**Unit 3**

**Tools and Techniques of Research**

3.1. Purpose of tools and techniques in educational research. 3.2. Techniques – observation, interview, sociometry projective techniques, testing. 3.3. Tools – check list, rating scale, questionnaire, opinionaire, inventiories, sociogram, cumulative record, rubrics, different types of test and their standardization and establishing reliability and validity. 3.4. E-tools.

Factual material or raw data is essential in every study. They can be obtained from many sources, direct or indirect. It is necessary to adopt or, evolve a systematic procedure, to collect essential data. Relevant data, adequate in quantity and quality should be collected. They should be sufficient, reliable and valid.

For collecting new, unknown data required for the study of any problem one may use various devices. For each and every type of research we need certain instruments to gather new facts, the experiments thus employ means are called tools. Different tools are suitable for collecting various kinds of information various purposes. The research worker may use one or more of the tools in combination for his purpose.

**Characteristics of a good tool / measuring instrument**

Reliability, validity, objectivity, comprehensiveness, comparability, practicability and usability are the major qualities that any satisfactory measuring device should possess. In order to arrive at correct judgments concerning the tests, the test or measuring instruments used should be based on dependable scores secured from dependable tests. More over from the point of view of objectivity, discriminating power, comprehensiveness etc. A test should be acceptable.

1. **Validity**

“*Validity refers to the degree to which evidence and theory support the interpretation of test scores entitled by proposed uses of tests*” (Joint Committee on Standards of Educational and Psychological Testing).

Validity means purposiveness. It may be defined as "*the accuracy with which a test measures whatever it is supposed to measure*". A test which can be used for many purposes may be valid for one purpose but may not be so for another purpose. Validity can be equated to truthfulness. The extent to which measurements are useful in making decisions relevant to a given purpose is known as validity. In other words validity of a test refers to "the extent to which it measures what it purposes to measure." Validity is connected with the stated objective of the test.

There are different types of validity including face validity, content validity, criterion validity and construct validity. Not all tests uses must meet all three validity. Different type of tests are used for different purposes and therefore need different types of validity.

For ex: Tests of intelligence are designed to predict academic achievement and are based on a psychological theory or construct. Thus this type of test needs both construct and prediction not content validity. Most achievement tests need only content validity.

**Types of validity**

Many different types of validity have been identified by the psychologists to conduct a good test. A good test is characterized by at least one and hopefully more than one of these types.

1. **Face validity**

It means that the given test appears or seems to measure what it is to measure; this validity does not refer to what the test actually measures.

1. **Content Validity**

A test is said to have content validity, if it does fulfill justice to the course content. Course content consists of the instructional objectives and the subject matter. A test having content validity must first of all have comprehensiveness. For this, the test constructor should make the content analysis. A design should be prepared giving weightage to the units and subunits of the curriculum which is the sum total of the learning experience. Content validity is also known as curricular validity or rational validity or logical validity. This validity is based up on judgement of several subject experts and test specialists.

This type of validity is particularly important for achievement test but not very important for aptitude tests because they are used for different purposes.

1. **Criterion related validity**

Criterion validity refers to the relationship between the scores on a measuring instrument and an independent external (criteria) variable believed to measure directly the behavior or characteristic in question. Test scores are related with external criteria. External criteria may be a test score or opinion from a teacher, expert etc. Here correlation is checked between the score and external criteria. If the correlation is high then it has criterion validity.

There may be two types of criterion referenced validity, depending up on the use of tests. Both concerned correlation between test scores and a criterion, but a distinction is made on the basis of time when the criterion data are collected. They are:

1. **Concurrent validity**

Concurrent validity is concerned with the correlation between test scores and a criterion measure available at the same time. Concurrent validity allows us to be show that our test is valid by comparing it with an already valid and standardized test. For eg; a new test of intelligence would have concurrent validity of it had a high positive correlation with the Stanford-Benet test.

1. **Predictive Validity**

A test has predictive validity if its products will used to predict other variables. If a test has capability for prediction, of performance then it has predictive validity. But the comparison is made at different times. It is concerned with the relation of test scores to some measures on future performance. If the scores on a spelling test help us to differentiate between pupils who will succeed and pupils who fail in stenography course, then we can infer that the spelling test has predictive validity as far as stenography is concerned. This type of validity is mainly useful in aptitude tests. Predictive validity can be estimated by the degree of the relationship between a measure and a subsequent external criterion measure of proven validity.

Because of this dependence of external criterion for establishing validity of the test , it is said to be criterion related validity.

1. **Construct Validity**

Construct validity of a test refers to the extent to which the test measures a particular characteristics of an individual. It is the type of validity that is essential for tests that are used to assess individual on certain psychological traits and abilities. construct validity is used in such tests as those of study habits, skills, anxiety, intelligence, motivation, reasoning ability, attitudes, aptitude etc.

1. **Reliability**

Reliability of a test is its trustworthiness or its consistency. It is delivered as the accuracy with which a test measures whatever it does measure. A relative test should yield essentially the same scores, when administered a second time to the same pupils, providing no learning or forgetting has taken place between the periods of the two testing.

One can describe an incident any number of time in the same manner without even the slightest modifications. We can conclude that he is consistent in describing the incident. But it may not be the actual incident that he describes. Different methods can be accepted to determine the reliability of a test. The reliability coefficient provides useful information for evaluating test. The reliability coefficient generated should be fall between the value 0 to 1.

**Reliability Coefficient Interpretation**

0.85 and above High reliability

0.85 to 0.60 Moderate reliability

Below 0.60 Very low reliability

* 1. **Test -retest** **method**

This method requires giving the same test to the similar set of subjects twice over a period of time( usually two weeks) and obtaining two sets of scores for the test. The correlation between the two sets of scores is known as test-retest reliability coefficient (also known as coefficient of stability). If the test is repeated the same day or after an interval of four days, subjects are likely to remember much of the material, practice and confidence induced by familiarity with the test material increase their scores on the retest. If too much time gap is allowed, then the psychological factors like growth and maturation, may affect the retest scores. The test retest method is generally less useful than the other methods.

* 1. **The equivalent or Parallel-form method**

In this method, reliability is determined using two equivalent forms of the same test content. Here two such tests are prepared and administered to the same group one after the other. These test forms should be identical with respect to the number of items, content, difficulty level etc. Determines the correlation between the sets of scores obtained by the group in the two tests.

* 1. **The Split-half method**

This technique tries to overcome the difficulties of preparing equivalent forms of the same test. Here the same test is split into a number of parts suitably so as to make them as equivalent forms. The most simple way of producing two parallel forms of the given test is to separate odd numbered and even numbered items of the given test in which items are arranged in the increasing order of difficulty. The correlation between the sets of scores obtained from the odd numbered items and even numbered items for every test, provides a measure of reliability called co-efficient of homogeneity. The reliability determined in this way the reliability of the half length of the test. A correlation formula is applied to obtain the reliability of full test. This is done by using Spearman-Brown formula which can be stated as,

**rtt  =**

Where, **rtt** =reliability coefficient of the full test.

**rhh** = reliability coefficient obtained between the two halves of the test

The main limitation of this technique is that it cannot be applied for a test of skills or speed. Again if test items are not of equal weightage, split half technique cannot be applied.

* 1. **The method of rational equivalence**

The forth method of establishing the reliability of the test score by means of a formula developed by Kuder and Richardson. We get a measure of internal consistency by the help of this formula. There is no need of splitting the test in this method as in the case of split half method.

The formula is,

**r = [ 1 -]**

Where, r= reliability coefficient of whole test

n=number of test items

P= proportion of correct responses to a particular item

q= proportion of incorrect responses to that item (p+q=1 is always)

𝛔= standard deviation of total scores

The reliability of a test may be raised by increasing the number of items of equal quality to the other items. Carefully designed directions for the administration of the test with no variation from group to group, providing an atmosphere free from distractions and one that minimizes boredom and fatigue, will also improve the reliability of the test instrument.

A test may be reliable even though it is not valid. However, for a test to be valid, it must be reliable. That is, a test can consistently measure(reliability) nothing of interest(be valid), but if a test measures what it is designed to measure(validity), it must do so consistently(reliably).

1. **Objectivity**

A test is said to be objective if it is free from personal biases in scorings. Objectivity of a test can be increased by using more objective type test items and the answers are scored according to the scoring key provided.

An examination or a test becomes subjective when the questions are vague or loosely stated, and when the scoring depends upon the arbitrary judgment of the examiners.

Objectivity of a test may be increased by

(a) Using more objective type test items.

(b) Making essay type items more exact and clear

(c) Preparing a marking scheme and scoring key

(d) Setting realistic standards.

1. **Discriminating Power**

Discriminating power of an item in the question paper is its power to discriminate between the superior and inferior students. Based on total scores on the test the papers are arranged from top to bottom and the highest 27% and the lowest 27% are chosen as the high group and the low group respectively. The performance of pupils of these two groups on each item constituting the test is analysed to find out the discriminating power. A simple arithmetic formula used for finding discrimination index is

 when U is the

Number of students in the upper group who answer the test item correctly L is that in the lower group, N, the number of students in each group.

Suppose in a pilot study the upper group and the lower group contain 60 students each, out of which 48 and 12 respectively answered an item correctly.



Generally items of discriminating power 0.25 to 0.8 included in the test

1. **Practicability and Usability**

Practicability of a test depends upon

(1) administrative ease

(2) Scoring ease

(3) Interpretation ease

(4) economy in time and cost

**6. Comprehensiveness**

The test should cover the whole syllabus. Due importance should be given to all the relevant learning material. It should also cover all the anticipated objectives. If these two exists, the test may be said to possess comprehensiveness.

**7. Comparability**

A test possesses comparability when scores resulting from its use can be interpreted in terms of a common base that has a natural or accepted meaning. There are two methods for establishing the comparability of standard tests.

(1) Availability of equivalent forms of a test.

(2) Availability of adequate **norms**.

**Norms**

One of the distinguishing characteristics of a standardized test is the provisions of norms to aid in the interpretation of individual scores. Norm referenced test interpretation involves some method of examining how an individual’s test scores compares to the scores of others in some known group. An individual’s test performance is typically interpreted by comparing it to the performance of a group of subjects of known characteristics (age, sex, race etc.). This known group is called normative sample or norm group.

A norm is usually the average or typical value of a particular characteristic measures in a specified homogeneous population. Norms report how students actually do perform. For ex: It may be the average achievement on a particular science test of a representative sample of 16 years old children or all eleventh grade children taking the science course.

A norm is statement of present achievement of the group and not a universal standard of accomplishment. In most cases average(either mean or median) achievement of a group is taken as the norm, but other times other points such as, percentiles or points on the standard deviation scales are used.

Most of the norms on widely used standardized instruments are based upon the scores of a fairly large cross section of pupils who live in the widely scattered parts of the nation.

1. **Age norms (Age equivalent scores)**

Age norms are usually based on the average scores( performance) obtained by the student at different ages and are interpreted in terms of age equivalence(norms). Suppose pupils who are 11 year 8 months old have an average of 35 correct responses on a reading test. The age norm for this 35 correct responses would be 11.8. Age norms are especially useful in the standardization of intelligence or mental ability test.

1. **Grade norms (Grade equivalent scores)**

A grade norm may be defined as the mean or median achievement of pupils in a given school grade on a given standardized test. Suppose the average score obtained by sixth grade pupils tested at the end of January on a reading test have 35 correct responses. This translated into grade norm 6.8, which represents achievement of the average pupil in the sixth grade, fifth month. It is useful on achievement tests for various subjects.

1. **Percentile norms**

Percentile norms provides us with a basis of interpret the score of an individual interms of his standing in a particular group. Imagine lining up participants in a race in order of winning. They would line up in first place, second place… etc. But imagine doing this for 100 pupils. The first winner would be standing in front of 99 other pupil. Thus they would be in the 99th percentile (having performed better than 99% of the group).

This means, a student ranking at 57th percentile performs better than 57% of students of the same age who wrote this test. Percentiles are a ranking system based on a lineup of performers.

Percentile norms are widely used on readiness tests for first grade children, on achievement tests in various subjects for high school children, on interest inventories, personality inventories and rating scales etc.

1. **Standard score norms**

A standard score is expressed as a deviation of a score from the arithmetic average of the normative group in which the standard deviation of the normative group is used as the unit of measurement. Standard scores are used in norm referenced assessment to compare one student’s performance on a test to the performance of the other students. Standard scores estimate whether a student’s score are above average, average or below average compared to peers.

Grouland has given the following formula for computing standard score.

**Z score =**

Where, X= raw score

M= mean of raw scores

SD= standard deviation of raw scores

These Z scores are scaled on a number line ranging from -4 to 4 with zero being the middle. On this scale zero is average, and the negative scores are below average.

Here Z score is always minus when the raw score is smaller than the mean. Forgetting minus sign can cause serious errors in test interpretation. It is for this reason that Z scores are seldom used directly in test norms. They are usually transformed into a standard score system that uses only positive numbers.

The another type of standard score is T score.

The formula is,

**T score= 50+ 10 (Z)**

These T scores range from 10 to 90 in intervals of 10 points. Fifty in average on this scale. Such scores simplify interpretation and increase comparability.

1. **Ordinal scales**

Ordinal scales are based on developmental sequences and used to identify stages reached by a child. Qualitative descriptions are also provided. In ordinal scales, successful performance at one level implies successful performance at one preceding levels. The scales developed within this frame work are based on the sequential patterning and uniformity of developmental sequences.

Eg: Ordinal scales of psychological development designed for children ages two weeks to two years.

Rank ordering of tasks is performed first in designing an ordinal scale, then age may be considered. Since these scales generally provide information about what the child actually able to do, they share important features with criterion referenced tests.

A major problem encountered in ordinal scale is inconsistency in anticipated sequences. Moreover, when dealing with special population, the developmental sequence may not be same. Each type of score describes an individual’s performance in reference to his/her location in a norm group.

**Scales of Measurement**

Measuring Observations of materials or characteristics of any sample in numerical method is called quantification and is needed for statistical analysis. There are four measurement scales or types of data. They are nominal, ordinal, interval and ratio scales.

**Nominal scales**

A nominal scale is least precise method of quantification. A nominal scale describes differences between things by assigning them to categories- such as professors, associate professors, assistant professors, instructors, or lectures- and to subsets such as males or females, it is given in the following table.

**Instructional staff of the institution**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Male | Female | Total |
| Professors | 20 | 4 | 24 |
| associate professors | 34 | 22 | 56 |
| assistant professors | 44 | 30 | 74 |
| Instructors | 26 | 14 | 40 |
| Lectures | 17 | 5 | 22 |
| Totals | 141 | 75 | 216 |

Nominal data are counted data. Each individual can be a member of only one set, and all other members of the set have the same defined characteristic. Nominal scales are non orderable, but in some situations this simple enumeration or counting is the only feasible method of quantification and may provide an acceptable basis for statistical analysis.

**Ordinal scales**

Ordinal scales permit the ranking of items or individuals from highest to lowest. The criterion for highest to lowest ordering is expressed as relative position or rank in a group: 1st, 2nd, 3rd,….nth. Ordinal measures have no absolute values, and the real differences between adjacent ranks may not be equal. Ranking spaces them equally, although they may not actually be equally spaced. The following example illustrates this limitation:

|  |  |  |  |
| --- | --- | --- | --- |
| **Subject** | **Height in Inches** | **Difference in**  **Inches** | **Rank** |
| A | 76 |  | 1st |
| B | 68 | 8 | 2nd |
| C | 66 | 2 | 3rd |
| D | 59 | 7 | 4th |
| E | 58 | 1 | 5th |

**Interval scales**

An arbitrary scale based on equal units of measurements indicates how much of a given characteristics is present. Interval scales are numeric scales in which we know not only the order, but also the exact differences between the values.  The classic example of an interval scale is Celsius temperature because the difference between each value is the same.  For example, the difference between 60 and 50 degrees is a measurable 10 degrees, as is the difference between 80 and 70 degrees.  Time is another good example of an interval scale in which the increments are known, consistent, and measurable.

Its primary limitation is lack of true zero. It does not have the capacity to measure the complete absence of the trait, and a measure of 90 does not mean that a person has twice as much of the trait as someone with the score of 45. Psychological tests and inventories are interval scales and have this limitation, although they can be added, subtracted, multiplied, and divided.

**Ratio scale**

The ratio scale has the equal interval properties of an interval scale but has two additional features:

1. The ratio scale has a true zero. It is possible to indicate the complete absence of a property. For example, the zero point on a centimeter scale indicates the complete absence of length or height.
2. The numerals of the ratio scale have the qualities of real numbers and can be added, subtracted, multiplied and divided and expressed in ratio relationships. Here the values are comparable in all respect. If two students have heights of 120 cm and 140 cm, then the difference in their heights is 20 cm and the heights are in the ratio 6:7 and 15grams weight is three times 5 grams.

**The major data gathering tools of research may be broadly classified under techniques such as:**

1. Testing
2. Observation
3. Interview
4. Inquiry forms
5. Sociometric projective techniques
   1. **Testing Technique**

The term test refers to the use of test scores as data. This technique involves subject response to either written or oral questions to measure knowledge, ability, aptitude, or some other trait. A numerical value obtained as a result of each subject’s answers to a standard set of questions. The instrument used as a way to describe or measure a characteristic of the subject. Tests are valuable measuring instruments for educational research. A test is a set of stimuli presented to an individual in order to elicit responses on the basis of which a numerical score can be assigned. This score based on a representative sample of the individual’s behavior, is an indicator of the extent to which the examinee possesses the characteristic being measured.

**Classification of tests**

Tests can be classified in terms of their purposes, that are the types of psychological traits that they describe and claim to measure. By this standard, we may distinguish different classes of tests. They are achievement test, aptitude test, intelligence and awareness test etc.

**Achievement test**

An achievement test attempts to measure what an individual has learned his or her present level of performance. Most tests used in schools are achievement tests. They are particularly helpful in determining individual or group status in academic learning. Achievement test scores are used in placing, advancing or retaining students at particular grade levels. They are used in diagnosing strengths and weaknesses and as a basis for awarding prizes, scholarships or degrees. Many of the achievement tests are used in schools are nonstandardised, teacher designed tests.

**Gronlund** defines an achievement test as *"a systematic procedure for determining the amount a student has learned through instruction".*

In research, achievement test scores are used frequently in evaluating the influences of courses of study, teachers, teaching methods, and other factors considered to be significant in educational practices.

Content validity is critical for this type of test. Concurrent validity might be used to help establish a new achievement test’s validity. Other types of validity are probably not necessary but would only be important if relevant for the test use. For standardizing tests, and assuming the test is group administered paper and pencil with multiple choice items. The reliability of such tests may be found out either by using test-retest method or split half method. Equivalent forms reliability seems to be little value with respect to achievement tests because it is concerned with two different forms of a test giving consistent results.

**Different types of achievement tests**

These tests could be divided into two main groups as follows.

1. Those that fulfill some specific educational purpose.

2. Those that test efficiency in a school subject or in general information etc.

Eg: Some tests aim at measuring the quantity, rate and speed of pupils in a particular subject or skill.

**Quality, Rate and Speed tests**

These tests aim at measuring the quality, rate and speed of pupils in a particular subject or skill.

**Range tests**

Such tests are designed to measure the extent to which an individual can answer questions which go on increasing in difficulty progressively.

**Accuracy tests** are other types of tests to assess specific educational purpose.

**Construction of an achievement test**

Following are the important considerations to be kept in mind in the construction of a test.

1. Planning of the test

2. Preparation for the test

A. Weightage to objectives

B. Weightage to content

C. Weightage to difficulty level

D. Weightage to form of questions

3. Preparation of a blue-print

4. Grouping of test items

5. Scoring key (objective type questions)

6. Marking Scheme (descriptive questions)

7. Question-wise analysis

* + 1. **Planning of the test**

Before constructing a good achievement test, the paper setter should think about the following aspect as the part of his planning.

The paper setter should aim at testing the achievement of the objectives. The next step is to determine the maximum time, maximum marks and the nature of the test. These should be decided in terms of the nature and scope of the units involved in the testing.

* + 1. **Preparation of a design for the test**

After determining the broad scope of the test, a design has to be developed in tune with it. The objectives, content, form of questions and the difficulty level of items are the most important factors to be considered in such a design.

1. **Weightage to objectives**

This indicates what objectives are to be tested and what weightage to be given to each objective. Teacher should decide the relative importance of each of the objectives applying his knowledge and experience and in tune with the nature of the content covered.

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl.No** | **Objectives** | **Marks** | **Percentage** |
| 1 | Knowledge | 5 | 20 |
| 2 | Understanding | 9 | 36 |
| 3 | Application | 8 | 32 |
| 4 | Skill | 3 | 12 |
|  | Total | 25 | 100 |

1. **Weightage to content**

This indicates the various aspects of the content to be given to the tests. Suppose a lesson or unit including various aspects of study have been taught. To test these, questions covering all the aspects should be included in the design with marks assigned to each aspects in relation to its importance with the other aspects. If only one unit is included in the test, it is called a unit test. Then the content is divided into a number of subunits and weightage is given to each unit.

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl.No** | **Content** | **Marks** | **Percentage** |
| 1 | Unit I | 4 | 16 |
| 2 | Unit II | 9 | 36 |
| 3 | Unit III | 7 | 28 |
| 4 | Unit IV | 5 | 24 |
| Total | | 25 | 100 |

1. **Weightage to form of questions**

The paper setter should select the form of questions that are suitable to the objectives and content to be tested. If we ask only essay type questions, we cannot get a satisfactory content coverage. This defect can be rectified by including short answer type and objective type questions.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl.No** | **Form of questions** | **No. Of questions** | **Marks** | **Percentage** |
| 1 | Objective type | 10 | 10 | 40 |
| 2 | Short Answer type | 5 | 10 | 40 |
| 3 | Essay type | 1 | 5 | 20 |
| Total | | 16 | 25 | 100 |

1. **Weightage to difficulty level**

The test should cater to the bright, the average and the dull. If all questions are too tough, the dullards will weep. If they are too easy the performance of bright pupils will be at par with that of backward. The test should contain, easy, average and difficult questions.

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl.No** | **Difficulty level** | **Marks** | **Percentage** |
| 1 | Easy | 5 | 20 |
| 2 | Average | 15 | 60 |
| 3 | Difficult | 5 | 20 |
| Total | | 25 | 100 |

* + 1. **Preparation of the Blue - Print.**

Blue-print is a three dimensional chart indicating the distribution of questions objective-wise, content-wise and form-wise. The blue-print gives the frame work for the test and indicates the broad limit within which the test constructor has to work.

**Blue - Print**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Objectives | Knowledge | | | Understanding | | | Application | | | Skill | | | Total |
|  | Form of  Qtns  Content | O | S.A | E | O | S.A | E | O | S.A | E | O | S.A | E |  |
| 1 | Unit I |  |  |  |  |  |  | 1(1) | 1(2) |  | 1(1) |  |  | 4 |
| 2 | Unit II |  | 1(2) |  | 2(1) |  |  |  | 2(2) |  | 1(1) |  |  | 9 |
| 3 | Unit III |  | 1(2) |  |  |  | 1(5) |  |  |  |  |  |  | 7 |
| 4 | Unit IV | 1(1) |  |  | 2(1) |  |  | 1(1) |  |  | 1(1) |  |  | 5 |
| Sub Total | | 1(1) | 2(2) |  | 4(1) |  | 1(5) | 2(1) | 3(2) |  | 3(1) |  |  | 25 |

Number inside the bracket indicates the marks and outside the bracket indicate number of questions.

O-objective type

S.A-short answer type

E-easy type

* + 1. **Preparation of question paper.**

The blue print gives a very clear idea about the number of questions to write from each topic according to their forms and objectives. With this precise directive suggested by the blue - print, the paper setter can start writing items according to requirements.

After writing the preliminary details such as the name of the examination, title of the paper, maximum marks and time, instruction for answering each part etc; the paper setter has to arrange the questions already written.

* + 1. **Preparation of Scoring Key and Marking Scheme.**

In order to maintain objectivity, scoring should be made strictly in accordance with a predesigned scheme of evaluation. In case of objective type items where the answers are in the form of some letter or other symbol, a scoring key is prepared. In the case of short answer and essay type questions the marking scheme is prepared. What the examiner should list out the value points to be credited and then to fix up the mark to be given to each value point.

Usually general instructions also are given at the end of the scheme of valuation in order to avoid subjectivity in scoring. Here indication may be given as to the penalty for committing errors, spelling mistakes, grammatical mistakes etc.

**Scoring Key and Marking Scheme.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No.** | **Expected out line of Answer** | **Marks allotted to each point** | **Total marks** |
| 1  2  3  ..  ..  10 | A  B  D  C | 1  1  1  1 | 1  1  1  1 |
| 11 | (1) Value point 1  (2) Value point 2  (3) Value point 3  (4) Value point 4 | ½  ½  ½  ½ | 2 |
| 12 | (1) Value point 1  (2) Value point 2 | 1  1 | 2 |
| 13  ..  ..  .. | (1) .....................  (2) ..................... | ½  ½  ½  ½ | 2 |
| 16 | (1) .....................  (2) .....................  (3) .....................  (4) .....................  (5) ..................... | ½  ½  1  1  2 | 5 |

* + 1. **Preparation of Question - wise analysis**

In order to avoid all loopholes, the paper setter prepares a table containing all relevant details of all the items of the test. This is done by making an analysis of each item in terms of objectives, specification, form of questions, difficulty levels marks and estimated time. This analysis is very helpful to check whether all the aspects envisaged in the design and blue print are satisfied by the test in its final form

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sl No. | Objective | Specification | Content/ Unit | Form of questions | Marks allotted | Difficulty level |
| 1 | Knowledge | Recalls | Unit Iv | 0 | 1 | E |
| 2 | Application | Apply | Unit I | 0 | 1 | A |
| 3 |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |
| 16 | Understanding | summarize | Unit3 | essay | 5 | A |

O - objective type.

S.A. - Short Answer type.

E.S -essay type

E - easy

A - Average

D - Difficult.

**General procedure for test construction/ Standardization procedure of a test.**

**I. Planning**

The construction of a test must start by a consideration of the limitations under which the test has to be developed. It includes a detailed set of specifications as to the purpose of the test and time, cost and resources. The nature of the population for which the test is constructed has to be defined. The length of the test, type, and nature of test items and method of scoring the test are also some basic considerations which are to be planned in advance.

1. **Preparation of preliminary draft**

The preliminary draft must have more than double the items required for the test. A rough idea of the difficulty of the items prepared can be obtained by trying out a few items on a small group of subjects from the population. The items prepared are then edited and carefully worded instructions, which indicate briefly the nature and purpose of the test, the nature of the task with a few examples must be supplied with the test.

The final manuscript of the preliminary draft is then submitted to experts for their opinion and criticism. After the modifications according to the experts opinion and criticism the final manuscript of this preliminary draft is administered to a small group of subjects from the population and check answers. This small group requires less than 10 subjects from population. It is called the **small group tryout** of the test.

This procedure may suggest further modifications. After the necessary modifications in the light of small group tryout, the preliminary draft is printed. For recording the responses of the subjects, a separate answer sheet must also be printed in which may be enclosed with the booklet of the preliminary draft.

1. **Try out/pilot test/preliminary test**

At this stage the preliminary draft is administered to a large random sample of the population for which the test is constructed. The size of the sample for tryout is usually taken as 370 for simplifying calculations in item analysis for selecting good items for the final test.

After the tryout stage, the time limit should be generous. The test may be so timed that nearly 90 percent individuals in the sample complete the last item. In the case of speed test, the time limit that produces a good scattered scores without fatigue should be fixed.

The test booklets along with their answer sheets are collected and scored with the help of a scoring key.

1. **Item Analysis:**-

Item analysis consistent of

(a) Item difficulty index and

(b) Item Discriminative power or validity index.

The process followed for ascertaining the effectiveness of test item is known as item analysis. Generally the effectiveness or suitability of items is ascertained on the basis of the difficulty level and discriminating power of the items. These two values of the item may be calculated by variety of techniques and procedures. The most convenient, simple and practicable procedure usually followed is;

1. Ranking all the scored papers in descending order.
2. Selecting the best 27% and the poorest 27% of the papers of calculation.
3. Tabulating for each item, the number of pupils in the upper and lower groups who answered each item correctly.
4. Computing the difficulty index and discriminating power of each item.

The formula used to find out difficulty index is,

**Di =**

The formula used for discriminative power or validity index is,

**Dp =**

Where,

**Di** = Difficulty index

**Dp** = Discriminating power

**U** = The number of correct responses in upper group

**L**= The number of correct responses in lower group

**N** = Total number of cases in each group.

1. Selection of item: On the basis of the difficulty index and discriminating power the items will be rated. Garret suggests that items with discriminative power of 0.20 or more and difficulty index of 0.4 to 0.6 are regarded as satisfactory. So the item satisfying both the above criteria should be selected.

It is worth noting that the items for non-cognitive tests are selected only on the basis of validity index or discriminative power. In such type of tests, there is no question of difficulty value of an item as the subject is required to respond to a series of statements or questions in yes or no, agree or disagree, or in a similar way, to indicate his feelings or opinions.

1. **Preparation of the final draft**

The selected items are put in the final draft of the test which is administered to a large sample for evaluating the test to estimate the parameters of validity, reliability and norms. Preparation of the scheme of valuation, writing down the preliminary details, instructions to work out the test etc are done at this stage.

1. **Evaluating the Test**

Evaluation is the final step in the test construction. Standardized test need to be evaluated. While evaluating standardized test the following points should be taken into consideration.

1. Norms to be calculated

Taking into consideration the performance of the group norms like grade, age, sex, percentile, standard score etc. should be calculated.

1. Validity Determination

Different type of tests are used for different purposes and therefore need different types of validity like content validity, construct validity, criterion validity etc.

1. Reliability Determination

To determine reliability we can take the help of methods like test-retest, parallel form or equivalent and split half method.

1. Preparation of the Manual

When we proceed to complete a standardized test, we shall have to prepare a booklet containing all details of the scope of the test, instructions in connection with administration, details of different norms etc.

**Qualities of a good achievement test**

1. A good achievement test is tried out and selected on the basis of its difficulty level and discriminating power.

2. It should have a description of measured behaviour.

3. It should contain a sufficient number of test items for each measured behaviour.

4. It should be divided into different knowledge and skills according to behaviours to be measured.

5. Its instructions with regard to its administration and scoring are so clear that they become standardized for different users.

6. It is accompanied by norms which are developed at various levels and on various age groups.

7. It provides equivalent and comparable forms of the test.

8. It carries with it a test manual for its administration and scoring.

**Awareness tests**

 The test on knowledge or awareness of something [exists](https://dictionary.cambridge.org/dictionary/english/exist), or [understanding](https://dictionary.cambridge.org/dictionary/english/understanding) of a [situation](https://dictionary.cambridge.org/dictionary/english/situation) or [subject](https://dictionary.cambridge.org/dictionary/english/subject) at the [present](https://dictionary.cambridge.org/dictionary/english/present) [time](https://dictionary.cambridge.org/dictionary/english/time) [based](https://dictionary.cambridge.org/dictionary/english/based) on [information](https://dictionary.cambridge.org/dictionary/english/information) or [experience](https://dictionary.cambridge.org/dictionary/english/experience) is termed as awareness test.

The construction and standardization procedure is same as that of achievement test. Content validity is critical for this type of test. Concurrent validity might be used to help establish a new awareness test’s validity. Other types of validity are probably not necessary but would only be important if relevant for the test use. For standardizing tests, and assuming the test is group administered paper and pencil with multiple choice items. The reliability of such tests may be found out either by using test-retest method or split half method. Equivalent forms reliability seems to be little value with respect to achievement tests because it is concerned with two different forms of a test giving consistent results.

**Aptitude Test**

Aptitude may be considered as a special ability or a specific capacity besides the general intellectual ability which helps an individual to acquire a required degree of proficiency or achievement in a specific field.

According to Freeman(1965), an aptitude test is designed to measure a person’s potential ability in an activity of specialized kind and within a restricted range.

Aptitude tests are used to predict success in some occupation, academic or training course. These tests have proved of great value for research in educational and vocational guidance. They can be used for predicting rate of learning in special fields of human activity and can avoid considerable wastage and stagnation.

**Importance of Aptitude Test**

Research data show that individually administered aptitude tests have the following qualities:

1. They are excellent predictors of future scholastic achievement.
2. They provide ways for comparison of a child‘s performance with other in a same situation.
3. They provide a profile of strength and weaknesses.
4. They asses difference among individuals.

The list of activities which may be undertaken by the human beings is limitless. One may have aptitude for one activity and the other may demonstrate an aptitude in something else. In this sense, it is quite impossible to have a fixed classification of human aptitudes. However for the sake of their measurement and application in the field of education and professions certain classifications were made. They are:

[ Refer notes- psychology Classification and measurement of aptitude]

The principle underlying the construction and standardization of aptitude tests are same as that of standardization techniques of tests. Content validity is not critical for aptitude tests, predictive validity and construct validity are usually important here. The reliability of such tests may be found out either by using test-retest method or equivalent forms method.

**Intelligence tests**

Intelligence measure general ability which enters into performance of all activities and which differs in magnitude from individual to individual. The items in such tests assess the individual’s ability to perceive relationships, solve problems and apply knowledge in a variety of ways. The items in an intelligence test are numerous and varied. They test different abilities which are supposed to constitute general intelligence.

[Intelligence tests are classified as verbal and non verbal tests; paper pencil and performance tests; speed and power tests; individual and group tests. (Refer notes- psychology)]

With all their limitations, intelligence tests are indispensable tools in educational research. They are used for classifying and categorizing subjects into various groups. They help a researcher to make decisions about the placement of individuals for school and work, and therefore, help him in making certain predictions. Researcher may come across some standardized tests of intelligence which may serve the purpose of his study. In case no test is available for use with a specific group, the researcher should develop a new test.

The principle underlying the construction and standardization of intelligence and aptitude tests are same as that of standardization techniques of tests. Content validity is not critical for intelligence tests, predictive validity and construct validity are usually important here. The reliability of such tests may be found out either by using test-retest method or equivalent forms method.

1. **OBSERVATION TECHNIQUE**

Observation offers the researcher a distinct way of collecting data. It does not rely on what people say they do, or what they say they think. It is more direct than that. Instead, it draws on the direct evidence of the eye to witness events first hand. It is a more natural way of gathering data. Whenever direct observation is possible it is the preferable method to use.

Observation method is a technique in which the behaviour of research subjects is watched and recorded without any direct contact. It involves the systematic recording of observable phenomena or behaviour in a natural setting.

**Purpose**

The purpose of observation techniques are:

1. To collect data directly.
2. To collect substantial amount of data in short time span.
3. To get eye witness first hand data in real like situation.
4. To collect data in a natural setting.

**Characteristics**

It is necessary to make a distinction between observation as a scientific tool and the casual observation of the man in the street.

An observation with the following characteristics will be scientific observation.

1. Observation is systematic.
2. It is specific.
3. It is objective.
4. It is quantitative.
5. The record of observation should be made immediately.
6. Expert observer should observe the situation.
7. It’s result can be checked and verified.

**Types of observation**

On the basis of the purpose of observation may be of varied type like:

1. Structured and Unstructured
2. Participant and Non-participant

**Structured and Unstructured observation**

The structured observations are much too formal and they are designed to provide systematic description to test casual hypotheses. Structured observations are executed in control situations like classroom or laboratory settings. Interaction analysis of the classroom verbal behaviour of a teacher is an example of structured observation. Structured observation starts with relatively specific formulations. There is much less choice with respect to the content of observation. The observer set up in advance categories of behaviour in terms of which he wishes to analyse the problem, and keeps in mind the time limit under which he has to make the observation. In the unstructured observations, it may not be possible to categorise behaviour in advance of observation. Instead of using predetermined categories, the observer considers aspects of behaviour in terms of their context are the situations of which they are part.

**Participant and Non-Participant Observation**

In participant observation, the observer becomes more or less of the groups under observation and shares the situation as a visiting stranger, an attentive listener, an eager learner or as a complete participant observer, registering, recording and interpreting behaviour of the group. In non-participant observation, the observer observes through one way screens and hidden microphones. The observer remains a look from group. He keeps his observation as inconspicuous as possible. The purpose of non-participant observation is to observe the behaviour in a natural setting. The subject will not shift his behaviour or they will not be conscious that someone is observing his behaviour. Non-participant observation is used with groups like infants, children or abnormal persons. It permits the use of recording instruments and the gathering of large quantities of data.

**Steps followed in the observation technique**

As a good research technique, observation needs proper planning, expert execution and adequate recording and interpretation.

1. Planning for observation

The planning for observation includes definition of specific activities or units of observation to be observed, the nature of the groups of the subjects to be observed, the scope of observation-individual of group, determination of the length of each observation period, deciding about the tools to be used in making the observation and recording etc.

According to Good (1966, pp.244-245) planning for observation includes the following factors:

1. An appropriate group of subjects to observe.
2. Selection and arrangement of any special condition for the group.
3. Length of each observation period, interval between periods and number of periods.
4. Physical position of the observer and possible effect on the subject or subjects.
5. Definition of specific activities or units of behaviour to be observed.
6. Entry of frequencies or tallies in the record, as a total for the entire observation period or by subdivision of time within the observation period.
7. Scope of observation, whether for an individual child or for a group.
8. Form of recording, including consideration of mechanical techniques and such quantitative factors as number, time, distance and spatial relationships.
9. Training of the observer in terms of expertness.
10. Interpretation of observations.
11. Execution of observation

And export execution of observation includes:

* 1. Proper arrangement of specific conditions for the subject or subjects to be observed.
  2. Assuming the proper role or physical positions for observing.
  3. Focusing attention on the specific activities or units of behaviour under observation.
  4. Handling well the recording instruments to be used.
  5. Utilizing the training and experience fairly well in terms of making the observation and recording the facts.

1. Recording and interpreting the observation

The recording of the observation data may either be simultaneous or soon after the observation. In the former case, the observer goes on recording his observation data simultaneously with the occurrence of the phenomena observed. In the latter case, the observer undertakes to record his observations not simultaneously with his actual observation process, but immediately after he has observed for a unit of time while the details are still fresh in his mind.

In viewing, classifying and recording behaviour, the observer must take utmost care to minimise the influence of his biases, attitudes and values on the observation report. The observer should know what he is looking for in a given situation and should carefully and objectively record relevant data. The subjectivity on the part of an observer is partly due to his emotional involvement, his selective perceptions and his different powers of recall. In order to overcome the biases introduced by the human observer, various mechanical instruments are used to obtain in a more accurate record of events. The use of cameras, tape recorders, stopwatch, binoculars, audio metre, stethoscope, light metre, thermometer, one way vision screen or mirror etc. allows behaviour to be measured to a degree of accuracy which could not be achieved by the human observer. It is advisable to develop an observation form or schedule while making observations. the specific behaviour is to be observed and recorded should be listed on this form. The observation form should be simple and the behaviours listed on it may be clearly specified and examples given where necessary.

Observation is done either directly, as when the observer plays a passive role and observes without intervening in any way; or in an interview, where the observer plays a more active role, by asking a series of questions or administrating a test, and where he observes the behaviour of the interviewee as well as recording his responses.

To aid in the recording of information gained through observation, a number of devices have been extensively used. In addition to rating scales and checklists, the direct observation makes use of anecdotes, time sampling method, incident sampling method and controlled diary method.

1. **Anecdotes:** the anecdote has been the most widely used method for describing naturalistic behaviour. It is a word description of a behaviour episode. There is no set pattern for anecdotal writing, and various styles has been used. Brandt (1972) has given the following suggestions for improving the scientific quality of anecdotes:
2. Write an adult out soon after viewing the incident.
3. Include the basic action or statements of the chief person, in the episode, that is, what he did or said.
4. Include enough setting details to indicate where and when the behaviour of occurred, under what conditions, and who were involved.
5. Responses or actions of others to the chief person's behaviour should be included.
6. Use direct quotation wherever possible in order to preserve the favour of how things were stated.
7. Anecdotes should preserve the sequence of actions and responses of the original behaviour incident.
8. Anecdotes should be objective, accurate and complete as far as important details are concerned.
9. If research resources are sufficient, use of tape recorder and typist to transcribe anecdotes into written form generally increases the amount of detail that can be included over simple stenographic or handwritten recording.

Anecdote descriptions have served as useful tools in behavioral research. Search descriptions have been extensively used in examining classroom practices; in analysing community influences on development; in assessing change in interpersonal behaviour of hyper aggressive children undergoing residential treatment.

1. **The time sampling method.** It is not usually possible to observe behaviour continuously for long periods because of the expenses and dynamic nature of behaviour. By time sampling method, behaviour can be studied for a number of short periods of time which are systematically spaced over the total period of study. For example, a child's behaviour may be studied for the whole School day by means of a series of observations, each of 10 minutes duration. It is worthwhile to study children over long periods of time by this technique to get a fair picture of their behaviour.
2. **The incident sampling method.** the incident sampling method concerns the observation of the behaviour of an individual in selecting incidents or situations in which he becomes involved. It involves the observation of certain instances of selected behaviour. After a series of such observations of selected behaviour, an observer may have sufficient data to draw inferences about the typical pattern of behaviour of the individual.
3. **The controlled diary method.**The control the diary method was first used by Himmelweit and his associates in 1958 to study the television viewing behaviour of children and later on by Wragg in 1968 to investigate the leisure activities of boys and girls. In this method, the observer keeps the diary in which share records certain aspects of the behaviour of a subject. The information gathered by controlled diary method is supplemented by the observation data gathered by other means.

**Reliability and validity of observational measurement**

In observational measurement, Brandt (1972) mentions about three kinds of reliability. First is revealed by the amount of inter observer agreement in records of the same behaviour. Lack of agreement may indicate insufficient training of the observers, ambiguous identification of characteristics to be rated or described, indistinguishable or overlapping categories, or observations made at somewhat different moments in time.

A second kind of Reliability has to do with the inconsistencies of a single observer from one time to another. Estimates of the degree of this kind of reliability can be made by asking an observer review and rate or code at different times exactly the same behaviour.

A third kind of reliability is concerned with the estimate of the variability of the trait itself. There are significant variations in human behaviour from one time to the next, one situation to another. The estimates of the degree of such variations can be made by collecting a considerable amount of observational data of the same trait and calculate the degree of similarity-dissimilarity over wearing types of setting and time periods. Resulting correlation coefficients are often referred to as 'stability coefficients'.

An observational measurement can be valid only to the extent that recorded differences in score represent actual differences in behaviour rather than differences in the impressions made on different observers. A number of extraneous variables, such as maturation of subjects during the course of observation, reactive effects of subjects, change in observers or scales, etc., may produce variations in the obtaied measures of observation. To overcome the variations due to the reactive effects, it is necessary not to make the subjects feel that they are being observed. An observation should take place in as natural setting as possible and not influenced by the presence of the observer or by his measuring or recording tools.

Best (1977, pg. 178) is of the opinion that both are reliability and validity of observational measurement are improved when observations are made at frequent intervals by the same observer, or when several observers record their observations independently.

**Limitations of Observation :**

1. The limitations of observation are:
2. Establishing validity is difficult.
3. Subjectivity is also there.
4. It is a slow and labourious process.
5. It is costly both in terms of time of time and money.
6. The data may be unmanageable.
7. There is possibility of biasness

**Advantages of observation :**

1. Data collected directly
2. Systematic and rigorous
3. Substantial amount of data can be collected in a relatively short time span.
4. Provides pre-coded data and ready for analysis.
5. Inter observer reliability is high.

However, observation is a scientific technique to the extent that it serves a formulated research purpose, planned systematically rather than occurring haphazardly, systematically recorded and related to more general propositions and subjected to checks and controls with respect to validity, reliability and precision.

1. **INTERVIEW TECHNIQUE**

The interview is a process of communication or interaction in which the subject or interviewee gives the needed information verbally in a face-to-face situation. Although the interview is generally associated with counseling or psychotherapy, it can be used effectively to collect useful information about individuals in many research situations.

**Types of Interview**

Interviews may be classified according to the purpose for which they are used and according to their design or structure.

**Research, interview** may be used as a tool for gathering data required by the researcher to test hypothesis or solve his problems of historical,experimental,survey or clinical type of research. This type of interview is called ‘research interview’.

**Clinical interview** to secure information about an individual’s problem, his past history, job or family adjustment. In such situations, the major purposes of interview are diagnosis and treatment. This type of interview is designed as ‘clinical interview’.

**Individual Interview**

Interviews vary in design or structure. In some situations , an interviewew may interview one individual at one time. It is called an ‘Individual interview’.

**Structured Interview** is a type of personal interview, in which the interviewer uses a fixed format, wherein the questions are prepared in advance. It uses highly systematized techniques of recording. It is a method of quantitative research used for the purpose of the survey, which aims at presenting the preset questions, in every interview, which the same sequence. It is also known as a patterned or planned interview.

**Unstructured Interview** is one, that does not use any fixed format, however, the interviewer may have a few planned questions prepared beforehand. It is a qualitative research method, in which the questions are prepared during the interview. As the interview is unplanned, it has an informal approach where a friendly conversation takes place between the interviewer and interviewee.

**Focus Group**

Sometimes because of limited time and resources it is preferable to collect information by interviewing collectively individuals, who share a common factor, in groups in a comfortable environment at a convenient venue rather than from a series of individual interviews. Such group

is called ‘focus group’. In a ‘focus group interview’, a group of individuals are interviewed by an interviewew. The size of the group should neither be too small nor too large.

**Characteristics of a Focus Group**

A good focus group has the following characteristics:

1. Nature and number of individuals constituting the focus group

* 1. Include those individuals in the group who have the characteristics, experience,or knowledge needed to provide rich information on the topic.
  2. Limit the size of the group to six-eight individuals so that almost all the participants have a chance to share the information.
  3. All participants in the group should feel comfortable while talking with one another.

2. Comfortable environment

1. Hold focus group in familiar or neutral settings such as office

buildings, libraries, schools etc.

1. Seat participants so that they can see easily one another.
2. Interview participants in their language.

3. Sampling and number of focus groups

1. Use purposive sampling for constituting focus groups.
2. Frame three to four focus groups for each audience category that is of interest. If after the third or fourth group the team is still receiving new information, the team might continue conducting focus groups until no new information is elicited.

4. Developing questions

1. The questions must be conversational and easy for the participants.
2. Use three steps to develop questioning route: (a)hold a brainstorming session(b) use brainstorming questions to draft and sequence questions and (c) send the draft questions to the team for feedback.
3. The questions should focus on getting information that directly relates to the objectives of the research study.
4. While developing questions, the researcher should keep in mind several guidelines. (a) use open-ended questions(b) avoid questions that can be answered with a “yes” or “no” (c) avoid why?” questions ; and (d) use “think back” questions.
5. Use questions that get participants involved.
6. Focus the questions, sequencing them from general to specific. Training of interviewer for holding focus group interviews

**A focus group interviewer should have knowledge of following aspects:**

1. Make sure that every participant speaks the same amount in a group. Everyone should have the opportunity to share.
2. Control dominant talkers by thanking them for their input and asking for others to

share.

1. Remind the group that it is important to hear from every one.
2. Call on quiet participants. They are often reflective thinkers and have creative things

to offer.

1. For starting the focus group discussion, the moderator must create a thoughtful, receptive atmosphere; provide ground rules; and set the tone of discussion in an open environment.
2. Use field notes, tape recording, video cameras, laptop computers for recording focus group discussion.

**Techniques of Interviewing**

Interview as a research tool can be modified according to the needs of the research situation, there are some techniques that need to be considered.

**1. Preparation for the interview**

It is necessary to plan for the interview carefully if it is effective in obtaining the required information. The interviewer must decide exactly what kind of data the interview should yield, whether the structured or unstructured procedure will be more useful, and how the results of the interview should be recorded.

**2. Conducting the Interview**

In the execution of an interview, a harmonious relationship between the interviewer and interviewee is most essential. A good rapport helps the interviewee to feel at ease and express himself willingly. In order to establish a good rapport, the interviewer should greet the interviewee in a friendly manner so as to get him settled in the new situation in a relaxed manner.

An interviewer generally should start with a pleasant conversation and ask factual nonthreatening questions in the beginning. To elicit adequate responses from the interviewee, Turney and Robb(1971,pp.134-135) have suggested certain rules that should be followed during the conduct of interview to facilitate date collecting.

* + - 1. Ask only one question at a time.
      2. Repeat a question if necessary.
      3. Try to make sure that the subject (interviewee) understands the question.
      4. Listen carefully to the subject’s answers.
      5. Observe the subject’s facial expressions, gestures, and tone of voice.
      6. Allow the subject sufficient time to answer the question, but do not let the interview drag.
      7. Avoid suggesting answers to the questions.
      8. Do not show signs of surprise, shock, anger ,or other emotions if unexpected answers are given.
      9. Maintain a neutral attitude with respect to controversial issues during the interview.
      10. Take note of answers that seem to be vague, ambiguous, or evasive.
      11. In the unstructured interview, ask additional questions to follow up clues or to obtain additional information.
      12. Use tact and skill in getting the subject(interviewee) back to an area of inquiry when he has strayed too far from the original question.

The interviewer should try to redirect the interview to more fruitful topics when he feels that the required information and data are not emerging. He should wind up the interview before the respondent (interviewer) becomes tired. A well prepared interview schedule ensures good use of limited interview time; it makes interviewing multiple subjects(interviewees) more systematic and comprehensive; and it keeps interactions between the interviewer and interviewee focused.

**3. Recording of the Interview**

Recording the interview is as important as preparation for the interview or conducting of the interview. The interviewer may make use of schedule, a structured format, rating scale or a tape recorder to record the responses of the interviewee. The use of tape recorder also permits the interviewer to devote full attention to the interviewee and saves much time of the interviewer which he may have to utilize in recording the responses during or after the interview.

**Reliability and Validity of Interview**

Validity is greater when the interview is based on a carefully designed structure, thus ensuring that the significant information is elicited (content validity).The critical judgment of experts in the field of inquiry is helpful in selecting the essential questions. For validity of the interview, it is advisable to compare the interviewers responses with other sources of data.

Reliability, or the consistency of response ,may be evaluated by restating a question in slightly different form at a later time in the interview. Repeating the interview at another time may provide another estimate of the consistency of response. If more than one interviewer is used, the researcher must demonstrate reliability of technique and scoring among the interviewers. This can be done through observing the interviews and having more than one interviewer score each tape or transcript.

According to Good(1966,p.237) the reliability of the data obtained through the interview is affected is affected by the following factors:

1. The desire of many interviewees to make good impressions, particularly in answer to questions relating to generally accepted standards of behaviour.

2. The reluctance of many subjects (interviewees) to reveal highly personal information that might appear damaging to the interviewee.

3. An attitude of confidence in and respect for the interviewer, on the part of the interviewee.

4. Content and form of questions, procedures established for the interview, physical setting, mode of recording, accidental distractions, and temporary state of the parties involved in the interview.

**Advantages of the Interview**

It provides an opportunity to the interviewer to question thoroughly certain areas of inquiry. The interview permits greater depth of response which is not possible through any other means. It also enables an interviewer to get information concerning feelings, attitudes or

emotions in relation to certain questions.

**Limitations of the Interview**

It is a time consuming technique. The effectiveness of the interview depends greatly upon the skill of the interviewer not ordinarily possessed by inexperienced researchers. There is a constant danger of subjectivity on the part of the interviewer, some interviewees will not respond freely, frankly and accurately.

An interview in qualitative research is a conversation where questions are asked to elicit information. The interviewer is usually a professional or paid researcher, sometimes trained, who poses questions to the interviewee, in an alternating series of usually brief questions and answers. They can be contrasted with focus groups in which an interviewer questions a group of people and observes the resulting conversation between interviewees, or surveys which are more anonymous and limit respondents to a range of predetermined answer choices. In phenomenological or ethnographic research, interviews are used to uncover the meanings of central themes in the life world of the subjects from their own point of view.

1. **INQUIRY FORMS**

Inquiry forms are a set of data-gathering research tools which make use of properly designed proformas for inquiring into and securing information about certain phenomena under investigation. Tools included in this category are:

* + 1. Questionnaire
    2. Checklist
    3. rating scale and
    4. opinionnaire or attitude scale.

1. **Questionnaires**

Questionnaire is a popular means of collecting all kinds of data in research. It is widely used in educational research to obtain information about certain conditions and practices, and to inquire into opinions and attitudes of an individual or a group. A questionnaire is a device consisting of a series of questions dealing with some topics given to an individual or group of individuals, with the object of obtaining data with regard to some problems under investigation. In simple words we can say that a questionnaire is a tool or an instrument made of set of questions. It is a set of standard questions for gathering related information from a group of individual.

According to Barr, Davis and Johnson “A questionnaire is a systematic compilation of questions that are submitted to a sampling of population from which information is desired”.

The questionnaire may be regarded as a form of interview on paper. Since there is no interviewer to explain ambiguities or to check misunderstandings, the questionnaire must be especially clear in its working. The variety of possible answers to each question must be anticipated more fully than for an interview. The questionnaire is probably the most used and most abused of the data gathering devices. A questionnaire is either administered personally to a group of individuals or it is mailed to them to save time and money in travel.

**Characteristics**

1. The covering letter of the questionnaire is drafted in a befriending tone and indicates its importance to the respondents.
2. The questionnaire contains directions which are clear and complete .Important items are clearly defined and each question deals with a single idea defined in unambiguous terms.
3. It is reasonable short, through comprehensive enough to secure all relevant information.
4. It does not seek information which may be obtainable from other sources such as school records and university results.
5. It is attractive in appearance, neatly arranged, clearly duplicated and free from typographical errors.
6. It avoids annoying or embrassing questions, which arouse hostility in the respondent.
7. Items are arranged in categories which ensure easy and accurate responses.
8. Questions do not contain leading suggestions for the respondents and are objective in nature.
9. They are arranged in good order. Simple and general questions should precede the specific and complex ones. Questions that create favourable atmosphere should precede those that are personal and touch delicate points.
10. They are so worded, that it is easy to tabulate and interpret the responses. It is always advisable to base them upon a preconceived tabulation sheet.

**Classification of Questionnaires**

The questionnaires can be classified in terms of the nature of the questions which are used. Questions may be asked in a closed or an open form. The researcher may use one type exclusively or both in combination.

1. **Closed Form Questionnaire**

Questionnaires that call for short or check responses are known as closed form or restricted type. They include a set of questions to which respondents can reply in a limited number of ways .The respondent is invariably permitted to reply only with ‘yes’ or ‘no’, or ‘no opinion’ or is requested to select answer from a short list of possible responses. He is asked to place a tick mark in a space provided on the answer sheet or he may be requested to underline a response. Sometimes he is asked to insert brief answers of his own. For certain type of information, the closed type of questionnaire is useful, because it is easy to respond, takes little time and effort to fill out, is relatively objective and is fairly easy to tabulate and analyze. The following example illustrates such type of question items:

Please tick the reasons given below for not introducing the ‘grade system marking’ by your school.

1. Non-availability of administrative guidance and support ( )
2. Non-availability of academic guidance and support ( )
3. It’s time-consuming ( )
4. It is not effective in overcoming the defects of numerical marking ( )
5. It cannot be changed and adopted according to the local institutionalized needs ( )
6. **Open Form Questionnaire**

The open -form or unrestricted type of questionnaire calls for a free response in the respondent’s own words .The form of the questions is unstructured and no clues are provided to the respondent. The open form of questions provides for greater depth of response and the greatest advantage of this type of questions is freedom that is given to the respondent to reveal his opinion and to clarify his response. However, the responses to such type of questions are sometimes difficult to tabulate, organize and interpret.

The following example illustrates such type of question:

State the reasons for not introducing the ‘Grade-System of Marking’ in your school.

|  |
| --- |
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|  |

**Construction of Questionnaires**

Constructing a good questionnaire requires both ability and perseverance on the part of the researcher. He should not use a ‘shotgun approach’ by attempting to cover his field of investigation broadly in the hope that some of the responses will provide answers for which he is searching blindly. There are some hints which a researcher may consider useful while constructing, administering and analyzing a questionnaire.

**1*. Purposes of the questionnaire***

A good questionnaire must serve two major purposes. First, it must translate the objectives of an investigation into specific questions, the answers to which will provide the data necessary to test the hypotheses and explore the area defined by the objectives. For this, each question must convey to the respondent the meaning of each objective so that the responses thus obtained can be analyzed and interpreted properly in the light of the required objectives. The statement of the research objectives and the specification of the data required to meet those objectives must precede questionnaire construction. Secondly, the questionnaire must motivate the respondents to communicate the required information. It is essential to include a courteous and carefully constructed covering letter to explain the purpose of the study. The covering letter should assure the respondent that delicate information will be held in strict confidence. The respondents will feel favorably disposed towards the inquiry if the purpose and nature of the study are stated in the covering letter.

**2*. Language***

In the construction of a questionnaire, the primary criterion for the choice of language is that the vocabulary and syntax should offer maximum opportunity for complete and accurate communication of ideas between the researcher and the respondent. Since the researcher has to depend on written language alone to get the required information, he has to be careful while phrasing the questions. There are some principles that might be employed to make the questions more precise. According to Best and Kahn (1992, pp.184-185) following are the principles of making the questions more precise:

1. *Define or qualify terms that could easily be misinterpreted*. Such common words like ‘how much’, ‘new curriculum’, ‘democracy’, ‘progressive education’, ‘cooperation’, and ‘integration’ are all liable to misinterpretation. To the question, “What work are you engaged in now?” the respondent may be tempted to answer, “Filling out your foolish questionnaire”.
2. *Be careful in using descriptive adjectives and adverbs that have no agreed upon meaning.*This fault is frequently found in rating scales as well as questionnaire. ‘Frequently’, ‘occasionally’, and ‘rarely’ do not have the same meanings to different persons. One respondent’s ‘occasionally’ may be another’s ‘rarely’.
3. *Beware of double negative.* For example, the use of double negative in “The State Government should not provide aid to the educational institutions in which education is not equal, regardless or race, creed, or caste” is misleading.
4. *Be careful of inadequate alternatives.* In the question: “Are you married?” Yes-No – the alternatives Yes/No are inadequate. Does this question refer to present or former marital status? How would the person answer who is widowed, separated, or divorced?
5. *Avoid the double-barrelled questions.* Divide them into two questions. Do you believe that gifted children should be placed in separate groups for instructional purposes and assigned to special schools?

In this question, one might agree on the advisability of separate groups for instructional purposes, but be very much opposed to the assignment of gifted students to special schools.

1. *Pin-point a word if you wish to indicate special emphasis*. For example, “Should all schools offer modern foreign language?” will get the desired responses more easily than if the word modern was not emphasized by bold print.
2. *When asking for rating or comparisons, a point of reference is necessary.*For example, “How would you rate this student-teacher’s classroom teaching? Superior-Average-Below Average” is vague until the respondent is told with whom is the student teacher to be compared-an experienced teacher, other student teachers, former student teachers-or should the criterion be what a student teacher is expected to be able to do?
3. *Avoid unwarranted assumptions.* For example, to the question “Are you satisfied with the salary rise that you received last year?” a ‘no’ answer might mean that the respondent did not get any rise; or that he is not satisfied with the rise that he got.
4. *Phrase questions so that they are appropriate for all respondents.* For example, “How many days per week do you send your student-teachers for practice teaching?” may not suit all respondents as some training colleges have continuous, some block, and some a combination of block and continuous teaching practice.
5. *Design questions that will give a complete response.* The question, “Do you read Hindustan Times?” Yes-No – would not reveal much information about the reading habits of the respondent. It should be followed by an additional item.
6. *Provide for the systematic quantification of responses*. To ask respondents to rank, in order of preference, a specific number of responses from a given list of items permits a convenient way of tabulation by inverse weightings:

1 st choice 5 points

2 nd choice 4 points

3 rd choice 3 points

4 th choice 2 points

5 th choice 1 point.

The total weighted scores would be the score for the particular item.

1. *Consider the possibility of classifying the responses yourself, rather than having the respondent choose categories.* For example, if a respondent is asked to classify his occupation in the following categories, the result might be quite unsatisfactory.
2. Skilled labour ………………….
3. Unskilled labour ………………….
4. Clerical work ………………….
5. Managerial work ………………….
6. Profession ………………….
7. Proprietorship …………………..

It is likely that by asking the respondent one or two short questions about his work, it could be classified more accurately.

1. At what place do you work?
2. What kind of work do you perform?
3. ***Information level of the respondents***

The assumptions about the expertness of the respondant in a particular field or the amount of information he possesses should not be unrealistic. The information elicited by the questionnaire must lie within the respondent’s present level of information.

The questions above the information level of respondents may result in resentment and embarrassment among the respondents. This problem is sometimes reffered to as ‘expert error’ that is, the error of ascribing to the respondent a degree of expertness in a particular field which he does not possess.

**4*. Social acceptance of responses***

The questions must provide the respondent a range of responses which meets his criteria of social acceptability. A question constitutes a threat to the respondent’s ego if he is required to give an answer which he feels is socially unacceptable. The respondent should not be confronted with the necessity of giving a socially unacceptable response to a question. The annoying or embarrassing questions must be avoided.

If the information desired from the respondents is of intimate or delicate nature, consider the possibility of providing for anonymous responses to get objective and reliable information. Even if the respondent’s name is necessary for the purposes of classification, it is essential to assure the respondent that his responses will be kept strictly confidential.

**5. *Leading questions***

The questions should be objective with no leading suggestions as to the most appropriate response. For example, in a question “would you say that you are in favour of co-education in secondary schools? “, it is easier for the respondent to answer ‘yes ‘ than ‘no ‘. In answering ‘yes ‘he is merely agreeing with the language of the question. It is more difficult to respond, “no”, since this response seems to contradict, or at least goes counter to the ideas of the person who worded the question. There are some words which involve respondents emotionally, either favourably or unfavourably, in a particular culture. It is advisable not to make use of such emotionally ’loaded’ words while phrasing questions of questionnaire.

**6. *Sequence of questions***

First, the questions should be limited to a single idea or to a single reference. Secondly, the questionnaire maker needs to give thought to the arrangement of the questions in a questionnaire. The questions should be so arranged that they permit the ideas of the respondents to flow logically. The sequence of questions must facilitate the easy progress of the respondent from item to item and it should lead the respondent to anticipate the next question. Questions should be presented in a good psychological order by adopting the ‘funnel approach’. This is a procedure of asking the most general or the most unrestricted questions first and following it with successively more specific and restricted questions. This order helps the respondent to organize his own thinking and motivates him to respond logically and objectively. The following sequence of questions on the introduction of the innovation of internal assessment, illustrates the funnel approach:

1. Is the innovation introduced by your school? Yes/No
2. If yes, please mention the year from which it was introduced ………
3. Is the innovation still continuing in your school? Yes/No
4. If yes, please tick how far the innovation has been useful in overcoming the defects of purely ‘External Public Examination’
5. If no, please mention the year from which the innovation was discontinued
6. Please tick the reasons given below for discontinuing, or not introducing the innovation.
7. On the basis of your experience and scholarship you may wish to provide any additional information about the innovation which is not covered above. If so please mention.

………………………………………………………………………………………..

……………………………………………………………………………………….

……………………………………………………………………………………….

**7*. The form or type of questions***

Another important consideration that weighs in the matter of constructing a questionnaire is that of ‘form or type’ of questions. As discussed earlier, the questionnaire may contain closed or open type of questions. Each type of these questions has its merits and limitations and the questionnaire framer must decide which type is more lightly to supply the information required. Kahn and Cannell (1957) are of the opinion that in the closed type of questions: (1) there is only one frame of reference from which the respondent can answer the question; (2) there is a known range of possible responses within this single frame of reference; and (3) there are clearly defined choice points which accurately represent the position of each respondent within this range. In the open type of questions, the respondent is encouraged to structure his answer as he wishes and it permits the respondent to state his own frame of reference when this is desirable. In some research situations it is useful to include both the open and closed type of questions in combination.

**8*. Length of the questionnaire***

A questionnaire should not be any longer than is necessary. The total number of questions must not be so many as to tire or bore the respondents.If too many questions are asked and the respondent becomes tired, the questions at the end of the series may not be well answered. If it is necessary to include a larger number of questions it is advisable to have two separate questionnaires.

**9*. Expert’s opinion***

It is advisable to get all the help from experts for planning and constructing a questionnaire. Questions should be submitted to the experts for criticism and modified accordingly.

**10. *Preliminary tryout of the questionnaire***

No matter how careful the questionnaire maker has been in phrasing his questions and designing his questionnaire, he needs to try them out with a few representative samples of the respondents before launching into the actual investigation. The first purpose of the pre-test is to examine the questionnaire from the research point of view. It is suggested that interviews with respondents should be conducted to see whether the responses fulfill the objectives of the investigation. Sometimes the tryout calls for major revision of the questionnaire and several tryouts are required until a workable questionnaire is developed. The second purpose of tryout is to determine the extent to which the questionnaire fulfills the following two criteria:

1. Does the questionnaire promote a congenial and appropriate relationship with respondents?
2. Do respondents understand the questions without having to be explained or reworded?
3. ***Validation***

The validation of a questionnaire utilizes the same principles and procedures as the validation of any tool of measurement. Each question of the questionnaire must be related obviously to the topic under investigation. In some situations, the questionnaire is validated against the actual overt behavior, which acts as the external criterion. This is done by relating question responses with the actual behaviour. Follow-up observations or respondentbehaviourat a particular time or sometime in the future are also used to estimate the predictive validity of some type of questionnaires.

1. ***Reliability***

The test-retest method is the feasible approach to the working out of the reliability of questionnaires. The comparison of responses of an alternate form with the original form of questionnaire is also made to estimate the reliability.Besides, consistency of the question responses, the accuracy of responses and the comparison of the accuracy of the question responses to the interview may also be taken note of while talking about the reliability of questionnaire.

**Scope of a Questionnaire**

In descriptive studies where the sources are varied and widely scattered, the questionnaire is a major instrument for gathering data. It is very handy in cases, where one cannot conveniently see personally all the people from whom the responses are required. This technique finds favour in determination of present status in certain aspects of education-current practice in schools, financial aspects, service conditions of teachers, etc. It can be used over extensive range of territory-national and international .As research techniques are becoming more and more refined day after day, it is hoped that this wayward child of the science of education will soon curb its unruly disposition and also mend its unseemly ways.

**Advantages of a Questionnaire**

* 1. Questionnaire is cheap, quick and provides relatively easy access to geographically scattered respondents.
  2. It provides respondents with the opportunity to consider their responses after looking up records and consult other people.
  3. The anonymity of self-administered questionnaire helps a respondent to answer questions on sensitive issues of confidential nature.
  4. The use of mailed questionnaire avoids the hassle of non-contacts i.e. respondent not being in when the researcher calls at his place.
  5. The respondents can complete the mailed questionnaire at a time convenient to them. There is no researcher (interviewer) bias because of his absence.

**Limitations of a Questionnaire**

In this technique, a research worker has to depend on several hundred persons from whom response is expected and it is not an easy job to get active and willing cooperation of all the respondents. One may be very delegent and sincere about his work, but one cannot be sure that the responses would be forthcoming. Some of the respondents may hold back their replies because they are skeptical about the value of research, others may not respond for want of time, or because they do not feel interested in the problem in hand or because they have not been sufficiently motivated by the introductory letter. The research worker may therefore remain in a state of expectancy and his work may be delayed.

1. The questionnaire cannot be used with children and illiterates.

2. It is sometimes difficult to formulate and phrase questions on certain complex, delicate and intricate problems.

3. There is no facility to seek clarification from respondents for their responses. The responses given by the respondents are accepted as final.

4. There is no check on a respondent who misinterprets a question or gives incomplete or indefinite responses.

5. Sometimes respondents may not like to respond to the questions involving certain controversial issues.

6. Even when he gets back a sufficiently large number of questionnaires, he may find that all of them have not been completely filled. Omissions may materially vitiate the results and significantly affect the interpretations.

7. Sometimes the respondents fill in their responses very indifferently, without bothering about their correctness and sometimes they deliberately give wrong information.

8 If the questionnaire is sent to different areas or to people of different categories and one set of respondents deliberately with holds its responses, the inquiry would be affected adversely. Suppose there is a judicial inquiry on discrimination against a minority and section of the minority concerned refuses to cooperate as a protest, evidently the results of the inquiry will not present a true picture.

**Example of the Tool**

HEALTH AND WELLNESS SURVEY QUESTIONNAIRE

PHYSICAL HEALTH

1. Do you have any permanent health problems?

a. yes b. no

2. How many days a school year do you stay home sick?

a. one b. two c. three-five d. five-seven e. ten or more

3. Are you allowed to sample your parent’s alcoholic drinks?

a. yes b. no c. sometimes

MENTAL/EMOTIONAL HEALTH

1. In the past year, how stressful has your life been?

a. extremely b. quite c. somewhat d. not at all

2. When you look in the mirror, if you could change one part of your body what would it be?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. If I fail at something, I usually respond by:

a. blaming myself

b. hurting myself

c. yelling at my parents

d. other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SOCIAL HEALTH

1. Have you ever left school because of a fight with friends or they way they were making you feel?

a. yes b. no

2. How many times a week do you sit down and talk, with your parents about school, your friends, your life?

a. once b. 2-3 c. more than 3

3. When invited to go to a party or a dance, please circle two of the feelings you sometimes feel either before or during the event.

a. excited d. happy

b. unhappy e. nervous

c. anxious f. all of the above

Questionnaire are the main and easy way of collecting data. But the questionnaire must be highly reliable and valid. Using standardized questionnaires will give us the appropriate data and will yield a valid study. One must follow all the basic guidelines and methods of constructing a questionnaire and test it before using it.

1. **Check List**

A checklist is a simple device consisting of a prepared list of items which are thought by the researcher to be relevant to the problem being studied. After each item a space is provided for the observer to indicate the presence or absence of the item by checking ‘yes’ or ‘no’, or a type or number of items may be indicated by inserting the appropriate word or number. A checklist draws the attention of the observer to relevant factors and enables him to record the data quickly and systematically.

Thus the responses to the checklist items are matter of ‘fact’, not of ‘judgement’. The checklist is an important tool in gathering facts for educational surveys, that is for checking of library, laboratory, game facilities, school buildings, textbooks, instructional procedures, etc. Checklists are sometimes used in the form of a questionnaire which are completed by the respondent rather than by the observer.

**Purpose** :

The main purpose of checklist is to call attention to various aspects of an object or situation, to see that nothing of importance is overlooked. For Example, if you have to go for outing for a week, you have to list what things you have to take with you. Before leaving home, if you will check your baggage with the least there will be less chance of forgetting to take any important things, like toothbrush etc., it ensures the completeness of details of the data. Responses to the checklist items are largely a matter of fact, not of judgment. It is an important tool in gathering facts for educational surveys.

**Uses :**

Checklists are used for various purposes. As we have discussed that we can check our requirements for journey, Birthday list, proforma for pass-port, submitting examination form or admission form etc. In every case, it we will check before doing the work, then there is less chance of overlooking any, important things. As it is useful in over daily life, it is also useful in educational field in the following way.

1. To collect data’s for educational surveys.
2. To record behaviour in observational studies.
3. To use in educational appraisal, studies – of school buildings, property, plan, textbooks, instructional procedures and outcomes etc.
4. To rate the personality.
5. To know the interest of the subjects also.

**Construction of a Checklist** :

* 1. Items in the checklist may be continuous or divided into groupsof related items.
  2. Items should be arranged in categories in alogical or psychological order.
  3. Terms used in the items should be clearly defined.
  4. Checklist should be continuous and comprehensive in nature.
  5. Checklist can be constructed in four different ways by arranging items differently.

Kempfer (1960) has suggested four ways and the researcher may make use of all or some of them to serve his purpose best.

1. The form in which the observer or respondent is asked to check all items found in a situation. For example, put a tick ( ) in the blank provided before each game played in your school.

---------------- Football

---------------- Hockey

---------------- Cricket

---------------- Volleyball

---------------- Basketball

1. The form in which questions with a ‘yes’ or ‘no’ are asked to be encircled, underlined or checked in response to the items given. For example :

Does your University have a Teachers’ Union? Yes/No

1. The form in which items are positive statements and the respondent or observer is asked to put a tick ( ) in the space provided on the right of the item. For example:

Our School has a Students’ Union. ( )

1. The form where items can best be put in sentences and the observer or respondent is asked to check, underline or encircle the appropriate word/ words. For example:

The school organises debates weekly, fortnightly, monthly, annually, irregularly.

The investigator has to select any one of the format appropriate to his problem and queries or the combination of many as it requires. The items of the checklist should be phrased in such a way that they are discriminative in quality. It will increase the validity of the checklist. A preliminary try out of the checklist may also prove helpful in making the tool more objective. Content validity of the items in the checklist can be measured.

**Analysis and Interpretation of Checklist Data :**

The tabulation and quantification of checklist data is donefrom the responses. Frequencies are counted, percentages andaverages calculated, central tendencies, measures of variability andco-efficient of correlation completed as and when necessary. In longchecklists, where related items are grouped together category wise,the checks are added up to give total scores for the category wisetotal scores can be compared between themselves or with similarscores secured through other studies.

The conclusions from checklist data should be arrived carefully and judiciously keeping in view the limitations of the toolsand respondents.

**Merits**

1. Students can measure their own behaviour with the help ofchecklist.
2. Easy and simple to use and frame the tools.
3. Wanted and unwanted behaviours can be included.
4. Personal - Social development can be checked.

**Limitations**

1. Only the presence or absence of the ability can be tested.
2. Yes or no type judgement can only be given.
3. Quantity cannot be tested through checklist.

For Example, you want to test the story telling skill of astudent. You can check only whether the student developed or notdeveloped the skill but you cannot study how much he hasdeveloped?When we want to check ‘yes’ or ‘no’ of any ability, checklistis used.

1. **Rating Scale**

Rating scale is one of the enquiry form. Form is a term applied to expression or judgment regarding some situation, object or character. Opinions are usually expressed on a scale of values. Rating techniques are devices by which such judgments may be quantified. Rating scale is a very useful device in assessing quality, especially when quality is difficult to measure objectively. For Example, “How good was the performance?” is a question which can hardly be answered objectively. Rating scales record judgment or opinions and indicates the degree or amount of different degrees of quality which are arranged along a line is the scale. For example: How good was the performance?

Excellent Very good Good Average Below average Poor Very poor

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This is the most commonly used instrument for making appraisals. It has a large variety of forms and uses. Typically, they direct attention to a number of aspects or traits of the thing to be rated and provide a scale for assigning values to each of the aspects selected. They try to measure the nature or degree of certain aspects or characteristics of a person or phenomenon through the use of a series of numbers, qualitative terms or verbal descriptions. Ratings can be obtained through one of three major approaches:

• Paired comparison

• Ranking and

• Rating scales

The first attempt at rating personality characteristics was the man to man technique devised curing World-war-I. This technique calls for a panel of raters to rate every individual in comparison to a standard person. This is known as the paired comparison approach. In the ranking approach every single individual in a group is compared with every other individual and to arrange the judgment in the form of a scale. In the rating scale approach which is the more common and practical method rating is based on the rating scales, a procedure which consists of assigning to each trait being rated a scale value giving a valid estimate of its status and then comparing the separate ratings into an overall score.

Rating scales are broadly classified into five categories:

I) numerical scales,

ii) graphic scales,

iii) standard scales,

iv) rating by cumulative points, and

V) forced choice ratings

We discuss them below in the same order.

**Numerical Scales**

In a typical numerical scale, a sequence of defined numbers is supplied to the rateror the observer. He/she assigns to each stimulus to be rated, an appropriate number-in line with these definitions or descriptions of the event or the stimulus. For example, the following scale may be used in obtaining ratings of the affective values of sensory testing of food products with individuals.

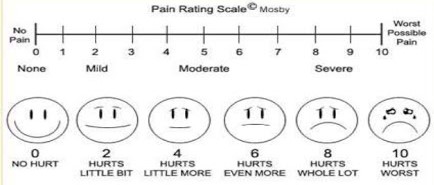
1. Most unpleasant imaginable
2. Most unpleasant
3. Extremely unpleasant
4. Moderately unpleasant
5. Mildly unpleasant
6. Indifferent
7. Mildly pleasant
8. Moderately pleasant
9. Extremely pleasant
10. Most pleasant
11. Most pleasant imaginable

The use of negative numbers is not favoured as those observers or raters who are not well versed in Algebra find it difficult to manage negative members. Numerical rating scales are the easiest to be constructed. They are also the simplest in terms of handling the results. However, numerical scales have the limitations of biases.

**Graphic Scales**

The graphic scale is the most popular and the most widely used type of rating scale. In this scale a straight line is shown, vertically or horizontally, with various clues to help the rater. The line is either segmented into units or continuous. If the line is segmented, the number of segments can be varied from case to case. There are many advantages in graphic scales. They are simple and easy to administer. Such scales are interesting to the rater and require little added motivation. However, scoring in the case of some formats of graphic scale is rather laborious.

**Example of Graphic Rating Scale**



**Standard Scales**

In standard scales a set of standards is presented to the rater. The standards are usually objects of the same kind to be rated with pre-established scale values. This type is like that of the scales for judging the quality of handwriting. The scales of hand writing provide several standard specimens that have previously been spread over on a common scale by some standardized procedure like equal-appearing intervals. With the help of these standard specimens, a new sample of handwriting can be equated to one of the standards, judged as being between two standards.

**Rating by Cumulated Points**

The unique and distinctive feature of rating by cumulative points is its immense use and ease of scoring. The rating score for an attribute, object or individual is the sum or average of the weighted or un weighted points. The 'check-list method' and the 'guess-who technique' belong to this category of rating. 'Check list methods' are applicable in the evaluation of the performance of an individual or an achievement scale in a job. The weights of +1 and -1 are assigned to every favourable and unfavourable trait, characteristics or attribute and the individual's score is the algebraic sum of the weights. In 'guess-who technique', some statements like "here is the one who is always doing the wrong things to make others sad", are constructed and each individual is asked to list all the members of his/her family who fitted such description, mentioning the same individual as many times as necessary. Each individual (in the family) scores a point for each favourable or unfavourable description applied to him/ her, and the total score is the sum total of all such points.

**Forced Choice Ratings**

In 'forced-choice rating' methods, the rater is asked, not to say whether the ratee has a certain trait or how much of a trait the ratee has, but to essentially say whether he/she has some or one trait or another of a pair. For example instead of deciding whether an individuals' leadership qualities are superior or above average, it may be asked if the person exerts strong influence on his/her associates, is able to make others act, and asserts during functions. With a brief review of the different rating scales let us get to know about the uses and the limitations of the rating scales.

**Purpose of Rating Scale:**

Rating scales have been successfully utilized for measuring the following:

• Teacher Performance/Effectiveness

• Personality, anxiety, stress, emotional intelligence etc.

• School appraisal including appraisal of courses, practices and programmes.

**Contruction of A Rating Scale.**

The following points may be kept in view while constructing a rating scale.

I A traits to be rates should be given a trait name and a definition.

Guilford has suggested some rules for defining and describing the traits

1. Traits should be described univocally, objectively and specifically.

2 . A trait that is to be rated should not be a composite of a number of traits that vary independently.

1. Each trait should refer a single type of activity or to the results of a single type of activity.
2. Traits should be grouped according to the accuracy with which they can be rated.
3. In describing traits avoid the use of general terms such as’ very’,’ extreme’, ’ average’ or’ excellent’.
4. Traits should be judged on the basis of past or present accomplishments rather than upon what the raters regard as future promise.
5. Interpret self ratings there is no trade in which all individuals or over estimate or all underestimate themselves.
6. Finally, do not use skates for traits on which reliable or more objective that the can be obtained. It would be unwise to depend upon ratings of health when medical records are obtainable, or use ratings on Intelligence when mental tests are available.

**II**  A rating should make use of good ‘cues’

Guildford listed 6 requirements for good cues

1. Clarity. Use short statements, in simple and unambiguous terminology.
2. Relevance. The cue should be consistent what are the trade name and its definition as well as with other cues.
3. Precision. A good cue implies to a point or a very short range on the container.
4. Variety. The use of the symptoms same terms in all or many of the cues may fail to differentiate Dum sufficiently.
5. Objectivity. Cues with implications of good or bad, worthy or unworthy, desirable or undesirable should generally be avoided.
6. Uniqueness. The cues for each trade should be unique to that trait. Avoid using cues of a very general character as ‘excellent’, ‘superior’ ‘average’ poor and the like.

**III**. There are no hard and fast rules concerning the number of steps or scale divisions to be used in writing skill rating scale. If the number of steps is too small, the rater’s are not capable of making much discrimination. On the other hand, too many steps in the scale are beyond the rater’s limited power off discrimination. In general, 5 to 7 scales seem to serve adequately.

**Use of Rating Scale :**

Rating scales are used for testing the validity of many objective instruments like paper pencil inventories of personality. They are also advantages in the following fields like :

* 1. Helpful in writing reports to parents
  2. Helpful in filling out admission blanks for colleges
  3. Helpful in finding out student needs
  4. Making recommendations to employers.
  5. Supplementing other sources of understanding about the child
  6. Stimulating effect upon the individuals who are rated.

**Advantages of Rating Methods**

1. Rating methods consume much less time than methods of pair comparison and rank order.
2. They are far more interesting to the rates, especially if graphic methods are used.
3. Writing methods can be used with raters who have minimum of training.
4. They can be used with large numbers of stimuli.
5. They have much wider range of application and can used for teacher- ratings, personality ratings, School appraisal, sociological survey etc.
6. Best ratings can be obtained by presenting one stimulus to rates at a time.

**Limitations of Rating Scale**:

The rating scales suffer from many errors and limitations like the following:

As you know that the raters would not like to run down their own people by giving them low ratings. So in that case they give high ratings to almost all cases. Sometimes also the raters are included to be unduly generous in rating aspects which they had to opportunity to observe. It the raters rate in higher side due to those factors, then it is called as the generosity error of rating.

**The Errors of Central Tendency :**

Some observes wants to keep them in safe position. Therefore, they rate near the midpoint of the scale. They rate almost all as average.

**Stringency Error :**

Stringency error is just the opposite of generosity of error. These types of raters are very strict, cautions and hesitant in rating in average and higher side. They have a tendency to rate all individuals low.

**The Hallo Error** :

When a rater rates one aspect influenced by other is called hallo effect. For if a person will be rated in higher side on his achievement because of his punctually or sincerely irrespective of his perfect answer it called as hallo effect. The biased-ness of the rater affects from one quality to other.

**The Logical Error** :

It is difficult to convey to the rater just what quality one wishes him to evaluate. An adjective or Adverb may have no universal meaning. It the terms are not properly understood by the rater and he rates, then it is called as the logical error. Therefore, brief behavioural statements having clear objectives should be used.

**Reliability and validity**

Reliability is established through split-half method. Validity is established by comparing them with order scales and also by correlating the results with actual behaviour.

1. **Attitude scale/ opinnionnaire**

The inquiry form that attempts to assess the attitude or belief of an individual is known as an opinionnaire or attitude scale.

Attitude scales are tools that are designed to measure attitude of subject or group of subject towards issues, institution and group of people (psychological object). Attitude is the degree of positive or negative affect associated with some psychological objects. This varies with the person. It is personal disposition which make the individual react to a situation in a favorable or unfavourable way.

In order to measure attitude we use scaling techniques so that the researcher will be able to quantify data. Attitude scale consists of carefully edited and selected items called statements. So we can define attitude scale as inquiry form that attempts to assess the attitude or belief of an individual.

According to Freeman (1965) there are three assumptions up on which attitude scale based.

* 1. The scale should deal with a controversial question.
  2. An individuals’ feelings and insights in regard to the question will determine his responses to various statements that are made pro and con.
  3. The statements can be scaled regarding the degree to which they favour, or are opposed to, the question under consideration.

**Criteria for the preparation of statements**

1. Avoid statements that refer to the past rather than to the present.
2. Avoid statements that are factual or capable of being interpreted as factual.
3. Avoid statements that may be interpreted in more than one way
4. Avoid statements that are irrelevant to the psychological object under consideration.
5. Avoid statements that are likely to be endorsed by almost every one or by almost no one.
6. Select statement that is believed to cover the entire range of the effective scale of interest.
7. Keep the language of the statements simple, clear, and direct.
8. Statements should be short, rarely exceeding 20 words.
9. Each statement should contain only one complete thought.
10. Statements containing universals such as all, always, none, and never often introduce ambiguity and should be avoided.
11. Words such as only, just, merely, and others of a similar nature should be used with care and moderation in writing statements.
12. Whenever possible, statements should be in the form of simple form of simple sentences rather than in the form of compound or complex sentences.
13. Avoid the use of words that may not be understood by those who are to be given the completed scale.
14. Avoid the use of double negatives.

**Different methods to measure attitude**

Several methods are used to measure attitude.

*Direct methods used to measure attitude scale are:*

* + 1. Asking the individual directly how he feels about a subject through interview.
    2. Observing the reaction of individual various situations.
    3. Inferring an individual’s attitude from his reaction to projective devices through which he may reveal his attitude unconsciously.

*Indirect methods used for measuring attitude are:*

* + 1. Asking the individual to check the statements in a list with which he is in agreement.
    2. Asking the individual to indicate the degree of agreement or disagreement with a series of statements about a controversial subject.
    3. Using attitude scales like Thurstone attitude scale, Likert’s scale and cumulative scale.

**Purpose of Attitude Scale:**

In educational research, these scales are used especially for finding the attitudes of persons on different issues like:

* 1. Co-education
  2. Religious education
  3. Corporal punishment
  4. Democracy in schools
  5. Linguistic prejudices
  6. International co-operation etc.

**Characteristics of Attitude Scale:**

Attitude scale should have the following characteristics.

1. It provides for quantitative measure on a uni dimensional scale of continuum.
2. It uses statements from the extreme positive to extreme negative position.
3. It generally uses a five point scale as we have discussed in rating scale.
4. It could be standardized and norms are worked out.
5. It disguises the attitude object rather than directly asking about the attitude on the subject.

**Preparation of the Opinionnaire or Attitude scale**

Various ‘scaling techniques’ have led to the development of different types of attitude scales which provide quick and convenient measure of attitudes. The ‘Method of equal appearing intervals ‘and ‘ Method of summated ratings’ have been extensively used in attitude or opinion research.

1. **The Method of equal appearing intervals/Thurstone attitude scale**

The method of equal appearing interval also known as differential scale was developed by Thurstone. This s a unidimensional scale .This scale was developed using consensus scale approach. Under such approach the selection of items is made by a panel of judges who evaluate the items of whether they are relevant to the topic area and unambiguous in implication. Thurstone’s attitude scale is an **11** point scale varying 1to 11. 1 indicates unfavourableness and 11 indicates extreme favorableness.

The Thurstone method has been widely used for developing differential scales which are utilized to measure attitude towards varied issues like war, religion, etc. This type of attitude scales are appropriate and reliable when used for measuring a single attitude.

**Steps in the construction of Thurston-type scale**

1. Developing the focus:

The first step in the development of every tools is to define the focus for the scale, i.e objectives and methodological steps should be defined. The description of the concept should be as clear as possible. The researcher has to take unidimensional concept for the preparation of attitude scale.

1. Collecting and editing data or generating potential scale:

After doing extensive survey of literature and consulting experts the researcher gathers a large no. of statements usually 80-100, statements, that express point of view toward a group,institution,idea or practice. The statements should be worded similarly and they should not differ in grammer and structure. The statement expresses varying degree of intensity of feeling or opinion. After collecting statements we have to edit statements keeping in view of objectives.

3. Sorting procedure or rating the scale items:

These statements are submitted to a panel of judges. These should be minimum 15 members in the panel. Each member in the panel arranges the statement in 11 groups or piles ranging from one extreme to another in position. Each of the judges is requested to place generally is the first pile the statements which he thinks most unfavorable to the Issue, in the second pile to place those statements which are next most unfavorable and he goes on doing so in this manner till in the 11th pile he puts the statement which he considers to be the most favorable.

This sorting by each judge yields a composite position for each of the items. If there is disagreement between the judges in arranging a position to an item, that item must be discarded.

4. Computing scale values for each item:

The next step is to analyze the rating data. Here the researcher have to compute the median and interquartile range. The items for the final scale are selected on the basis of Q and median,i.e the items should be fairly and evenly spread on the scale continuum.

5. Selecting the final scale items:

Select the statements that are at equal interval across the range of medians-values of the selected statements should be as low as possible. On a 9-point scale Q value should not exceed 2.If the Q value is 50% then there is good agreement among the judges in judging the favourblness or unfavourblness.

The final form of the scale is then constructed by selecting 30 to 35 statements which most relevant, least ambiguous and which cover or represent different intensities of the attitude.

1. Administering the scale

The respondents are asked during administration to make their agreement or disagreement with each statements.

1. Reliability and validity

The reliability of the attitude scale developed by the method of equal appearing interval is established by the split-half method. The validity of the attitude scale is obtained by correlating the average score of the attitude scale with same external criterion.

**Limitations**

1. Values arranged to various statements by the judges may reflect their own attitude.

2. More labour and time is required for the construction.

3. More money is required

4. It is not completely objective.

1. **The Likert scale**

Likert scale is a unidimensional scale. This scale was developed by Remmise Likert.This scale is also known as summated scale.

Summated scales/Likert type scales are developed by utilizing the item analysis approach where a particular item is evaluated on the basis of how well it discriminate between those persons whose total score is high and those score is low.

Summated scale consist of a no. of statements which express either a favorable or unfavorable attitude towards the given psychological object to which the respondent is asked to react. The respondent indicates his agreement or disagreement with each statement in the instrument. Each response is given a numerical score, indicating its favourableness, and the scores are summed up or totaled to measure the respondents attitude, i.e the overall score represents the respondents position on the continuum of favourable-unfavourableness towards an issue.

Usually Likret scale are 5 point scale. But sometimes 3 or 7 point scale may be used. At one extreme of scale there is strong agreement with given statements and at the other, strong disagreement, and between them lie intermediate points.

Strongly agree (1) Agree (2) Undecided (4) Disagree (4) strongly

Disagree (5)

Each point on the scale carries a score. Response indicating the least favorable is given the least score (1) and the most favorable is given the highest score(5)

If the instrument consists of 30 statements, the following score values would be revealing.

30 × 5=150 Most favorable response possible

30 × 3= 90 A neutral attitude

30 ×1= 30 Most unfavorable attitude

It is thus known as a method of summated ratings. The summed up score of any individual would fall between 30 and 150. Scores above 50 will indicate a favorable and scores below go an unfavorable attitude.

**Steps in the construction Likert scale**

1. *Defining the focus:*

Define what you are trying to measure. Since it is unidimensional scale, the concept to be measured should be are dimensional in nature. operational definition should be provided. Clear instruction should be provided.

1. *Gathering the items or collecting and editing of statement*

A large no. of statements which express a feeling towards the psychological objects are collected. The items should be that can be rated and a 1 to 5 or 1-7 agree-disagree response scale. The no. of favorable and unfavorable statements should be approximately equal. After the statements have been gathered, they are edited keeping in view of criteria.

1. *The try out*

The preliminary draft of the scale is administered to a sample of 200 subject who are selected from the population for which scale is constructed. They are asked to indicate their response to each statement by checking are of the categories of agreement or disagreement using five point scales.

1. *Selection of items and preparation of the final draft*

The response to various statements are scored in such a way that a response indicating the most favorable attitude is given the score of 5 and that with the most unfavorable attitude is given 1. Then the total score of each respondent is obtained by adding this scores that he received for separate statements.

Arrange the scores in ascending or descending order .In the method of summated scaling item analysis is used for selecting items, for this 25% of the subject with highest score and 25% of subject with lower scores are taken. The two groups provide criterion group in terms of which to evaluate the individual statement. ’t’ value have to found out. The value of‘t’ is a measure of extend to which a given statement differentiate between the high and low groups. A‘t’ value equal to or greater than 1.75 indicates that the average response of high and low groups to a statement differs significantly. The statements with ‘t’ value equal to or greater than 1.75 are selected for the final draft of the attitude scale.

1. *Reliability and validity*

Reliability is established through split-half method. Validity is established by comparing them with order scales and also by correlating the results with actual behavior.

**Merits**

1. It is relatively easy to construct
2. It is more reliable
3. This scale have the ability to discriminate (discriminating power) between the attitude of subjects.
4. It can be used in respondent centre and stimulus centered studies.
5. Less time and labour is required for construction.

**Demerits**

1. No clarity regarding total score

2. This is only an ordinal scale.

3. The five portion is the scale is not equally spaced.

1. **Cumulative Scale**

This scale was introduced by Louis Gultman. So this scale is also called Guttmann’s scale or scalogram analysis. This scale is also unidimensional. The special feature of this type of scale is that statements are in form of a cumulative series. This means that the statements are related to one another in such a way that an individual who replies favorable to no.3 else replies favorably to 2 and 1 also. The individual score is worked out by counting the no. of points concerning the no. of statements he answers favorably.

**Analysis and interpretation of Attitude scores**

In equal –appearing interval scales, the attitude score obtained by a single individual has an absolute interpretation in terms of psychological continuum of scale values of the statements making up the scale. The attitude score of an individual is taken as the mean or median of the scale values of the statements with which he agrees. If this score falls in the middle range of the psychological continuum, the attitude of the individual is described as ‘neutral’. If it falls towards the favorable end of the continuum, it is described as favourable, and it falls towards the unfavorable end, it can be described as unfavorable. In equal –appearing interval scales, the interpretation of an attitude score is made independently of the distribution of scores for a particular group of individual.

On the other hand, the interpretation of an attitude score on a summated –rating scale cannot be made independently of the distribution of scores of some defined or norm group. This is because the summated –rating score corresponding to the zero or neutral point on a favorable- unfavorable continuum is not known as it is known in the case of equal appearing interval scores. The interpretation of the summated –rating attitude score of an individual in terms of favorableness or unfavourableness is always done with the help of the mean of the norm group.

**Limitations of Attitude Scale**

In the attitude scale the following limitations may occur

1. An individual may express socially acceptable opinion conceal his real attitude.
2. An individual may not be a good judge of himself and may not be clearly aware of his real attitude.
3. He may not have been controlled with a real situation to discover what his real attitude towards a specific phenomenon was.
4. There is no basis for believing that the five positions indicated in the Likert’s scale are equally spaced.
5. It is unlikely that the statements are of equal value in ‘farness’ or “againstness”.
6. It is doubtful whether equal scores obtained by several individuals would indicate equal favorableness towards again position
7. It is unlikely that a respondent can validity react to a short statement on a printed form in the absence of real like qualifying Situation.
8. In spite of anonymity of response, Individuals tend to respond according to what they should feel rather than what they really feel.

However, until more precise measures are developed, attitude scale remains the best device for the purpose of measuring attitudes and beliefs in social research.

1. **Sociometric Projective Techniques**

Sociometry is defined as the measurement of social relationship that exist among the members of a group. It was developed by Moreno and associates. The term sociometry is derived from Latin words ‘Socius’ meaning social and ‘Metrum’ meaning ‘measure’, thus the term would mean social measurement. Sociometric techniques attempt to describe attractions or repulsions between group members by asking them to indicate whom they would select or reject in various situations to study adjustments, group dynamics, learning, motivation, discipline and other problem areas that involve social relations.

There is an extensive body of sociometric research on classroom groups from kinder garden through college, fraternities dormitory residents, camp groups, factory and office workers, military combat units and entire communities. United States Air Force has used sociometry to study the nature of leadership in various situations. For example, the following question was used in a study of air combat crews. ’What member of the crew would you select, disregarding rank, as the most effective leader if your plane were forced down in a remote and primitive area? Name three in order of your preference’

Numerous sociometric techniques are used to measure social interactions within groups but sociogram, sociometric matrices, Guess-who technique and social distance scale are most frequently used in educational research.

**Sociogram**

Sociometric choices may be represented graphically on a chart known as a sociogram. It is often used by the classteacher, counsellor or psychologist to study interpersonal relationship of groups. In research situations it is used to study the problems of learning motivation discipline and group dynamics.

**Administration of Sociometric Test**

The researcher generally begins with the question such as with whom would you most like to work on a small group project? And give your first second and third preference. Each member of a group is provided with a form on which he can write the names of the members he has chosen. Based on the preferences given by the students a sociogram is constructed.

**Presentation of Results**

The results of the sociometric testing are usually reported in the form of a sociogram. If there are boys and girls in the group then the boys may be represented as triangles and girls by circles. A choice may be represented as single pointed arrows, a mutual choice by an arrow pointing in opposite direction. Rejections may be noted by dotted lines.Identifying numbers are placed within the symbols. Numbers of those chosen most often are placed nearest the centre of the diagram and numbers of those chosen less often are placed further outward. Those who not chosen are literally on the outside, The members who are chosen most often are called *‘Stars’*, those not chosen are called *‘Isolates’*. Small groups made of members who choose one another are *‘Cliques’*.

The easiest method of presenting data is to place the results on a table. For the sake of illustration, the data giving the name and corresponding number of each member of the group are presented as in the table 1. In the first three columns, the students own choices are recorded . In the next three columns the number of times that each student is chosen by others and the last column, the total choices are recorded.The data are based on the choices which are taken from the form on which students have listed their preferences.

**Table.1**

***Sociometric Data Sheet***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | |  | |  | | | |  | |  | | | |  | |
|  | | |  | |  | | | |  | |  | | | |  | |
|  | | Students Choice | | | | | | Times Chosen | | | | | | Total | | | |
| Sr no | Student | | 1st | | 2nd | | 3rd | | 1st | | 2nd | | 3rd | |
| 1 | Shyam | | 2 | | 4 | | 15 | | 0 | | 1 | | 0 | | 1 | |
| 2 | Ali | | 4 | | 1 | | 3 | | 1 0 | | | | 1 | | 2 | |  | |
| 3 | Bagat | | 5 | | 7 | | 2 | | 0 | | 1 | | 3 | | 4 | |  | |
| 4 | Krisna | | 10 | | 7 | | 3 | | 1 | | 1 | | 1 | | 3 | |  | |
| 5 | Gopal | | 7 | | 9 | | 10 | | 2 | | 3 | | 1 | | 6 | |  | |
| 6 | Rekha | | 8 | | 3 | | 5 | | 1 | | 0 | | 1 | | 2 | |  | |
| 7 | Bansi | | 11 | | 5 | | 3 | | 2 | | 3 | | 0 | | 5  1 | |  | |
| 8 | Vijay | | 6 | | 5 | | 9 | | 1 | | 0 | | 0 | |  | |
| 9 | Anjani | | 10 | | 5 | | 6 | | 0 | | 1 | | 2 | | 3 | |  | |
| 10 | Daleep | | 13 | | 7 | | 12 | | 3 | | 2 | | 1 | | 6 | |  | |
| 11 | Akbar | | 7 | | 10 | | 4 | | 2 | | 2 | | 0 | | 4 | |  | |
| 12 | Rakesh | | 5 | | 10 | | 13 | | 0 | | 0 | | 1 | | 1 | |  | |
| 13 | Anand | | 17 | | 11 | | 19 | | 2 | | 1 | | 3 | | 6 | |  | |
| 14 | Suresh | | 10 | | 11 | | 13 | | 0 | | 2 | | 1 | | 3 | |  | |
| 15 | Harish | | 11 | | 16 | | 14 | | 1 | | 0 | | 1 | | 2 | |  | |
| 16 | Abbas | | 15 | | 14 | | 19 | | 1 | | 1 | | 1 | | 3 | |  | |
| 17 | Satish | | 19 | | 13 | | 16 | | 1 | | 1 | | 0 | | 2 | |  | |
| 18 | Basant | | 13 | | 17 | | 9 | | 0 | | 0 | | 0 | | 0 | |  | |
| 19 | Roop | | 16 | | 14 | | 13 | | 1 | | 0 | | 2 | | 3 | |  | |
|  | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |
|  | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |

The first student on the data sheet is Shyam. In the students ‘choice’coloumn, this student has selected student number 2(Ali) as his first choice, student number 4 (krisna) as his second choice and student number 15 (Harish) as his third choice. The column headed ‘Times Chosen” shows that Syam is listed as a second choice by one student but is not listed as a first or third choice by other students, therefore is one and this is recorded in the ‘Total Choices’ column similarly, the data for other members of the group can be interpreted.

From the ‘Total Choices’ column it is seen that three students, Gopal, Daleep and Anand have been chosen six times and one student Bansi has been chosen five times. These students are referred to as ‘Stars’. Moreover one student Basant has not been chosen at all by other group members. Such a student is called asn ‘Isolate’. Syam, Vijay and Rakesh have been seldom chosen and they are called as ‘neglectees’.

The next step is to construct a sociogram. A sociogram provides daigramatic picture of the groups relationships. The following process is used in constructing the sociogram:

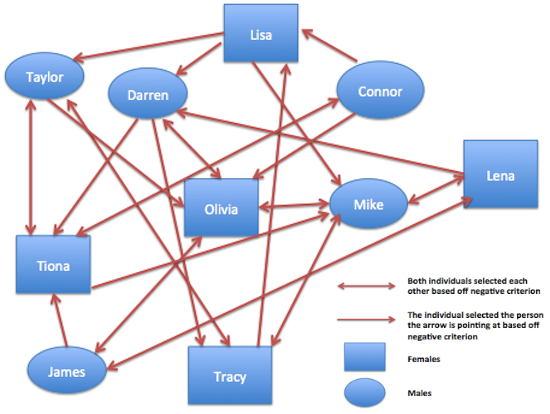
* + - 1. Place the names of the stars in the centre of the Sociogram, using triangles to denote boys and circles to denote the girls.
      2. Place the names of those receiving the next highest scores(in circles and triagnles)near the names in the centres but far enough to permit the drawing of lines connecting traingles and circles.
      3. Place the isolates(who receive no scores) and the seldom chosen individuals around the outer area of sociogram.
      4. Use lines to indicate choices and arrow heads to show direction of choice. A solid line might be used for a first choice, a broken line for second choice and a dot-dash for third choice. Sometimes different colours are also used for first, second and third choices.

**Interpretation of the Sociogram**

The sociogram is interpreted by nothing its general shape and pattern. If the lines indicating choices show that a few individuals have chosen each other by seldom by anyone else, a clique is indicated. These cliques indicate lack of co-operation. When a segment of the group is completely cutoff from the rest of the groups, there is evidence of a cleavage or social split in the group. Longines with much overlapping of choice and many individuals choosing each other indicate a well integrated group. It means that the group has good leadership, co-operation and group spirit.

**Relaibility and Validity of Sociometric Techniques**

The concept of reliability and validity may not apply directly to sociometric techniques, but most of the reported studies dealing with the relation of the results obtained by the use of sociometry to actual behaviour show moderately high correlations



Star: Olivia

Cliques: Lena & Mike, Tiona& Taylor

Isolates: Jim

***Figure 1* An example of sociogram**

**Uses of Socio-Metric Technique**

The Socio-metric technique has the following uses in the guidance programme:

* 1. By studying the choice of students through socio-metric technique the teacher can determine the nature and degree of social relationship existing among the students.
  2. It is useful in identifying those who are isolated, the one who is not preferred by any other individual.
  3. It is also useful for identifying those who are liked by many others and who can be better leader of the group. By working with them guidance can be provided.
  4. Socio-metric technique is more useful with small groups. The position or status of the individual is determined on the basis of some particular criterion.
  5. It is a simple, economical and natural method of observational and data collection.
  6. Socio-metric methods are used whenever human actions like choosing, influencing, dominating and communicating in group situations are involved.
  7. They can be employed in a wide variety of research in the laboratory as well as in the field.
  8. They can be used to discover cheques in groups, communication and influence channels, patterns of cohesiveness and connectedness and so on.

**Limitations of Socio-Metric Technique:**

In spite of having the above merits or uses of this non-testing device, it is criticized in the following grounds:

* 1. A data of socio-metric tests seem so different from other kind of data.
  2. The investigators or counsellors find it difficult to think of socio-metric measurement of individuals.
  3. The rating of one person by others is an old practice.
  4. There are certain traits or qualities that are very difficult to be measured and if at all they are measured through observations or other tools the measurement may not be accurate and free from subjectivity.

1. **Non- Projective Technique - Inventories**

Inventory is a list, record or catalog containing list of traits, preferences, attitudes, interests or abilities used to evaluate personal characteristics or skills. The purpose of inventory is to make a list about a specific trait, activity or programme. Inventories are instruments that attempt to take stock of one or more aspects of an individual’s behavior rather than to measure in the usual sense. Inventories have been used in educational research to obtain trait descriptions of certain defined groups such as underachievers, dropouts, members of minority groups etc. They have also been used in research concerned with interrelationships between personality traits and such variables as intelligence, achievement, and attitudes.

**Types of inventories**

There are mainly two types of inventories. They are:

1. **Interest Inventory and,**
2. **Personality Inventory**
3. **Interest Inventory**

Persons differ in their interests, likes and dislikes. Interests are significant element in the personality pattern of individuals and play an important role in their educational and professional careers. The tools used for describing and measuring interests of individuals are the interest inventories or interest blanks. They are selfreporting instruments in which the individuals note their own likes and dislikes. They are of the nature of standardized interviews in which the subject gives an introspective report of his feelings about certain situations and phenomena which is then interpreted in terms of interests.

The use of interest inventories is most frequent in the areas of educational and vocational guidance and case studies. Distinctive patterns of interest that go with success have been discovered through research in a number of educational and vocational fields. Mechanical, computational, scientific, artifice, literary, musical, social service, clerical and many other areas of interest have been analyzed informs of activities. In terms of specific activities, a person’s likes and dislikes are sorted into various interest areas and percentile scores calculated for each area. The area where a person’s percentile scores are relatively higher is considered to be the area of his greatest interests, the area in which he would be the happiest and the most successful. As a part of educational surveys of many kinds, children’s interest in reading, in games, dramatics and in other extracurricular activities and in curricular works, etc. is studied.

Content validity is usually important here as are predictive and construct validity. However, the actual purpose of the test user will determine the types of validity needed. Test- retest, stability over items, and standard error of measurement are the relevant forms of reliability here as may be stability over scores and inter-tester, depending on the nature of the specific test. ( Refer Best, john W. Kahn, James V. (2014)*. Research in Education* .Delhi: PHI Learning Private Limited. (297-299).

1. **Personality Inventories**

The non-projective techniques of personality measurement include personality inventories. Personality inventories are usually self – report instruments. The individual checks responses to certain questions or statements. These instruments yield scores that are assumed have been shown to measure certain personality traits or tendencies.

Because of individuals’ inability or unwillingness to report their own reactions accurately or objectively, these instruments may be of limited value. Part of this limitation may due to the inadequate theories of personality on which some of these inventories have been based. At the best they provide data that are useful in suggesting the need for further analysis. Some have reasonable empirical validity with particular groups of individuals but prove to be invalid when applied to others. For example, one personality inventory has proved valuable in yielding scores that correlate highly with the diagnoses of psychiatrists in clinical situations. But when applied to college students, its diagnostic value has proved disappointing.

The types of validity and reliability needed for this type of test depends on greatly on the nature of test and its intended use. Any of the forms of validity may or may not be critical. How the test is to be used will determine this. The predictive validity of their results will be low if the subjects tested are below seventeen years of age, Since studies by Strong suggest that interests are not stable until this age is attained. As to reliability, we can assume test- retest, stability of items, and standard error of measurement.

**Advantages of Inventories**

1. It is economical.
2. Simplicity is another important advantage.
3. It is objective to a certain extent.

**Disadvantages of Inventories**

1. The information obtained may be superficial or biased.
2. The difficulty of validating inventories limits their use as scientific instruments.

**Sample Inventory Questions**

These questions are taken from **Big Five personality test, which** is the most scientifically validated and reliable psychological model to measure. It is also used commercially by psychologists, career counselors, and other professionals.

**Instructions**

1. This personality test contains 10 statements. There is no time limit. Most people take about 1ess time - please allow yourself plenty of time.
2. Please respond to all of the statements and answer in sequence.
3. Double-check that you have made the right choice. If you need to change an answer, simply select the new response and the incorrect response will disappear.
4. Try not to use the 'Neutral' option too often.
5. Describe yourself as you generally are now, not as you wish to be in the future.
6. Describe yourself, as you honestly see yourself, in relation to other people of the same sex and of roughly the same age. Your spontaneous answer is usually the most accurate.

For each statement choose the response that best represents your opinion:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Statements** | **Strongly Disagree** | **Disagree** | **Neutral** | **Agree** | **Strongly Agree** |
| I am a worrier |  |  |  |  |  |
| I love to help others |  |  |  |  |  |
| I trust others |  |  |  |  |  |
| I have a vivid imagination |  |  |  |  |  |
| I complete taskssuccessfully |  |  |  |  |  |
| I get angry easily |  |  |  |  |  |
| I often feel sad |  |  |  |  |  |
| I panic easily |  |  |  |  |  |
| I keep my promises |  |  |  |  |  |
| I am always prepared |  |  |  |  |  |

Top of Form

**Cumulative Record**

Cumulative record is defined as a “permanent record of a student which is kept up to date by school, it is his educational history with information about his school achievement, attendance, health, test scores and similar pertinent data.” (Jones). The cumulative record is a valuable technique prepared by teachers in the school for the purpose of collection of data about the student as a result of which the teachers and guidance workers become able to offer required guidance service to the students for their prosperity and development. Generally it covers three consecutive years. It contains information regarding all aspects of life of the child or educed – physical, mental, social, moral and psychological. It seeks to give as comprehensive picture as possible of the personality of a child. Basically it is a document in which it is recorded cumulatively useful and reliable information about a particular pupil or student at one-place. Hence presenting a complete and growing picture of the individual concerned for the purpose of helping him during his long stay at school. And at the time of leaving the school, it help in the solution of his main fold problems of educational, vocational and personal-social nature and thus assisting him in his best development. If the cumulative record is kept together in a folder it is called cumulative record folder (CRF). If the cumulative record is kept in an envelope, it is called cumulative record envelope (CRE). If the cumulative record is kept in a card, it is called cumulative record card (CRC).

**Need for Cumulative Record**

The need for such a record was felt in view of an inadequate information that was felt in view of an inadequate information that was contained in the various forms as available. The secondary education commission has made the following observation regarding the need for school records. “neither external examination singly or together can give a correct and complete picture of a pupils all round progress at any particular age of his education, yet it is imparted for us to assess this in Order to determine his future course of study or his future vocation.” For this purpose , a proper system of school records should be maintained for every pupil indicating the work done by him in the school from day to day, month to month, term to term, and year to year. Such a school record will present a clear and continues statement of the attainment of the child in different intellectual pursuits throughout the successive stages of his education. It will also contain a progressive evolution of development in other directions of no less importance such as the growth of his interest, aptitudes, and personal traits, his social adjustments, the practical and social activities in which he take part.

**Characteristics of Cumulative Record**

1. The cumulative record is a permanent record about the pupil or student.
2. It is maintained up to date. Whenever any new information is obtained about the pupil. It is entered in the card.
3. It presents a complete picture about the educational progress of the pupil, his past achievements and present standing.
4. It is comprehensive in the sense that it contains all informations about the pupils attendance, test scores, health etc.
5. It contains only those information which are authentic, reliable pertinent, objective & useful.
6. It is continuous in the sense that it contains information about the pupil from the time he enters for pre-school education or kindergarten system till he leaves the school.
7. Whenever any information is desired by any body concerned with the welfare of the child. He should be given the information but not the card itself.
8. Confidential information about the pupil is not entered in the CRC but kept in a separate file.
9. It is transferable from one school to another with students.

**Types of Information Maintained in the CRC**

1. Identification Data

Name of the pupil, sex, fathers name, admission number, date of birth, class, section, any other information that helps in easy location of the card.

1. Environmental and Background Data

Home-neighbourhood influences, socio – economic status of the family, cultural status of the family, number of brothers and sisters, their educational background, occupational status of the members of the family.

1. Psychological Data

Intelligence, aptitudes, interests, personality, qualities, emotional and social adjustments & attitudes.

1. Physical Data

Weight, height, illness, physical disabilities etc.

1. Educational Data

Previous school records, educational attainments, school marks, school attendance

1. Co-curricular Data

Notable experiences and accomplishment in various fields-intellectual, artistic, social, recreational etc.

1. Vocational Information

Vocational ambitions of the student.

1. Supplementary Information

It is obtained by the use of standardized tests.

1. Principals Overall Remarks.

**Sources of Collection of Information**

1. Parent’s or Guardians Data Form

Family background and the personal history of the child may be gathered from the parents who are asked to fill in the form.

1. Personal Data Form

In order to obtain information regarding the pupils interest and participation in extracurricular activities and his vocational preferences. The personal data is of great use. The pupil may be asked to give details of himself. This will supplement the information obtained from the parents data form.

1. School Records.
   1. Records of Achievement Test
   2. Records of Other Test
   3. Admission and Withdrawal Records
2. Other sources
   1. Personal visits by the teacher
   2. Observations made by the teacher.

**Uses of Cumulative Record**

1. It is useful for guidance worker and counselors it provides a comprehensive, objective picture about the student including his strength and weakness.
2. It is useful for guidance counselor to help pupil in educational achievement, vocational choice and personal progress so far adjustment is concerned.
3. It is useful for headmaster or principal to ascertain the pupils performances in different subjects and his limitations
4. It is useful for parents to provide special privileges to make up the deficiencies what lie in case of his child .
5. It is useful for teachers to know the students and his progress and weaknesses at a glance.
6. It does not give chance for overlapping of data collected by different teachers about the students.
7. It is useful in making case study about the student.
8. It is useful for the students for the vocational purpose.
9. Because of its fundamental role in the educational research field Record keeping is vital to an education system’s information cycle as a whole and in the process of efficient information production and collection. School records are an important means of accountability also.

**Limitations:**

1. The entire data is of little uses if they are not collected properly objectively and accurately.
2. The purpose of cumulative record is not server if it is not maintained secretly and confidentially.
3. Sometimes the information and its interpretations become confusing as the information are collected by different teachers.
4. The cumulative record needs much money to come to light which is not possible in the part of school to spend on this head.
5. The maintenance of cumulative record is a hard some job like clerical work in the part of teachers.
6. It is a lengthy process which needs much time to be worked out.

The cumulative record serves as a well arranged store-house of all the informations regarding the students. It is based on factual informations and there is also need to mention secrecy of information. There should be the importance of usefulness of cumulative records so it may be used properly. Its content should be proper and systematically. The maintenance of the cumulative record should begin when the students enters school and should follow the student from class to class within a school and from school to school as he continuous his progress. The class teacher will maintain the cumulative record. In view of the fact that he spends much time with the students he will be in a greater position to judge them from different aspects. He will maintain a diary or note book in which he will note down from time to time his observations about his students. At the end of the year he will make the necessary entries in the cumulative record card. It is very desirable that he consults his colleagues who also know the pupils. The record should be maintained by the counselor and should not be circulated throughout the faculty for making entries on its by other members of the staff. These entries should made by them on other forms and the entry in this card should be made very carefully by counselor.

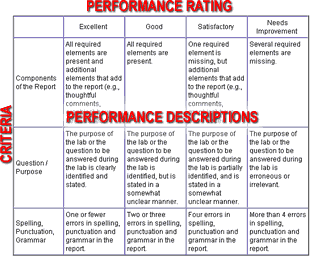
**Rubrics**

A rubric is a great tool for teachers because it is a simple way to set up a grading criteria for assignments. Not only is this tool useful for teachers, it is helpful for students as well. A rubric defines in writing what is expected of the student to get a particular grade on an assignment.

Rubrics are multidimensional sets of scoring guidelines that can be used to provide consistency in evaluating student work. They spell out scoring criteria so that multiple teachers, using the same rubric for a student's essay, for example, would arrive at the same score or grade.

Heidi Goodrich Andrade, a rubrics expert, defines a rubric as "a scoring tool that lists the criteria for a piece of work or 'what counts.' " For example, a rubric for an essay might tell students that their work will be judged on *purpose, organization, details, voice,* and *mechanics*.

A good rubric also describes levels of quality for each of the criteria. These levels of performance may be written as different ratings (e.g., Excellent, Good, Needs Improvement) or as numerical scores (e.g., 4, 3, 2, 1) Under mechanics, for example, the rubric might define the lowest level of performance as "7-10 misspellings, grammar, and punctuation errors," and the highest level as "all words are spelled correctly; your work shows that you understand subject-verb agreement, when to make words possessive, and how to use commas, semicolons and periods."



**Uses of Rubrics**

According to Heidi Goodrich Andrade:

* Rubrics help students and teachers define "quality."
* When students use rubrics regularly to judge their own work, they begin to accept more responsibility for the end product. It cuts down on the "am I done yet?" questions.
* Rubrics reduce the time teachers spend grading student work and makes it easier for teachers to explain to students why they got the grade they did and what they can do to improve.
* Parents usually like the rubrics concept once they understand it, and they find rubrics useful when helping with homework. As one teacher says: "They know exactly what their child needs to do to be successful."

**Construction of rubric**

**1. List the criteria that will be used in assessing performance in the first column.**   
The criteria should be related to the learning outcome(s) that you are assessing. For example, a musical performance might be rated for intonation, rhythmic accuracy, and tone quality and an oral presentation might be rated for content, organization, delivery and language. Be sure that your criteria are explicit.

**2. Determine your performance ratings / levels in the first row.**  
Examples of performance ratings may be:

* Descriptors (In Progress, Basic, Proficient, Advanced)
* Numbers (1,2,3,4)

**3. Write a description for each performance level.**

Describe the different levels of performance that match each criterion. You may want to start with the best and worst levels of quality, and then fill in the middle levels based on your knowledge of common problems. It may be helpful to sort examples of actual student work into three piles: the very best, the poorest and those in between.  Try to articulate what makes the good assignments good and the poor assignments poor.

**4. After use, evaluate and revise rubric as needed.**

**E-tools**

An e-tool is computer or web based application intended to make a task easier.

**ICT Products & Services for research are:**

1. E-mail and document exchange
2. E-journals
3. E-books
4. Locate, collect data using internet
5. Online databases
6. Free/paid online courses for career development
7. Preparing manuscripts, proposals, and papers
8. Discussion forums
9. Blogging
10. Teleconferencing/ video conferencing

**Use of ICT in Research Process are:**

1. Identify research areas
2. Literature survey
3. Choose methods for research
4. Data collection
5. Analyse and interpret
6. Referencing
7. Present/share/ disseminate

Examples for Indexing database services 
Repositories 
http://shodhganga.inflibnet.ac.in/ 
http://repository.lib.ncsu.ed...

e- tools for Literature Survey 
Examples for Online articles / journals 
ïhttp://www.freefullpdf.com/ 
ïhttps://archive.or...

e- tools for Data Collection 
Examples 
http://www.google.com/forms/about/ 
http://www.surveygizmo.com/ 
https://www.s...

e-tools for analyses & Interpretation 
Examples 
Windows Excel 
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e-tools to check plagiarism & grammar 
Examples: 
www.grammarly.com 
http://www.paperrater.com/plagiarism_checker 
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Ethics 
ICT has a very valuable role to play in research as long as it 
ïis used appropriately 
ïSupports genuine research...What can ICT offer for my Research? 
24/7 access to 
materials and 
support. Enables more 
engaging 
materials to be 
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