CHAPTER – VII

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CHAPTER – VII

SUMMARY

7.1 INTRODUCTION:

Intelligence plays an important role in one’s academic, professional, social and personal life. It is because of this reason that parents, teachers and employing organizations have always been concerned with the problems of measuring intelligence. Earlier primitive man employed crude methods of measuring intelligence by means of physical strength and solving puzzle. With the advancement of civilization and development of scientific enquiry the methods of measuring intelligence were also improved. Psychologists and educators have developed various kinds of tools like scales and tests to measure intelligence of children. With the help of these scales, IQ of children of different age-group can be measured. The use of intelligence tests has greatly increased in these days. The fact is due to wide individual differences that exist among individuals with regard to intelligence. Truly speaking, no two individuals, even identical twins or individuals nurtured in identical environments, are endowed with equal mental energy. The assessment of intelligence by various tests has given reasons enough to believe that not only does intelligence vary from individual to individual, but it also tends to vary in the same individual from age to age and situation to situation.
7.2 REVIEW OF RELATED LITERATURE:

To the French psychologist Binet goes the credit of giving the world the first systematic intelligence tests. Binet (1905) and his co-worker Simon published the first scale for measurement of intelligence known as Binet - Simon scale. Binet (1908) and Simon revised the scale and it was the first Age-Scale which had created interests among the psychologists. The concept of Mental Age (MA) which gives a measure of the individual’s level of intellectual development, though formulated by Binet in 1905, was first used in the 1908 scale. Terman (1916) brought out the Stanford Revision of the Binet-Simon scale which is known as the Stanford-Binet Scale and popularized the term ‘Intelligent Quotient’ (IQ), which has since then, been found to be an extremely practical concept. American Psychologist Wechsler (1949,67) published his new intelligence test known as the Wechsler-Bellevue scale for children above 10 and adults and the new version was named as WAIS- Wechsler Adult Intelligence Scale. He also devised a scale for children known as Wechsler Intelligence Scale for Children aged 5-15 and a scale known as the Wechsler Preschool and Primary Scale of Intelligence. Cattell (1930) developed a Culture Fair test of Intelligence while Thurstone (1938) developed the Primary Mental Abilities (PMA). Kuhlman and Anderson (1963) developed an intelligence test for children age group KG to grade 12 levels. McCarthy (1972) developed a scale of children abilities known as the McCarthy Scales of Children Abilities (MSCA) suitable for children between the ages 2½ to 8½. Thorndike & Hagen (1982) devised a Cognitive Abilities Test (CAT) for primary levels. Kaufman & Kaufman (1983) developed the Kaufman Assessment Battery for Children (K-ABC) aged 2½ to 12½ and in 1990 they developed the Kaufman Brief
Intelligence Test (K-BIT), designed as a quick screening instrument to estimate the level of intellectual functioning of the age group 4 to 90 years.

Historically, in India, construction of psychological testing was started by the Christian missionaries' up to the year 1921. The first Indian who took the initiative in the construction of Intelligence test was Rice in 1922 who about the year 1929 published his "Hindustani Binet Performance-Point Scale". The test was an adaptation of the Binet test along with some additional performance tests. Kamat in the thirties adapted the 1917 version of the test in Marathi and Kannada, Shukla in the forties developed the Gujrati version. Mahalanobis was the pioneer in developing group intelligence tests in Bengali. Subsequently, we have the tests developed by Lal, Jalota and Mohsin in Hindi. Bhatia Standardized for the first time a battery of performance tests for school going children. The first Indian doctorate in test construction was awarded to Desai (1954) for developing a group test of intelligence in Gujrati. In the area of non-verbal intelligence test, Pathak (1955) made a pioneering study of Good-enough’s Draw-a –man Test and developed a new scoring method in her standardization of the test for Gujrati children. In the area of Performance test, Mehta (1961) developed a pioneering study in a group test of intelligence for students of the age group 11 and 17 years. In the field of adaptation of foreign tests Malin (1964) worked out the first Indian adaptation of WISC for the students of age-group 6-15 Kapat (1960) constructed a group test of intelligence in Bengali for children of grade V- VII. Pandey (1961) constructed and standardized a group test of intelligence in Nepali for children of class VIII to X. Pathak (1961) constructed a group test of intelligence in Marathi for the age group 9 to 13 years. Hundal and Singh (1963) devised their scale for Punjabi speaking children of age group 13 to 17 years. Ahuja (1966) & Ahuja (1969) constructed a group test
of intelligence in English for Bombay children in age group of 13 to 17 and 9 to 13 years respectively. Patel (1970) Constructed and standardized verbal group test in Gujarati for children of 14 + to 16 + years of age. Thakur (1979) Constructed and standardized a Verbal Group Test of Intelligence in Assamese for students reading in classes V to VIII in Upper Assam. Mishra (1985) Constructed and standardized a Verbal Group Test of Intelligence in Oriya for the age group 12 + to 15 +. Lahlmingliana (2005) Constructed and standardized a Verbal Group Test of Intelligence in Mizo for the age group 13 to 16 + years of Mizoram state.

From the above reviews it could be observed that there are many standardized intelligence tests in the country today, but most of those tests were found to have developed for a specific regional languages and cultures. No fully fledged study could be traced out with respect to the intelligence testing for the Khasis children in Meghalaya.

7.3 NEED AND JUSTIFICATION OF THE STUDY:

Shillong the capital of Meghalaya in North-East, India, has always been the hub of educational prospects in the region, where students of different backgrounds and different socio-economic status flock in to receive the best education, which different institutions of the state provide. So, the capital of the state has become the home of many communities. This has lead to the increased educational competition and challenges amongst the Khasi students and outsiders. As the world is also becoming more and more advanced and complex; educational performance and competition among the students have also become more and more difficult. The teachers and parents are often confused, curious and talked about the differences in the educational performance and academic achievement of the school going
children; as most of them believe that intelligence is one of the main determinants in the student’s success and failure. It is this phenomenon which has encouraged the investigator to study the intelligence of the Khasi School going children of the state. In fact, if a child’s potential or talent could be measured, estimated or at least identified before he enters into a course of training or discipline, much wasted efforts could be spared. The measurement or identification of intelligence and other mental abilities is very crucial at all stages and it can be checked and examined by intelligence test. A good intelligence test may contribute to the improvement of education. Tests of abilities and other personal characteristics play a large role in modern life, contributing to countless decisions that shape individual’s upbringing, schooling and careers.

As uses of Intelligence Tests are manifold, many intelligence tests have been constructed and standardized by researchers of our country from time to time. Tests prepared by others researchers of the country are not suitable to the Khasi children of the state in terms of item, content and language. Seeing the relative importance of both, the general ability of the students as a development to human resources in one hand and the necessity of intelligence tests as a measuring tool, on the other; the investigator, feels that it is important to properly test the intelligence of the Khasi school-going children, in order to provide effective educational policies and programs.

The investigator therefore, decided to construct and standardize a verbal group test of intelligence in the Khasi language for the Khasi school-going children, on the following grounds:

1. Intelligence Tests prepared for children of other states are not suitable in terms of the culture, content and language of Khasi children
2. So far no test has been constructed and standardized in the Khasi language for Khasi children of the state of Meghalaya.

3. No intelligence test is available with the local norms

7.4 STATEMENT OF THE PROBLEM:

The problem of the study is stated as follows:

"Construction and Standardization of A Verbal Group Test of Intelligence in the Khasi language for School going children"

7.5 OPERATIONAL DEFINITIONS OF THE TERMS USED:

The terms used in the title of the study are operationally defined as follows:

i  **Intelligence**: Intelligence is a general intellectual capacity which consists of the abilities: to reason well with abstract materials, to comprehend well, to have a clear direction of thought, to relate thinking with the attainment of a desirable end.

ii **Intelligence Test**: Intelligence test is a standardized instrument which measures general mental abilities of an individual.

iii **Construction**: Construction of a test means writing of items and selection of items by means of items analysis.

iv **Standardization**: Standardization means preparing the uniform procedures of administering and scoring the test and establishing its reliability, validity and norms.
7.6 OBJECTIVES OF THE STUDY:

The objectives of the study are as follows:

1. To construct a verbal group test of intelligence in the Khasi language for school going children studying in classes VIII, IX and X of the age group 14 to 16 + years.
2. To standardize the test by establishing its reliability and validity.
3. To set up norms for the test
4. To develop a test manual
5. To study the level of intelligence of the Khasi children (age-wise) as obtained by the intelligence test constructed by the investigator.

7.7 DELIMITATION OF THE STUDY:

The study is delimited in the following ways:

1. The sample of the population is restricted only to the Khasi speaking school-going children of four districts of the state of Meghalaya viz.: East Khasi Hills, West Khasi Hills, Jaintia Hills and Ri Bhoi District.
2. The test instrument is limited only to measure the intelligence of the students belonging to the age-group 14 to 16 + years studying in classes VIII to X.
3. The test items and instructions in the manual were prepared in the Khasi language. However, English version was also made available for the purpose of references only.

7.8 RESEARCH DESIGN:

The present study was designed as follows:
A. Population:

For the present study, the population comprises of both Khasi boys and girls students of the state of Meghalaya studying in classes VIII to X of the age group 14 to 16 + years. The total number of Khasi speaking students studying in classes VIII to X at the time of collecting the data was about 32,110.

B. Sample of the study:

For the present study, the investigator adopted the Simple Random Method which was found appropriate for the study. The study has three sets of samples for the different stages of test construction.

i. Sample for preliminary try-out:

For the preliminary try-out a very small sample of 180 Khasi students studying in classes VIII - X was taken randomly comprising of 80 boys and 100 girls.

ii. Sample for first try-out:

For the first try-out a sample of 555 Khasi students comprising of 277 boys and 278 girls was selected randomly representing each grade.

iii. Sample for the final try-out:

For the final try-out, a sample of 3000 Khasi students (ten percent of the total population) comprising of 1298 boys and 1702 girls were selected randomly from the Khasi speaking population of 4 districts of the state (Table 3.3).

C. Tools Used:

For the present study, the following tools were used:
i. Verbal Group Test of Intelligence constructed by the investigator

ii. Ahuja’s Group Test of Intelligence

iii. Cattell’s Culture Fair Test of Intelligence

iv. Rating scale constructed by the investigator

D. Method of Study:

As the objective of the present study is to construct and standardize an Intelligence test, the investigator decided to use a descriptive method of research, to prepare the following materials: (Appendix 1-4)

(a) Test Booklet   (b) Test Manual
(c) Answer Sheet   (d) Scoring Key

(a) Test Booklet:

For the present study, a booklet containing the general instructions of the test and ten sub-tests spreading in 100 items was prepared. In each subtest of the booklet, necessary instructions and practice examples were provided. The investigator has carefully categorized the selection of items, so, as to make the present test comprehensive enough, to cover out the intellectual behaviour of the students of classes VIII –X, as follows:

1. Classification  2. Coding  3. General Comprehension
7. Number Series  8. Evaluation of Relationship
(b) Test Manual:

For the present study, the investigator has prepared a Manual of the test, (both in Khasi and English language) which consists of the details of the following: (Appendix 1-B and 2-B):

1. Construction procedure
2. Direction for Administering and Scoring the test.
3. Sample for Standardization
4. Reliability and validity of the Test.
5. Different kinds of Norms in Tables
6. Interpretation.

(c) Answer Sheet

For the present Test, a compiled answer sheet of all the subtests was prepared where in the subject (student) is required to put a (X) cross mark at the correct answer indicated by the alphabets A, B, C, D, (Appendix 1-C and 2-C).

(d) Scoring Key

For the scoring key of the present test, the investigator has prepared a transparent stencils, where the correct answer of each item of all the ten subtest were indicated by a box in a tracing paper (Appendix1-D and 2-D).

(E) Collection of Data:

Based on the nature of the study, the collection of data was done in three phases:
(a) First Phase:

The first phase of collection of data for the preliminary try-out was done in the month of May 2007. The test was administered to 180 Khasi students from 6 High Schools. Data obtained from this phase was used to make a preliminary modification of the test.

(b) Second Phase:

The second phase of data collection was done in October 2007. The same procedures of administering the test were followed by the investigator in the second phase. For this try-out a sample of 555 Khasi students were taken randomly from 10 High Schools (Table 3.2).

(c) Third Phase:

The third phase of data collection for final try-out was done in the months of May to August, 2008. In this phase a large sample of 3000 Khasi students were drawn from 42 High Schools (Table 3.3) of the schools population from four Khasi speaking districts of Meghalaya. The data was collected by administering the following three tools:

(i). Investigator’s Group Test of Intelligence (in Khasi language).

(ii). Ahuja’s Group Test of Intelligence.

(iii). Cattell’s Culture Fair Test of Intelligence. (Scale 2 Form A)

Data collected from the third phase was used for the standardization of the test.

(F) Statistical Techniques used:

In the present study, the investigator used the following statistical techniques

(i) **For scoring procedures:** to avoid the problems of guessing, the formula of correcting the difficulty index of an item for chance success was used as suggested by Garrett\(^1\).

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\[ P_c = \frac{R - W/(K-1)}{N - HR} \]

(ii) For Item Analysis: the difficulty value and discriminative power of an item was calculated by applying Davis's formula\(^2\).

\[ DV = (P_u + P_l)/2 \]

\[ DP = P_u - P_l \]

(iii) For Item selections: only the items whose difficulty values (DV) found between 0.30 to 0.70 and discriminative power (DP) equal to 0.40 and above as suggested by Stanley & Hopkins\(^3\) were retained for the final form.

(iv) For estimating the reliability of the test: The (a) Split-half and (b) Kuder-Richardson reliability methods were used. For calculating the Split-half, Pearson's Product Moment and Spearman-Brown Prophecy formulae were used. The formulae were as follows:

(a) Pearson's Product Moment formula:

\[ r = \frac{N \sum X'Y' - \sum f X' \sum f Y'}{\sqrt{(N \sum f X'^2 - (\sum f X')^2)}} \times \sqrt{(N \sum f Y'^2 - (\sum f Y')^2)} \]

Spearman-Brown Prophecy formulae:

\[ r_{11} = \frac{2 r'_{11}}{1 + r'_{11}} \]


(b) K-R 21 formula

\[ r_{11} = \frac{n\sigma^2 - M(n-M)}{\sigma^2(n-1)} \]

(v) *For estimating the validity of the test* the following three methods were adopted:

a) *Content Validity* of the test was rated by the expert's judgment.

b) *Concurrent Validity* was studied by correlating the present test scores with two external criterion tests: Ahuja Group test and Cattell's Culture Fair Test and was calculated by Pearson's Product Moment Method.

c) *Construct validity* of the test was studied by the Inter subtest Correlation and Factorial validity was verified by Thurstone's Centroid Method. To estimate the internal consistency of the present test, the inter-subtests correlation among all ten subtests and the correlation of the sub-tests with the total were computed with the help of computer software Packages of social Sciences.

d) *For Testing the Normality age-wise and class-wise*: the normality of the distribution of the scores was calculated by the Mean, Median, Standard Deviation, \( P_{10}, P_{90} \), Skewness and Kurtosis.

e) *For establishing the Norms*: Sigma Score or Z-Score, Percentile Score, \( T \)-Score, DIQ and Stanine score were used to derive for the test age-wise and class-wise.

7.9 **CONSTRUCTION OF THE TEST;**

The steps involved in the construction of the present test were as follows:
(i) Planning, (ii) Preparation, (iii) Preliminary try-out, (iv) Try-out, (v) Item Analysis, (vi) Item selection, and (vii) Final form of the test

(i) Planning:

Planning is an essential activity in all stages of test construction. Test planning not only involves the preparation of an outline or specifying the content or operation to be covered by the test, but it also involves decision with regards to the: (a) Nature of the test, (b) Types of items to be included, (c) Time-limit for the test and (d) Scoring procedure

(a) Nature of the Test:

After referring to different related psychological tests, the investigator decided to develop a comprehensive test by including ten sub-tests so that the general mental abilities of students may be measured as widely as possible. For the present test, the following ten subtests were included:

1. Akin/Imitative Words
2. Classification
3. Verbal Analogy
4. Number Series
5. Arithmetic Reasoning
6. General Information
7. General Reasoning
8. Coding
9. Evaluation of Relationship
10. General Comprehension

(b) Types of items to be included:

The second step in test construction is the preparation of the type of items to be included. For the present study, the investigator decided to have the multiple-choice items. Multiple-choice
items have come to be the most popular, common, flexible and effective form for standardized testing in recent years and they are also found to have the following advantages:

i. They help to measure the student's capacity for interpretation and discrimination.

ii. They are highly objective, and can be readily scored either by hand as well as machine.

iii. They are not difficult for students to understand and use.

iv. They are not so much influenced by guessing.

(e) Length of the Test:

For the present study the investigator decided that the length of test should be within a period of school hour i.e. 35 minutes for attempting all the 100 items of the final form including the instructions.

(d) Scoring Procedures:

For scoring, the test unit weightage procedure has been preferred over differential weightage. Hawks, Mann and Lindquist (1936) recommended that the simplest and nearly in all cases a satisfactory procedure for scoring an objective test is to give a credit of one to each correct response, the total score thus being the total number of correct responses. To avoid the problems of guessing the investigator has decided to apply the formula of correcting the difficulty index of an item for chance success as has been suggested by Garrett (1981)\(^4\).

\[
P_e = \frac{R - W}{N - HR}
\]

Where,

\(P\) = the percent who actually know the right answer
\(R\) = the number who get the right answer
\(W\) = the number who get the wrong answer
\(N\) = the number of examinees in the sample.

Hr = the number of the examinees who do not reach the item (and hence do not try)
K = the number of options or choices.

Scoring was done with the help of a scoring key which was prepared by the investigator. The score, thus obtained was used for estimation of reliability and validity as well as item analysis of the test.

(ii) Preparation:

For the present study, the preparation was based on the following steps:

(a) Writing the test items.
(b) Test Directions for the examinees.
(c) Reviewing and editing of the test items and
(d) Preparing the answer-sheets and scoring key.

(a) Writing the Test Items:

While preparing the test items, the investigator has referred to all the possible common sources available. Intelligence tests prepared by researchers, books on test your IQ, related psychological tests, related dissertations available in the field, magazines, journals and books on the Khasi’s culture were critically examined. In addition to these, the investigator has also consulted various subjects’ experts to share their views in this matter. On the basis of all the above information collected, the investigator prepared around 400 items. These items were then tried out on 20 students of classes VIII, IX, X. After a thorough study of the responses collected from the 20 respondents, the following 200 items were retained:
### Total No. of Subtests & Items included for Preliminary Try-out

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Subtests</th>
<th>No. of items included</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Akin/Limitative Words</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Classification</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Verbal Analogy</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Number Series</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>Arithmetic Reasoning</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>General Information</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>General Reasoning</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>Coding</td>
<td>20</td>
</tr>
<tr>
<td>9</td>
<td>Evaluation of Relationship</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>General Comprehension</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>200</strong></td>
</tr>
</tbody>
</table>

(b) Test Directions for the Examinees:

For the present study, the directions has specified clearly in front page of the test booklet and in all its subtests separately. Test directions contained the following information:

(i) The time allowed for completing the test.

(ii) Number of items in the tests.

(iii) Maximum marks for the test.

(iv) How and where to record the answers.

(c) Reviewing and Editing of the Test Items:

After the test items of the present study have been written, it has to be reviewed and edited; the purpose was to have a final decision concerning several matters like: length of the test, time-limits, arranging of items of the test, or any technical flaws, directions for the examinees, if any. When all these problems were sorted out, reviewed and edited, the test items were prepared in test booklet form and were made ready for a preliminary try-out.
(d) Preparing Answer - Sheet and Scoring Key:

For scoring the answers, a separate answer sheet was prepared rather using the test booklet itself, because the test booklet was prepared to be reusable whereas answer sheets were prepared to be consumable. The answer sheet was prepared in such a way that spaces were provided for the choices A, B, C, D, against each item. The students were instructed before hand to put a (X) cross mark corresponding to the correct answer.

To make the scoring easier, the investigator used tracing paper of the same size of the answer sheet and by drawing boxes at places corresponding to the correct answer. In each page of answer sheet star marks were put at the top and bottom corners at the right and left to fix the scoring key in the correct position. The correct answers was visible in a ‘X’ cross mark at the boxes of the scoring key which was adjusted on the page of the answer sheet. Then the total scores were then counted easily.

(iii) Preliminary try-out:

The main purpose of the try-out was to improve and modify the language ambiguity and difficulty of the test items. It was a step to find out how pupils react to the test in terms of content and language. The prepared test at this stage contained of 200 items which was given for preliminary try out on the sample of 180 Khasi students of six High Schools of Shillong town. The time-limit was not set at this stage. The responses and reactions of the testees were recorded. On the basis of the feedback collected, the items which were found vague and different were modified and re-arranged accordingly. After some modifications, it was decided that all the 200 items were to be included in the first try-out.
(iv) First try-out:

The main purpose of the first try-out in the present study was to select the appropriate items and reject the inappropriate ones on the basis of item analysis for obtaining item indexes, viz., (i) Difficulty Value and (ii) Discriminative power and (iii) Determining the time limit of each subtest and length of the test. For this try-out, a sample of 555 Khasi students was drawn from ten high schools of Shillong town as already described in chapter 3. The test containing of 200 items spreaded over ten sub-tests was administered to 555 students and data was collected.

(v) Item Analysis:

When the items have been tried out, they were subjected to procedures called Item analysis. Item Analysis is a statistical technique which is used for selecting and rejecting the items of a test on the basis of their difficulty values and discriminative power. The present study employed the Kelley’s method of item analysis, where the indices of item difficulty and discriminative power were calculated by 27 percent top and 27 percent bottom dichotomy and rejecting the middle 46 percent. To compute the difficulty value and discriminative power of an item of the present test, answer sheets of 555 students were arranged in descending order (i.e. from the highest to the lowest score) The three groups were formed as follows:

(i). Upper 27 percent of total sheets (i.e 150 sheets)
(ii). Middle 46 percent of total sheets (i.e.255 sheets)
(iii). Lower 27 percent of total sheets (i.e. 150 sheets)

To get the corrected value for chance success the following Guildford’s formula of correction as suggested by Garrett (1981) was adopted:

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5 H.E. Garrett: *op.cit.* p. 368.
\[ P_c = \frac{R - W(K-1)}{N - HR} \]

Where,
- \( P_c \) = the percent who actually know the right answer
- \( R \) = the number who get the right answer
- \( W \) = the number who get the wrong answer
- \( N \) = the number of examinees in the sample.
- \( HR \) = the number of the examinees who do not reach the item (and hence do not try)
- \( K \) = the number of options or choices.

Now, for each item the proportion of the pupils who passed an item correctly in the upper and the lower groups was determined. The difficulty value and discriminative value of an item was then calculated by using the following formula as suggested by Davis as quoted by Sharma\(^6\)

\[
\text{Difficulty value (DV)} = \frac{P_U + P_L}{2}
\]
\[
\text{Discriminative Power (DP)} = P_U - P_L
\]

Where,
- \( P_U \) = Proportion of correct answers on the item of upper group examinees
- \( P_L \) = Proportion of correct answers on the item of lower group examinees.

(vi) **Items Retained for the Final Form of the Test:**

The items whose difficulty value found in between 0.30 and 0.70 and discriminative power 0.40 and above were retained as suggested by Stanley and Hopkin\(^7\). The items with negative discriminative power were rejected. However, items which did not fall under the said difficulty value and discriminative power were omitted. As a result, out of 200 items, 100 items were rejected who's

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\(^6\) R.A. Sharma: *op. cit.* p. 187

item difficulty and discriminative power did not fall in the range as mentioned above. The total 100 items were then retained for the final test was given as below:

**Showing the number of items retained in each subtests having DV 0.30-0.70 and DP above 0.40**

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Items accepted having DV .30-.70 and DP above .40</th>
<th>Total No. of Items accepted in each subtests</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CL 5, 10, 12, 13, 15, 16, 17, 19</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>CO 3, 5, 12, 13, 14, 15, 16, 17, 18, 19, 20,</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>GC 2, 4, 6, 8, 9, 10, 11, 12, 16, 17</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>AW 2, 4, 6, 7, 8, 10, 11, 12, 13, 14, 17, 20</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>VA 1, 4, 7, 10, 12, 13, 15, 17, 18, 19</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>GR 2, 3, 7, 8, 9, 12, 13, 17, 18</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>NS 4, 5, 6, 8, 9, 10, 12, 13, 14, 15, 16, 18, 19</td>
<td>13</td>
</tr>
<tr>
<td>8</td>
<td>ER 3, 4, 5, 6, 9, 10, 13, 14, 15, 17, 20</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>GI 2, 6, 8, 9, 13, 16</td>
<td>6</td>
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<tr>
<td>10</td>
<td>AR 1, 2, 3, 5, 12, 14, 15, 16, 18</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

**(vii) Final Form of the Test:**

On the basis of their recorded time in the answer-sheet, average time taken by 555 students was calculated for each sub-test. Thus the final form of the test after item analysis and time taken in each subtest was given as follows:
Number of Items retained & Time taken in each Subtest

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Sub-Test</th>
<th>No. of Items retained</th>
<th>Time- taken (in Minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Classification</td>
<td>9</td>
<td>1 1/2</td>
</tr>
<tr>
<td>2</td>
<td>Coding</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>General Comprehension</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Akin Words</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Verbal Analogy</td>
<td>10</td>
<td>2 1/1</td>
</tr>
<tr>
<td>6</td>
<td>General Reasoning</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Number Series</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Evaluation of Relationship</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>General Information</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Arithmetic Reasoning</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>30 mins</strong></td>
</tr>
</tbody>
</table>

7.10 STANDARDIZATION OF THE TEST:

For standardization of the present test, reliability and validity of the test have been estimated and norms have been established. For estimating the reliability, validity and derivation of norms of the present test, the final data collected from the entire sample of 3000 was used. The data was collected by administering the three types of tests viz. Ahuja’s Group Test of Intelligence, Cattell’s Culture Fair Test of Intelligence and the Investigator’s Group Test of Intelligence.
(i) **Estimation of Reliability:**

For computing the reliability of the present test, Split-half and Kuder-Richardson reliability methods were used. To compute the split-half reliability the scores of the entire sample 3000 were divided into two equivalent halves of odd and even items. The coefficient of correlation \( r'_{11} \) between the two sets of scores obtained from the two halves was computed by Product Moment Method and was found to be 0.76. From the reliability of the half test, the self correlation of the whole test was then estimated by Spearman-Brown Prophecy formula. The coefficient of correlation was found to be 0.86. For estimating the reliability index of the present study, the formula of K-R 21 was followed. The Kuder-Richardson reliability coefficient of the present test was found to be 0.89.

(ii) **Estimation of Validity:**

For estimating the validity of the present test, the following three methods were used:

(a). Content Validity

(b). Concurrent Validity

(c). Construct Validity

(a). **Content Validity:**

For rating the present test, the investigator constructed a rating scale consisting of seven questions. The constructed rating scale was given to 20 experts. According to them the items by and large were representative of the mental ability of the school going children of age-group 14 to 16 + to a great extent and the test was able to measure the level of intelligence. Further, the test covered the various components of intellectual abilities to a
great extent and items were suitable for school going children in terms of content, difficulty
and language.

(b). Concurrent Validity:

The concurrent validity of the test was determined by correlating the present test
scores with two external criterion scores obtained from the Ahuja’s test and Cattell’s Culture
Fair Test. The obtained concurrent validity coefficient of correlation of the present test with
Ahuja’s test was found to be 0.80 and with respect of Cattell’s Culture Fair test was 0.66
respectively.

(c). Construct Validity:

To estimate the internal consistency or construct validity of the present test, the inter-
subtests correlation among all ten subtests and the correlation of the sub-tests with the total
test were computed with the help of a Computer Software Packages of Social Science
(SPSS). On computation it was found that all the ten subtests were inter-correlated and
significant at .01 level. The internal consistency of the present test was further verified by
using Thurstone’s Centriod Method. It was found to be a unifactor test

(iii) Establishment of Norms:

The data collected from the sample of 3000 Khasi students (1298 boys and 1702
girls) was used for derivation of norms. Before deriving the norms, the normality of the
frequency distribution was tested age-wise and grade-wise. In order to judge the normality
of the distribution of the scores, the value of Mean, Median, S D, P_{10}, P_{90}, Skewness and
Kurtosis were calculated. The Mean, Median, SD, of each Age-group and Grade was found
to be very close to one another, skewness is 0.198 and kurtosis is .282 as required for normal
distribution. This shows that the distribution of the sample was approximately normal.

As the present test is meant for the Khasi students of classes VIII – X (age group 14
– 16 +) Sigma score norms, Percentile norms, T-score norms, DIQ and Stanine scores have
been derived grade-wise and age- wise.

(a) Sigma Score Norms (Z):

Sigma scores are a kind of standard measure which indicate how many standard
deviation the given score deviates from the mean of the distribution. In other words,
deviations from the mean expressed in SD units are called Sigma Scores. Sigma Scores are
also called as ‘Z-Score’. The Sigma Scores or Z-Scores were calculated by applying the
following formula:

\[ Z = \frac{(X - M)}{\sigma} \]

Where

\[ Z = \text{Standard score in } \sigma \text{ units} \]
\[ X = \text{Raw score of an individual} \]
\[ M = \text{Mean of test score} \]
\[ \sigma = \text{Standard Deviation of the test scores}. \]

The sigma score for each raw score of the present test were given in Table 5.18-5.33

(b) Percentile Norms:

Percentile Norms are expressed in percentile ranks. A Percentile Rank indicates a
pupil relative’s position in a group in terms of percentage of pupils scoring below him. To
calculate the individual’s percentile norms on a test, the deviation of scores were first
expressed in sigma score as already described above. With the help of these scores
percentage of deviation from the mean was obtained by seeing area under the normal probability curve from Garrett's Table A\(^8\). The percentile norms were then established by adding or subtracting 50 to this value. The percentile norms for each raw score were given in Table 5.18-5.33

© T-Score Norms:

T-Score are normalized standard scores converted into the distribution with a mean of 50 and SD of 10 (Garrett)\(^6\). If normalized standard score is multiplied by 10 and added to or subtracted from 50, it is converted into T-Score. Thus the formula used for calculating T-Score is as follows:

\[
T\text{-Score} = 50 \pm 10 \text{ (Z score)}.
\]

The values of T-scores for each raw score were calculated for different age groups of both the sexes and class group separately and presented in separate Tables 5.18-5.33

(d) Deviation Intelligence Quotient (DIQ) Norms:

Deviation Intelligence Quotient is a normalized standard score which does not involve the mental age of a child. It is not the ratio of mental and chronological ages. The raw scores were transformed into DIQs with the help of the following formula:

\[
\text{DIQ} = 100 + 16 (\sigma)
\]

The DIQ scores for each raw score were calculated and presented for different age groups of both the sexes and class group and presented in Table 5.18-5.33. The separate Tables for DIQ scores in classified forms for all age groups and sex-wise were also worked out and presented in Table 5.3\(^Y\) - 5.4\(^\$\).

(e) Stanine Score Norms:

In Stanine scale, raw scores are converted to a nine points scale (ranging from 1-9) with a mean of 5 and SD of 1.96 (approximately 2). Stanine norms for each raw score were calculated and presented in Table No. 5.18 to 5.33.

(iv) Studying the Level of Intelligence of the entire Sample 3000:

The level of intelligence of the present study was studied by the same data collected on the sample of 3000 which have been used for estimating the reliability, validity and establishing the norms. The level of intelligence of the 3000 children was described in Tables 5.34 – 5.40 sex-wise and age-wise. A glance to these tables showed that the level of intelligence was normally distributed at all age levels. Table 5.41 revealed that the Mean of every age-group was very closed to 100 and S.D to 16. The Mean and S.D. of the entire sample (3000) were 99.64 and 16.01 respectively. This leads to the conclusion that the process of standardization of the present test was quite satisfactory.

7.11 FINDINGS AND IMPLICATIONS OF THE STUDY

(i) The Test:

The main reason for construction of t of Intelligence in the Khasi language is because there was no such standardized psychological test constructed in the Khasi language to measure either the general mental ability or the scholastic achievement of the school going children. Therefore, to meet this demand the investigator constructed the verbal group test of Intelligence for the Khasi speaking school-going children of the state of Meghalaya, studying in classes VIII – X of the age-group 14 -16 years +. The Test has been designed in such a way that it covered the different aspects of mental abilities of the school-going
children of the state of Meghalaya, studying in classes VIII – X of the age-group 14 -16 years +. The Test has been designed in such a way that it covered the different aspects of mental abilities of the school-going children and to be able to administer easily in 35 minutes of the school period. The provision of answering the items in the separate Answer-Sheet allows one to re-use the Test Booklet. To administer the test, clear Instructions and Practice Examples of all the 10 sub-tests have been written clearly in the Test Booklet.

(ii) Subtests:

The test contained the following 10 sub-tests:

(a) **Classification:** This type of item is used to assess the ability of seeing the relationship to form the group and the power of discrimination to isolate the correct response. In this type of item, words, terms, concepts, facts and objects are given which belong to a class or group, but of these, one does not belong to the class that is to be identified.

(b) **Coding:** This type of items is mainly used to assess the perceptual and memory ability. The letters of a word are substituted by numbers or the numbers are substituted by the letters of a word. The examinees have to substitute by using the same code for another set of code letters. The same system of code letters can be used for substituting another word.

(c) **General Comprehension:** This type of item is used to assess the ability to grasp, understand and react to a given situation. In this type of sub-test, items are defined as a series of sentences in which certain important words or phrases have been omitted. The examinees are required to fill in or continue the sentence by selecting from the alternative words or phrases to complete the statement.
(d) **Akin/Imitative Words**: this type of item is commonly used in the Khasi community and cannot be translated into English. It is used to assess the ability of relationship of a particular word with another. When speaking, an imitative word is added, like adding tags to a speech, e.g. hynmen-hynbew, here the word hynmen means an elder brother and hynbew is an akin/Imitative word. The examinee is required to choose the correct response from the given four words.

(e) **Verbal Analogy**: An analogy is a type of item which involves two parallel or similar situations. In the first situation two words are given having some specific relationship. In the second situation, an incomplete form is given where only one word is provided. The second word is to be selected or to be recalled for establishing the same relationship by the examinees.

(f) **General Reasoning**: This type of test is used to assess the ability to reason logically. In this sub-test, the examinee is required to find out the solution of the given problems.

(g) **Number Series**: In this type of items, the numbers are arranged to form a series of numbers. These numbers are related to each other to continue to form series. An examinee has to identify this relationship with the help of his number reasoning ability. In the same order, he has to provide the next number in the continuation of the series.

(h) **Evaluation of Relationship**: This type of item is used to assess the ability to evaluate the relationship of people. The examinee is required to find out the correct relationship of an individual with another. This sub-test is based on the Khasi's culture.
(i) **General Information:** This is a type of mental ability test which is used to understand and grasp substantive meaning in language, thought and action. In this test the examinee is given a problem. He is required to solve the problem by selecting the best answer from the given alternatives.

(j) **Arithmetic Reasoning:** This type of test is commonly used in a general mental ability test. In this test a problem is given in one or two sentences and the examinee is required to solve the problem in numerical

(iii) **Number of Items:**

The whole Test contained of 10 sub-tests in 100 items which can be administered in 30 minutes. Following were the items retained and time taken in each sub-test:

**Number of Items Retained and Time taken in each subtest**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Sub-Test</th>
<th>No. of Items retained</th>
<th>Time-taken (in Minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Classification</td>
<td>9</td>
<td>1½</td>
</tr>
<tr>
<td>2</td>
<td>Coding</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>General Comprehension</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Akin Words</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Verbal Analogy</td>
<td>10</td>
<td>2½½</td>
</tr>
<tr>
<td>6</td>
<td>General Reasoning</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Number Series</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Evaluation of Relationship</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>General Information</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Arithmetic Reasoning</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>30</td>
</tr>
</tbody>
</table>
(iv) **Reliability of the Test:**

The Split-half and Kuder-Richardson reliability of the test were found as follows:

### Reliability of the Test

<table>
<thead>
<tr>
<th>Types of Reliability</th>
<th>r_{11}</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split-half reliability</td>
<td>0.86</td>
<td>.01*</td>
</tr>
<tr>
<td>Kuder-Richardson reliability</td>
<td>0.89</td>
<td>.01*</td>
</tr>
</tbody>
</table>

* Significant at .01 level.

(v) **Validity of the Test:**

(a) **Content Validity of the Test:**

The Content Validity was determined by seeking the expert’s opinions on a rating scale. The analysis of the responses revealed that the test items were suitable in terms of the contents, difficulty and language.

(b) **Concurrent Validity:**

The Concurrent Validity of the present test was calculated by using Ahuja’s Group Test of Intelligence and Cattell’s Culture Fair Test as the criterion test which were as follows:

### Validity of the Test

<table>
<thead>
<tr>
<th>Criterion test used</th>
<th>r_{11}</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahuja’s test validity</td>
<td>0.80</td>
<td>.01*</td>
</tr>
<tr>
<td>Cattell’s test validity</td>
<td>0.66</td>
<td>.01*</td>
</tr>
</tbody>
</table>

* Significant at .01 level.
(c) Construct Validity:

Construct validity of the test was calculated by determining the inter-subtests correlations and factorial validity indicating first common factor was given below:

**Inter-Subtests Correlations**

<table>
<thead>
<tr>
<th>Sub-test</th>
<th>Internal consistency ( r ) with the total test</th>
<th>First Common factor (Thurstone's Cantroid method)</th>
<th>Ranks order of the subtest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Classification</td>
<td>.527</td>
<td>.563</td>
<td>8</td>
</tr>
<tr>
<td>2. Coding</td>
<td>.661</td>
<td>.620</td>
<td>5</td>
</tr>
<tr>
<td>3. General Comprehension</td>
<td>.574</td>
<td>.601</td>
<td>7</td>
</tr>
<tr>
<td>4. Akin Words</td>
<td>.555</td>
<td>.543</td>
<td>9</td>
</tr>
<tr>
<td>5. Verbal Analogy</td>
<td>.632</td>
<td>.653</td>
<td>2</td>
</tr>
<tr>
<td>6. General Reasoning</td>
<td>.643</td>
<td>.654</td>
<td>1</td>
</tr>
<tr>
<td>7. Number Series</td>
<td>.680</td>
<td>.625</td>
<td>3</td>
</tr>
<tr>
<td>8. Evaluation of Relationship</td>
<td>.602</td>
<td>.604</td>
<td>6</td>
</tr>
<tr>
<td>9. General Knowledge</td>
<td>.363</td>
<td>.441</td>
<td>10</td>
</tr>
<tr>
<td>10. Arithmetic Reasoning</td>
<td>.616</td>
<td>.621</td>
<td>4</td>
</tr>
</tbody>
</table>

On computation it was found that all the ten subtests were inter-correlated and significant at .01 level.

(v) Normality of Sampling Distribution:

The test constructed was administered on a sample of 3000 students and data was collected. The statistics obtained from the data analyzed was as follows:

**Distribution of Descriptive Statistics**

<table>
<thead>
<tr>
<th>No</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>SK</th>
<th>KU</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000</td>
<td>55.43</td>
<td>54.86</td>
<td>14.34</td>
<td>0.198</td>
<td>0.282</td>
</tr>
</tbody>
</table>
The above statistics revealed that the Mean, Median of the data fall nearly at the same point, Skewness is 0.198 and Kurtosis is .282 as required for normal distribution. It shows that the distribution of the sample was approximately normal.

(vi) **Derivation of Norms:**

For the present test, Sigma score norms, Percentile Ranks, T-Score norms, Deviation IQ norms and Stanine Score norms have been derived and presented in Tables 5.18 – 5.33.

(viii) **Interpretation Table for Deviation IQ:**

The DIQ of the entire sample was classified in the following seven (7) groups as suggested classification of revised Stanford-Binet test for interpreting the DIQ of the child:

**Classification for Interpreting DIQ of the entire Sample**

<table>
<thead>
<tr>
<th>DIQ Scores</th>
<th>Total</th>
<th>Percentage</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 70</td>
<td>55</td>
<td>1.83</td>
<td>Mentally Defective</td>
</tr>
<tr>
<td>70 - 79</td>
<td>285</td>
<td>9.50</td>
<td>Borderline Defective</td>
</tr>
<tr>
<td>80 - 89</td>
<td>512</td>
<td>17.07</td>
<td>Low Average</td>
</tr>
<tr>
<td>90 – 109</td>
<td>1327</td>
<td>44.23</td>
<td>Normal/Average</td>
</tr>
<tr>
<td>110 – 119</td>
<td>455</td>
<td>15.17</td>
<td>High Average</td>
</tr>
<tr>
<td>120 – 139</td>
<td>361</td>
<td>12.17</td>
<td>Superior</td>
</tr>
<tr>
<td>140 &amp; above</td>
<td>1</td>
<td>0.03</td>
<td>Very Superior</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3000</td>
<td><strong>100.00</strong></td>
<td></td>
</tr>
</tbody>
</table>
Distribution of Level of Intelligence among the Total Sample:

The test constructed by the investigator was administered on a large sample of 3000 school going children (1298 Boys and 1702 Girls) of the age group 14 to 16 + years. The data so collected was utilized for computing the reliability, validity and establishing the norms. The same data was also used to study the level of intelligence of the sample which was given as below:

Classification of Sex-wise DIQs of the entire Sample (N=3000) (Age group 13-17 years)

<table>
<thead>
<tr>
<th>DIQ Scores</th>
<th>Boys</th>
<th>%</th>
<th>Girls</th>
<th>%</th>
<th>Total</th>
<th>%</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 70</td>
<td>21</td>
<td>1.62</td>
<td>34</td>
<td>2.00</td>
<td>55</td>
<td>1.83</td>
<td>Mentally Defective</td>
</tr>
<tr>
<td>70-79</td>
<td>124</td>
<td>9.55</td>
<td>161</td>
<td>9.46</td>
<td>285</td>
<td>9.50</td>
<td>Borderline Defective</td>
</tr>
<tr>
<td>80-89</td>
<td>225</td>
<td>17.33</td>
<td>287</td>
<td>16.86</td>
<td>512</td>
<td>17.07</td>
<td>Low Average</td>
</tr>
<tr>
<td>90-109</td>
<td>559</td>
<td>43.07</td>
<td>768</td>
<td>45.12</td>
<td>1327</td>
<td>44.23</td>
<td>Normal/Average</td>
</tr>
<tr>
<td>110-119</td>
<td>216</td>
<td>16.64</td>
<td>239</td>
<td>14.04</td>
<td>455</td>
<td>15.17</td>
<td>High Average</td>
</tr>
<tr>
<td>120-139</td>
<td>152</td>
<td>11.71</td>
<td>213</td>
<td>12.51</td>
<td>361</td>
<td>12.17</td>
<td>Superior</td>
</tr>
<tr>
<td>140 &amp; above</td>
<td>1</td>
<td>0.07</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0.03</td>
<td>Very Superior</td>
</tr>
<tr>
<td>Total</td>
<td>1298</td>
<td>100</td>
<td>1702</td>
<td>100</td>
<td>3000</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

A glance to the above table shows that the level of intelligence was normally distributed for both boys and girls and for the entire sample.
Classification of Age-wise distribution of DIQ, Mean & S.D of the total sample=3000

<table>
<thead>
<tr>
<th>DIQ</th>
<th>13yrs</th>
<th>14yrs</th>
<th>15yrs</th>
<th>16yrs</th>
<th>17yrs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-55</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>55-60</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>60-65</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>65-70</td>
<td>3</td>
<td>13</td>
<td>12</td>
<td>6</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>70-75</td>
<td>10</td>
<td>23</td>
<td>40</td>
<td>24</td>
<td>4</td>
<td>101</td>
</tr>
<tr>
<td>75-80</td>
<td>22</td>
<td>54</td>
<td>51</td>
<td>47</td>
<td>10</td>
<td>184</td>
</tr>
<tr>
<td>80-85</td>
<td>20</td>
<td>69</td>
<td>66</td>
<td>48</td>
<td>13</td>
<td>216</td>
</tr>
<tr>
<td>85-90</td>
<td>30</td>
<td>108</td>
<td>89</td>
<td>51</td>
<td>18</td>
<td>296</td>
</tr>
<tr>
<td>90-95</td>
<td>30</td>
<td>93</td>
<td>97</td>
<td>80</td>
<td>15</td>
<td>315</td>
</tr>
<tr>
<td>95-100</td>
<td>30</td>
<td>117</td>
<td>119</td>
<td>60</td>
<td>19</td>
<td>345</td>
</tr>
<tr>
<td>100-105</td>
<td>43</td>
<td>91</td>
<td>96</td>
<td>90</td>
<td>16</td>
<td>336</td>
</tr>
<tr>
<td>105-110</td>
<td>37</td>
<td>103</td>
<td>108</td>
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<td>110-115</td>
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<td>115-120</td>
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<td>67</td>
<td>56</td>
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<td>11</td>
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<tr>
<td>120-125</td>
<td>13</td>
<td>56</td>
<td>52</td>
<td>22</td>
<td>7</td>
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<tr>
<td>125-130</td>
<td>12</td>
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<td>31</td>
<td>26</td>
<td>7</td>
<td>114</td>
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<tr>
<td>130-135</td>
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<td>22</td>
<td>21</td>
<td>12</td>
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<tr>
<td>Total</td>
<td>310</td>
<td>931</td>
<td>940</td>
<td>651</td>
<td>168</td>
<td>3000</td>
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<tr>
<td>Mean</td>
<td>99.90</td>
<td>99.58</td>
<td>99.47</td>
<td>99.44</td>
<td>100.89</td>
<td>99.64</td>
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<tr>
<td>SD</td>
<td>16.09</td>
<td>16.07</td>
<td>15.77</td>
<td>16.17</td>
<td>16.46</td>
<td>16.01</td>
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</table>

The above table shows the age-wise distribution of DIQs for the entire sample N=3000 was found to be normally distributed. It is observed that the Mean of every age-group was very close to 100 and S.D to 16. The Mean and S.D. of the entire sample (3000)
were 99.64 and 16.01 respectively. This leads to the conclusion that the process of standardization of the present study was quite satisfactory.

(x) Implications of the Study:

The present test is the first Verbal Group Test of Intelligence constructed in the Khasi Language for school-going children of the state of Meghalaya of the age-group 14 to 16 + years aims to serve the following purposes for the Khasi students:

(a) Testing the Intelligence of the Khasi Students:

The problem of the teachers and parents could only be solved if modern tools are available to identify the level of intelligence of the students. The present test could be used as one of those tools to measure the level of intelligence of the Khasi student and the knowledge so collected could be used for providing educational guidance according to the level of the intelligence of the students.

(b) Intelligence Testing in Selection and Classification of Candidates:

The school authority or any authority either for administrative and organizational reasons, can use the present test for selection and placing candidates of lower grades base on the obtained scores. Candidates may be classified as superior, average and below average.

(c) Intelligence Testing and Promotion of Pupils:

From time to time it has been seen that a large number of school students failed to score the minimum pass mark. When the number of failure is sufficiently large, pupils are awarded grace mark on some principle and thus the pass percentage is raised to a comfortable figure. In some schools, marginal cases are considered upon taking into account
pupil’s performance in previous examinations or class work. These methods of promotion for marginal cases are often found to be not quite related to the basic problem of giving the most potential pupil a chance to improve. Therefore a test like the present intelligence may be useful to school authorities in solving promotional problems of the Khasi students at the higher level.

(d) Intelligence Testing and School Admission:

When people have realized the value of education, there is always a rush for admission in good schools and colleges especially at the level-entrance classes. The school authority used to select students on the basis of their over-all performance of the last examination. Such procedures can faster the screening process, especially when there is a huge demand for admission. No doubt such screening is useful for selecting pupils; but such type of yardstick is not healthy for all students and for all times together, as certain uncontrollable factors may affect the student’s performance. It is in such a situation that the present test may offer considerable help in selecting students for admission.

(e) Intelligence Testing and Researches:

The present test could be used by the B.Ed/M.Ed students who have to do a project work as a part to fulfill the partial requirement of the syllabus. The test will also be useful for the research scholars at Ph.D. level to collect information on the level of intelligence of the Khasi speaking students of the state. This will be a great help to them to get the correct information. The test will also be used by research workers as external criteria to validate another test.
(xi) Suggestions for Further Researches:

Construction of intelligence testing have been a long pursuit all over the country, but with respect to the Khasis of the state of Meghalaya, this is the first study where attempt has been made to construct and standardize a verbal group test of intelligence in the Khasi language for school going children of the age group 14 to 16+ years. The present study may have its own limitations as it may not cover all aspects of intelligence testing which needs to be investigated. The investigator, therefore, would like to suggest the future investigators to conduct studies on the following aspects:

1. Construction and standardization of verbal group test of intelligence in Khasi language for pre-primary school children of the age group 3 to 5+ years of Meghalaya.

2. Construction and standardization of verbal group test of intelligence in Khasi language for primary school going children of age-group 6 to 12+ of Meghalaya.

3. Construction and standardization of verbal group test of intelligence for adults of the state of Meghalaya.