CHAPTER I

INTRODUCTION

In this fast changing age of atomic energy it has become absolutely necessary for any country to use man-power in the best possible ways if it wants to keep its position in the world. The aims and methods of education have to be modified so that mass education has some effect on social pattern. The growth of education in India has for years been under a continuous and powerful influence of the Western system.

If the masses are to be educated the educationists have to recognize the importance of individual differences. The genius, the normal, the intelligent, and the dull cannot be treated in the same ways. A well trained psychologist can differentiate among the children very easily with the help of scientifically developed instruments and help the teacher in doing his best. Educationists in India have now realized the importance of consideration of child's interests, aptitudes, personality traits and abilities in its developmental stages while planning the educational programmes for the child.

The growth of civilization has made the social structure complex and created a situation wherein the individual has a scope as well as a compulsion to choose
the vocation. Though India is not so far advanced as the West, the guidance movement is no more limited to vocational guidance alone.

Hence, has arisen the need for psychological measurements. When tests are used for the determination and analysis of an individual's intellectual abilities or non intellective traits, the purpose might be to provide educational and vocational guidance to place an individual in a special class for superior pupils or in one for the mentally retarded, to diagnose weaknesses in order to provide remedial instructions or to discover causes, intellectual or otherwise which might account for behaviour problems in school. In clinics, psychological tests are used primarily for individual diagnosis of factors associated with personal problems of learning, behaviour, attitudes or specific inter personal relations.

In business and industry, tests are helpful in selecting and classifying personnel for placement in jobs that range from the simpler semiskilled to the highly skilled, from the filing clerks and sales persons to top management. Thus psychological tests are significant educational, vocational and diagnostic assets today.

Psychological tests did begin to assume appreciable significance until about 1910-15. In the first
decade of the nineteenth century the testing of intelligence began on scientific lines. Since then many devices and techniques of mental measurements have emerged. Whereas the field of intelligence testing has been widely explored in the West, one does not find in Gujarat many suitable tests. Even then the following tests can be enumerated.

1. The first verbal group intelligence scale in Gujarati for pupils of standard VIII to XI was constructed and standardized by K. G. Desai. The same scale is revised by K. G. Desai and C. L. Bhatt and it is widely used in Gujarat.

2. C. L. Bhatt constructed and standardized a battery of group tests of intelligence which are verbal as well as non-verbal in structure.

3. Non-verbal group tests of intelligence are devised by D. M. Bhavsar which are useful for the pupils of standard IX to XI.

4. M. C. Bhatt has adapted the well-known Wechsler Intelligence Scale for children in Gujarat.

5. J. H. Shah has adapted the 1960 revision of the Stanford Binet Intelligence Scale, for Gujarati children.
N. N. Shukla adapted Kamat's Marathi revision of the 1916 Stanford Binet Intelligence Scale and published the Gujarati version in 1950.

It can be noted from the above list that there is no available test which is purely performance in nature. Some of the clinics and schools for mentally retarded children do require the performance scale. Drever and Collins remark:

If we are agreed that the handling of concrete material should form a part of child's education and much more part in the case of the majority of children then it forms at present, so likewise we must also admit that in any adequate testing of a child's intelligence, the ordinary type of intelligence test must be supplemented by the kind of tests we call performance tests. These are tests in which the subject has to deal with concrete material, that is they are tests of the concrete rather than of the abstract type of intelligence.

(Drever and Collins, p. 12)

So a need for individual performance tests was found acceptable. Hence it was decided to construct and standardize an original performance scale for the school going population in the age range 6 ± to 15 ± in Gujarat.

An Outline of the Work

The measurement of intelligence being the indirect way of measurement, it cannot be as perfect and
accurate as physical measurements. Psychological measurements yield reliable and valid results depending upon the precautions taken and accuracy observed during their construction and standardization. The first step taken in this direction is to define the applicability. The applicability of the tests was restricted to pupils of standards II to XI. The sample for standards V to XI was taken from high schools while the sample for standards II to IV was drawn from primary schools attached to high schools. Pupils studying in purely primary schools were excluded.

The test material, the manuals, the scoring schemes and the mental functions measured by different verbal, non-verbal and performance tests were studied. As it was decided to construct performance tests, the investigator had to consider which functions could be measured by such tests. Different types of performance tests mentioned below were then selected to measure the particular mental functions.

1 Form Boards
2 Block Designs
3 Picture Arrangement
4 Block Building
5 Mazes
6 Picture Completion
The first tryout of the tests included no statistical procedures. The tests were administered to twenty pupils of different age groups. The subjects were asked to carry out the mental processes loudly. The time taken for each item was noted as no time limit was fixed for any item. Sometimes questions were asked by subjects pertaining to the working procedure. These questions were taken note of and were considered while preparing the test manual. The manual of directions for the administration of the tests was prepared. To locate ambiguities in the directions and for further suggestions, the tests were got reviewed by five experts.

The second tryout was carried out with 44 students of age groups 5 + to 15 +. One accelerated, one retarded and two normal students were tested in each age group. The results were analysed. The instructions were finalized.

In the third tryout, eleven students of each group including two accelerated, two retarded and seven normal were tested. It was seen that the instructions were followed rigidly during the testing. The observations were noted. The data were statistically processed for calculating the indices of item difficulty and item discrimination. The items were arranged according to their difficulty values. The applicability of the test
was restricted from 6+ to 15+ as the test was not found to be working properly with children of age 5+. The time limit for each item was fixed and scoring key, depending upon the time taken for correct responses, was prepared.

Thus the test material with items arranged in order of difficulty, manual of directions, and the scoring sheet were ready for the final tryout.

The final form of the tests was given to 400 students, forty in each age group. The method of random sampling though best, is not employed. The sample is chosen by stratification. The details of sampling will be discussed in a subsequent chapter.

The sexwise and agewise means and standard deviations of scores were calculated. The level of significance of the difference between the mean scores of boys and girls for each age group was calculated. These were not significant even at .05 level. So the means and standard deviations of boys and girls together for all age groups were calculated. Then the curve of mental growth was drawn. The mean for each age group was read from it. The population standard deviations for the age groups 6+ to 8+ and 9+ to 15+ were taken separately and deviation IQs with a mean of hundred and standard deviation of fifteen were calculated separately for both the groups. The ready reckoner for the calculation of IQs was
prepared. The IQs of all the testees were found out and frequency polygons were drawn.

The usual practice to use Terman classification for IQ ratings is not followed. The method employed by Wechsler and based upon statistical concept of intelligence was followed for classification. This scheme of classification is symmetrical, comprising of as many classes above the mean as there are below it.

The reliability of the test was checked by using split-half as well as test-retest method. For the purpose of validation, the IQs on the present tests were correlated with the IQs on Desai Bhatt group tests, Bhatt group tests, Bhavsar non-verbal group tests, G. B. Shah non-verbal group tests, Adaptation of Wechsler Intelligence Scale for children in Gujarat, Trivedi Mechanical Aptitude test, School Marks in different subjects and Teachers Ratings. The validity was also checked by comparing means and SDs of groups of accelerated, normal and retarded students. The results are found to be quite satisfactory.

The factorial validity of the tests is established by Principal-axes method by the programme of Hotelling. In this method of factoring, each factor extracts the maximum amount of variance and gives the smallest possible residuals. The correlation matrix is condensed into the smallest number of orthogonal factors in this method. In practice, this method has limitations.
that the computations are laborious. The computer available in Physical Research Laboratory, Ahmedabad was fed with the programme of Hotelling and results obtained are given in the chapter on validity studies.

The following was prepared for the use of the tests:

1. Standardized instructions for test administration

2. Record Blank containing the following:
   (a) Scoring key based upon time and errors
   (b) Maximum time limit allotted to each test item
   (c) No. of errors allowed in each test item in tests 4 and 5

3. Ready reckoner for calculating the IQs

4. Classification of IQs