the odd and even items. The reliability coefficient is .80.

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SOCIAL ADJUSTMENT INVENTORY

THE PRESENT EXPERIMENT

SCORES

BASIC VIII

TABLE 44

No.	Score	No.	Score	No.	Score
1	112	19	180	37	202
2	200	20	182	38	180
3	168	21	184	39	170
4	212	22	192	40	182
5	178	23	190	41	162
6	170	24	192	42	142
7	190	25	100	43	150
8	180	26	202	44	152
9	200	27	156	45	154
10	182	28	146	46	110
11	187	29	148	47	120
12	120	30	142	48	124
13	118	31	140	49	126
14	114	32	132	50	136
15	112	33	122	51	148
16	180	34	200	52	150
17	182	35	192	53	152
18	172	36	200	54	164

No.	Score	No.	Score	No.	Score
55	174	67	188	79	160
56	176	68	184	80	152
57	178	69	172	81	154
58	180	70	200	82	150
59	184	71	202	83	152
60	192	72	204	84	148
61	202	73	190	85	140
62	200	74	180	86	142
63	212	75	178	87	136
64	178	76	176	88	150
65	190	77	150	89	160
66	190	78	148	90	170

SOCIAL ADJUSTMENT INVENTORY

THE PRESENT EXPERIMENT

SCORES

TRADITIONAL VIII

TABLE 45

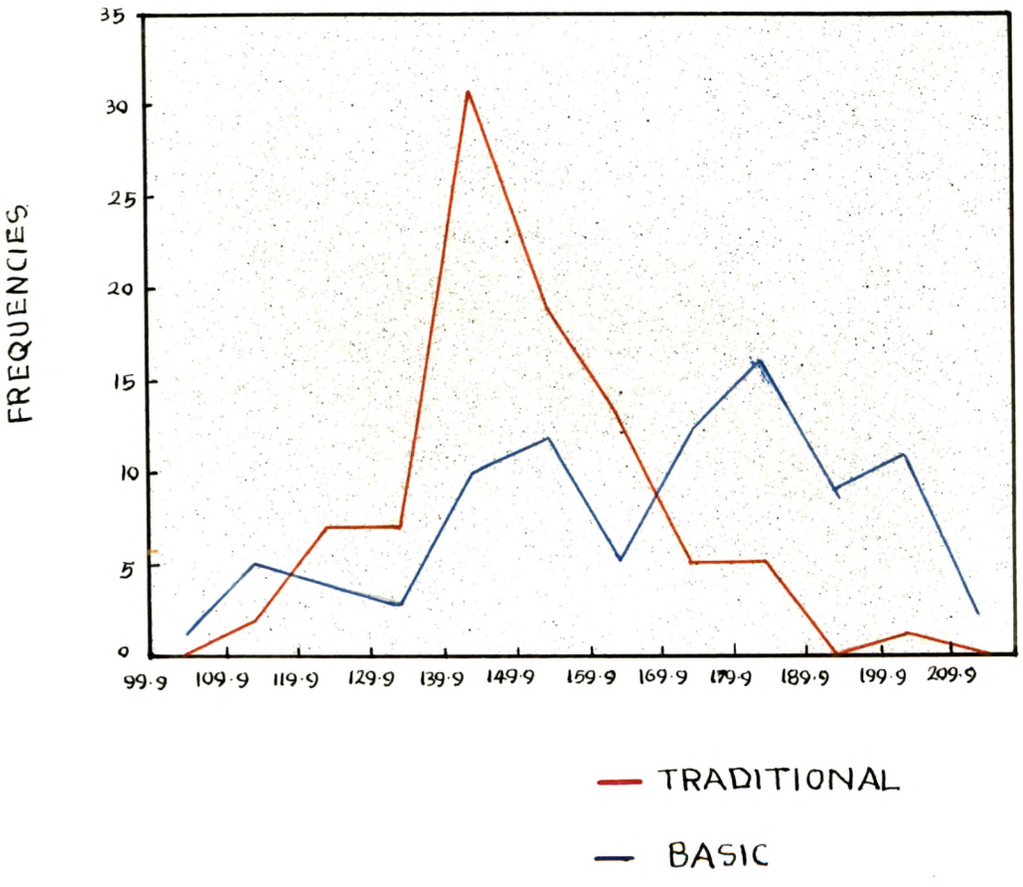
No.	Score	No.	Score	No.	Score
1	120	14	120	27	156
2	180	15	122	28	150
3	182	16	132	29	148
4	150	17	134	30	140
5	142	18	136	31	200
6	140	19	138	32	140
7	152	20	140	33	142
8	156	21	142	34	140
9	160	22	144	35	152
10	162	23	150	36	160
11	142	24	152	37	156
12	120	25	160	38	158
13	114	26	166	39	140

No.	Score	No.	Score	No.	Score
40	132	57	148	74	170
41	122	58	150	75	168
42	124	59	152	76	166
43	114	60	140	77	164
44	120	61	162	78	160
45	140	62	140	79	152
46	142	63	138	80	142
47	148	64	140	81	140
48	146	65	142	82	142
49	144	66	140	83	140
50	150	67	142	84	140
51	152	68	150	85	142
52	154	69	160	86	132
53	162	70	170	87	152
54	172	71	180	88	150
55	180	72	182	89	148
56	142	73	172	90	160

FREQUENCY GRAPH

Graph - 7

SOCIAL ADJUSTMENT



SOCIAL ADJUSTMENT

$\Sigma d_i = 1638$

$\Sigma d_i^2 = 90961$

TABLE NO.46

Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
18.2	61149.40	247.28	6.58^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 6.58 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

V. THE MINNESOTA MANUAL DEXTERITY TEST

The test consists of an oblong board containing fifty-eight round holes into which circular blocks can be fitted. Two operations are measured:

1. Speed of fitting the blocks into the holes; and
2. Speed of turning over the blocks that are already in the holes.(6)

Apparatus required:

The Minnesota Manual Dexterity Test and a stop-watch.

Method of administering the Test:

PART I

The Placing Test:

The board is placed along the edge of the table in front of the subject. In the beginning all the blocks are in the holes with their red ends upwards. The board is then slided to the convenient position and lifted up, leaving the blocks. The board is then put in its original position for starting the work.

The subject is instructed as follows:

" Stand facing the board. This is a speed test. You have to put back all the blocks into the holes in the board as fast as you can. Use only one hand. Start with the top block in the left hand column of holes. Then take the next block in the same column. When the first column is

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(6) Baroda Studies in Mental Measurement No.2. Faculty of Education and Psychology,M.S. University of Baroda.

finished, go right on to the next in the same manner. Continue the work till you put all the blocks in the board."

The administrator of the test demonstrates to the testee the work of putting back all the blocks in the holes of the board so that the latter gets acquainted with the work he has to do.

Four test trials are given and the time taken for each trial is noted in seconds. An interval of thirty seconds is given between two successive trials. The final score is the sum of the times in seconds for all four test trials.

P A R T II

The Turning Test :

All the blocks are in the board with their red ends facing upwards. The following are the instructions :

" This time you have to turn the blocks over as fast as you can. Start with the top blocks in the left-hand column and work down the column towards yourself. After finishing the first column go to the top block of the second column and continue in the same manner. Pick up the block with the right hand, twist the wrist until the bottom of the block is facing your left hand which grasps it and place it back in the same hole with its blue end upward. Continue in the same manner with the remaining blocks."

The administrator demonstrates to the subject the work of turning all the blocks in the board so that the latter gets acquainted with the work he has to do.

Each subject is allowed to turn blocks in one board for practice and then times taken for four successive trials are noted. An interval of thirty seconds is given between two successive trials. The final score is the sum of the times in seconds for all four trials.

Norms:

Norms are calculated in percentile ranks.

Purpose of the Test :

The present test gives a measure of the degree of eye-hand coordination of the testees. As such, it is mainly useful to test the mechanical aptitude of the testees. As a guidance tool the test can serve a very useful purpose in secondary schools.

Interpretation of the Test Scores:

As this test is a tool for vocational guidance, the counsellor should be cautious in interpreting the test scores. It can be seen from the table of norms that low scores show the existence of

a high aptitude among the testees. This is so because of the fact that the scores in seconds are converted into Percentile Ranks.

Usefulness of the test :

This test is very useful for selecting employees for jobs requiring a very high degree of eye-hand coordination. The following are a few such jobs :

Typing, Composing, Filling,
Spinning, Weaving etc.

Persons having a percentile rank of 50 and above are better fitted than others doing such jobs.

Reliability of the test :

In order to find the reliability of the test the time taken by each subject for the first and the third trial was correlated against the time for the second and the fourth trial.

Reliability coefficients found by using abbve method are :

1. Placing test : 0.87
2. Turning test : 0.90

The present Experiment :

The test was administered to both the groups. The scores are as under :

THE MINNESOTA MANUAL DEXTERITY TEST

SCORES OF THE PLACING TEST

TABLE 47

No.	...BASIC VIII...		...TRADITIONAL VIII...	
	Total Scores	Percentile Rank	Total Scores	Percentile Rank
1	2	3	4	5
1	250	20	240	45
2	252	18	237	54
3	259	10	248	24
4	262	8	243	35
5	270	3	242	38
6	258	11	234	60
7	235	58	244	33
8	225	80	247	26
9	237	54	250	20
10	230	70	254	14
11	244	33	260	9
12	245	30	264	6
13	235	58	251	19
14	239	50	249	22
15	243	35	246	28

1	2	3	4	5
16	225	80	230	70
17	224	81	232	65
18	223	82	228	74
19	228	74	240	45
20	229	72	244	33
21	233	62	247	26
22	238	52	248	24
23	247	26	248	24
24	250	20	250	20
25	233	62	244	33
26	234	60	225	80
27	228	74	235	58
28	226	78	239	50
29	246	28	246	28
30	237	54	242	38
31	223	82	247	26
32	219	90	241	40
33	251	19	237	54
34	240	45	227	76
35	236	56	233	62
36	230	70	249	22
37	233	63	247	26
38	251	19	239	50
39	225	80	242	38
40	227	76	232	65

1	2	3	4	5
41	230	70	225	80
42	232	65	244	33
43	229	72	240	45
44	240	45	248	24
45	245	30	245	30
46	237	54	232	65
47	240	45	234	60
48	244	33	244	33
49	246	28	251	19
50	250	20	260	9
51	232	65	247	26
52	243	35	248	24
53	227	76	252	18
54	228	74	239	50
55	232	65	226	78
56	236	56	230	70
57	238	52	250	20
58	231	67	244	33
59	247	26	250	20
60	239	50	247	26
61	241	40	244	33
62	236	56	246	28
63	220	88	235	58
64	221	86	240	45
65	224	81	248	24

1	2	3	4	5
66	214	93	246	28
67	232	65	251	19
68	225	80	244	33
69	233	62	246	28
70	234	60	249	22
71	239	50	238	52
72	229	72	240	45
73	228	74	244	33
74	246	28	243	35
75	250	20	236	56
76	247	26	232	65
77	230	70	250	20
78	231	67	247	26
79	244	33	248	24
80	240	45	250	20
81	239	50	225	80
82	238	52	240	45
83	236	56	242	38
84	240	45	248	24
85	230	70	239	50
86	231	67	243	35
87	226	78	246	28
88	225	80	247	26
89	250	20	252	18
90	240	45	249	22

THE MINNESOTA MANUAL DEXTERITY TEST

SCORES OF THE TURNING TEST

TABLE 48

	...BASIC VIII...		...TRADITIONAL VIII ...	
No.	Total Scores	Percentile Rank	Total Scores	Percentile Rank
1	2	3	4	5
1	200	42	202	38
2	204	34	206	30
3	190	61	204	34
4	191	60	208	26
5	180	78	210	23
6	186	67	200	42
7	202	38	204	34
8	210	23	196	50
9	194	54	198	46
10	196	50	191	60
11	195	52	194	54
12	196	50	204	34
13	188	64	207	28
14	190	61	214	19
15	184	70	216	16

1	2	3	4	5
16	196	50	220	12
17	202	38	196	50
18	201	40	195	52
19	212	21	186	67
20	215	18	197	48
21	180	78	202	38
22	179	80	188	64
23	178	81	204	34
24	180	78	210	23
25	190	61	214	19
26	195	52	190	61
27	186	67	194	54
28	192	58	202	38
29	196	50	199	44
30	185	68	197	48
31	190	61	192	58
32	202	38	198	46
33	206	30	204	34
34	196	50	205	32
35	192	58	211	22
36	184	70	212	21
37	200	42	205	32
38	202	38	204	34
39	194	54	201	40
40	188	64	202	38

1	2	3	4	5
41	183	72	208	26
42	185	62	190	61
43	198	46	196	50
44	194	54	199	44
45	208	26	197	48
46	210	23	192	58
47	199	44	208	26
48	180	78	207	28
49	176	83	204	34
50	172	88	193	36
51	190	61	201	40
52	189	62	196	50
53	186	67	199	44
54	182	74	211	22
55	200	42	212	21
56	201	40	213	20
57	196	50	215	18
58	188	64	220	12
59	180	78	222	10
60	182	74	190	61
61	190	61	196	50
62	186	67	204	34
63	184	70	206	30
64	188	64	210	23
65	178	81	212	21

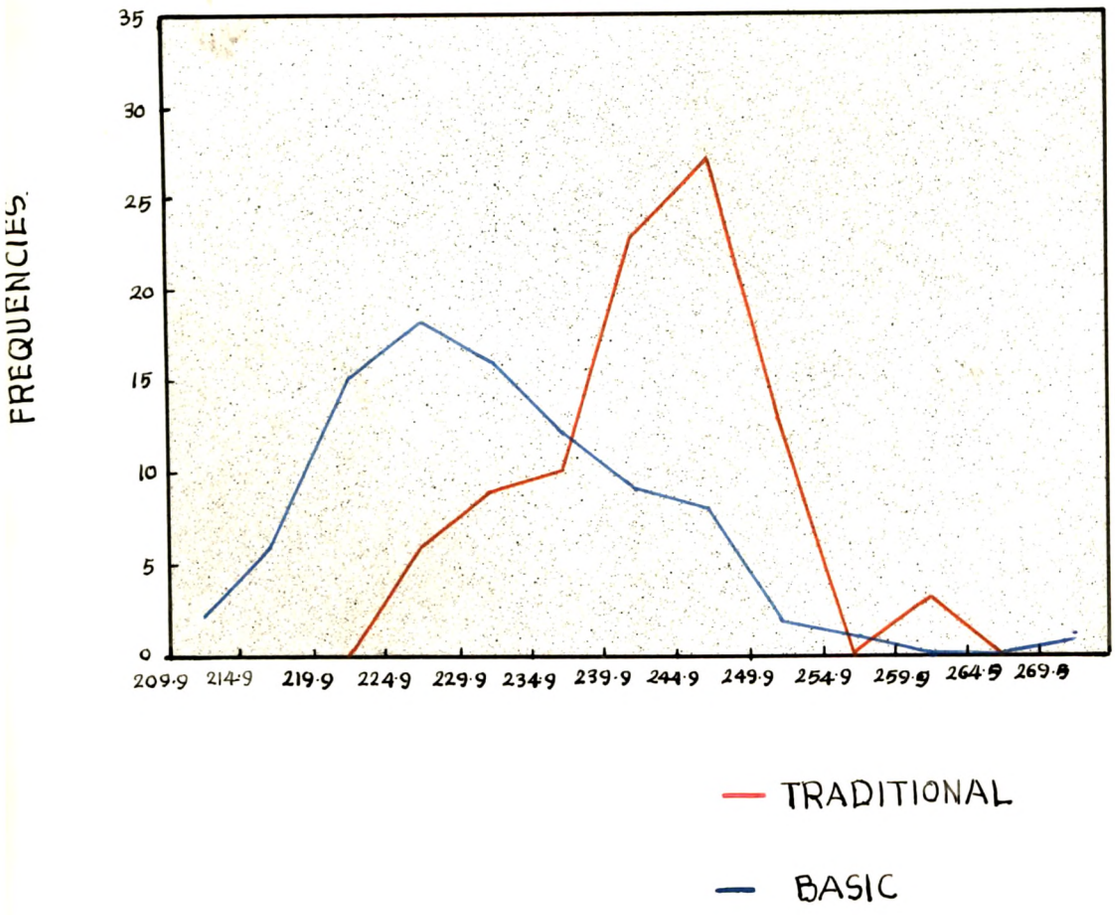
1	2	3	4	5
66	172	88	203	36
67	180	78	200	42
68	182	74	203	36
69	176	83	193	56
70	186	67	194	54
71	189	62	207	28
72	194	54	209	24
73	199	44	215	18
74	180	78	220	12
75	182	74	208	26
76	179	80	210	23
77	182	74	204	34
78	183	72	194	54
79	196	50	205	32
80	192	58	211	22
81	191	60	207	28
82	192	58	208	26
83	187	68	209	24
84	185	68	198	46
85	184	70	208	26
86	180	78	212	21
87	178	81	201	40
88	190	61	203	36
89	193	56	214	19
90	192	58	210	23

FREQUENCY GRAPH

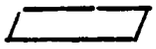
(M.M. Dexterity Tests)

Graph - ⏱ - A

PLACING



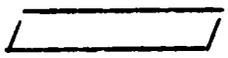
PLACING



$\Sigma d_i = -582$

$\Sigma d_i^2 = 16318$

TABLE NO.49



Significance of difference of Means by means of t-test (paired)

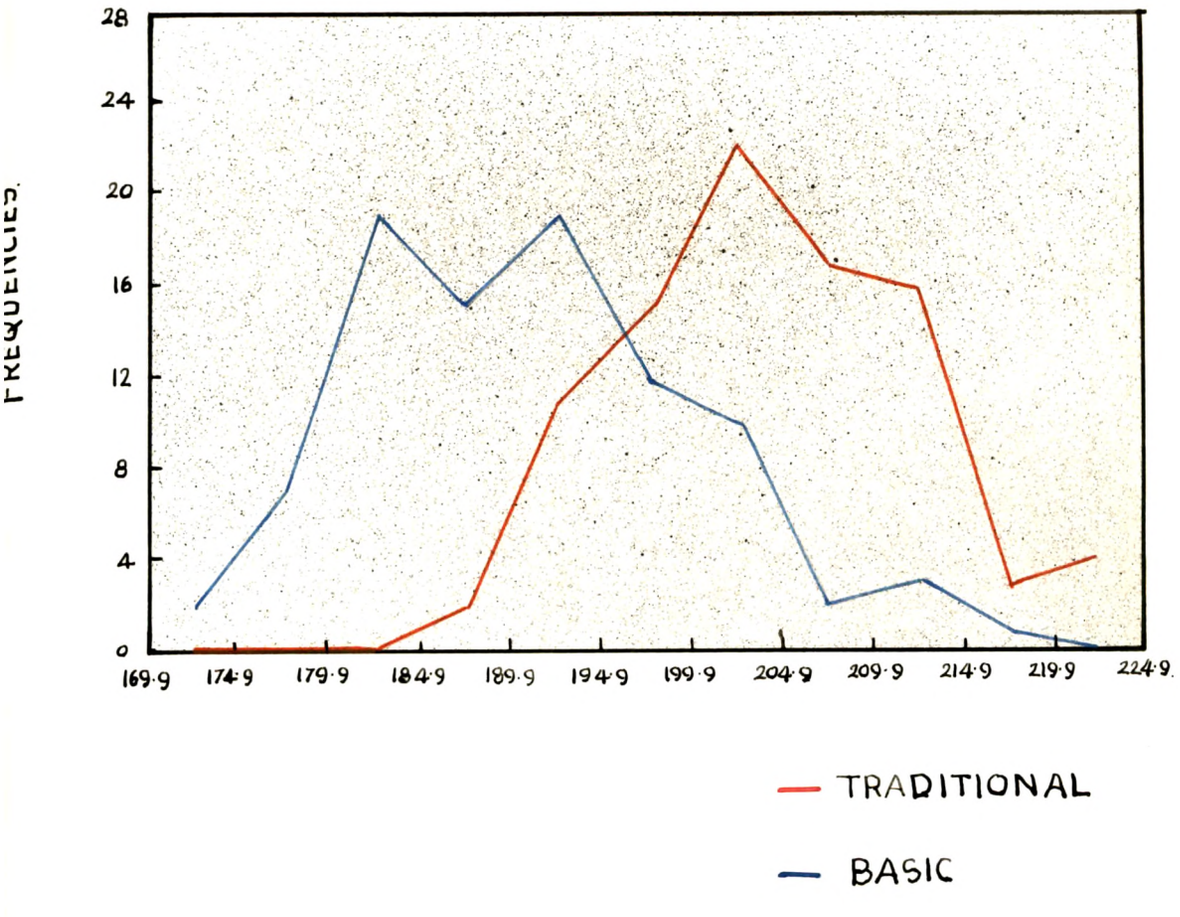
M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
-6.47	12550.52	112.03	5.17^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 5.17 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.

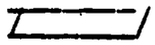
FREQUENCY GRAPH
(M.M.Dexterity Test)

Graph - 8 - B

TURNING



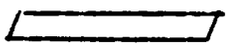
TURNING



$\Sigma d_i = -1229$

$\Sigma d_i^2 = 32324$

TABLE NO.50



Significance of difference between Means by means of t-test (paired)

M_d	Σx_d^2	$\sqrt{\Sigma x_d^2}$	t
- 13.66	15530.40	124.62	9.81^{xx}

On consulting t-table from Fisher and Yates' tables, we find that at 1% level of significance, the observed value of t = 9.81 for 89 degrees of freedom is highly significant. Hence the difference between the means is significant and cannot be considered as due to chance.