CHAPTER II
MEASURING INSTRUMENT

Most of the tests used in this study are well known and have often been used in various studies in India and abroad. A detailed discussion of these tests, therefore, does not seem to be necessary. Only their salient features are reported. References for more complete information are also given. They are discussed under two heads:

i) Predictors (Intellectual and non-intellectual variables);

ii) Predicted variables.

PREDICTORS

Intellectual Variables:

I) Raven's Progressive Matrices Test (RPMT)

The standard form of the Raven's Progressive Matrices Test (RPMT) (1964) was used in the present study. It is a non-verbal analogy test consisting of a series of geometrical designs grouped into sets. The first problem in each set is intended to be self-evident and is followed by problems of increasing difficulty. In each item, a part of a geometrical design is missing. A number of alternatives - six or eight - are given below each of these designs, all of which fit the missing part but only one logically belongs to it. An answer which fits may, as Bortner (1965) puts it: (a) complete a pattern, (b) complete an analogy, (c) systematically alter a pattern (d) introduce
systematic permutations, or (e) systematically resolve figures into parts. The subject by studying explicitly or implicitly the relations between the various parts of the design or matrix, has to decide which is the right alternative.

Raven claims that the test is based on Spearman's three neogenetic principles. Progressive matrices, he writes "is a test of a person's capacity at the time of the test to apprehend meaningless figures presented for his observation, see the relation between them, conceive the nature of the figure completing the exact system of relations presented, and by so doing develop a systematic method of reasoning."

The test has been designed for use with subjects of the age group 6 to 65 and is claimed to be culture free.

It has profitably been used in India on the college population by various investigators — Kandu and Chakarvarty (1964), Srivastva (1967), Rath (1954), Rao (1962). They have found the test to be fairly reliable (reliability coefficients ranging between .80 and .95) and a valid measure of individual differences attributable to intelligence. Mitra (1965) after examining the difficulty and validity indices of the test items for the Indian sample found that the test, as a whole, show fairly low culture loadings.

The other two forms of the test, i.e., (i) Coloured Matrices for children and (ii) Advanced Progressive Matrices
have also been used in some studies in India; Hazeni (1960) and Tamhankar (1967).

A few other Indian investigators, Dosajh (1958), Singh (1966), Rao (1962) and Mehrotra (1959) have used the test for predicting the success of school and college students in different academic subjects. They found that the test has a fairly good prognostic value and can profitably be used in combination with other predictors for predicting the academic success of the students.

II. Factor B of 16 PF.

Factor B is one of the sixteen factors measured by Cattell's sixteen personality factor questionnaire.

The person scoring low on factor B tends to be slow to learn and grasp. His dullness may be simply a reflection of low intelligence, or it may represent poor functioning due to psychopathology. Whereas the person who scores high on factor B tends to be quick to grasp ideas, a fast learner, intelligent. In the present study the scores on this factor have been obtained by using an adapted version of Catell's 16 PF (Jalota: 1964). For measuring this factor there are ten verbal items distributed all over the test. There is no time limit for the test. The author of the test claims that it is a fairly reliable and valid measure of intelligence as defined above.

III. Early Academic Success

Two indices of early academic achievement have been
used as predictors: (i) percentage of marks in Matriculation (ii) percentage of marks in First Degree examination - B.A., or B.Sc. Both these examinations are conducted by the Panjab University under the supervision of their staff. The question papers are set by the examiners appointed by the University. They are required to set a representative paper covering the prescribed syllabus for the subject concerned. The paper setters also issue detailed instructions to the sub-examiners who mark the answer books. The sub-examiners send about twenty answer books marked by them to the head examiner or paper-setter, as the case may be, for the approval of the standard of marking. He resumes marking only after receiving the approval of his standard of marking. All the marked answer books are then sent to the paper-setter or head-examiner for his scrutiny and approval. The answer books are re-evaluated if it is found that the instructions for marking the answer books were not followed truthfully.

All this is done with the hope of making the evaluation of answer books as objective as possible. It is, however, difficult to assess as to how far they succeed in their objective. Thus the criteria of early achievement of academic success is of doubtful reliability. This, however, is the only prevalent method currently and traditionally used in the country for assessing the academic achievement of the students.

In either examination, the relative position of the examinee is determined on the basis of his total marks
in the relevant examination. For this purpose the total marks are converted into percentages and candidates are classified as under:

Less than 33% ... ... Unsuccessful
33% or more but less than 50% ... ... 3rd Division
50% or more but less than 60% ... ... 2nd Division
60% or more ... ... 1st Division
75% and above ... ... Distinction

In our study we have not thus classified the subjects and instead have used the percentage of marks in the Matriculation and first degree examinations as indices of early academic achievement. These marks, as explained above, are based upon the examinations conducted centrally by the Panjab University, evaluated externally by sub-examiners and reviewed by the head-examiners or paper-setters nominated by the University.

Non-intellectual Variables

I. Maudsley Personality Inventory (MPI)

The Maudsley personality inventory was developed by Eysenck. It seeks to measure extraversion and neuroticism, two factors of personality within the framework of the Eysenckian theory.

It consists of 48 items, 24 each for assessing extraversion and neuroticism. The items included in the present study are Hindi translation of the original MPI (Eysenck, 1959) with very minor modifications made by
Singh (1964). Using this inventory Jalota (1964), Hundal and Agyajit (1968), Hundal and Kuljit (1969), Hundal and Sudhakar (1969) found the split half reliability coefficients ranging between .72 and .93 for the neuroticism scale and .53 and .61 for the extraversion scale. These values are somewhat lower than the respective values reported by Eysenck (1959), where for the neuroticism scale split half reliability coefficients range between .85 to .90 and for the extraversion scale between .75 to .85. The test is very popular with investigators in India. Inspite of reported low reliability co-efficients they have found it to be a very useful measure of extraversion and neuroticism.

It can be administered individually or in a group situation. There is no time limit for the test though most of the subjects do not take more than 15 minutes to complete it.

II. Indian Version of Allport's A - S Reaction Study

The Indian version of Allport's A - S Reaction study men's form — Hundal (1964), women form, Hundal and Sharma(1966), contains all the items of the original test, though some minor modifications of language have been made in some of the items. In all, it contains 43 statements. These are multiple choice type items, each having two or more alternative responses. Subjects have to choose just one response which agrees with his mode of reaction.

The authors of the test have assigned weight scores
to the item responses following the technique described by Ruggle and Allport (1939). Through item analysis techniques they have, also, found that the test responses effectively distinguish between groups showing personality characteristics associated with ascendance and submission.

The split half reliability coefficient of men and women forms in their studies (N = 200 post-graduate students in each case) are .66 and .71 respectively. These tests have been adapted for use with English knowing adults. No time limit is enforced in the testing but most of the subjects complete it in about 30 minutes.

III. Hindi Version of Cattell's 16 P.F (Form Ka)

The Hindi version of Cattell's Sixteen Personality factor questionnaire (Jalota and Kapoor, 1964) spans the domain of known measurable aspects of human personality in terms of 16 distinct factors.

This test is easy to administer and can be used as a group or individual test for persons of 15 to 16 years of age and above. The vocabulary required is of the average newspaper standard. Although no time limit is enforced in the testing, it takes about 50 to 60 minutes to complete an eight-page booklet with 147 items.

Authors report that the split half reliability coefficients corrected by the Spearman Brown prophecy formula, for different factors, ranges from .38 to .74: only two being below .46. In view of the small number of
items, about 10 for measuring each factor, reported reliability coefficients may be regarded as satisfactory. The inter-correlations among factors are low, mostly in the range of .01 to .10 and rarely in the range of .11 to .20. Thus, factors are largely independent of each other. The studies reported in the manual of the test also show that the results obtained from the Indian sample with the test are comparable with those of their counterpart in America. Studies in India, by Jalota (1957), Rao (1960), and Bhagoliwal (1960) show that the test is a valid tool for assessing the individual's personality.

IV. Allport-Vernon - Lindzey Study of Values (Adapted version)

The Allport - Vernon - Lindzey study of values (1951) was adapted to the Indian situation by Chowdhry (1959). The author has simplified the instructions given in English and illustrated certain factors or situations from Indian history and life in consultation with Prof. P. E. Vernon and G. W. Allport. No item has been added or eliminated. The test contains 45 questions and is divided into two parts. In the first part two alternatives have to be rated either as 3 or 0, or 0 and 3, or 2 and 1, or 1 and 2 according to agreement or disagreement with the statement. In part two, the four alternatives are rated in order of personal preference, giving 4 to the most attractive, 3 to the second most attractive, 2 to the next one and 1 to the least attractive alternative. There is no time limit for the test but it takes about 30 to 40 minutes to complete the blank.
The test is designed to measure six dominant interests or motives in personality: theoretical, economic, aesthetic, social, political, and religious. Theoretically it is based on Spranger’s contention that personality can be inferred from the individual’s values.

The reliability of the test measure was worked out by the Kuder - Richardson (1939) technique. The reliability coefficients for different values range from .82 to .99. After a few careful studies, Chawdhry (1959 a, 1959 b) claims that "the adaptation of the scale in Indian situations seems to be quite satisfactory". In a subsequent studies: Shukla (1965); Kumar (1964), Pal (1969) confirm the opinion of Chawdhry about the usefulness of the test in the Indian situation.

Attitude towards the Teaching Profession

A scale for measuring attitude towards teaching was constructed following Likert’s (1932) technique. Items for the first try-out were borrowed from earlier studies in this area (Prashar, 1965). In all there were 40 statements, half expressing favourable and the other half unfavourable opinion about the teaching profession. These statements were given to 180 teacher-trainees who were asked to respond to each one in term of their own agreement or disagreement with the statement. In obtaining response from the subjects, we permitted them to use any of the five categories; strongly agree, agree, undecided, disagree, strongly disagree.
While scoring the responses of the subjects in case of favourable statements, the strongly agree response was given a weight of 4, the agree response a weight of 3, the undecided response a weight of 2, the disagree response a weight of 1 and the strongly disagree response a weight of 0. For unfavourable statements, the scoring system was reversed with the strongly disagree response being given the 4 weight and the strongly agree response the 0 weight. The selection of the item was made on the basis of phi-values computed for each statement in the test. For the computation of phi-values the group was dichotomised at the median. The phi coefficient denotes correlation of a single item with the total score on the test. As such it is a measure of the extent to which a given statement differentiates between high and low scores on the test. For the computation of phi values, the proportion of persons scoring higher and lower than the neutral score of 2 on each statement were worked out separately for each item. The phi-coefficients, for each item were looked up from ab ac Fig No.15.5 Guilford (1954). Phi values to be significant at .05 and .01 levels for 180 subjects are .14 and .19 respectively. Thirty items with phi values of .14 or above were retained to constitute the attitude scale. Results are reported in Table I.

PREDICTED VARIABLES

I. Evaluation of "Theory Papers"

At the end of training course the teacher-trainees
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are examined in the following eight theory papers:

**Compulsory subjects**

1) Educational Psychology  
2) Principles of Education  
3) School Organisation  
4) Methods of Teaching  
5) History of Education  
6) Educational and Vocational Guidance  
7 & 8) Any two of the following elective subjects:–

i) Teaching of English  
ii) Teaching of Mother Tongue  
iii) Teaching of Social Studies  
iv) Teaching of Science  
v) Teaching of Geography  
vi) Teaching of Mathematics  
vii) Teaching of Home Science

The examination is conducted by the Panjab University after the completion of one year of training in the college. The conduct of the examination and the evaluation of the answer-books is done on the lines of the Matriculation and first degree examinations described earlier. The index of performance of the teacher-trainees is the average percentage of marks obtained by them in all the subjects.

II) Evaluation of "Teaching Skill"

Here, too, the trainees are examined after the
completion of a one-year training period. The examination is conducted by the Panjab University. The candidate has to give two lessons, one each in the elective subjects offered by him. His lessons are watched by two examiners, internal and external. The internal examiner is a member of the college faculty. The trainees being examined, had been under his charge throughout the year. The external examiner is appointed by the University. The performance of the candidate is evaluated independently by the two examiners. They are free to judge in whatever manner they may like. In any case no rating schedule is used. The two examiners then submit their reports to the co-ordinator. The final award is given after discussion of the two reports. It must be admitted that the procedure, as such, has all the limitations associated with rating techniques. It, therefore, cannot be regarded as a sound procedure for evaluating the performance of teacher trainees. We had to accept this as a criterion since no better index was available.