CHAPTER : I
INTRODUCTION

We do, of course, differ in our inborn powers; but let it not become an inhibiting idea or an overweening obsession.

- O.A. Mace

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1.1 Introductory

Psychological measurement is a close and important concern of all those who are keenly interested in education. No two children in the world are alike. They differ in their abilities in one way or the other. Education must be given according to the abilities and needs of the children, and needs of the children depend, among other things, upon their innate abilities. Hence, there is a need to study such abilities of children with the help of psychological tests.

Inspite of the felt need of good methods for the psychological measurement, it was only in the last century that systematic and scientific attempts were made in the area of psychological measurement in the western countries. The development of psychological tests is still in its infancy in India, but looking to the interest and enthusiasm of our psychologists, educationists and the public, it can be said that it has a glorious future.

It has been accepted that each individual is a unique adventure of life, and that the function of education is guidance of this adventure to the realization of the potentialities of each individual in the face of the actual world of men and things by utilizing his special talents.
In the sphere of education, it has been observed that hundreds of undeserving students are being pushed through college every year, and a good number of gifted children being forced to spend their time and talents in activities with which they are totally unfamiliar. Such situations arise because of the ignorance about the pupils on the part of parents as well as teachers.

Many parents set high level of aspirations for their children or encourage them to develop one which may be far above their level of accomplishment. Such children might get into many difficulties unless treated sympathetically with due regard to their level of intelligence.

1.2 Importance of Measurement

One of the distinguishing characteristics of modern education is the use of evaluation and measurement. The remarkable scientific discoveries and advances of the past few hundreds of years depended squarely upon accurate measurement. The work of the chemist, the physicist, the biologist, and the astronomer could not be done without accurate measurement.

As measurement became more accurate and more commonly used, it was inevitable that refinements in technique affect educational measurement. To be sure, teachers have had the
responsibility of judging and appraising ever since teaching began. They could not fail to note that some individuals learned more easily and rapidly than others; that some learned more of what was taught and retained what was learned far longer than others.

It has long been a part of responsibility of teachers not only to note and estimate the amount of such differences, but also to make reports on them and on pupil progress. As new and more refined methods of measurement were discovered and developed in natural sciences, they gradually influenced other fields, including education. This development in education is of comparatively recent origin, it has had tremendous effects on learning and teaching.

In order to judge, the attainment of his pupils accurately and fairly, a teacher must have accurate measurement techniques at his disposal and must know how to use them properly and how to interpret results obtained through them.

Today measurement touches and influences every phase of education. Whether it be marking, promotion, guidance and counselling, curriculum development, instruction, or some other aspect of the work, measurement enters the picture and usually plays an important role. However, while recognizing the pervasiveness and usefulness of measurement
in education, the student and teacher must always keep in mind that measurement is a tool, a means to an end, not an end in itself.

Attempts have been made to determine the extent, to which pupils in schools are exerting themselves up to or below their capacities by comparing their results on mental tests on one hand and that on educational examinations on the other. If a child does well on a mental test and less well in an educational examination, he is supposed to manifest a lack of seriousness of effort because his achievement is not as one might expect. Educational tests obviously involve mental processes, and the psychological tests draw heavily on the material learned and the skills developed in school. The only difference between mental tests and educational tests is that the mental tests are general in scope while the educational tests are specific in their reference. Mental tests emphasize psychological process, while the educational tests emphasize attainment in some particular subject.

We must agree that children cannot perform tasks beyond their capacity. It is impossible to pour more than a pint out of a pint-pot. A teacher willing to know the intellectual capacity of his pupils would like to administer a test which is more general. This will help him to plan his regular teaching as well as the remedial one.
1.3 Tests and Classification

The goal of psychological testing is to obtain as accurate an estimate of the test-taker's performance as is possible. Accurate estimation in psychological testing, as in other scientific procedures, depends on the control of errors, that is, on minimizing the influence of factors irrelevant to the purpose of the testing. This control is established by developing procedures designed to make the test taking situation the same, or as similar as possible, for all individuals. Standardization is such a process of developing controls.

In order to facilitate understanding of tests in education, it is necessary to define a standardized test.

According to Cronbach, "a test is a systematic procedure for comparing the behavior of two or more persons." ¹

A standardized test is one in which the procedure, apparatus, and scoring have been fixed so that precisely the same test can be given at different times and places.

"Some tests are provided with tables of norms stating what scores are usually earned by representative

subjects. Tests having such norms are sometimes called standardized test and the process of gathering norm data is called standardization."

According to Noll,

"A standardized test is one that has been carefully constructed by experts in the light of acceptable objectives or purposes; procedures for administering, scoring, and interpreting scores are specified in detail so that no matter who gives the test or where it may be given, the results should be comparable, and norms or averages for different age or grade levels have been pre-determined".

There are many ways in which tests can be classified. For example, they can be classified according to administrative procedure, such as individual administration versus group administration or as oral instructions versus written instructions. They can be classified according to form, purpose, content, and other characteristics. We shall place tests in two categories, the first being those which seek to measure the maximum performance of the subject. We use this when we wish to know how well the person can perform at his best; they may be referred to as tests of ability. The second category includes those tests which seek to determine his typical performance i.e. what he is likely to do in a given situation or in a broad class of situations.

2. Ibid., p. 22.

Tests of personality, habits, interests, and character fall in this category, because characterizations like 'shy', 'interested in art', and 'anxious when in disagreement with a superior' describe the individual's typical behaviour.

Thus the tests are classified as shown below:

* Ability tests (general, multiple and special),
* Achievement tests, and
* Interest, personality, habits and Attitude inventories.

As mentioned above, often the first two categories are considered to contain tests of maximum performance and the third, tests of typical performance.

Some classify ability and achievement tests as cognitive measures, and interest, personality, habit and attitude inventories as noncognitive measures.

According to Cronbach, ability tests have been subdivided into three categories:

i. individually or group administered tests that give a general measure of intelligence,

ii. tests that give measures of differential abilities.

5. Ibid., p. 269.
iii. tests that are measures of special ability.

1.4 Functions of Tests

The tests of ability, aptitude, achievement, and personality also find wide use in business, industry, and the military services. Scarcely any large business organization or industrial concern could function today without a personnel manager or director and staff of trained personnel technicians or psychologists. Much use has been made of standardized and special tests in selecting persons for employment, determining what type of work they are fitted for and measuring their efficiency. In addition to educational, business and industrial uses of measurement materials, the armed services use large quantities of tests, rating scales and other measuring instruments. Men and women are tested at pre-induction centers and during recruit training for selection purposes, for special training, for fitness for unusual kinds of duty, for adjustment to the service, and for countless other purposes.

1.5 Psychological Tests in Gujarat

Testing movement in Gujarat also needs a special mention. Gujarat is one of the states in India, which came

6. Ibid., p. 301.
into existence as a separate state, with its own dialect, Gujarati. Language has remained as a common thread through all the districts of this wide state. So any test, whether it is a verbal or non-verbal test, has not remained restricted for any one district, but has become a test for the state. As in the other parts of the country, some work has been done in Gujarat for measuring intelligence of the children. In Gujarat, the movement in mental testing took momentum after independence.

Intelligence Tests in Gujarat: The first Indian doctorate in test construction was awarded to Desai (1954) for developing a battery of group tests of intelligence in Gujarati for the age group 12 to 18 years studying in standards VII to XI of secondary schools. The other group tests of intelligence in Gujarati are by Bhatt (1962), Patel (1966), Patel (1970), Patel (1974) and Shah (1975). Bhatt designed the scale for Gujarati children of standards V to VII. The test was partly verbal and partly non-verbal. The group test constructed by Patel (1966) contained verbal as well as figural items. Patel (1974) and Shah (1975) constructed tests of general ability for Gujarati speaking children. Patel’s test was standardized for students of grades VII

through X drawn from various districts of Gujarat State. Shah's omnibus test covered the age range 13+ to 16+ and its sample was drawn from the Gujarati speaking children of Greater Bombay ... Attempts have been made to adapt WISC and WAIS for the use in India. Bhatt's (1970) adaptation of WISC was primarily meant for Gujarati population ... Shah (1971) adapted the 1960 revision of the Stanford-Binet Intelligence Scale for Gujarati Children in the age range 2+ to 18+ ... In the area of non-verbal tests of intelligence, Phatak (1955) made study of Goodenough's Draw-a-Man Test and developed a new scoring method in her standardization of the test for Gujarati children ... Shah (1964) developed a non-verbal measure of intelligence and standardized it on Gujarati children in the age range 7 to 13 years ... Phavsar (1967) prepared a non-verbal test for high school students of grades IX to XI corresponding to 13 to 18 years age-group ... Patel (1974) constructed a non-verbal test of general ability, with test items in pictorial form, designed to measure individual differences in intelligence of children studying in grades VII through X ... Patel (1973) constructed the performance scale of intelligence for the age group 6+ to 15+ in Gujarati.

1.6 The Problem

The problem under study is as follows:
"Construction and Standardization of General Ability Tests for the students of standards XI & XII of Higher Secondary Schools of Gujarat State".

In order to avoid misunderstanding about the terms involved in the statement of the problem, it is essential for the researcher to make precise, the connotation and meaning of the terms involved in the statement of the problem. They are:

(a) Construction
(b) Standardization
(c) General Ability
(d) Standards XI & XII

Over and above this, there are two other technical terms frequently used in this study. They are:

(a) Non-Verbal Test and
(f) Group Test

(a) Construction

Construction means to start constructing the items for the test. It is revealed from the history of the development of tests of general mental ability, that most of the tests are adapted from foreign tests rather than constructed as original tests. The brief historical view in the chapter to follow will clarify this.
The present investigator has accepted the concept of General Ability according to Flanagan, who has developed Tests of General Ability (TOGA) from K.G.-12, and constructed the test based on that principle. Hence, for the present test the term 'construction' means to construct the original test items on the principles involved in TOGA.

All the test items which are to be subjected to the process of standardization must be evolved or constructed. For the process of standardization, the test items must undergo the process of pre-pilot and pilot administrations and item analysis. Thus, the final form of the test, emerges without undergoing changes in the basic form and content.

(b) Standardization

This is a statistical term and it implies that the same content (items) be presented to each test taker and that there be rules specified for administering and scoring the test. Thereafter establishing the norms, its reliability and validity.

(c) General Ability

This is an abstract concept. Different psychologists have interpreted it differently. Hence with a view to clarifying the concept, whole of Chapter II is devoted.
However, the concept adopted by J.C. Flanagan for TOGA has been accepted in toto for the present test.

(d) Standards XI and XII

The standards XI and XII refer to the grades of the higher secondary schools. In Gujarat State, the student is allowed to enter, at the age of six, in Std. I of the primary school. Standards I to VII belong to primary, basic or elementary schools. After these primary school standards viz., I to VII are the standards VIII to X of the secondary school. At the end of Std. X, Gujarat Secondary School Certificate Examination Board conducts S.S.C. Examination. On successfully passing the S.S.C. Examination, the students are allowed to get admission in Std. XI. The higher secondary schools run two years courses viz., Std. XI and Std. XII.

(e) Non-Verbal Test

It is mostly a paper and pencil variety. In this type of test, pupils do not use words in attaching meaning to or in responding to test items. Tests involving the use solely of numbers, of graphical representations, or of figures and pictures or of materials are of this type.
(f) **Group Tests**

Group tests can be administered to more than one individual at a time and usually can be administered simultaneously to any size group.

1.7 **The Scope and Objectives**

In Gujarat State, a few attempts have been made to develop psychological tests to measure general mental ability of the children. The need for construction and standardization of Intelligence Tests and Aptitude Tests, suitable to Indian environment was felt as early as 1939. Later on the Secondary Education Commission Report in 1952-53 recommended that a Central Research Organization may be established for carrying out research on educational and vocational guidance and for preparation of the tests needed. It was felt that the C.R.C. must contain the record of the level of general ability, aptitude and interest of the pupil.

It has been noticed from the existing tests that there is a need for the tests having a few of the following characteristics:

* It has been found that for smooth administration of the group test, the test with very few sub-tests is preferred.
Due weightage should be given to environmental effects as it plays an important role in determining general ability of the children.

Pupils like to see different pictures than to read a paragraph about it. Hence the non-verbal i.e. pictorial items may be included in the test.

As culture-free abstract-reasoning items as well as culture-fair information items measure potential ability of the pupils to learn, both types of items be included in the test.

In order to avoid mental fatigue as well as boredom, a test with a time-limit of about 40 to 45 minutes be preferred.

Pupils will be interested in giving a test, if the tester controls the problems by reading aloud and then allowing to answer in a prescribed time-limit.

Thus, there is a scope and utility for the test of general ability, non-verbal in form with the test content based on culture-free abstract reasoning and culture-fair information items from different environments of Indian home, community, nature & recreation and basic & social sciences.
The present test, with some of the features mentioned above, will have vast scope in the field of measurement of general ability in Gujarat. The scope of such a General Ability Test has earned more weightage with the advent of ten plus two (10 + 2) pattern in the Gujarat State. It is because of this felt need that U.G.C. has so kindly approved the research proposal and made avail of the research fellowship to the present investigator.

The teachers, administrators, guidance and counselling officers and parents might find it very useful. The test can help them in measuring potential ability of the pupils to learn. It would prove to be a sparking ray for diagnosing students, with good general ability but showing poor educational achievement, only if their basic potential to learn is estimated. Hence there would be a scope for all interested to employ various methods to substantiate the potential.

Therefore, keeping in view the scope, the investigator has determined the following as main objectives:


2. To study the significance of sex differences with reference to their general ability.
3. To provide higher secondary schools of Gujarat State with a standardized tool to measure individual differences in general mental ability of the students of the standards XI and XII.

The scope of the application of the tests covers teachers, parents, counsellors and researchers. This will enable them to measure the potential ability of pupils and thus to provide adequate counselling to them.

1.8 Limitations of the Study

The test, even with a wide scope has certain limitations too. They are as follows:

* It is limited to Gujarati speaking pupils of standards XI & XII.
* Its norms are based on the population of Gujarat State.
* The children with poor-vision, poor hearing or inadequate eye-hand co-ordination will be handicapped in taking the test.

With this wide scope, specified objectives and limitations, the investigator decided to construct and standardize a general ability test.
1.9 **Test Construction and Report**

For devising a highly reliable and valid tool, a great care should be taken right from planning to the work of complete standardization. As far as procedure is concerned, it resembles more or less similar to most of the tests of mental measurement. This, being a non-verbal group test of general ability for standards XI and XII, the ability components and types of items, which are to be included in the test must be determined in the first instance. For this, the ability components incorporated in the various sub-tests of verbal and non-verbal tests developed in India and abroad were to be studied.

The entire work of construction and standardization of general ability test has been reported in the chapters like:

1. Introduction,
2. Nature of General Ability,
3. Review of the work done in Mental Testing,
4. Test Design and Construction,
5. Experimental Tryouts,
6. Final Run of the Test,
7. Fixation of Test Norms,
8. Test Reliability,
9. Validity Studies, and
10. Retrospect and Prospect
The test thus developed may be helpful to the pupils, teachers, parents, researchers and guidance and counselling workers in the field of education and psychology.