

Course Content

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1.1 Concept of test, measurement, assessment and evaluation

A. Test

- Test may be called as a tool, a question, set of questions, an examination which use to measure a particular characteristic of an individuals. It is something which provides information regarding individual's ability, knowledge, performance and achievement. A test is a device or technique used to measure the performance, skill level, or knowledge of learner on a specific subject matter.
- Test is a tools or instrument or means for collection of information of any attributes, properties or enquiry of any person or anything. We also call sometimes, test as an examination or quiz. Test is a method to determine student's ability.
- In education, it is called an examination or exam, it serves to assess or measure students' performance, knowledge or skills. Test is a method of measuring a person's ability, knowledge, or performance in a given domain.
- Definition The international dictionary of education (1981) explains test as: - Any method by which the presence of quality or genuineness of anything is determined.
- Examination to evaluate the performance and capabilities of a student or class.
- In the field of psychology, test is considered as a very useful tool to estimate some sort of psychological traits such as achievement aptitude, interest, intelligence, personality, skill etc. They include sample of stimuli led to some psychological trait, Individual shows specific responses for these stimuli. The quantity and quality of these responses are measured based on specific criteria. It enables to tester to assign a numerical value about their possession of particular trait. Decision about individual's possession of that quality can be made based on this numerical value. For example, the question paper used to measure the achievement of learners is an example of test. The stimuli are the questions and the written answers of students are the responses. The quality and quantity of this written answer facilitates the tester to estimate the amount of achievement of a particular student. Test can be defined as follows: -

- "Test is the organized succession of stimuli designed to measure quantitatively or to evaluate qualitatively some mental process, traits and characteristics."

-Bean
- "Test is a systematic procedure for comparing the behavior of two or more person."

- Lee J. Cronbach
- "A test is a systematic procedure for obtaining data or measurements in

-Carter V. Good
- "A test is an instrument or a systematic procedure for measuring sample of behavior by posing a set of questions in a uniform manner." - **Linn and Gronlund**

➤ "A test is a standardized procedure for sampling behaviors and describing it with categories or scores." -**Robert J. Gregory**

➤ "A test is a systematic procedure in which individual tested is presented with a set of constructed stimuli to which he responds, the responses enabling the tester to assign the test a numeral of a set of numerals from which inferences can be made about test's possession of whatever the test is supposed to measure

-**Fred N. Kerlinger**

➤ In summary, it can be said that test is the combination of either tool or procedure to measure any trait possessed by an individual. It is measured by sample behavior shown by that individual on test items, which are a group of stimuli designed to emit a desired.

B. Concept of measurement

➤ Process of quantifying individual's achievement, personality, attitudes, habits and skills Quantification appraisal of observable phenomena. It is Process of assigning symbols to dimensions of phenomena.

➤ An operation performed on the physical world by an observer Process by which information about the attributes or characteristics of things are determined and differentiated.

➤ The term "Educational Measurement" refers to any device for the general study and practice of testing, scaling, and appraising the outcomes of educational process. It includes administration and scoring of tests, scale construction, validation and standardization, and application of statistical techniques in the interpretation of obtained measures or test results.

➤ इमेल र फ्रेस्वी (Ebel & Frishie) भन्दछन "मापन भनेको व्यक्ति तथा उसका विशेषतालाई तो कएका नियमका आधारमा अडक प्रदान गर्ने प्र क्रया हो Measurement is the process of assigning.

Meaning of educational measurement

➤ Measurement is the process of assigning marks to objects according to some accepted rules.

- **S. Stevens**

➤ **According to Morrison, the meaning of educational measurement: -**

"Measurement is basically a part of the process by which the teacher gives numerical form to any characteristic of the student."

➤ **According to Richard H. Lindemann the meaning of educational measurement is :-**
"Measurement may be defined as assigning a number from a set of numbers to each element of a set of persons and things according to some accepted rule."

➤ Measurement is the process obtaining a numerical description of the degree to which an individual possesses a particular characteristic Measurement answers the question How much?

➤ Measurement is an act or a process that involves the assignment of a numerical index to whatever is being assessed. Measurement is collection of quantitative data. A measurement is made by comparing a quantity with a standard unit.

➤ In Education, the numerical value of scholastics ability aptitude, achievement etc. can be measured and obtained using instruments such as paper and pencil test. It means that the values of the attribute are translated into numbers by measurement.

Importance of measurement

➤ Measurement is an essential factor of evaluation. It is a necessary basis for evaluation. Evaluation is not possible without measurement.

- Measurement only produces raw score which lacks reliability and validity. That is why it is a part of evaluation.
- Measurement is used in our day-to-day life. So far as the teaching-learning process is concerned, It takes a remarkable place.
- Measurement influences teaching- learning process in one way or the other.
- Through the analysis of fact and data received by measurement, teaching learning process can be reformed.
- Measurement helps to make the educational process effective. Because, it helps to find out how much the students achieve, how much they learn in particular subject, what are the mistakes of teaching-learning process and so on. And, by the help of those facts and data, existing educational programmers can be evaluated.
- That is why measurement is a must for evaluating the whole educational system. It is the basis for evaluation. Therefore measurement is important in the field of evaluation.

Functions of Measurement: -

In psychology and education, the results of measurement serve various functions such as:

1. Classification
2. Selection
3. Comparison
4. Prediction
5. Diagnosis
6. Improving Instructional Practices
7. Developing Curriculum
8. Counseling and Guidance
9. Helping Administration
10. Research

There are Two types of Measurement:

1. Physical measurement
2. Mental\psychological measurement

1. Physical measurement

Physical measurement is the measurement of the object which has absolute existence. For example, we measure the height of individuals, the weight of rice, etc. Here, we directly measure the height or weight of an individual and all the measuring tools of physical measurement start from zero. Physical measurement is always accurate and quantitative, and there are some set of tools for physical measurement all over the world.

2. Psychological measurement

A Psychological measurement focuses on developing and testing tools to validity measure psychological qualities (such as knowledge, attitudes and opinions, emotions, cognitions, and personality).

Psychological measurement is the development of procedures to measure people's characteristics like intelligence or personality. ... Also known as psychological assessment or testing, it can be employed for researching or for predicting a future behavior.

- Sometimes we fail to distinguish between mental measurement and physical measurement because they do resemble. We will be unable to appreciate the role of evaluation unless we recognize and understand the differences between these two types of measurement.
- Usually, physical measurement comprises the measurement of objects, things, etc. and is concerned with the measurement of height, weight, length, size, volume etc. whereas measurement in behavioral sciences comprises the measurement of mental processes, traits, habits, tendencies etc.

Methods of Measurement

- i. For both physical and mental measurement, some tools and methods are necessary. The variation of method may be due to the nature of variable and purpose of measurement. The methods of measurement are as follows:
- ii. **Tests:** A test consists of a set of questions to be answered or tasks to be performed. Tests are used to assess the ability or trait in question. Psychological and educational tests are standardized procedure to measure quantitatively or qualitatively one or more than one aspect or trait by means of a sample of verbal or non-verbal behaviors. The psychological tests are used to know the ability of the students, to diagnose the weakness, to predict the future progress, and to provide educational and vocational guidance. The different types of tests are: achievement tests, intelligence tests, attitude tests, aptitude tests, personality tests, creativity tests etc.
- iii. **Inventories:** Different inventories are used for different traits. Interest inventories are used to measure interest; personality inventories are used to measure certain traits on personality.
- iv. **Observation:** There are certain traits like honesty, punctuality, persistence, truthfulness etc., which can hardly be measured objectively via tests. So here, observation is an important technique of measurement. The observation may be participant observation or non-participant observation for accurate and scientific observation.
- v. **Interview:** Interview is a face-to-face interaction between one interviewee and one interviewer or more than one interviewers. There are certain things which an individual does not want to express and they can be only assessed through interviews. The interview schedules may be used and the interviewer through a better personal support, and in congenial atmosphere, can succeed to bring out the inner feelings of the interviewee through carefully planned interviews.
- vi. **Checklist:** A checklist consists of a series of items which needs response from the respondent. The presence or absence of an item may be indicated by 'Yes' or 'No'. Checklists are popularly employed for appraisal of studies, school buildings, textbooks, outcomes, instructional procedures etc.
- vii. **Rating Scales:** Rating scale is used to evaluate the personal and social conduct of the learner. We take the opinion of teachers or parents or friends or judges on a particular quality or trait of a pupil along a scale. The rating scale may be of 5 points, 7 points, 9 points or 11 points. For example, to assess particular trait, we can use a 5-point scale as: very good, good, average, below average, and poor. Rating scales can be used to evaluate: personality traits, tests, school courses, school practices, and other school programmes.
- viii. **Attitude Scales:** Attitude refers to the bent of mind or feelings of an individual towards an object, an idea, an institution, a belief, a subject or even a person. Attitude scales are used to measure this trait objectively with accuracy.

- ix. **Projective Techniques:** Projective techniques are very ambiguous and subjective in nature. Through projective techniques, the sub-conscious and pre-conscious mind of an individual is reflected. For example, with the help of Thematic Apperception Test (TAT), we measure the personality of individuals.

Levels of Measurements

There are four different scales of measurement. The data can be defined as being one of the four scales. The four types of scales are: -

1. Nominal Scale
2. Ordinal Scale
3. Interval Scale
4. Ratio Scale

Nominal Scale

A nominal scale is the 1st level of measurement scale in which the numbers serve as “tags” or “labels” to classify or identify the objects. A nominal scale usually deals with the non-numeric variables or the numbers that do not have any value. Characteristics of Nominal Scale

- A nominal scale variable is classified into two or more categories. In this measurement mechanism, the answer should fall into either of the classes.
- It is qualitative. The numbers are used here to identify the objects.
- The numbers don't define the object characteristics. The only permissible aspect of numbers in the nominal scale is “counting.”

Ordinal Scale

The ordinal scale is the 2nd level of measurement that reports the ordering and ranking of data without establishing the degree of variation between them. Ordinal represents the “order.” Ordinal data is known as qualitative data or categorical data. It can be grouped, named and also ranked.

Characteristics of the Ordinal Scale

- The ordinal scale shows the relative ranking of the variables
- It identifies and describes the magnitude of a variable
- Along with the information provided by the nominal scale, ordinal scales give the rankings of those variables
- The interval properties are not known
- The surveyors can quickly analyze the degree of agreement concerning the identified order of variables

Interval Scale

The interval scale is the 3rd level of measurement scale. It is defined as a quantitative measurement scale in which the difference between the two variables is meaningful. In other words, the variables are measured in an exact manner, not as in a relative way in which the presence of zero is arbitrary.

Characteristics of Interval Scale:

- The interval scale is quantitative as it can quantify the difference between the values
- It allows calculating the mean and median of the variables
- To understand the difference between the variables, you can subtract the values between the variables
- The interval scale is the preferred scale in Statistics as it helps to assign any numerical values to arbitrary assessment such as feelings, calendar types, etc.

Ratio Scale

The ratio scale is the 4th level of measurement scale, which is quantitative. It is a type of variable measurement scale. It allows researchers to compare the differences or intervals. The ratio scale has a unique feature. It possesses the character of the origin or zero points.

Characteristics of Ratio Scale:

- Ratio scale has a feature of absolute zero
- It doesn't have negative numbers, because of its zero-point feature
- It affords unique opportunities for statistical analysis. The variables can be orderly added, subtracted, multiplied, divided. Mean, median, and mode can be calculated using the ratio scale.
- Ratio scale has unique and useful properties. One such feature is that it allows unit conversions like kilogram – calories, gram – calories, etc.

C. Meaning of Assessment

- It is a systematic process. By which we assess the performance of students through tests. they help in collecting data related to skills, knowledge and attitude of students. In addition, they help to improve students' performance. There is various type of assessment.
- Assessment is a process by which information is gained relative to some known purpose or goal. In addition, it is a large term that includes testing. Similarly, a test is also a form of assessment. Also, tests are for administrating assessment made under unnatural situations.
- In other words, assessment is a process of measuring performance. It also tests the knowledge of the students. For the reason, all tests are assessment but all assessment are not test. In addition, they conduct tests at the end of the lesson or unit.

Definition of Assessment

“Assessment involves the use of experimental data on student's learning to refine programs and improve students' learning.” – Allen

Nature of Assessment

- Assessment is tightly linked with the learning process. Similarly, it unites with the course of study and teaching. For keeping a check on students' progress and achievement course of study play a constant role. Also, the teacher and students work to achieve the outcomes of the course of study.
- Classroom review helps teachers to continuously detect students learning. It gives students a calculation of their improvement as a pupil. Provides close examination chance to students in the learning process.
- They help in the collection of regular response to students' learning. Also, how they respond to specific teaching approaches. It uses a variety of plans. The opinion has a deep impact on the self-respect of students. Also, it is dangerous for learning.
- Thus, the evaluation includes all those activities by teachers which help in reviewing students. Furthermore, this information used as a review and modifies teaching activity.

Functions of Assessment

It performs many functions which are listed below: -

1. **Detecting Function:** - It detects all the activities during the elevation. From making plans to estimating the results all activities are closely watched. It also helps in improving performance and achieving desired results.

2. **Making Decisions:** -They have to decide what has to be done for improvement. All the decision related to assessment has to be taken by the teacher. It helps to focus on improvements.
3. **Screening:** - The teacher has to assess the probable incidence of the problem. They have to do this by using a simple yes or no. Assessment defines the problem while screening identifies and treats it.
4. **Student's Placement in the Remedial Course:** - It means that if a student's evaluation is below average. In that case, remedial courses should be provided for them. Furthermore, these courses will in performance improvement.
5. **Instructional Planning:** - Instructional planning is a process for teachers. It helps the teacher to make a plan to target the course of study. Furthermore, it helps to address the diverse need of students.
6. **Feedback/Response:** - This process helps to validate how student's marks are derived. It also identifies and prizes specific character in student's work. In addition, it guides students to make improvement in their work.
7. **Inspiration:-** Inspiration or motivation is a very important tool. This tool provides information about the type of environment and tasks which helps in motivation.

D. Concept of Evaluation

Evaluation has its origin in the Latin word "Valupure" which means the value of a particular thing, idea or action. Evaluation, Thus, helps us to understand the worth, quality, significance amount, degree or condition of any intervention desired to tackle a social problem.

- Evaluation means finding out the value of something.
- Evaluation simply refers to the procedures of fact finding.
- Evaluation consists of assessments whether or not certain activities, treatment and interventions are in conformity with generally accepted professional standards.
- Any information obtained by any means on either the conduct or the outcome of interventions, treatment or of social change projects is considered to be evaluation.
- Evaluation is designated to provide systematic, reliable and valid information on the conduct, impact and effectiveness of the projects.
- Evaluation is essentially the study and review of past operating experience.

Ralph Tyler: - Evaluation is the process of determining to what extent the educational objectives are being realized.

James M.lee:- Evaluation is the appraisal of pupil's progress in attaining the educational goals set by the school, the class and himself. The chief purpose of evaluation is to guide and further the students learning. Evaluation is thus a positive rather than a negative process.

The concept of evaluation in education (1963): - The extent to which an objective is being attained - The effectiveness of the learning experiences provided in the classroom - How well the goal of education has been accomplished.

Purpose of evaluation

1. Students' achievement

Teaching learning process aims to provide the knowledge, skill, attitude and concept. And, it is necessary to evaluate the students whether they achieve those expected objectives or not. Through the different testing and non testing devices of evaluation, the achievement of the students can be realized. That is why evaluation is essential to judge the level of students in educational process.

2. Diagnosing the learning difficulties

Evaluation helps to diagnose the problems, hindrance and difficulties in the process of teaching learning process. Evaluation finds out those problems and tries to make teaching learning process effective.

3. To motivate students

The achievements achieved through evaluation make the students realize their progression which consequently motivates the students to achieve the best result.

4. feedback for the learning of students

Evaluation is conducted to provide constant feedback to students by diagnosing the problems and giving strong support to students for learning.

5. To guide students

Evaluation reveals the ability, capacity, skill, knowledge, concept, interest, need and aspirations of the pupils which consequently helps to lead them to the right path. It clearly shows which direction should the students follow. In other words, evaluation helps the students for the selection of further studies and professions, too.

1.2 Types of Evaluation:-

1. Placement Evaluation
2. Formative Evaluation
3. Diagnostic Evaluation
4. Summative Evaluation

1. **Placement Evaluation:** In this type of evaluation, learner's entry behavior or capability is assessed to find out whether the student possess knowledge, skills and attitude needed to begin the course of instruction. It is used to find out to what extent student has already mastered the objectives of the planned instruction. e.g. entrance exam.

2. **Formative Evaluation:** It is evaluation used to monitor student learning progress during instruction with the purpose of providing on going feedback to students and teachers regarding success and failure of teaching/learning process.

Formative evaluations strengthen or improve the object being evaluated.

3. **Summative Evaluation:** This type of evaluation is given at the end of the course or unit of instructions to find out which student, to what extent has mastered the intended learning outcomes. Though the results of summative evaluation are primarily used for assigning the grades or for certifying learners' mastery of instructional objectives, they can also be used to give feedback on the appropriateness of objectives and the effectiveness of instruction.

4. **Diagnostic Evaluation:** This type of evaluation is concerned with finding out the reasons for students persistent or recurring learning difficulties that cannot be resolved by standard corrective measures or formative evaluation.

The aim of diagnostic evaluation is to find out the causes of learning problems and plan to take remedial actions.

What are the Differences between Educational Measurement and Evaluation?

The following are the differences between the educational measurement and evaluation.

- i. While evaluation is a new concept Measurement is an old concept.
- ii. While evaluation is a technical. Measurement is a simple word.
- iii. While the scope of evaluation is wider. The scope of measurement is narrow.

- iv. In evaluation pupil's qualitative progress. In measurement only quantitative progress of the pupils can be explored. Changes and behavioral are tested in evaluation, the learning experiences are pre-determined teaching objectives are tested. In measurement the content skill and basis objectives are tested provided to the pupils in accordance with of some objectives but the result is expressed in numerals, scores testing, average and percentage.
- v. The qualities are measured in the evaluation as a whole. In measurement, the qualities are measured as separate units.
- vi. Evaluation is the process by which the previous effects and hence caused behavioral changes are tested.
- vii. Measurement means only those techniques which are used to test a particular ability of the pupil.
- viii. In evaluation, various techniques like observation, hierarchy, criteria, interest and tendencies measurement etc. are used for testing the behavioral changes. In measurement, personality test, intelligence test and achievement test etc. are included.
- ix. Evaluation is that process by which the interests, attitudes, tendencies, mental abilities, ideals, behaviors and social adjustment etc. of pupils are tested. By measurement, the interests, attitudes tendencies, ideals and behaviors cannot be tested.
- x. The evaluation aims at the modification of education system by bringing a change in the behavior. Measurement aims at measurement only.

Measurement	Evaluation
It concerns only with quantitative achievement.	It concerns with qualitative achievement.
It includes narrow sector i.e. physical aspect.	It includes the whole aspects.
It does not study objects, events, things, persons etc. comparatively.	It always conducts comparative study of objects, things, events, persons etc.
It is only means to measure something.	It represents the qualities, traits, values and characteristics of something.
It is status determination.	It is quality or value determination.
It explains the situation of something.	It explains worth of something.
It is conducted in limited area and within certain time as necessary.	It is a continuous process without time and space bound.

What are the difference between Formative and summative Evaluation?

Formative Evaluation	summative Evaluation
<ul style="list-style-type: none"> • To monitor learning progress during instruction. • Ongoing, continuous • Feedback to the Teacher and Students • Teacher made tests & Observational techniques. • Information for modifying instruction. b) Prescribing group of individual remedial work • Oral questions and observation. • Daily continuous interaction. • Terminal Exams. Unit tests. Project Evaluation. Teacher- aid evaluation. 	<ul style="list-style-type: none"> • To assess learning progress at the end of teaching. • At the end of the instructional process. • Assigning Grades, & Extent of achievement of jobs. • Rating scale & Evaluation of Projects • Certifying pupil's mastery of the learning outcome. b) Assigning grades. • Judging the appropriateness of the course objectives. b) Effectiveness of the instruction • Delayed instruction. Guiding the development • Making an overall assessment. process.

What are the difference between physical and psychological measurement?

physical measurement	psychological measurement
<ul style="list-style-type: none"> • It is an absolute measurement. • The reference point is zero. • It has definite or certain order. • Though ultimate perfection is not possible but defined and certain measurement is possible. • It has the fixed units for measuring a trait. • It is constant throughout the measurement. Units are fundamental and of define value. • The data are interpreted directly. • The trait is directly measured. • It is perfectly objective and valid. • There are fixed tools for measuring the separate traits. • It is almost at ratio scale it has a great precision. 	<ul style="list-style-type: none"> • It is a relative measurement. • It has no absolute, normative or arbitrary zero. • The reference point is group performance. • It has recognizable order. Perfection is not possible. • There is no fixed unit for measuring any trait or variable. • It varies during the process of measurement. Units are derived and of indefinite value • The raw data are meaningless but these have to be transformed into standard scores for interpretation • The trait is indirectly measured with the help of behaviors • It is a subjective measurement but tries to make it objective and valid There is no fixed or final measuring instrument for a single trait or variable • It is at nominal, ordinal and interval scales It has less precision.