UNIT I – CONCEPT OF ASSESSMENT, MEASUREMENT AND EVALUATION

Structure

1.1 INTRODUCTION

Evaluation is an important component of the teaching – learning process. It helps teachers and learners to improve teaching and learning. It is a continuous process not a periodic exercise. It helps in forming of values of judgment, educational status, or achievement of students. Evaluation in one form or the other is inevitable in teaching-learning, as in all fields of activity of education judgments need to be made. Hence it is desirable that teachers must acquire knowledge and understanding about the various aspects of evaluation and its application in classrooms. As we are much concerned about the educational evaluation now, the teaching-learning process and role and place of evaluation in the teaching-learning process is dealt with here. Hence, this unit will provide you with the knowledge of measurement, assessment and evaluation and the distinction between them.

1.2 OBJECTIVES

After going through this unit, you will be able to

- define and explain the concept of measurement and evaluation
- distinguish between measurement and evaluation
- analyse the place and purpose of evaluation

- explain the importance of evaluation

1.3 CONCEPT AND MEANING OF ASSESSMENT, MEASUREMENT AND EVALUATION

ASSESSMENT

By assessment we mean the processes and instruments that are designed to measure the learner's achievement, when learners arranged in an instructional programmme of one sort or another. It is concerned with ascertaining the extent to which the objectives of the programme have been met. The term assessment is often used interchangeably with the terms evaluation and measurement. However, assessment has a narrower meaning than evaluation but a broader meaning than measurement. In its derivation, the word 'assess' means "to sit beside" or "to assist the judge". It, therefore, seems appropriate in evaluation studies to limit the term assessment to the process of gathering the data and fashioning them into an interpretable form; judgment then can be made on the basis of assessment. Let us take an example of testing of school children by Secondary board. Tests are administered in reading, writing, science and other academic areas. Based on the information provided by the Secondary board, educators, citizens and political leaders then make judgments about the effectiveness of the education system. Assessment, as we define it , precedes the final decision making stage in evaluation like, the decision to continue, modify, or terminate an educational programme.

What is Assessment?

14.1 LET US SUM UP

Assessment may be defined as "any method used to better understand the current knowledge that a student possesses." This implies that assessment can be as simple as a teacher's subjective judgement based on a single observation of student performance or as complex as a five-hour standardized test. The idea of current knowledge implies that what a student knows is always changing and that we can make judgments about student achievement through comparisons over a period of time. Assessment may affect/decisions about grades, advancement, grades, advancement, placement, instructional needs, and curriculum.

Purpose of Assessment

The reasons why we assess vary considerably across many groups of people within the educational community.

Who Needs to Assess?	Purposes of Assessment
Policymakers	Policymakers use assessment to Set standards, Focus on goals, Monitor the quality of education, Reward / sanction various practices; Formulate policies, Direct resources including personnel and money, Determine effects of tests.
Administrators and school	Monitor program effectiveness planners use assessment to Identify program strengths and weaknesses, Designate program priorities, Assess alternatives, Plan and Improve programs.
Teachers and Administrators.	Make grouping decisions use assessment to: Perform Individual diagnosis and prescription, Monitor student progress, Carry out curriculum evaluation and refinement, Provide mastery promotion / grading and other feedback Motivate students, Determine grades.
Parents and students	Gauge student progress assessment to Assess student strengths and weaknesses, Determine school accountability, Make informed educational and career decisions

Effects of Traditional Tests

Billions of dollars are spent each year on education, yet there is widespread dissatisfaction with our educational system among educators, parents, policymakers, arid the business community. Efforts to reform and restructure schools have focused attention on the role of school improvement. In the quantity of formalized testing and the consequences of poor test scores, many educators have begun to

strongly criticize the measures used to monitor student performance and evaluate programs. They claim that traditional measures fail to assess significant learning outcomes and thereby undermine curriculum, Instruction and policy decisions.

Characteristics of Good Assessment

Good assessment information provides accurate estimates of performance and enables teachers or other decision makers to make appropriate decisions. The concept of test validity captures these essential characteristics and the extent that an assessment actually measures what it is intended to measure, and permits appropriate generalizations about a student'sskills and abilities. For example, a ten-item addition/subtraction test might be administered to a student who answers nine items correctly. If the test safely generalizes that the student will likely do as well on similar items not included on the test. The results of a good test or assessment in short, represent something beyond how students perform on a contained task or a particular set of items they represent how a student perform on the objective which those items were intended to assess.

Measurement experts agree that test validity is tied to the purposes for which an assessment is used. Thus, a test might be valid for one purpose but inappropriate for other purposes. For example, our mathematics test might be appropriate for assessing students' mastery of addition and subtraction facts but inappropriate for identifying students who are gifted in mathematics. Evidence of validity needs to be gathered for each purpose for which an assessment is used.

A second important characteristic of good assessment information is its consistency, or reliability. Will the assessment result for .this person or class be similar if they are gathered at some other time or under different circumstances or if they are scored by different raters? For example, if you ask someone what his/her age is on three separate occasions and in three different locations and the answer Is the same each time, then that information is considered reliable. In the context of performance-based and open-ended assessment, inter-rater reliability also is essential it requires that independent raters give the same scores to a given student response.

Other Characteristics of Good Assessment for Classroom purposes

- The content of the tests (the knowledge and skills assessed) should match the teacher's educational objectives and instructional emphases.
- The test items should represent the full range of knowledge and skills that are the primary targets of instruction.
- Expectations student performance should be clear
- The assessment should be free of extraneous factors which unnecessarily confuse or inadvertently cue student responses.

(For example. unclear directions and contorted questions may confuse a student and confound his/her ability to demonstrate the skills which are intended for assessment).

- Researchers at the National Center for Research on Evaluation, standards, and Student Testing (CRESST) are developing an expanded set of validity criteria for performance –based, large – scale Assessments. Assessment researchers Bob Linn, Eva Baker, and Steve Dunbar have identified eight criteria that performance-based assessments should meet in order to be considered valid.

MEASUREMENT

The word measurement means the act or the process of ascertaining the context or quantity of something. In another way measurement is an act or process that involves the assignment of a numerical index to whatever is being measured. Measurement tells about the number, the quantity or the score of something. Measurement of any kind is a matter of determining HOW MUCH or HOW LITTLE? HOW GREAT? orHOWSMALL? HOW MUCH MORE THAN? or HOW MUCH LESS THAN? Measurement is an important feature of our daily life from birth to death. Almost every aspect of our life is touched by measurements in its numerous forms. For example, immediately after birth and in the following days, the infant's temperature, weight, etc., are measured in the hospital and recorded for medical use. The mother gives the infant a measured quantity of food. The tailor takes certain measurements all of our body to stitch a garment of proper size. Electric and water supply lines are metered to determine the amount of electricity or water consumed for preparing the demand bill.

EVALUATION

Evaluation is a relatively new term in educational vocabulary. It is a wider concept than testing and measurement and is supposed to judge the worth of all the educational outcomes brought about as a result of teaching learning process. It takes into account the growth of the child as a whole individual and in his total environment. Evaluation is a recent scientific concept and more comprehensive. It takes into consideration both quantitative and qualitative changes in the total being.

Evaluation is an act or process that allows one to make a judgment about the desirability or value of a measure, which tells how good or how satisfactory an individual's performance has been. For example, a teacher measures Rahul's height to be 125cm. She evaluates his height when she says that he is short.

If a student gets 75 marks out of 100 it is measurement. But when the teacher is called upon to say whether the score is good or poor, it is talking about evaluation.

Different authors have different notions of educational evaluation. The most extended definition of evaluation has been supplied by C.E. Bee by (1977), who described evaluation as "the systematic collection and interpretation of evidence leading as a part of process to a judgment of value with a view to action."

Check Your Progress 1

i) What is measurement?

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ii) What is assessment?

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iii) What is evaluation?

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1.4 RELATIONSHIP AND DIFFERENCE BETWEEN MEASUREMENT AND EVALUATION

Sl.No	**MEASUREMENT**	**EVALUATION**
1	Measurement determines the quantity of something or behaviour.	Evaluation determines both the quantity and quality of something or behaviour.
2	Measurements answer the questions HOW MUCH? HOW LITTLE?	Evaluation answers HOW MUCH? HOW GOOD? and concerned about the value or quality.
3	Measurement looks at a single aspect of an individual's achievements.	Evaluation puts together the individual aspects of an individual, and makes judgments about the whole person.
4	Measurement describes an	Evaluation describes an

	individual as he is.	individual in terms of a group of which he is a member.
5	Measurement determines the actual performance.	Evaluation compares the performance with his aptitude.
6	Measurement describes actual situation.	Evaluation judges the worth or value of the situation.
7	It does not involve any Pre-determined objectives on the basis of which judgments are made.	Takes into account the previous achievements of the pupil and thus determines the rate of his progress his future progress. This help evaluator to make an estimate his future progress.
8	Measurement is a means to an end and its main function is to collect the evidences.	Evaluation is an end in itself and its main function is to appraise the Value of evidence.

1.5 NEED AND IMPORTANCE OF EVALUATION

Evaluation is a broader term than the measurement. It is more comprehensive than mere measurement. It is more inclusive than the term measurement. It goes ahead of measurement which simply indicates the numerical value. It gives the value judgment to the numerical value. It includes both tangible and intangible qualities.

Therefore evaluation is much more comprehensive and inclusive term than measurement and test. A test is a set of questions, measurement is assigning numbers to the results of the test according to some rules on the other hand evaluation adds value judgment. Therefore evaluation includes both quantitative description (measurement) and qualitative description (non-measurement) along with value judgments.

The main aim of teaching learning process is to enable the pupil to achieve intended learning outcomes. In this process the learning objectives are fixed then after the instruction learning progress is periodically evaluated by tests and other evaluation devices.

The need and importance of evaluation can be perceived in the following ways.

- Evaluation helps in preparing instructional objectives.
- Evaluation process helps in assessing the learners' needs.
- It helps in providing feedback to the students.
- It helps in preparing programmed materials.
- It helps in curriculum development.

- It helps in reporting pupils' progress to the parents.
- Evaluation data are very much useful in guidance and counseling.
- It helps in effective school administration.
- Evaluation data are helpful in school research.

1.6 PURPOSE OF EVALUATION

A comprehensive scheme of educational evaluation serves a number of purposes that ultimately contribute to the improvement of the instructional methods, text books, curriculum and even an advancement of our educational goals. "Education helps us to set tasks and goals which are higher than what we aspired for earlier, thus giving leadership in education"

Broadly speaking the purposes of evaluation can be categorized into two kinds, Educational and administrative.

The educational purpose of evaluation are primarily concerned with quality control in relation to

A) The Learning: This includes such functions as monitoring student progress, diagnosing student weakness, determining the need for remedial work, and improving the quality of the learning environment.

B) The Teaching: This is concerned with assessing the effectiveness of teaching, the teaching strategies, methods and techniques.

C) The curriculum: This includes improving courses and curricula, texts and students and teacher's materials.

The administrative purposes of evaluation include accountability to:

a) Society: This includes accountability to society in terms of the demands and requirements of the employment market.

b) Parents: This mainly manifests itself in a perceived need for regular reporting to parents about the progress of their children.

c) Educational system: This includes the requirements of educational system itself for purpose of selection of students for various courses, such as for entrance to higher grade or tertiary level.

1.7 PLACE OF EVALUATION IN EDUCATION

Evaluation is a continuous appraisal of the achievement of the aims of education as well as the methods of teaching and learning with a view to continuous improvements so that education becomes dynamic and self- developing.

Evaluation claims a major place in the educational process in evaluating the personality development of the individuals that is the aim of the education too. Evaluation of the personality development is a long-term process. One cannot be evaluated in one day as it is continuous and comprehensive process, which takes place in school and outside the schools, where they can get totality of experiences and involves the participation of the pupils, teacher, parents and community with a view to make up improvements in the child and the whole educational process.

Personality development of an individual is measured and evaluated in terms of learning outcome and behavioral changes which are brought about as a result of teaching-learning process by fixing educational objectives. Achievement and realization of educational objectives are made possible through this elaborate evaluation techniques. So it becomes an integral part of the educational system and is internally related to the educational objectives.

Thus evaluation claims a place in the educational process in the following way:

1. By testing the genuineness of objectives and helping in their modification, when they are not achieved.

2. By judging the effectiveness of the methods of teaching in terms of the objectives of teaching.

3. By assessing the psychological and logical soundness of the material according to the changing objectives.

4. By appraising the all-round development of the child and predicting the future success of the student in a particular field.

5. By helping the improvement and modification of the evaluation tools and techniques which are changing time to time.

Check Your Progress 2

i) What is the relationship between measurement and evaluation?

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ii) How will you categorize the evaluation broadly?

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Relationship between educational objectives, learning experiences and Evaluation

Educational evaluation has now come to be recognized as a means of improving class room teaching and testing. Viewed in relation to a specific-filed, evaluation based objectives help the subject teacher in clarifying his ideas about the objectives of teaching. It also enables him to select worthwhile and realistic objectives of teaching that would best achieve those objectives. It is also expected that the evaluation approach, if property and adequately followed, would provide specific directions for improving the syllabus, teaching methods and pupil guidance, its greatest merit, perhaps, is that it brings about an integral relationship between the educational trinity, namely, objectives, learning and evaluation in such a way that one influences and strengthens the others.

The above words sum up the core of modern approach to evaluation procedures in the teaching learning process. For an evaluation procedure to be complete, it must pass through three well-defined steps, which are;

Step 1: Formulating objectives of teaching and translating them in terms of desired changes to be brought about in the child.

Step 2: Determining and providing learning experiences appropriate to the objectives.

Step 3: Preparing tools of evaluation to measure or assess the extent to which the contemplated learning experiences have actually taken place in the child.

1.8 LET US SUM UP

In this unit we attempted to illustrate the teaching-learning process. The educational evaluation was explained with the role, place and purpose of evaluation. We defined the concepts of measurement, assessment and evaluation along with distinction between measurement and evaluation. Finally, we conclude with the relationship between educational objectives, learning experiences and Evaluation.

1.9 UNIT END EXERCISES

1. Bring out the relationship between measurement and evaluation with a suitable example.
2. Justify the use of Evaluation in your classroom and School.

1.10 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

i) Measurement is an act or process that involves the assignment of a numerical index to whatever is being measured.

ii) By assessment we mean the processes and instruments that are designed to measure the learner's achievement, when learners are engaged in an instructional program of one sort or another.

iii) Evaluation is an act or process that allows one to make a judgment about the desirability or value of a measure, which tells how good or how satisfactory an individual's performance has been.

Check Your Progress 2

i) Measurement determines the quantity of something whereas evaluation determines both the quantity and quality of something or behaviour.
Measurement looks at a single aspect of an individual's achievements whereas Evaluation puts together the individual aspects of an individual, and makes judgments about the whole person.
Measurement describes an individual as he is and evaluation describes an individual in terms of a group of which he is a member.

ii) Evaluation can be categorized into two kinds, Educational and administrative.

1.11 SUGGESTED READINGS

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UNIT II – APPROACHES TO EVALUATION

Structure

2.1 INTRODUCTION

As a teacher one is involved directly in the evaluation of the learner. The theory that you have learnt will have to be applied by you as a teacher in the classroom. This unit very much concerned about this activity of the teacher. Teachers teach and help the learners to learn. The learning that takes place is assessed or evaluated not only to benefit the students but also to the benefit of teachers. The teacher can evaluate his of her work. Also, at the end of the lesson the teacher has to get the feedback on what the learner has achieved as a result of the teachers' efforts and also , indirectly to assess his or her own achievement s as a teacher. The teacher also has to conduct tests periodically and regularly in order to study the progress of the children. Hence, in this unit we are going to learn the different types of tests that can be employed in a classroom situation.

2.2 OBJECTIVES

After going through this unit, you will be able to

- explain the different tests like Placement, Formative, Summative, diagnostic, and Prognostic tests.
- analyse the use of tests like Placement, Formative, Summative, diagnostic, and Prognostic tests.
- discuss the purpose of various tests like Placement, Formative, Summative, diagnostic, and Prognostic tests.
- distinguish between Formative and Summative Evaluation

- define Continuous and Comprehensive evaluation
- describe the need and relevance of Continuous and Comprehensive evaluation
- discuss the concept of Continuous and Comprehensive evaluation

2.3 TEST AND DIFFERENT TYPES - PLACEMENT, FORMATIVE, SUMMATIVE, DIAGNOSTIC, PROGNOSTIC

The way evaluation techniques are used in classroom instruction provides a convenient framework for describing evaluation procedures. One such classification system follows the sequence in which evaluation procedures are likely to be used in classroom instruction. These categories are related to their role in teaching in the following manner:

1. Evaluation of pupil learning progress during instruction (Placement evaluation)

2. Evaluation of pupil learning progress during instruction (Formative evaluation)

3. Evaluation of pupil achievement at the end of instruction (Summative evaluation)

4. Evaluation of pupil's learning difficulties during instruction (Diagnostic Evaluation)

The functions of each of these types of classroom evaluation are unique enough to require instruments specifically designed for the intended use.

PLACEMENT EVALUATION

Placement evaluation is concerned with the pupil's entry behavior and typically focuses on questions such as the following (1) Does the pupil possess the knowledge and skills needed to begin have a sufficient command of computational skills? (2) To what extent has the pupil already mastered the objectives of the planned instructions? Sufficient mastery might indicate the desirability of the pupil's skipping certain units or of his being placed in more advanced course. (3). To what extent do the pupil's interest, work, habits and personality characteristics indicate that one mode of instruction might be better than another e.g. group instruction versus independent study. Answers to questions like these require the use of a variety of techniques; readiness tests., aptitude tests, pre-tests on course objectives, self-report inventories, observations techniques and so on.

The goal of placement evaluation is to determine the position in the instructional sequence and the mode of instruction that are most likely to provide optimum achievement of each pupil

FORMATIVE EVALUATION

As noted earlier, formative evaluation is used to monitor learning progress of students during instruction. Its purpose is to provide continuous feedback to both pupil and teacher concerning learning successes and faults. Feedback to students provides reinforcement of successes of learning and identifies the specific learning error that needs correction. Feedback to the teacher provides information for modifying instruction and for prescribing group and individual work. Formative evaluation depends heavily on specially prepared test for each segment of instruction (e.g., Unit Chapter).

These are usually mastery tests that provide direct measures of all the intended learning outcomes of the segment prescriptions for alternative of remedial instruction are typically keyed to each item in the test or to each set of items measuring a separate skill. Tests used for formative evaluation are most frequently teacher-made, but customized testes (tests made to order by publishers) can also useful in monitoring pupil progress and identifying learning errors. Since formative evaluation is directed toward improving learning and instruction the results are typically not used for assigning course grades.

DIAGNOSTIC EVALUATION

Diagnostic evaluation is concerned with the pupil's persistent or recurring learning difficulties that are left unresolved by the standard corrective prescriptions of formative evaluation. if a pupil continues to experience failure in reading, mathematics. or other subjects. Despite the use of prescribed alternate methods of instruction (e.g. programmed materials visual aids). Then a more detailed diagnosis indicated. To use a medical analogy, formative evaluation provides first aid treatment for simple learning problems, and diagnostic evaluations searches for the underlying causes of those problems that do not respond to first aid treatment. It involves the use of specially prepared diagnostic tests as well as various observational techniques. Serious learning problems are also likely to require the services of remedial, psychological and medical specialists. The primary aim of diagnostic evaluation is to determine the causes of learning problems and to formulate a plan for remedial action.

SUMMATIVE EVALUATION

Summative evaluation typically comes at the end of a course (or unit) of instruction. It is designed to determine the extent to which the instructional objectives have been achieved and is used primarily for assigning course grades or for certifying pupil mastery of the

intended learning outcomes. The techniques used in summative evaluation are determined by the instructional objectives, but they typically include teacher made achievement tests ratings on various types of performances (e.g. laboratory, oral report). Although the main purpose of summative evaluation is grading, or the certification of pupil mastery, it also provides information for judging the appropriateness of the course objectives and the effectiveness of the instruction.

PROGNOSTIC EVALUATION

Prognostic Evaluation is a test which indicates future outcome of the students in a particular area.

2.4 DISTINCTION BETWEEN FORMATIVE AND SUMMATIVE EVALUATION

Sl.No	Formative Evaluation	Summative Evaluation
1.	It is used during the course of instruction.	It is used only at the end of the course of instruction.
2.	It is an on-going process.	It is an end process.
3.	It is developmental evaluation.	It is judgmental evaluation.
4.	Immediate feedback is given here.	Immediate feedback is not given.
5.	Specific skills are tested.	Objectives of the course and effectiveness of instruction are tested.
6.	Improvement of learning instruction is aimed here.	Assigning grades, promotion and certifying the pupils' mastery is aimed here.

Check Your Progress 1

1. Write the meaning of the following tests in a single line. Placement test, Formative test, Diagnostic Test, Summative Test

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2. Bring out the relationship between Formative and Summative tests.

2.5 CONTINUOUS AND COMPREHENSIVE EVALUATION: MEANING, NEED AND RELEVANCE

Historical Background

With this chapter, we come to grips with the issue of institution-based evaluation. In fact, Continuous and Comprehensive Evaluation is the expanded name of evaluation in institutions commonly called CCE.

In order to understand the concept better and for effectively putting it into practice, it appears desirable to briefly go through the history of the emergence of the concept.

Radhakrishnan Commission (University Education Commission 1948) which was the first education commission in independent India introduced this idea to Indian Education. It expressed its unhappiness at the fact that only external examinations dominated the educational scene as the sole determinants of evaluation and certification an individual's ability and potential. The commission made a concrete recommendation that one-third of the marks IA each subject should be reserved for sessional work

This recommendation was pushed further by the Mudaliar Commission (Secondary Education Commission 1952).

The idea picked up momentum with the endorsement of the policy related to, the taking into cognizance of the performance of the students in institutions for judging their abilities.

In 1956 the body known as the All India Council for Secondary Education (AICSE) was established for implementing the recommendation of the Mudaliar Commission. The AICSE organised the famous Bhopal Seminar on Examination. The seminar recommended that 20% of marks in each subject be reserved for

internal assessment. As this seminar was attended by educational stalwarts and decision makers from the whole country, this recommendation was almost immediately implemented by several Boards of school education including Bihar, Punjab, M.P., Madras awl Vidarbha.

However, the scheme started with good educational intentions soon started being misused by unscrupulous elements, for boosting marks so much so, that it had to be withdrawn from wherever it was introduced one by one.

Subsequently the Kothari Commission (Education and National Development 1966), while referring to the scheme observed that the experience with the Internal Assessment scheme had not been very happy.

However, a valuable idea emerged, and that was that, the schools may issue an independent certificate of school performance and other facets of personality of the students.

This certificate may be a supplement to the one issued by the examining agency in respect of external examinations.

The concept was further reinforced through the incorporation of the idea in the National policy on Education 1986/92 which clearly recommended "Continuous and Comprehensive Evaluation that incorporates both scholastic and non-scholastic aspects of growth spread over the total span of instructional time".

With this directive the Nationals Council of Educational Research and Training (NCERT), with the author at the helm of affairs in respect of evaluation projects, took up the challenge of preparing a scheme and guidelines for its implementation. This document entitled "Comprehensive Evaluation in Schools" was published by the NCERT in 1989.

When the scheme was being developed, the author had advised the group working on it that:

- the experiences of Rajasthan, Tamil Nadu and Kerala which had developed such schemes earlier be taken into account.
- only one scheme be prepared, which may be applicable in all institutions.
- the scheme may be simple to implement with built-in flexibility for application in all types of schools through suitable adaptations.
- the scheme should be possible to be implemented within the available time.
- the implementation of the scheme should not put any unwieldy demands on the teacher's time and ability.

- the scheme may require only a one-day orientation of the teachers.

Thus, these were the special characteristics of the scheme of Comprehensive and Continuous Evaluation recommended by the NCERT.

A special meeting of the representatives of the Boards of School Education was also then convened to discuss the scheme which was endorsed. The scheme was also subsequently endorsed by the next conference of the Boards of School Education convened by the Council of Boards of School Education in India (COBSE). All this prepared the grounds for the Boards to implement the Scheme. Even though the process of the implementation of educational reforms is always slow, the following Boards have (by 2008) introduced CCE:

Assam	Jammu and Kashmir
Gujarat	Kerala
CBSE	Manipur

Other states are preparing for the introduction of the scheme through needed adaptations to meet local needs.

The Concept of CCE

The very name of the scheme gives out its concept. The word comprehensive' means that covers different scholastic and co-scholastic facets of the personality comprehensively. The next term continuous connotes that the assessments made, as a part of the scheme do not consist of only events but constitute a process, built into the total teaching-leaning programme, as an integral part, including observation of student behaviour in different solutions the periodical tests and examination rituals. The third term evaluation implies that the main purpose of the total endeavour is to improve the competencies and the' of performance of the students rather than simply assessing and certifying them.

Structural Importance of CCE

The CCE is important in more ways than one. The scheme:

- covers the diverse facets of the total personality of the students, making available information about a student, which cannot be covered by any external examination like health status, personal and social qualities, interests, attitudes and values and
- Proficiency in games, sports and other outdoor activities.
- Elevates the status of the institutions to the level of the External examining agency in assessing students for public consumption, through the issue of an independent. certificate by the institution

to every student and an endorsement of the school certificate by the Board in its certificate of external examinations.

- Raises the tone of the institution and improves discipline.
- Prompts the institutions to devote due attention to the development of various facets of personality which they could conveniently overlook earlier, inspite of their undisputed value for success in life.
- Eliminates the possibility of the boosting of marks arid other malpractices by unscrupulous teachers in academic areas as they have not to be added to those of external examinations but presented independently in the institutional certificate t& be subsequently compared with the scores obtained in external examinations. The institutions therefore are bound to become more objective, accurate and cautious in this exercise. The step is also likely to contain other related malpractices.

Features of CCE

- The 'comprehensive' component of CCE takes care of assessment of all round development of the child's personality. It includes assessment in Scholastic as well as Co-Scholastic aspects of the pupil's growth.
- Scholastic aspects include curricular areas or subject specific areas, whereas Co-Scholastic aspects include Life Skills, Co-Curricular Activities, Attitudes and Values.
- Assessment in Scholastic areas is done informally and formally using multiple techniques of evaluation continually and periodically. The diagnostic evaluation takes place at the end of unit/term test. The causes of poor performance in some units are diagnostic tests. These are followed with appropriate interventions followed by retesting.
- Assessment in Co-Scholastic areas done using multiple techniques on the basis of identified criteria, while assessment in Life Skills is done on the basis of Indicators of Assessment and Checklists.

Benefits of CCE

1. CCE helps in reducing stress of students.
2. CCE helps in improving student's performance by identifying his/her learning difficulties at regular time intervals
3. Scheme of CCE is expected to help the child make informed choice of subjects in class XI based on his aptitude, interests, liking, and academic performance.
4. Stress of a single mark is lost.They are too young to handle it.

5. Competition is healthy.
6. Continuous study – Throughout the year
7. If child is good in co-scholastic he/she gets upgraded in scholastic.
8. Teachers evaluate students in day-to-day basis and use the feedback for improvement in teaching – learning process.
9. Teachers can use varieties of evaluation methods over and above the written tests.
10. Students can be assessed in both scholastic and co-scholastic areas.
11. Evaluation is done throughout the year and therefore it is expected to provide more reliable evidence of students' progress.
12. CCE encourages the students in forming good study habits.
13. The feedback provided by CCE can be effectively used in remedial teaching to slow learners.

OUTLINE OF THE SCHEME OF INSTITUTION-BASED EVALUATION

Health Status Height Weight Eye-sight Hearing Any special physical Handicap	Technique of Evaluation Measurement Observation Tools of Evaluation Weighing Machine/Balance Measuring Tape Periodicity of Evaluation Twice in an academic session Coverage All aspects to be covered in evaluating all students.
Academic Achievement Subjects of study Sessional Work practical Work Surveys project Work Periodical Tests/ Examinations	Techniques of Evaluation Performance in practical / Oral and Written Tests and •Examinations .Assignments •Observation 'Projects • Surveys Tools of Evaluation **Questions**

	Unit Tess Question Papers/ Full tests Observation Schedules Cbeck.list5/hlvent0tcs Rating Scales Periodicity of Evaluation Continuous and periodical Coverage All students
Personal and Social Qualities Regularity Punctuality Discipline Habits of Cleanliness Co-operation Diligence Sense of Responsibility Initiative Civic Consciousness Emotional Stability	Technique of Evaluation Observation Tests of Evaluation • Anecdotal Records - Check-lists - Rating Scales Periodicity of Evaluation • Observed continuously • Entered in anecdotal records/P01t5J certificates twice in a session coverage All students to be evaluated 10 respect of the first four qualities and in respect of other qualities only when evidences: are available.
Interests Lit envy interests (like Extra Reading, Debates, Recitation, Creative Writing, Speech Making etc.) Cultural interests (like Drama, Music, Dance)	Technique of Evaluation Critical observation of performance Tests of Evaluation Teachers assessment Anecdotal Records
Artistic Interests (like Drawing, Painting,	Rating Scales Periodicity of Evaluation Observed continuously

Embroidery Sculpture Scientific Interests (like • Experimentation, • Exploration, • Excursions • Science/Field Trips, Science Club Activities) Social Service Interests Each one teach one Surveys Adoption of village etc.	Recorded twice in an academic session Coverage Any one activity of any category to be opted for by the student for beingevaluated and reported. Inrespect of participation in any other activities only a mention to be made in the certificate without a rating.
Attitudes Towards Teachers Towards Institution mates Towards Institutional Programnes Towards Institutional Property	Technique of Evaluation Observation Tests of Evaluation. Anecdotal Records Rating Scales Periodicity of Evaluation Continuously observed and recorded in anecdotal records. Entered in certificates twice in a session Coverage All students
Outdoor Activities Games Sports Swimming Gymnastics Gardening craft Adventure Activities Scouting First-Aid Nature Study	• Tests Technique of Evaluation • Observation Tests of Evaluation • Performance Tests • Rating Scales • Teacher's Ratings Periodicity of Evaluation • Continuous observation of performance recorded in Anecdotal Records

	• Entry in certificate twice in a session Coverage One of the opted Games/Sports to be compulsory for evaluation for every student. In addition, every student to opt for only one activity in any one other area to be evaluated. Performance in this student selected area to be recorded in the certificate. Participation in any other additional activities only to be mentioned without evaluation.

PROCEDURES OF EVALUATION

Procedures of evaluating different facets of growth of students

Procedures in regard to evaluation in schools necessarily involve

- Continuous observation
- Periodical assessments
- Arriving at an index of performance twice in a session for making entries in the certificate.

In regard to health status the evaluation maybe made twice m a year and represented numerical terms (Kilograms-grams and Meters and centimeters.

In regard to academic achievement also the entries may be made in the certificate in numerical terms giving in respect of each subject the maximum marks and marks obtained along with the highest, lowest and mean marks only twice a year. The figures entered in the certificate will be represented as percentages of the total of scores obtained in tests, assignments, projects and other related academic achievements.

In regard to personal and social qualities, only four attributes may be evaluated in respect of all the students. Others will be evaluated only when evidences are available. Evaluation will be basically based on observation by the teachers and entries in theAnecdotal Record Forms. The evaluation may be done in terms of grades on a five point rating scale (A, B, C, D and E). Grade E may, however, not be awarded

to any candidate as it connotes failure. Entries in the certificate will be made twice in an academic session.

In regard to interests, only one activity related to any one area of interest offered by the institution may be selected by a student, for being evaluated. In case she participates in more than one, an entry will be made to that effect without any grading. Grades may again be awarded on a five point scale (with no student awarded E) on the basis of observation and entries, in the Anecdotal Record Form. Certificate entries to be made twice a year

In regard to attitudes, all the identified four attitudes may be evaluated in respect of all students. The rating will be based on observation by the teacher and the Anecdotal Record Forms. Grades on a five point scale will be awarded but again no student will be awarded the grade E. Entries in the certificate will be made twice a year.

In regard to outdoor activities, one game or a sport available in the institution will be selected by a student for evaluation. One additional activity offered by the institution shall also be opted for by a student from any other identified area. These two will be evaluate on the basis of performance as observed from time to time. Entries will be made in Iii certificate twice in a session. A five point grading will be used but no student will be awarded an E.

To sum up, it could be said that:

- entries in the certificate will be made twice in an academic session.
- entries will be based on measurements, assessments, teacher observation and entries in Anecdotal Record Forms
- for ensuring objectivity at the time of the certificate ratings, an additional teacher nominated by the head of the institution would team with the class teacher.
- entries in regard to health status and academic achievement will be made in numerical terms.
- personal and social qualities, interests, attitudes, participation in outdoor activities will be evaluated in terms of grades on a five point scale with no student awarded an E in any case.
- in the final external examination sessions the entries in the certificate will be required to be made just once in the first term.
- No final grades will be awarded in any class on the basis of the aggregated terminal grades. Each entry will indicate the level of performance of proficiency for a particular term as an independent entry.

Anecdotal Record Form: Particularly, in regard to the evaluation of co-scholastic aspects of personality, the Anecdotal Record Form is the main tool of data collection.

These are printed/photo-copied forms printed on half of the size of a sheet of foolscap paper and available in the staff room, in the room of the Head of the institution, just as various forms are freely available in the bank. An anecdotal record form may have the following format:

FORMAT OF AN ANECDOTAL RECORD FORM

The Anecdotal Record Form can be filled in by any member of the teaching staff about any student in the school when he observes a praise-worthy or an undesirable behaviour on the part of a student at any place.

This is filled in instantly on observation and passed on to the .lass teacher. The class teacher makes an entry in his register of receipts of anecdotal record forms. This register ought to have the following columns:

FORMAT FOR THE MAINTENANCE OF ANECDOTAL RECORD FORMS

Yet another thing that needs to be specially mentioned is that while ratings for the certificate or Progress Report are being derived on the basis of the Anecdotal Record Forms twice a year, the Head of the Institution should nominate another teacher to learn up with the class teacher for accomplishing the exercise for ensuring greater objectivity.

An Administrative need: When the Certificates/Report Cards are being printed it is desirable to have them printed separately for:

The Nursery and K.G Classes

The Primary Stage (I - V)

The Middle Stage (VI -VIII)

The Secondary Stage (IX -X)

The Senior Secondary Stage (XI- XII)

These should reflect the special features of each stage of education.

Arriving at Ratings for Certification

Entries are required to be made about the ratings of a student's performance or proficiency in the Certificate which is to be issued by the institution as a supplement to that of external examination in respect of the terminal stages of education.

However, for the lower classes entries have to be made in the Cumulative Record of the student to be maintained in the school and the Progress Report Card to be issued to the student from time to time for information of parents.

It is, therefore, necessary to deliberate on the issue of arriving at the various entries to be made in all these three documents.

The first prerequisite in this regard is maintenance of records within the institution. This is more important at the secondary, the senior secondary and higher stages where formal certificates have to be issued to the students as almost a legal requirement because a student may ask for a duplicate certificate which when issued should not differ from the one issued originally. Even in cases of other students seeking transfer certificates also, this assumes importance.

The process has been rendered easy as computers are available and even where they are not, the records cm be manually maintained easily. Even otherwise records about students are maintained and CCE is only aimed at systemizing these efforts so that the information can be safely preserved and easily retrieved.

In respect of Health Status there will be mostly two entries to be made and these will be individually determined ones, where there will be no processing required for determining them. The will be entered as they stand at the time of evaluation.

In regard to personal and social qualities and attitudes, the procedure will be equally easy, as even here, only one entry will need to be decided upon and made separately in respect of the four qualities to be rated compulsorily for all and others only when observed.

CRITERIA OF EVALUATION

Evaluative criteria for different areas and aspects of growth

In the areas of Interests and Co-curricular activities the procedure for arriving at the entries will be slightly different. This will be so because the evaluative criteria in some cases may be more than one as elaborated below:

Area	Aspect	Evaluative Criteria
	Extra Reading comprehension of contents	Evaluative Criteria Number of books read maintenance of totes
	Debating	Subject - matter Language Delivery
	Recitation	Correctness Modulation of voice Gestures Emotional Appeal

	Creative Writing	Subject matter Language Presentation
	Speech making	Arguments Language Delivery
	Club Activities	Participation Performance - Team spirit
Cultural Interests	Dramatization	Make-up Acting Dialogues Emotional Appeal
	Music	Rhythm Tune Effect
	Dance	Make-up Movements Facial Expression
Artistic Interests	Drawing and Painting	Correctness Composition Colour scheme Effect
	Artistic Embroidery	Selection of design Colour scheme Stitches Performance
	Sculpture/Modelling	Proportion Precision Eye appeal

NOTES

	Craft	Knowledge about material used Skill in handling materials Skill in handling tools Product quality
Scientific Interests	Science Club Activities Preparation of Charts and Models Improvisation of apparatus Collection of samples Personal activities Listening to talks about science Reading about inventions and discoveries Experimentation Exploration	Initiative Innovation Precautions Record keeping Team spirit Enthusiasm about learning more
Social Service Interests	School Functions School Discipline School cleanliness Problems of the locality	Volunteering for related work Participation Contribution Readiness to extend help
Attitudes	Towards Studies	Diligence Curiosity to learn Desire to solve problems Attentiveness
	Towards Teachers	Obedience Helpfulness Respectfulness
	Towards School programmes	Participation Enthusiastic contribution Helpfulness
	Towards School-mates	Helpfulness in need

		Cooperation in joint ventures Consideration
	Towards School property	Cleanliness Protection from damage
Outdoor Activities (Performance level)	Games	Discipline on the field Sporting spirit Team spirit Performance
	Sports	Discipline on the field Sporting spirit Performance
	Swimming Gymnastics	Knowledge of basic rules Precautions Observance of rules
	Gardening	Performance Basic knowledge about plants Care of the plants Maintenance of records of plant growth.
	Adventure Activities	Knowledge of possible hazards Adequacy of preparation Precautions and remediation First Aid Equipment and ability to use it Advance training Individual responsibility in the team Ready availability of help in emergency Ability for overcoming hurdles Overall performance

	Scouting/Girl Guiding	Doing a good turn, Inculcation of habits guided bythe spirit of Social Service Familiarity with rules Scout craft
	First Aid	Knowledge about first-aid in different emergencies and skill in giving first aid.
	. Nature study	Critical study of natural phenomenon Study of the impact of nature on our lives. Appropriate Record Keeping Drawing one's own conclusions and verifying them.
	. Nature study	Critical study of natural phenomenon Study of the impact of nature on our lives. Appropriate Record Keeping Drawing one's own conclusions and verifying them.

Derivation of Grades

The above list of areas, aspects and their respective evaluative criteria is by no means we exhaustive. It could certainly be modified, further augmented and further refined by the teachers as per need.

The point desired to be made is that evaluation in respect of different aspects will need to be made in respect of different evaluative criteria individually and then combined to get an overall grade. This operation is simple.

The rating will be done in terms of grades on a five point scale, using just four of them (A,B, C and D)

The corresponding numerical grades in respect of symbolic or letter grades will be:

Symbolic grades		**Numerical grades**		**Grade Ranges**	
A	=	5	4.6	To	5.5
B	=	4	3.6	To	4.5
C	=	3	2.6	To	3.5
D	=	2	1.6	To	2.5
E	=	1	0.6	To	1.5

E, however, will not be awarded on any item to anybody. In case of recitation, for example, if a student gets

Evaluative Criteria	**Symbolic grades**	**Corresponding Numerical Grades**
For Correctness	A	5
For Modulation of voice	B	4
For Gestures	C	3
For Emotional appeal	A	5

The Corresponding Numerical Grades will then be added up

5 +4 +3 + 5= 17, and divided by the number of grades combined i.e. k This will give the final overall grade for the particular activity.

$$= \frac{17}{4}$$

= 4.25

= B

(Derived on the basis of given grade ranges)

The arithmetic is simple and does not need any special effort or expertise.

In regard to academic areas the entries have to be made in numerical terms but converted as percentages for entry in certificates. There could be a variety of components with different maximum marks e.g in a term/academic session.

There are 2 types of Assessments, in an academic year, to test the Scholastic areas: Formative Assessment (FA) and Summative Assessment (SA).

Formative Assessment FA is carried out as a part of the instruction methodology and provides continuous feedback to both the teachers and the learners. It Comprises of

Classwork
Homework
Oral Questions
Quizzes
One minute paper
Toughest Point
One sentence Summary
Project
Assignment

Summative assessment is carried out at the end of a term. It measures how much a student has learnt from the course and is usually a graded test i.e., Examination.

Non- Scholastic Areas
1. Life Skills

Thinking Skills	Social Skills	Emotional Skills
• Self Awareness	• Interpersonal Relationships	• ManagingEmotions
• Problem Solving	• EffectiveCommunication	• Dealing with Emotions
•Decision Making	• Empathy	
• Critical Thinking		
•Creative Thinking		

2. Attitudes andValues

- Teachers
- School mates
- SchoolProgrammesandEnvironment
- Value Systems

3. Co Curricular Activities

3(A) Activities (any two):	3(B) Health and Physical Education (any two):
• Literary and Creative Skills • Scientific Skills • Information and Communication Technology (ICT) • Organizational and Leadership Skills (Clubs)	• Sports/Indigenous Sports • NCC/NSS • Scouting and Guiding • Swimming • Gymnastics • Yoga • First Aid • Gardening

Check Your Progress 2

1. Write the meaning of the CCE.

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2. Bring out the uses of CCE.

2.6 LET US SUM UP

In this Unit, we have dealt with the various types of tests viz., Placement, Formative, Diagnostic and Summative tests and Continuous and Comprehensive evaluation. We have started discussing the various types of tests in detail and discussed CCE later. We have concluded with the Scholastic and non-scholastic areas under CCE after discussing the features and the benefits of Continuous and Comprehensive evaluation.

2.7 UNIT-END EXERCISES

1. Prepare a series of formative test question papers for a term for your subject.

2. Prepare a diagnostic test choosing a unit from your major subject.

3. Design a CCE Scheme to evaluate your students.

2.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1.

i) Evaluation of pupil learning progress during instruction (Placement evaluation)
ii) Evaluation of pupil learning progress during instruction (Formative evaluation)
iii) Evaluation of pupil achievement at the end of instruction (Summative evaluation)
iv) Evaluation of pupil's learning difficulties during instruction (Diagnostic Evaluation)

2.

i) Formative evaluation is used during the course of instruction whereas summative is used at the end of the unit or course of instruction.
ii) Formative evaluation is an on-going process but summative evaluation is an end process.
iii) Formative Evaluation is developmental evaluation whereas summative is a judgemental evaluation.
iv) Immediate feedback is received in formative evaluation whereas there is no scope for immediate feedback in the summative evaluation.
v) Improvement of learning instruction is aimed here in formative evaluation whereas assigning grades, promotion and certifying the pupils' mastery is aimed here in summative evaluation.

Check Your Progress 2

1. Continuous and comprehensive evaluation (CCE) is the school-based evaluation of the pupil on a continuous process throughout the year which helps in checking all the standards of performance in both scholastic and co-scholastic areas.

2.

i) CCE helps in reducing stress of students.
ii) CCE helps in improving student's performance by identifying his/her learning difficulties at regular time intervals
iii) Scheme of CCE is expected to help the child make informed choice of subjects in class XI based on his aptitude, interests, liking, and academic performance.

iv) Teachers evaluate students in day-to-day basis and use the feedback for improvement in teaching – learning process.
v) Teachers can use varieties of evaluation methods over and above the written tests.
vi) Students can be assessed in both scholastic and co-scholastic areas.
vii) Evaluation is done throughout the year and therefore it is expected to provide more reliable evidence of students' progress.
viii) CCE encourages the students in forming good study habits.
ix) The feedback provided by CCE can be effectively used in remedial teaching to slow learners.

2.9 SUGGESTED READINGS

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NOTES

UNIT III – TECHNIQUES OF EVALUATION-I

Structure

3.1 INTRODUCTION

Evaluation of students' behaviour is an integral part of any teaching task. Evaluation implies passing judgement on activities performed by individuals. Teachers are very often required to do so. It is, therefore imperative for teachers to be well versed with the techniques of evaluation. Various techniques (subjective, objective and projective) for conducting evaluation exercises have been developed and are in use among educational practitioners.

This unit discusses the significance, administration and utility of some of the most commonly used techniques of evaluation viz., self-reporting, observation, projective and Sociometric techniques.

3.2 OBJECTIVES

After going through this unit, you will be able to

- grasp the meaning of technique of evaluation
- explain the significance of self-reporting technique
- differentiate between objective and projective technique
- assess pupil characteristics through interview
- enumerate various types of techniques of conduction interview
- differentiate between a questionnaire and an inventory
- construct a questionnaire

3.3 GENERAL TECHNIQUES OF EVALUATION

Evaluation of students' behaviour is an integral part of Leaching-learning. Teachers are very often required to pass their judgement on various tasks/activities performed by the students. It implies that teachers should be well versed with various -techniques of evaluation. The techniques of evaluation may broadly be classified as subjective, objective and projective. Subjective techniques are generally based on the information supplied by the students or the impressions gathered by the teacher. The most commonly used subjective techniques include verbal or non-verbal conversations, self-report, observation, opinions of friends, neighbours, parents, relatives, teachers, colleagues, etc. The main criticism of this type of techniques is that the information elicited may not be accurate or realistic. However, attempts can be made to achieve accuracy.

Objective and Projective Techniques

The second type of techniques termed objective techniques. Under these techniques, testing situation, procedure and assessment norms are pie-determined so as to ensure that different test administrators/investigators would arrive at the same conclusions. Since some element of specificity is introduced, it is rated to be more valid than the subjective techniques. In fact, subjective methods are put to refinement, e.g., one may collect information from more than one person instead of only one. Even in this technique, certain hidden aspects of behaviour are not explicitly reflected if the testee is clever enough and wants to suppress them deliberately. To take care of this aspect another category of evaluation techniques is used which are known as projective techniques in which semi-structured or unstructured stimuli are presented and the testee is required to provides them with a structure. The reactions of testees are considered, analyzed and interpreted to reflect his latent feelings and emotions.

All these three types of techniques of evaluation have got their advantages and limitations. Wisdom lies in their most appropriate and balanced use to arrive at dependable conclusions so as to help the child in his/her developmental process.

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3.4 QUANTITATIVE TECHNIQUE AND QUALITATIVE TECHNIQUES

The tools such as rating scale, intelligence and aptitude tests, inventories, anecdotal record, teacher made tools and standardized tests of achievement tests have their own special role, uses and limitations. Rating scale, for instance, is useful to classify opinions and judgements regarding situations, objects etc. Intelligence and aptitude tests on the other hand are used as tools to measure in numerical terms the potential performance and special ability of a person. Inventories are used to assess the expression of the inner feelings of individuals through questionnaires and personality inventories. Anecdotal records are used to assess the behaviour in the past of a person in a particular situation. The important events are recorded by the teacher. It helps to know the specific quality of a person. Teacher made and standardised tools are used to measure in numerical terms the attainments of students in various school subjects.

3.5 SELF- REPORTING TECHNIQUES

For evaluation purpose, the wealth of information about the student is usually obtained from him by interviews and questionnaires (inventories). These techniques are used to gather data by obtaining responses to questions.

A) INTERVIEW

The interview is a face-to-face personal conference, in which the required information is obtained directly from as individual.

There are at least three main aspects to the technique of interviewing:

i) Parts of an interview.

- A beginning (establishing rapport and clarifying the purpose of the interview)
- A middle (data gathering or exploration of alternative solutions to a problem)
- An end (summarizing and terminating the face-to-face relationship)

ii) Securing responses

- Structure or controlled interview (Here there is an attempt to cover a definite group. Schedules of questions are generally drawn up beforehand)

• Unstructured or uncontrolled interview (Here conditions are least)

iii) Recording Result

The teacher takes a brief note during the course of the interview and summarizes the main points after the interviewee leaves. With the constant of the interviewee, a tape recorder may be used.

PURPOSE OF INTERVIEW

According to Haln and Mc Lean, interview technique can be used for the following purposes:

i) To collect new information and amplify or interpret the information already gathered.

ii) To permit counselee to think aloud in the presence of a sympathetic listener.

iii) To carry necessary information to the counselling.

iv) To find socially acceptable and personally satisfying alternatives with and for counselee.

TECHNIQUES OF CONDUCTING INTERVIEW

The effective technique of conducting interview involves the following points:

i) See that physical conditions are congenial and that there is not much of external interruption caused by noise etc,

ii) Rapport with the interviewee by asking friendly questions is essential for the success of an interview.

iii) There should be no evidence of fatigue.

iv) The purpose of the interview must be kept in view and all interviews should be directed towards that end.

v) Interview should not be interrupted by the interviewer's critical or condemnatory remarks.

vi) Before the interview is closed, the interviewee should get the assurance that he/she can confide in the interviewer. He/she must go satisfied with some plan of action.

In an interview, the personal qualities of the interviewer are as important as the use of this technique.

ADVANTAGES

i) It provides for flexibility. It allows the interviewee to ask for a clarification of a question and the interviewer to raise all kinds of follow-up questions to the answers of the respondent. The interviewer can skim over certain areas and probe others intensively.

ii) It lends itself to dealing with confidential and personal material which cannot be obtained through a questionnaire.

iii) It gives the interviewer the opportunity to hear how an interviewee has said something (e.g., accent, fluency, tone of voice, meaning, etc.) as well as what he has said.

iv) An informal interview on how Vijay solves an arithmetic problem may reveal to the teacher what techniques of thinking Vijay employs.

v) Quietly chatting with a student at his sent, the teacher can gather valuable information about him.

vi) It enables each side to have a look at the other. No employer would like to take an employee without seeing him, nor an employee would like to join a firm without meeting somebody from the firm.

vii) The interview is a method acceptable to both sides. An acceptable selection method e.g., tests of intelligence etc. could cause considerable initial tension, which might impair performance.

viii) The skillfully handled interview provides a highly flexible situation. Different approaches can be tried.

ix) The interview is relatively quick and economical.

USES

This technique is widely used in guidance and counseling in getting information regarding a child's interest, needsand adjustments, etc.

B) INVENTORIES OR QUESTIONNAIRES

A questionnaire is a list of planned written questions related to a particular topic or series of topics. Space is provided for the reply to each question.

In the structured (close-end) type of questionnaire, the answers are checked or underlined by the respondent. In the unstructured (open-end) type the respondent is allowed to make free response to the questions. The inventory comes under the first type.

In practices, when we want to collect the respondent's family data, personal data, health data, special school activities, educational

and vocational plans, etc. we call the questionnaire a questionnaire. When we want to evaluate the respondent's interest, attitude, opinion, feelings and other personal special adjustments, we present him a series of questions or statements in the form of a check list. Such self-report techniques are generally referred to as inventories.

CONSTRUCTING QUESTIONNAIRES OR INVENTORIES

The following points should be observed:

i) Use the questionnaire or inventory when it is most appropriate, e.g., when

a) the group may soon break up because it is temporary
b) the group is together for the first and last time
c) there is insufficient time for individual interview
d) there are too many to be interviewed
e) there are too many people who can't reached personality
f) an independent response from each person is desired
g) the desired data are either non-existent or not conveniently available
h) answers to a comparable set of questions are desired

ii) Define the general purpose and specific objectives, e.g.,

a) To secure background data on an individual (or group) which may be valuable in accounting for classroom behaviour
b) To secure a pencil-and-paper aid in evaluating the extent to which educational objectives are being realised
c) To secure data which will be pertinent to planning curriculum
d) To secure a picture of the status of an experience, a unit, a project, a study or a group.

iii) Construct appropriate questions or statements

a) A question or statement should be clearly stated. A clear question is one whose
- Vocabulary is understandable
- Phrasing is simple and straight forward
- Terms are unequivocal
- Print is readable

b) It should not be double or triple-barreled.
c) Do not confine the respondent to a choice which does not describe his position, e.g.,

a. Poor: When you sew ,do you prefer a sewing machine ( ) or a needle ( )? Check one

d) Better: Do you sew? Yes/No

i. If yes, do you prefer a sewing machine () or a needle ( )?

1. (Check one)

e) Do not include too many questions or statements.

f) They should be so written as to facilitate the tabulation and presentation of findings.

iv) Arrange questions or statements in appropriate groupings. This is to ensure a mind-set and to make the tabulation more systematic and interpretation of the question simpler.

v) Design an appealing format. It must be well printed, well-spaced and attractive-looking, which encourage the respondent to answer questions fully and with interest.

vi) Check the questionnaire or inventory for adequacy. This is to eliminate spelling, grammatical, and typographical errors.

ADMINISTERING THE QUESTIONNAIRE OR INVENTORY

For good administration, the conditions are

(a) Insuring a good climate for proper administration;

(b) Stating clear purposes;

(c) Providing clear directions and a good working situation.

Check Your Progress 1

1. Suggest some points that you would like to follow while using self-reporting techniques.

_____

_____

2. List a few Self-reporting Techniques.

_____

_____

3.6 LET US SUM UP

The various techniques of evaluation are employed to assess various aspects of human behaviour including the personality. These techniques may be classified as subjective, objective and projective

depending upon the elicited responses. Self-reporting techniques are acceptable method of studying the individuals' choices and preferences.

3.7 UNIT- END EXERCISES

1. Construct a Questionnaire to evaluate the study habit of your students.

2. How are self-reporting techniques helpful to study the personality of the students?

3. How will you conduct an interview?

4. Differentiate between a Questionnaire and an Inventory.

3.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your progress 1

1. i) Use standardised inventories
   ii) Use more than one Questionnaire
   iii) Administer twice with changed sequence of items
2. Interview, Inventories and Questionnaires.

3.9 SUGGESTED READINGS

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NOTES

UNIT IV – TECHNIQUES OF EVALUATION-II

4.1 INTRODUCTION

It is imperative for teachers to be well versed with the techniques of evaluation for the evaluation of students' behaviour is an integral part of any teaching. Evaluation is passing judgment about others quantitatively and qualitatively. This unit discusses about the various observational techniques, projective techniques and sociometric techniques and its purposes, administration and advantages.

4.2 OBJECTIVES

After going through this unit, you will be able to

- enumerate various types of observations and their significance in educational institutions
- assess pupil characteristics through observation
- understand the importance of peer ratings
- organise and interpret results of peer ratings
- define projective techniques
- enlist situations of the uses of projective techniques
- define sociometric techniques
- analyse the use of sociometric techniques
- make use of sociometric techniques in classrooms.

4.3 OBSERVATION TECHNIQUES

Observation

Observation of the pupil's behavior is an important technique of gathering information for the purpose of evaluation. Observation is as primitive a procedure as it is modern and new with many new techniques used as observation procedures. It is a tool by which the

external behaviour of person/persons in controlled or uncontrolled situations can be observed and recorded. Thought observation is the most widely used of all measurement procedures, yet it is "measurement without instrument ". Observation is an attempt to observe and appraise whatever happens, as it happens. In fact, teachers are ever observing their pupil's behaviour. They also give their interpretations of the incidents they observe. But these interpretations are not always objective. In spite of this, observation is a common technique used by teachers to collect data relating to human behaviour. In educational evaluation, observation is the mostly used of all measurement procedures. This is so, perhaps, because a number of behavioral phenomena may not be assessed validly by another procedure.

In order to gain improved results through observation, following points should be kept in mind:

i) Determine ahead of time the purpose of observation. This means, the observer should know what exactly he is to observe.

ii) Observe only one pupil at a time.Prof.Downie suggests that when group behavior is to be observed, moving pictures and recordings must be used in order to get a record of the many things going on at a time.

iii) A child under observation may be seen doing many things that are unimportant. Record only significant behaviour.

iv) Observation may be done at different times during the day. This will exhibit many points of significant behaviour.

v) Observed behavior should be recorded and summarized immediately after the observation is over. It may be recorded during the period of observation if the person being observed is not conscious of this fact.

A few important limitations of the observation procedure may be noted here:
a) It is difficult to have standardized and objective observation. Whatever type of behavior is occurring is largely a chance happening, and what the observer sees is entirely up to him.

b) Observation involves the observer's personal likes and dislikes. Some external happenings may cause changes in the attitude of the observer himself which, in turn, may influence his recording.

4.4 PROJECTIVE TECHNIQUES

The content of projection:

The word "projection" is used in the psychoanalytical literature as a defense mechanism which stands for the process whereby the image transfers on the some external object. An office boss may find fault with his subordinates or a professor with his students if he had a quarrel with his wife at home. He projects his own feelings onto the person outside him.

In the words of Frank.S.Freeman:

"Psychologically, projection is an unconscious process whereby an individual,

- Attributes certain thoughts, attitudes, emotions or characteristic to other persons or certain characteristics to objects in his environment:
- Attributes his own needs to others in his environment: or
- Draws incorrect inferences from an experience. Projection is not recognized as being of personal origin with the result that the content of process is experienced as an outer perception and of external origin."

The basic idea underlying the projective methods is that no two persons perceive the world in exactly the same manner. Hence, in the projective technique, the subjects are expected to project their own 'images' into the unstructured test materials. If the inner urges are blocked off through social pressure or by fear of punishment, the subject will project his feelings on to some other subject or situation, which is taken as symbol.

The person is asked to be as subjective as possible. He is asked to behave in an imaginative way. E.g. making up a story, interpreting inkblots or constructing some objects out of plastic materials. They are interested to reveal the underlying tracks, moods, attitudes and fantasies that determine the behavior; here the subject should have complete freedom from any sort of self-criticism. The freedom with an appeal to imagination tends to favor the projection of the real personality. That is why, the author reveals unconsciously more about himself in his fictional work than in his consciously written autobiography.

Types of Projective Techniques:

A number of projective techniques have been made available by psychologists. Out of these, the important techniques are:

1. Rorschach Ink – Blot test
2. Thematic Apperception Test
3. Word association test
4. Story completion test

Rorschach Ink Blot test:

This test was standardized in 1921 by Herman Rorschach, Swiss psychiatrist. Ferguson describes this test under the heading" The perceptual approach", since the individual makes use of his perception while making responses to the stimuli. In this test, the subject is required to interpret standard ink – blots presented in series.

The test is constructed on the basis of 4 general aspects of the responses:

- Their location: large or small areas, whole or parts.
- The determinants: the characteristic of the blot which seems to be mainly responsible in determining his perception e.g. shading, colour, shape and size
- Contents: general kinds of objects named –animals, etc.
- Original or popular.

Construction of the test:

Rorschach prepared several hundreds of ink –blots of different sizes, types and colors. As these were given to mental patients, he found their diagnostic value.

The responses from different types of patients were the same. This led to Rorschach to use these inkblots to find the diseases of mental patients. Out of several hundreds of ink – blots, only ten were selected for the final test. Therefore, in the Rorschach test there are 10 inkblots. These inkblots have a serial numbers from 1 to 10. They are white papers fixed on cardboard pieces. The colors of inkblots are various. Often it is dark – grey, but red, blue colors are also present in some inkblots. As the number increases, the inkblots become more and more complex and difficult. There is a great complexity in card no.1 and card no.10.

All these cards have been well standardised. They have been given to hundreds of people of known and unknown groups and the responses have been standardized. We have got norms and comparing the scores of the subject with the norms, the personality can be explored and interpreted.

Administering the test:

The examiner must know very well all the ink – blots before they are given to the subject. They are arranged according to serial number and one is given to the subject at a time. The examiner tells the examinee that people can see all sorts of things, persons, objects and animals, etc. in these inkblots. He further adds as what the examinee sees through it. The subjects are free to take any view of the inkblot. He can see it from any side and take his own time. He is required to tell what part of the inkblot suggests a certain object. As far as possible, he

is to see the whole of inkblot as some objects and later he should proceed to parts.

The examiner is also there. He records the time as well as the responses of the subject. He must not interfere with the subject. Therefore, his seat is just at the back of the subject. He has to note the time, especially when the subject takes long time to give responses. Remarks and exclamation of subjects are not to be counted. At times when certain parts of the inkblots are not clear, the examiner can ask the subject to clear the point.

It is always better that the test is finished in one sitting. If the subject is bored or fatigue, then the test is given after 5th, and not before or after it. It means that it is better to finish the test in one sitting. However, there can be two sittings. In the first sitting the five ink –blots must be finished and in the second the last or remaining five ink –blots should be finished.

Originally, this is individual test, but for normal literate persons it can be used as group test. In the group test, the inkblot is projected on cinema screen one by one. A sufficient long time and all the subjects see it and go on writing whatever they see. No doubt, time is saved but it permits less adequate inquiry than individual test, but otherwise it is satisfactory for intelligent adolescence and adults.

Scoring and interpretation:

Scoring and interpretation in Rorschach test are based upon four major categories as detailed below.

1. Location:

This means the part of the area that has been perceived by the subject. This may be entire inkblot, a large portion, a small portion or a part of the white background, the area may be well précised or the subject may only have the blurred or vague idea about it.

2. Determinant:

This refers to the characteristic of the inkblot perceived by the subject. The characteristic may be form, shading, color, perspectives or motion or combination of them all. This means what caused the subject to see the inkblot as he saw it.

3. Content:

This refers to the fact whether the subject saw the animal, human shapes, plants or landscapes, sex or something else.

4. Originals or popular:

This means whether the response / responses are the one that could be commonly or popularly given or that is uncommon or original.

Interpretation of the responses are based on the above characteristics.

The uses of the Ink –blot test:

- This test is widely used to classify abnormal subjects by finding their troubles.
- It is a great tool in the hands of psychologists for systematic procedures in mental hygiene and other reformatory institution, this is commonly used.
- Besides its diagnostic use in clinics and mental hospitals its very useful in making prediction for the future.
- As such this is a great valuable test on which the councilors in vocational guidance programmers depend.
- This field of Rorschach test is used to predict the academic and vocational fitness and success of young persons, and this is getting more and more important.

The test is also used to supplement Binet's results for poor learners by suggesting to them whether low score or backwardness is due to lack of mental power or any inhabitation, which prevents the use of mental power. It is also useful to find causes of antisocial activities of delinquent and other problem children.

Thematic Apperception Test (T.A.T)

Thematic Apperception Test (abbreviated as T.A.T) was designed by Murray and Morgan in 1938. Ferguson describes this technique under the head "The imaginational approach". The principal data of the test is a particular topic or theme which the subject projects into a vague picture. The subjects look at the picture and weave a theme or a story around it from his own subjective imagination. Thus he indirectly, in deliberately and unwillingly projects his own mind and his own feelings into theme of the picture. He perceives only what he subjectively feels. His perception is subjective while the picture acts just as a stimulus. So the test is named as Thematic Apperception Test.

The T.A.T. consists of a series of 20 pictures selected by Murray and Morgan. Each picture is presented to the subject. He is asked to look at the picture, think and imagine a story that is suggested by the picture. The subject weaves a story (fictitious one) out of the picture, creates characters as seen in the picture, explains their relationship to each other and states outcomes of the story one by one as the picture are presented in a particular order. The psychologists go on recording what the subject says. Then he analyses the data and finds out the majors theories such as he personal interest, attitudes, mental conflicts, ambitions, family adjustments, social adjustment, sexual matters etc. Common elements of the theme in all the 20 pictures are discovered. These reveal a wealth of information about: the sub-scores

and the total personality of the subject. The test as a whole throws light on the functioning of the mind.

Interpretation in T.A.T

The story of TAT may be interpreted in many easy ways, depending upon the viewpoint of the examiner and the purpose for which the test is administered. Murray has suggested following points for analyzing the stories:

1. The hero: The character in each picture with whom the subject identifies himself.
2. Motives, trends and feelings of each of the heroes of stories.
3. Forces in the hero's environment
4. Outcomes: relation of the outcomes of the story to the rest of the plot.
5. Themes: Intersection of a hero's need with environment forces.
6. Interests and sentiments: choice of topics and style of dealing with them, handling of sex relationships.

It may be cautioned here that the single response of a TAT has significance only as an element in the total pattern. It is the recurring themes and features that are significant.

On the model of T.A.T., which are designed for adults, children Apperception Test (C.A.T.) has also been prepared by Bellak. In India some adaptations of the T.A.T and C.A.T have been done, especially by Dr. Uma Chaudharey and the psychological Institute.

Check Your Progress 1

1. Name the important projective techniques of evaluation.

   _____

   _____

2. What are the major categories based on which the scoring is done in Rorshach Inkblot Test?

   _____

   _____

4.5 SOCIOMETRIC TECHNIQUES

Sociometric Techniques are useful in evaluating the personal-social adjustments of a pupil. Sociometry is concerned with how an individual is seen and accepted by his peers. Sociometric techniques

have been and are constantly being used by students. When they select the year, they are employing Sociometry.

The essential point is to devise a series of questions that will elicit a student's true feelings about other members in his class.

e.g., 1) Whom would you like to sit next to in class?

2) Who is your best friend?

3) Who would you like to play indoor games with?

ADVANTAGES OF SOCIOMETRIC TECHNIQUES

1) They reveal information about the personal-social adjustments of students.
2) They are quite economical in time and money.

USING SOCIOMETRIC DATA

Teacher can use these data-

1) (a) for organizing classroom groups,
   (b) To improve the social climate in the classroom
   (c) To improve the social structure of the group
   (d) To help those who have been isolated become more acceptable to their peers.
2) To study the effects of certain experiences on a group structure
3) To study the relationship between a group structure and such factors as sex, religion, color, age.
4) To study the stability of a group structure.

TEACHER-MADE SOCIOMETRIC TECHNIQUES

The following are some of the teacher-made Sociometric techniques:

- Peer Appraisal ("Guess Who" technique).
- Nominating procedures (Sociogram).
- Social Distance Scales.

1) Peer Appraisal Methods

A peer appraisal can be a very good supplement in the evaluation program. In evaluating such characteristics as popularity, leadership ability, concern for others, follow students are often better judges than teachers.

Whenever peer ratings are desired, two major principles must be adhered to:

1) The traits to be rated should be within the student's experimental background.
2) Complete anonymity and confidentiality must be maintained.

A) "Guess who" technique

Each pupil is given a list of descriptions and asked to name the pupils who best fit each description. One may include one's own name if one believes the description suits one.

e.g., 1) This boy is an effective leader, always sides with the students if they are right, strong and stout, a good orator.

The teacher can readily see which pupils are mentioned most frequently, seldom, or not at all for each characteristic.

2) Nominating Procedure (Sociogram)

This is very similar to the guess who method except that the questions are slightly different. Instead of choosing a name to fit a description, the student is asked to nominate as well as who was nominated. Reciprocal relationships are looked for.

e.g., on a piece of paper, write your name and, under it mention names of three persons in order of reference with whom you would like to study.

Although the choice can be weighted, it would be preferable to use a simple count rather than a weighting procedure.

The results are tabulated in a matrix and a graphic picture of the data matrix (the sociogram) is prepared. From the sociogram, we can identify the students who are most popular (stars), those who receive no choices (isolates) and those who receive only a single choice (neglectees).

3) Social Distance Scales

In the sociogram, the student is generally restricted to the number of choices he can make.Because of this restriction, we do not have a complete picture of the group's social structure. To determine the extent to which the group accepts or rejects Bharat, or conversely the extent, to which Bharat accepts each member in the group, the social distance scale is used.

In the social distance scale, every child reacts to every other child in respect of the questions asked. A simple tally then provides the teacher with sociometric data for the total group.

Check Your Progress 2

1. Why do we use Sociometric techniques?

2. Name the three teacher-made sociometric techniques.

4.6 LET US SUM UP

Participatory and non-participatory observation and peer ratings would provide objective measures of the characteristics of individuals as noted and experienced by others. Severe maladjustments and behaviour disorders need to be studied through projective techniques which clinically examine the deep rooted motives, emotions and feelings as the causes of expressed behaviours using the semi or unstructured stimuli. You may also like to appreciate that the projective techniques are good tools to examine the secret of one's personality and provide clinical guidance. Also you have learnt the various techniques of evaluation in classroom situations.

4.7 UNIT- END EXERCISES

1. How is observation useful to you in your classroom as a teacher?
2. How will you administer TAT in your classroom?
3. Prepare a sociogram to find the Stars and Neglectees in your classroom.

4.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your progress 1

1.
    1. Rorshach Inkblot test
    2. Thematic Apperception Test
    3. Story completion test
    4. Word Association Test

2.
    1. Location
    2. Determinants
    3. Content
    4. Originals or Popular

Check Your progress 2

1. Sociometric Techniques are used to evaluate the personal-social adjustments of a pupil. Sociometry is concerned with how an individual is seen and accepted by his peers.
2.
    1. Peer appraisal Method
    2. Nominating Procedure
    3. Social Distance Scale

NOTES

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UNIT V – TOOLS OF EVALUATION

Structure

5.1 INTRODUCTION

In this unit we are going to discuss a few tools of evaluation such as rating scales, Aptitude tests, Anecdotal records, Inventories and Teacher made and standardised tests of achievement. Each tool and test has its own special role and its uses and limitations.

We are going to discuss the different types of Rating Scales which is useful to classify opinions and judgments regarding situations, objects etc. Aptitude tests on the other hand are used as tools to measure in numerical terms the potential performance and special ability of a person. Anecdotal records are used to assess the behaviour in the past of a person in a particular situation. The important events are recorded by the teacher. It helps to know the specific quality of a person. Teacher made and standardised tools are used to measure in numerical terms the attainment of students in various school subjects.

5.2 OBJECTIVES

After going through this unit, you will be able to

- grasp the meaning of tools of evaluation
- explain the significance of Rating scales
- enumerate various types of rating scales and their significance in educational institutions
- assess pupil capacity through aptitude tests
- understand the importance of teacher-made and standardised tests

- appreciate the new trends in evaluation viz., Grading system, Computer based Examination, Choice Based Credit System and other New Trends
- define anecdotal records
- enlist situations of the uses of computer based examinations
- analyse the use of grading and Choice based credit systems.

5.3 TOOLS OF EVALUATION – RATING SCALES AND TYPES – APTITUDE TESTS – ANECDOTAL RECORDS- INVENTORIES - TEACHER MADE AND STANDARDIZED TESTS

RATING SCALES

Rating scale is an important technique of evaluation.” Rating" is the assessments of a person by another person. Ruth Strange calls it 'directed observation'. A. S. Barr and others define rating as "Rating is a term applied to expression of opinion or judgement regarding some situation, object or character. Opinions are usually expressed on a scale of values. Rating techniques are devices by which such judgements may be quantified". A rating scale is a device by which the opinion concerning a trait can be systematized.

A rating scale is an improvement over check list. While check list simply records that something happened, a rating scale adds another dimension: how much or how well it happened. In a commonest type of rating scale, the columns opposite the list of traits may be captioned either in quantitative terms such as Always, Sometimes, and Never or in quantitative terms such as Good, Average, and Poor.

For example:

How good was the performance?

Excellent	Very good	Good	Average	Poor
1	2	3	4	5

(Five points rating scale)

“Rating scale is judgements or opinions and indicates the degree”.

TYPES OF RATING SCALES:

1. Numerical Rating Scale:

In which numbers are assigned to each trait. If it is a seven point scale, the number 7 represents the maximum amount of that trait in the individual and 4 represents the average. The rater merely enters the appropriate number after each name to indicate judgement of the person.

A	B	C	D	E	F	G
1	2	3	4	5	6	7

2. Descriptive Rating Scale:

In which descriptive phrases or terms assigned to each trait. The rater enters the appropriate phrase after each name to indicate judgement of the person.

A	B	C	D	E
Excellent	Good	Average	Below Average	Poor

3. Graphical Rating Scale:

A straight line may be represented by descriptive phrases at various points. To rate the subject for a particular trait a check mark is made at the particular point. e.g., a person can be rated for his moral character as

Low Moral		Good Moral		High Moral
0	25	50	75	100

4. Score Cards:

It is a type of scale in which whatever is being rated is analysed into its component parts. An expert assigns each part a maximum score. The rater assigns a value to each item as he passes judgement, and these values are totaled and a final score is pronounced.

5. The Rank Order Scale:

In this type the judge is simply required to place the people being rated in a rank order from high to low on the attitude or opinion in questions. A given individual's scale position is given in relation to other people in the sample. The units of the scale are unequal.

6. Method of Paired Comparisons:

In which the rater compares each person being rated with respect to the trait of every other individual, being rated in the general terms of "equal”,” better", or "worse".

7. Man To Man Scale:

In this case, an individual is asked to rate the person to be rated (the ratee) by comparing him to a person already rated and assigned a position on the scale. The rateeis assigned his position.

SOURCES OF ERROR IN RATING SCALES

There are several common sources of error in rating scales. All these sources affect the validity of a rating. Errors may be due to

1. Ambiguity
2. The personality of the rater
   - Halo effect
   - Personal bias
   - Logical error
3. Attitude of the rater
4. Opportunity for adequate observation

1. Ambiguity:

This refers to the wording and meaning of the traits that are measured, e.g., to one rater, aggressiveness may be a positive trait suggesting self-assertion. To another it may connote hostility. The term such as honesty, effective and fruitful learning, intelligent citizen, personality, ideal character etc. must be clarified. Unless all pupils are rated on the same attributes, the rating will be invalid and unreliable.

2. Personality of the Rater:

This refers the halo effect, personal bias (generosity error, central tendency error and logical error).

The halo effect occurs when a rater's general impression of a person influences his rating.

A generosity error is committed when a rater favours the high (desirable) end of continuum-that is, when he is very lenient.

A severity error is committed when a rater favours the low (undesirable) end of continuum-that is, when he is very harsh.

A central tendency error is committed when a rater avoids using extremes and favours the middle position-that is, rates everybody about average.

A logical error is closely related to the halo effect, but is not due to personal bias. It occurs when two traits, such as intelligence and socio-economic status are closely related and the rater is influenced in his rating of one by the presence or absence of the other. Intelligent persons possess a high socio-economic status.

3. Attitude of Raters:

Accurate observation is a very time-consuming process. Unless the raters truly believe that there is some value to be derived from ratings, they may consider them only as another administrative process and not to do a conscientious job.

4. Opportunity for Adequate Observation:

This is the most serious error. The error is committed when the rater does not know well enough the pupil he is rating. The only reasonable thing to do is to refuse to rate the pupil on those traits about which you have little or no knowledge.

IMPROVING THE RATING SCALE

i) Identify educationally significant traits.

ii) Clearly define the traits to be rated and the scale points to be used.

iii) Avoid technical jargon. If slang will help convey the intent, use it by all means.

iv) Express the traits to be rated as questions rather than as declarative statements.

v) If the line showing the continuum is used, it should follow immediately after the questions,

vi) Determine how discriminating you want the ratings and divide the continuum accordingly. (Three to Seven intervals).

Check Your Progress 1

1. Enumerate the types of Rating Scales.

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2. What are the sources of Errors in Rating Scale?

APTITUDE TESTS

Though intelligence tests seek to measure general mental abilities which are valuable in almost any type of thinking, yet effective educational and vocational guidance and appropriate placement of students call for tests specially directed at specialised abilities. Such types of tests are called tests of special abilities, traits or aptitudes these waits are used for guidance, as well as prediction of success individual-in a particular field Therefore, these aptitude tests are used for guidance as well as prediction of success in some occupation Training or

academic courses are possible on the basis of scores on a standardized aptitude test.

The important aptitude tests are:

1) Differential Aptitude Test Battery (DATB)

2) General Aptitude Test Battery (GATB)

3) Mechanical Aptitude Test Battery (MATB)

4) Mechanical Assembly Test

Aptitude

Intelligence tests are very frequently used for measurement of General Capacity. It has been observed that general intelligence is one of the significant pre-determiners for success in academic achievement and in various professions.

Capacity in all fields of human activities such as arts, music, clerical work, mechanics, teaching, medical, and engineering etc. is defined as aptitude. Aptitude tests are used for the prediction of the capacity and potential success in particular fields. The chief purpose of aptitude tests is to predict, or to identify individuals who have the greatest potential for development along special lines or who are likely to profit most by special training.

Some of the Aptitude tests in the area of Science and Teacher training, developed in our country is described below:

1. Scientific Aptitude Test Battery (Hindi) having test items on Reasoning, Numerical Ability, Science Information and Science vocabulary. This has been developed to predict the success in Science at high school. This test serves the purpose of classification, selection arid guidance for scientific courses at secondary level (K.C Agarwal).
2. Scientific Aptitude Test for college students: This test consists of 45 items, and assesses the potentialities of students for success in the science subjects in college through seven areas (A.K.P. Sinha and J.N.K. Sinha).
3. Teaching Aptitude Test Battery This test aims to measure the aptitude in the teaching profession through 80 items related to 8 areas (ShaminKarim& Ashok KumarDixit).
4. Teaching Apitute Test: This test measures aptitude for the teaching profession (Jaiprakash and R.P. Srivastava).
5. Teaching Aptitude Test Battery: It has 120 items and is designed to select students' courses (R.P. Singh and S.N. Sharma).

Aptitude tests are often designed on the basis of job analysis. If a test is to predict for a certain type of work, say that of an electrician, a detailed analysis of the job of an electrician may be made. On the basis

of this analysis arc determined the specific abilities and skills required of a successful electrician. Then a test is ‘constructed to measure these skills, abilities and attitudes etc. objectively and accurately. The value of the test as a prediction of success is determined by giving it to a group of persons starting the Electrician training course, and the results checked against success or failure in the course of training and on the job. Here training p clarity about the job.

In the field of education, many studies have been made of the nature of various kinds of jobs. Job analysis has been made in four different ways.

1. To analyse the concept of the job in terns of large functions, based primarily on general experience and judgement.
2. To analyse documentary statements of duties.
3. To ascertain the activities actually engaged in by persons on the job - the process most commonly thought of as job analysis.
4. Amount of time devoted to various duties, perhaps based on actual records, perhaps on estimates.

ANECDOTAL RECORD

Anecdotal Record is somewhat informal device used by the teacher to record behaviour of students as observed by him from time to time. Green and others define an anecdotal record as "an objective description by the teacher of a significant occurrence or episode in life of the pupil ". It is the written description of the incidents that happens in the life of the pupils.

Anecdotal records can be used

i) " To furnish the multiplicity of evidence needed for good cumulative records"

ii) " To substitute for vague generalizations about students specific exact descriptions of behaviour"

iii)"To stimulate teachers to look for information that is pertinent in helping each student realize good self-adjustment"

iv)"To contribute towards an understanding of an individual's basic personality patterns"

Anecdotal records should possess certain characteristics:

i) They should contain a factual description of what happened, when it happened and under what circumstances the behaviour occurred.

ii) The interpretation and recommended action should be noted separately from the description.

iii) Each anecdotal record should contain a record of a single incident.

iv) The incident recorded should be one that is considered to be significant to the pupil's growth and development.

The following points are worth keeping in mind while recording anecdotes:

1. Anecdotes must be stated accurately and objectively.

2. An anecdote should be written immediately after the incident is observed, while it is still fresh in the observer's mind.

3. No opinion or judgement is mixed with description.

4. The behaviour recorded must be significant. If possible, it should be related to certain amount of background information.

5. Anecdotes should not merely reveal negative behaviour. Incidents of positive behavior must find due place in the pupil's file.

6. In order to facilitate evaluation, the observer may give his interpretation of incidents under a separate head. So, it is useful to divide the folder on which the anecdote is written into two parts-one carrying the heading description and the other carrying the heading interpretation.

ADVANTAGES OF ANECDOTAL RECORDS

1. If properly used, they provide factual information of a single, significant incident in the pupil's behaviour.

2. They record critical of spontaneous behaviour (in a natural setting)

3. They provide the teacher with objective descriptions.

4. They are very good for young children who are unable to use pencil-and-paper test.

5. They direct the teachers' attention to a single pupil.

6. They provide for a cumulative record of growth and development.

7. They can be used by the counsellor as a source of information for giving guidance.

8. They provide more complete descriptions of behaviour better suited to understanding and guiding pupils than the other observation.

INVENTORIES

A questionnaire is a list of planned written questions related to a particular topic or series of topics. Space is provided for the reply to each question.

In the structured (close-end) type of questionnaire, the answers are checked or underlined by the respondent. In the unstructured (open-end) type the respondent is allowed to make free response to the questions. The inventory comes under the first type.

In practices, when we want to collect the respondent's family data, personal data, health data, special school activities, educational and vocational plans, etc. we call the questionnaire a questionnaire. When we want to evaluate the respondent's interest, attitude, opinion, feelings and other personal special adjustments, we present him a series of questions or statements in the form of a check list. Such self-report techniques are generally referred to as inventories.

CONSTRUCTING OF INVENTORIES

The following points should be observed:

1) Use the questionnaire or inventory when it is most appropriate, e.g., when

- the group may soon break up because it is temporary
- the group is together for the first and last time
- there is insufficient time for individual interview
- there are too many to be interviewed
- there are too many people who can't reached personality
- an independent response from each person is desired
- the desired data are either non-existent or not conveniently available
- answers to a comparable set of questions are desired

2) Define the general purpose and specific objectives, e.g.,

- To secure background data on an individual (or group) which may be valuable in accounting for classroom behaviour
- To secure a pencil-and-paper aid in evaluating the extent to which educational objectives are being realised
- To secure data which will be pertinent to planning curriculum
- To secure a picture of the status of an experience, a unit, a project, a study or a group.

3) Construct appropriate questions or statements

a) A question or statement should be clearly stated. A clear question is one whose

- Vocabulary is understandable

- Phrasing is simple and straight forward
- Terms are unequivocal
- Print is readable

b) It should not be double or triple-barreled.

c) Do not confine the respondent to a choice which does not describe his position, e.g.,

Poor: When you sew, do you prefer a sewing machine ( ) or a needle ( )? (Check one)
Better: Do you sew? Yes/No

If yes, do you prefer a sewing machine () or a needle ( )?(Check one)

d) Do not include too many questions or statements.

e) They should be so written as to facilitate the tabulation and presentation of findings.

4) Arrange questions or statements in appropriate groupings. This is to ensure a mind-set and to make the tabulation more systematic and interpretation of the question simpler.

5) Design an appealing format. It must be well printed, well spaced and attractive-looking, which encourage the respondent to answer questions fully and with interest.

6) Check the questionnaire or inventory for adequacy. This is to eliminate spelling, grammatical, and typographical errors.

ADMINISTERING THE INVENTORY

For good administration, the conditions are

(a) Insuring a good climate for proper administration;
(b) Stating clear purposes;
(c) Providing clear directions and a good working situation.

TEACHER MADE AND STANDARDIZED TESTS

Teachers construct various tools for the assessment of various traits of their students. The most commonly used tools constructed by a teacher are the achievement tests. The achievement tests are constructed as per the requirement of a particular class and subject area they teach. Besides achievement tests, for the assessment of the traits, a teacher observes his students in a classroom, playground and during other co-curricular activities in the school. The social and emotional behaviour is also observed by the teacher. All these traits are assessed. For this purpose too, tools like rating scales are constructed.

Tools used by the teacher may both be standardised and non-standardised. A standardised tool is one which got systematically developed norms for a population. It is one in which the procedure, apparatus and scoring have been fixed so that precisely the same test can be given at different time and place as long as it pertains to a similar type of population. The standardised tools are used in order to:

1 Compare achievements of different skills in different areas
2 Make comparison between different classes and schools

They have norms for the particular population. They are norm referenced.

On the other hand, teachers make tests as per the requirements of a particular class and the subject area they teach. Hence, they are purposive and criterion referenced. They want:

- to assess how well students have mastered a unit of instruction;
- to determine the extent to which objectives have been achieved;
- to determine the basis for assigning course marks and find out how effective their teaching has been.

Check Your Progress 2

1. Define Aptitude.

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2. List a few advantages of Anecdotal Record.

5.4 NEW TRENDS IN EVALUATION - GRADING SYSTEM – COMPUTER BASED EXAMINATION – CHOICE BASED CREDIT SYSTEM-OTHER NEW TRENDS

GRADING SYSTEM

What is grading? In the system of grading, students are classified into a few ability groups or categories according to their level of achievement in an examination. The above achievement is defined in the form of numerical letters or grades, each of which denotes a certain

level of performance, generally not in absolute terms but in relation to the performance of the whole group.

As stated above, grading is essentially meant for categorizing students into a few ability groups on the basis of their performance in the examinations. There are two approaches to formation of groups that define the grades (1) on the basis of absolute marks and (2) on the basis of relative marks or rank order of marks. Let us see what these mean and also consider their merits and demerits.

Absolute Grading

This approach involves direct conversion of marks into grades. Whatever the distribution of marks in a subject, the marks between two fixed points on 0-100 scale would correspond to a given grade. An example of this is the categorization of students into 5 groups – Distinction, 1st, 2nd, 3rd Division and Fail categories on the basis of marks as below;

75 or Above : Distinction

60-74 : I Division

45-59 : 2nd Division

33-44 : 3rd Division

Below 33 : Fail

It is possible to form any number of groups to correspond to grades (A, B, C etc.) in this way on the basis of marks. However, in view of the disparity in the distribution of marks of different subjects, Grade A of one subject cannot be treated at par with Grade A of another subject though Grade A is based on the same cut off point in both the subjects. For example, if it is decided to award grade A to those scoring 90% or more whatever be the subject, there may be no student getting Grade A in English or History while quite a few will be getting grade A in Mathematics. In a sense it only serves as a substitute for individual marking system except that it gives a number of ability groups.

Comparative Grading

This involves conversion of marks into grades on the basis of rank order or percentiles. In this case the distribution of marks is taken into consideration while determining the range of marks corresponding to different grades. For example, the top 5% students may be given grade 'A', the next 10% grade B and so on. Here the actual cut-off score for grade 'A' in one subject may be quite different from that of another subject. In this case, the grade that a student gets depends on his or her relative performance, that is, on what his or her marks are in

relation to the marks of others. This type of grading actually corresponds to norm referenced testing.

Advantages of Grading

It will minimize misclassification of students on the basis of marks.

It will eliminate unhealthy competition among high achievers.

It will reduce societal pressure and will provide the learner with more flexibility.

It will lead to a focus on a better learning environment Operational

It will facilitate joyful and stress free learning.

It considerably reduces inter and intra examiner's variability in marking.

It also takes care of imperfection of tools used for assessment.

The fear of examination is not there in the minds of students.

The suicide rate had decreased due to the introduction of grade system.

The distinction among individuals on the basis of single-number right score warrants absolute precision of judgement on the part of teachers, which is not humanly possible, especially in the context of assessment of students' potential. Hence, the answer lies in grading which places students of similar potential in one grade.

Award of grades through relative grading method invariably covers the entire range of distribution regardless of the nature of subject, meaning thereby that every subject will have A grade, B grade, C grade, D grade, E grade. This subscribes to the fact that learning is evenly distributed across the subject areas.

COMPUTER BASED EXAMINATION

With the introduction of the first computers in the 1970s, the potential of this new technology to generate not only new types of learning environments but also completely new settings for the design and administration of tests, was quickly recognized. Compared to the well-known paper-and-pencil tests, which imply a static presentation of test items with limited interactivity and which depend on complex logistics and administration procedures implemented by trained test administrators, computer-based tests seemed to offer a number of advantages. Due to the interactive testing environments and the data-processing capacities offered by the computer, these potential

advantages and added values cover a range of new possibilities that might extend from standardized and automatized administration and scoring procedures through interactive and media-enriched new item types to the possibility of recording and exploiting behavioral data or the possibility of new test administration procedures such as adaptive testing. From a historical perspective, computer-based testing has also capitalized on the introduction of new psychometric models, especially the introduction of item response theory in the 1960s. Further, administering tests on computers opens the door toward the measurement of psychological constructs that have been beyond the reach of paper-and-pencil instruments, because they require interactions in complex environments and can only be accessed through observations in natural settings. The computer offers the possibility to simulate these environments, to record important interactions, and thus to administer tests for these interactive constructs in an efficient and scalable way. This would not be feasible without this new technology. In the last decades, research on computer-based testing has thus experienced a considerable development, as the empirical basis for the potential added value of computer-based tests compared to classical paper-and-pencil instruments had to be developed. However, computer-based testing did not only come with advantages. A number of technical and theoretical challenges related to these tests, such as the availability and compatibility of hardware and software or the need for large item banks have been initially underestimated. Today, one of the major challenges of the field is the development of truly interactive test formats that take full advantage of the technical possibilities offered by the computer. These developments raise a number of challenges in the field of theory development related to the new technology enriched constructs, in the field of psychometric developments related to new complex types of test data, and in the field of IT development related to the need for comparable hard- and software components.

It is generally recognized that examinations determine the extent to which educational objectives have been achieved as well as the extent to which educational institutions have served the needs of community and society(Shah, 2002). Examinations are not limited to measure educational or societal objectives and needs but incorporate in a way of coping with the educational system (Havens, 2002). Rehmani (2003) briefly described that ‘examinations play a significant role in determining what goes on in the classroom in terms of what, and how teachers teach and students learn and can have impact on both teaching and learning’. Wikipedia used test or examinations as alternative terms of assessment and defined it as: ‘test or an examination (or exam) is an assessment indeed to measure a test-takers knowledge, skill, aptitude, physical, fitness or classification in many other topics’.

CHOICE BASED CREDIT SYSTEM

The Indian Higher Education Institutions have been moving from the conventional annual system to semester system. Currently many of the institutions have already introduced the choice based credit system. The semester system accelerates the teaching-learning process and enables vertical and horizontal mobility in learning. The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice based credit system provides a 'cafeteria' type approach in which the students can take courses of their choice, learn at their own pace, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning, it is desirable that the HEIs move to CBCS and implement the grading system.

HIGHER EDUCATION has undergone quite a lot of transformation over the years. After the Kothari Commission report in 1966, discussions on college autonomy started and a few colleges became autonomous since 1978 and a few of them have completed 25 years of such a freedom. Academic freedom, under autonomy, helped many colleges to innovate new curricula, design relevant courses, frame new syllabi and introduce new evaluation methods. But the required flexibility for the students to have a greater choice of courses appropriate to their interests, needs and long-term goals is not available even in autonomous colleges; rather a rigid and compartmentalized system is perpetuated.

Choice based credit system (CBCS), or a cafeteria like system is the solution for this type of transformation from the traditional teacher oriented education to a student-centered education. Taking responsibility for their own education in this way, students can benefit the most from all the available resources. Academic commissions and committees such as UGC, TANSCHE and NAAC recommend CBCS for higher education.

Though a few institutions claim to have introduced this system, in reality not much of freedom is given to the students. Everyone agrees that intellectual depth and breadth characterize higher education. But, in allowing the students to choose their favourite courses, certain questions arise. The rules regarding the number of students in each class and the number of hours per week for the students or for the teachers have not changed from the old affiliated system.

There is a strong resistance to change from every quarter of the academic world. Students are compelled to take two years of language course of their mother tongue. They are not encouraged to take courses

according to their abilities and pace and there is no freedom for the first year student to take an advanced course or a third year student to take an introductory course. Students are compelled to be inside the classroom for the entire five hours a day schedule leaving no scope for independent study.

Why not a student earns a few credits from one college and transfers the credits to some other college? Why not a student who is working on a part-time basis earns a few credits and stretches his studies to four or five years according to his convenience? Why is there a kind of compulsion to complete a degree programme in three years? Why is there no provision to change the college after earning a few credits? CBCS has the facility to transfer the credits from one institution to another provided there are provisions in the rules of the autonomous colleges and the universities to accept transfer of credits.

The academicians often talk about university and the industry collaborations. Why not a few credits earned in a related industry is considered within the curriculum? As creative and performing arts are becoming popular in campuses, credits can be thought of for such activities too. Though the students will choose courses of inter-disciplinary nature, the required courses for majoring in a subject will ensure depth. Professionalism and quality consciousness are the basis for every change. With faculty advising, CBCS can offer a very flexible and open system for a quality up gradation of higher education.

What is Choice Based Credit System?

University Grants Commission has come up with the Choice Based Credit System (CBCS) programme in which the students have a choice to choose from the prescribed courses, which are referred as core, elective or minor or soft skill courses and they can learn at their own pace and the entire assessment is graded-based on a credit system. The basic idea is to look into the needs of the students so as to keep up-to-date with development of higher education in India and abroad. CBCS aims to redefine the curriculum keeping pace with the liberalisation and globalisation in education. CBCS allows students an easy mode of mobility to various educational institutions spread across the world along with the facility of transfer of credits earned by students.

FEATURES OF CBCS

• This is a uniform CBCS for all central and state and other recognised universities.

• There are three main courses: Core, Elective and Foundation.

• There are also non-credit courses available which will be assessed as 'Satisfactory' or 'Unsatisfactory'. This is not included in the computation of SGPA/CGPA.

• All the three main courses will be evaluated and accessed to provide for an effective and balanced result.

How does it work?

It has the following basic elements:

• **Semesters:** The assessment is done semester wise. A student progresses on the basis of the courses taken rather than time like three years for science, arts, commerce or four years for engineering etc. Each semester will have 15–18 weeks of academic work which is equal to 90 teaching days. There is flexibility in creating the curriculum and assigning credits based on the course content and hours of teaching.

• **Credit system:** Each course is assigned a certain credit. When the student passes that course, he earns the credits which are based on that course. If a student passes a single course in a semester, he does not have to repeat that course later. The students can earn credits according to his pace.

• **Credit transfer:** If for some reasons, he cannot cope with the study load or if he falls sick, he has the freedom to study fewer courses and earn fewer credits and he can compensate this in the next semester.

• **Comprehensive continuous assessment:** There is a continuous evaluation of the student not only by the teachers but also by the student himself.

• **Grading:** UGC has introduced a 10-point grading system as follows:

- O (Outstanding): 10
- A+ (Excellent): 9
- A (Very Good): 8
- B+ (Good): 7
- B (Above Average): 6
- C (Average): 5
- P (Pass): 4
- F (Fail): 0
- Ab (Absent): 0

How is the credit counted?

One credit per semester is equal to one hour of teaching, which includes both lecture (L) or tutorial (T) or two hours of practical work/field work (P) per week. A study course can have only L component or only T or P component or combination of any two or all

the three components. The total credits earned by a student for each semester is L+T+P.

In compliance with the global grading system

All the major higher education institutions across the world are implementing a system of credits. For instance, we have the European Credit Transfer System (ECTS) in Europe's universities, the 'National Qualifications Framework' in Australia. There is the Pan-Canadian Protocol on the Transferability of University Credits. In the UK, we have the Credit Accumulation and Transfer System (CATS). Even the systems operating in the US, Japan, etc. are based on credit system.

ADVANTAGES OF CHOICE BASED CREDIT SYSTEM

• The CBCS offers a 'cafeteria' approach in which the students can choose courses of their own choice.

• The credit system allows a student to study what he prefers in his own sequence as per his interests.

• They can learn at their own pace.

• They can opt for additional courses and can achieve more than the required credits.

• They can also opt for an interdisciplinary approach to learning.

• Inter college/university migration within the country and outside becomes easy with the transfer of Credits. This means that it will be easier for foreign universities to come and offer courses in India.

• Can opt for one part of the course in one institute and the other part in another institute. This will help in making a clear choice between good and bad colleges/ institutes.

• The students have more scope to enhance their skills and more scope of taking up projects and assignments, vocational training, including entrepreneurship.

• The system improves the job opportunities of students.

• The system will help in enabling potential employers assess the performance of students on a scientific scale.

DISADVANTAGES OF CBCS

• Not very easy to estimate the exact marks.

• Teachers' workload may fluctuate.

• Needs proper and good infrastructure for a universal spread of education.

It is too early to say whether CBCS will be successful or not. The UGC has always initiated measures to bring efficiency and excellence in the Higher Education System of India. The basic motive is to expand academic quality in all aspects, right from the curriculum to the learning-teaching process to examination and evaluation systems. However, so far multiple methods are followed by different universities across the country towards examination, evaluation and grading system. Considering this diversity, the implementation of the choice based credit system seems to be a good system in assessing the overall performance of a student in a universal way of a single grading system.

Check Your Progress 3

1. What are the new trends in Evaluation?

5.5 LET US SUM UP

In this unit, an attempt has been made to make you aware about the importance of evaluation in education and how it is to be done in school situation. Various tools like rating scale for classifying opinions and judgements on a scale are discussed in detail along with its various types. Where to use, what type of scale are explained for your practical use.

The importance of the aptitude test has been highlighted. Also, anecdotal record and inventories as reports on informal observation play a very important role in the evaluation of students. Also, the new trends in evaluation viz., Grading system, Computer based Examination, and Choice Based Credit System have been explained for your understanding. We are sure the brief picture of various tools will prove very helpful to you in your institutions.

5.6 UNIT- END EXERCISES

1. What are the various tools of evaluation?

2. Differentiate between a rating scale and an anecdotal record.

3. Identify the areas where the aptitude tests could be used.

4. How will you use anecdotal record in your classrooms?

5. Write a brief note on the following: i) Grading ii) CBCS

5.7 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1.

i. Numerical Rating Scale
ii. Descriptive Rating Scale
iii. Graphical Rating Scale
iv. Score Cards
v. The Rank order Scale
vi. Man to man Scale
vii. Method of Paired Comparison

2.

1 Ambiguity
2 The personality of the rater
- Halo effect
- Personal bias
- Logical error

3 Attitude of the rater
4 Opportunity for adequate observation

Check Your Progress 2

1. Capacityin all fields of human activities such as arts, music, clerical work, mechanics, teaching, medical, and engineering etc. is defined as aptitude.

2.

1. If properly used, they provide factual information of a single, significant incident in the pupil's behaviour.

2. They record critical of spontaneous behaviour (in a natural setting)

3. They provide the teacher with objective descriptions.

4. They are very good for young children who are unable to use pencil-and-paper test.

5. They direct the teachers' attention to a single pupil.

6. They provide for a cumulative record of growth and development.

7. They can be used by the counsellor as a source of information for giving guidance.

8. They provide more complete descriptions of behaviour better suited to understanding and guiding pupils than the other observation.

Check Your Progress 3

1.

a) Grading system
b) Computer based Examinations
c) CBCS

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UNIT VI – INSTRUCTIONAL OBJECTIVES AND EVALUATION

6.1 INTRODUCTION

How many of you have ever been asked to write objectives as part of your planning and teaching? If you are teaching in a school, you probably have been called upon to state objectives specifying outcomes that your students can achieve. If you are principal or supervisor, you probably have has the responsibility of stating objectives and helping teachers to state them.

In this unit, we have discussed the instructional objective and specifications. Also the evaluation pattern of Cognitive Domain, Affective Domain, Psycho-motor domains have been discussed for clarification.

6.2 OBJECTIVES

After going through this unit, you will be able to

- define instructional objective
- distinguish educational objectives from instructional objective
- describe educational objectives in three domains

6.3 INSTRUCTIONAL OBJECTIVES AND SPECIFICATIONS

AIMS

We know that a number of subjects are taught in schools. Why a number of subjects are taught in schools? They are taught for some reasons which may be called purposes. The purposes may be called goals. The goals are the final destination where the students are expected to go. The final destination or the goal is called aim. So we

can say that goals may be called aims and a number of subjects are taught to achieve these aims. All the subjects taught in schools may be put together and called education system or education. The aims are called "aims of education". These aims are the goals to be achieved by the students in the school as a result of studying different subjects.

What are aims of education? They are many. One of the important aims of education is to eradicate illiteracy from our country. Can we say the duration required to achieve this aim? It is not possible for us to tell the time required to reach this aim. It may take five years, ten, twenty years or even more. However, we can say that it is a long process. Which requires a longer period?

So, we can say that the term "aim" is a general term used in winder sense and broader concept. What do these aims show the teachers? They show the teachers the goals they have to reach by teaching different subjects in the schools. These aims are to be achieved by the students by studying different subjects. These show them where they have to go. So, we can say that they show the directions to the students. Do you think that different subjects show different directions? No, it is not the case. All the subjects show the same direction. So, we can say that the aims are the directions of the entire educational system: Do you think that aims like these could be achieved within school programmed? We are trying our level best to eradicateilliteracy from our country for the past forty years. We are unable to eradicate illiteracy from our country. What is worse? The illiteracy is growing in bulk.

What do we understand from this? We understand that aims like these could not be achieved within limited number years. They may take hundreds of years or more. So the students may not achieve these aims within their education period. When they could not be achieved by students through the school activities the aims become meaningless for the students as well as for the teachers.

From the decisions above we can find out the characters of the aims as follows.

1. Aims are the directions in education.
2. Aims cannot be changed from subject to subject.
3. Aims are the directions given to the entire educational system.
4. Aims are beyond the scope of school programme.
5. Aims become meaningless, being broad and wide.

We can say, now, that aims of education can be started they cannot be achieved within the school programme.

OBJECTIVES: we have seen that aims of educations shows the direction of the entire educational system: the purpose for teaching different subjects in school. If aim is the direction then what is objective? Objective is the possible point of achievement in that direction. In order to eradicate illiteracy from our country (aim) free and compulsory education is given to all children. We admit more and more children. When we do this, children stay away from school and become dropouts. This may be due to many reasons. We try to attract them by giving food, books, cloths, etc. after some years they stop coming to school and this becomes wastage.

Some children who come to school regularly may not go to the next class. And this becomes stagnation. As a result, whatever may be the effort to provide literacy to all we are unable to increase the percentage of literate persons in our country. When will we achieve this aim? We do not know, but some children join the school and continue to attend, pass the examinations and go to the next class (objectives). All students may come to school for one day or a month or a year and learn some subjects. This becomes objective.

Now we can say that objectives can be achieved in the classroom. Do they change from subject to subject? Yes they change from subject to subject. When the objectives are achieved by the students they become meaningful. When they become meaningful they are clearly known to everybody.

From the above discussion we can find out the characters of objectives as follows.

1. Objectives are the possible point of achievement in the directions of aims.
2. Objectives can be achieved i,e. they are within the scope of school program.
3. Objectives change from subject to subject.
4. Objectives are meaningful.
5. Objectives are used in more explicit sense.

We can say that objectives can be achieved by students in different subjects. When we say that students acquire knowledge about the location of different cities in India, it is easy for the teacher to make the student locate different cities in India. The student learns to locate the cities by looking in the map provided by the teacher. So he is able to achieve the objective when he is able to locate the cities in India.

SPECIFICATIONS

In order to locate cities in India map (objective)'the students read the names of different cities and identifying are the activities carried out by the students in order to locate cities in India map. The

students actually do these activities and we are see students doing these activities. These activities can be observed and described. So, we can say that these activities are the specific behaviours employed by the students in order to achieve the objectives. These behaviours are called specifications. What are specifications? Specifications are the specific behaviours of the students in order to achieve an objective. An easy way to find out specifications is to ask your-self, "Can my student do these things?" this answers become the specifications. You can ask questions like can my student read? Can my student write? Can my student draw? What are the answers for these questions? My student can read, can write and can draw. What do the words read, write and draw indicate? They indicate the specific behaviours, the students reads, writes and draws. These behaviours of the student are specific, clear, observable and measurable. So, we can say that specification, are precise, observable and measurable.

From the above discussion we can find out the characters of specifications as follows:-

1. Specifications contain an action verb like reads, write, draws etc.
2. They continue two parts.
   i). The students behaviour, ii) the content area.
3. They are in the form of student's achievement and not in the form of teacher's intention.
4. They are in the form of achievement of a single student.
5. They contain only one behaviour to be modified.

From the above discussion we have learnt that the aims are the directions in education, objectives are the possible points of achievement in that direction end specifications are the specific behaviour employed by the students to achieve the objectives. Aims are common for all subjects but objectives are different for different subjects and different types of specific, behaviours to be adopted to reach the objectives.

EDUCATIONAL OBJECTIVES

Evaluation is a process of ascertaining the nature and quantum of change and should necessarily be based on, or be directed towards such a goal.

An educational objective is often limited to t mentioned in the prescribed syllabus or to what the teacher does in the classroom. An educational objective may better be defined "as a desired change in behaviour in a person that we try to bring about through education" (B. J.Furst). These changes have the basic characteristic of direction and nature (quality and extent). In other words, it may mean (1) a

dimension Of learning, (2) worth whileness of pattern of learning for realising it, and (3) level of learning to be attempted.

These objectives obviously have to serve as guide posts in learning. A platform of well-defined educational objectives provides the basis for systematization, articulation, unity, balance and for determining priorities in an educational effort. The main purpose of stating objectives at the general level is to provide a basic platform for an educational system. They lay down fundamental guidelines for curriculum development but being broadly stated may be able to guide a specific educational activity only in a limited manner.

To ensure functionality, these overall goals will have to be further brok5n down and made specific step by step to the level of actual learning experiences from goals to aims, from aims to objectives and from objectives to specifications. Hence, it will be desirable to apply the following threefold criteria to them.

1. Worth whileness from the standpoint of society's requirements.
2. Practicability in the light of resources.
3. Attainability in terms of pupil's readiness and capability.

INSTRUCTIONAL OBJECTIVES

Every day, teachers make a wide variety of instructional decisions that directly affect their students' learning. These decisions range from the choice of materials, pacing and sequencing of activities, to ways of reinforcing pupil's learning require of assessing whatever the students have learnt. Different types of learning require different learning experiences and hence different types of objectives. Teaching students how to multiply differs from teaching them how to predict future events from also lessons not only in the form of instruction but also in the materials used and the way outcomes are assessed.

Teaching -learning situation at any level involves three major components namely, the teacher, the learner and the subject matter to be processed. The causal observation of a classroom at the school level would reveal the typical picture of a teacher with a group of students and the teacher enabling them to process knowledge and concepts.

Generally the activity of the teacher is described as teaching and that of student as learning: When we examine these two activities closely, it is possible to realize that they are not separate entities. When teaching activity is initiated, learning takes place (though the two are not identical) and the amount of learning has implication for teaching. Hence there is a reciprocal relationship between the two.

Educational research has established the fact that achievement is enhanced in a classroom, where children can perceive a sense of direction for learning. Classroom management and teaching blend

together as a unified process when instructional objectives provide goal clarity for teachers and children.

An instructional objective describes the specific teaching outcome; the behaviour required to perform it and determines the means for measuring or evaluating it. Such evaluation is based on directional statements that identify the expected learner outcomes, establish purposes and stipulate -levels of achievement.

The accountability movement with its-stress on evaluating the product has placed a high priority on the use of instructional objectives that are stated in behavioural terms which further permits the measurement of the learner's outcome.

Instructional objectives are specific and arc behavioural in nature. These are mainly based on specific observable or measurable goals in pupil's learning.

An instructional objective establishes a minimal level of attainment for deciding whether or not the desired learning has been achieved.

An instructional objective may describe the mediating conditions under which the behaviour is to be achieved, as well as provides the procedures for determining whether or not a certain level of attainment has occurred.

Instructional objectives state both what behaviour is intended to be developed (curricular aspect) and what actual behaviour is developed and tested (evaluation aspect).

RELATIONSHIP BETWEEN EDUCATIONAL AND INSTRUCTIONAL OBJECTIVES

An educational programme is organised around certain expectation which could be named like goals, aims, objectives or specifications - some of these expectations may be long-ranged enough to require a lifetime to accomplish, some intermediate, while many others may be just immediate. Education is in fact a process of bringing about changes in the individuals in desired directions i.e.' enabling them to perform certain skills, to develop certain understanding, interests, attitude etc., to add to their stock-of knowledge and ultimately to lead them to a happy productive and socially acceptable and useful life.

Time relationship of educational goals aims and instructional objectives

1. Educational goals tend-to identify generalised outcomes that are to be realised over an extended period of time whereas instructional objectives have an immediate intent.

2. Instructional objectives specify learning outcomes more sharply than educational goals.
3. Educational goals ordinarily reflect a synthesis of the expressed ideas and values considered to be the most desirable by society. They are usually normative. In this respect, they do not account for the variability that is encountered in a specific classroom situation. Variability in the classroom can be achieved by instructional objectives. Therefore, educational goals must be translated into instructional objectives that are relevant to the specific situation and-specific subject area.
4. In the list of educational objectives sometimes we come across a large list of statements, indicating desirable areas of growth. The statement of such objectives is often broad and global in nature: They may be realisable through a -variety of curricular orco-curricular programmes and may be concerned with no particular stage of education. They may as well be applicable to the whole of the country and in other cases to the whole world. Hence they are overall, major, broad or general goals of education. They are not always amenable to evaluation. In order to make them amenable to evaluation, they would be broken into a variety of curricular activities and be converted into instructional objectives.

THE CHANGING CONCEPT OF EDUCATIONAL OBJECTIVES INTO INSTRUCTIONAL OBJECTIVES

We may broadly define educational objectives as purposes and aims. However, they are often defined in terms of outcomes of different kinds, classes, categories and levels. An educational objective is said to be ‘the product of values judgement which in practice represents a decision taken by sonic persons as a worthy end. -

This judgement should be the best possible one under the circumstances. In-order that the decision is sound it could be in tile illness of things to proceed towards it in a systematic manner. This involves work of three kinds

1. derivation and statement of objectives;
2. classification of objectives;
3. definition of objectives in terms of behavioural outcomes for actual classroom practices.

Broadly speaking, the first category of work is of a general rather than of an abstract nature. This yields major ‘ideas’ for developing objectives which on being translated into specific statements, help in developing an instructional programme and in specifying the types of courses required at different levels. -

The second category of such effort is needed for further classification and understanding of these objectives by discovering a

system among them and articulating them appropriately in terms of an educational programme.

Finally, there is the category of action which pertains to the definition of objectives at an operational level for a particular curricular area. This calls for the statements of learning situations. The nature of behaviour expected and the extent of achievement or behaviour modifications visualized. Teaching—learning situations, activities, and evaluation programmes directly from there. These are termed as instructional objectives.

Check Your Progress 1

1. Define Educational objective.

2. Define Instructional objective.

3. Bring out the relationship between educational objective and instructional objective.

6.4 COGNITIVE DOMAIN, AFFECTIVE DOMAIN, PSYCHO-MOTOR DOMAIN – EVALUATION PATTERN.

THE COGNITIVE DOMAIN AND ITS CLASSIFICATION -BENJAMINS. BLOOM (1956)

Benjamin S. bloom and his companions have developed cognitive domain in 1956. Cognitive domain of educational objectives is concerned with intellectual aspect of the mental process. This domain induces those objectives which deal with recall, recognition of knowledge and development of intellectual abilities and skills.

Bloom's Taxonomy classifies the cognitive domain in to six levels of learning and each requires the use of different types of thought behavior. The six levels are:

I. KNOWLEDGE II. COMPREHENSION III. APPLICATION

IV. ANALYSIS V. SYNTHESIS VI. EVALUATION.

1. KNOWLEDGE:

(i) KNOWLEDGE OF SPECIFICS: refers to the ability to recall the specific and isolable bits of information. The emphasis is on symbols with concrete referents.

1.1 KNOWLEDGE OF TERMINOLOGY: knowledge of the referents for specific symbols (verbal and non-verbal)

1.2 KNOWLEDGE OF SPECIFIC FACTS: refers to very precise and specific information such as the specific dates, events, persons, places, etc.

(2) KNOWLEDGE OF WAYS AND MEANS DEALING WITH SPECIFIC:

Refers to the knowledge of the ways of organizing, studying, judging and criticizing. This includes the methods of inquiry, the chronological sequences and the standards of judgement within a one field as well as the patterns of organization through which the area of one field themselves are determined and internally organized.

2.1 KNOWLEDGE OF CONVENTION: refers to the knowledge of characteristic ways of treating and presenting ideas and phenomenal.

2.2 KNOWLEDGE OF TRENDS AND SEQUENCES: refers to the knowledge of the process, directions and movements of phenomena with respect to time.

2.3 KNOWLEDGE OF CLASSIFICATION AND CATEGORIES: refers to the knowledge of the classes sets, decisions, and arrangements which are regarded as fundamental for a given subject for a given field, purpose etc.

2.4 KNOWLEDGE OF CRITERIA: refers to the knowledge of criterion by which facts, principles, opinions and conduct are judged.

2.5 KNOWLEDGE OF METHODOLOGY: refers to the knowledge of method of inquiry, techniques and procedures employed in a particular field.

(3) KNOWLEDGE OF THE UNIVERSALS AND ABSTRACTIONS IN A FIELD:

This involves knowledge of the major ideas; schemes and patterns by which phenomena and ideas are organized.

3.1 KNOWLEDGE OF PRINCIPLES AND GENERALIZATION:

This involves knowledge of particular abstractions which summarise observations of phenomena.

3.2 KNOWLEDGE OF THEORIES AND STRUCTURES: refers to the knowledge of the body of principles and generalizations together with their interrelations, which present a clear, rounded, and systematic view of a complex phenomenon, problem or field.

In knowledge category remembering is the major psychological process involved and it forms the basis for all other categories.

ACTION VERBS FOR STATING SPECIFIC OUTOMES: identify, label, list, match, name, outline, reproduce, select, state.

EXAMPLES:

1. The pupil photosynthesis.
2. The pupil states Boyle's law.
3. The pupil locates routes of in various on an outline map.
4. The pupil identifies the relationship between French revolution and the industrial revolution in England.
5. Pupil names 5 important freedom fighters.

(ii). COMPREHENSION:

Comprehension refers the ability to apprehend what is being communicated and makes use of idea without relating it to other ides or materials seeing its fullest meaning. i.e. ability to grasp the meaning of materials. This level represents the lowest level of understanding.

1.TRANSLATION: refers the ability to grasp the meaning if the material by translating it into one form to another (words to number, symbol to words) with care and accuracy. This involves objective part of part rendering of communication.

2. INTERPRETATION: refers to the explanation or summarization of a communication. It involves a recording re-arrangement, of a new view of the material.

3. EXTRAPOLATION: of the materials by extending of trends or tendencies beyond the given limit to determine implications, consequences, corollaries effects, which are in according with the condition described in the original communication.

ACTION VERBS FOR STATING SPECIFIC LEARNING OUTCOMES:

Convert, defend, distinguish, estimate, explain, extend, generalize, give examples, infer, paraphrase, predict, rewrite, summarize.

Examples:

1. The pupil explains the policy of satyagraha.
2. The pupil generalizes that the modulus number is always a positive number.
3. The pupil gives example of kinds of noun.
4. The pupil summaries the independent movement in India.
5. The pupil distinguishes between aims and objects.

(iii) APPLICATION: refers to the ability to use principles, ideas, and the ideas in particular and concrete situation. Learning outcomes in this area require a higher level of understanding.

ACTION VERBS FOR STATING SPECIFIC LEARNING OUTCOMES:

Change, compute, demonstrate, discover, manipulate, modify, operate, predict, prepare, produce, relate, show, solve, use.

EXAMPLES:

1. The pupil solves problems on focal length.

2. The pupil prepares suitable instruction for the experiment, specific heat of a substance.

3. The pupil demonstrates the working of the exhaust pump.

4. The pupil computes square root of 125to two decimal places.

5. The pupil predicts that the volume of an air bubble raising from bottom of a lake will increase.

(IV) ANALYSIS:

It refers to the ability to break down a communication into its constituent parts to make organization of ideas clear. Learning outcomes in this area requires an understanding of both the content and structure from of the material.

1. ANALYSIS OF ELEMENTS: Refers to the ability to identify the elements and parts of communication.

2. ANALYSIS OF RELATIONSHIP: Refers to the ability to make the explicit connections and interactions among the elements and parts of communication.

3. ANALYSIS OF ORGANIZATIONAL PRINCIPLES: Refers to the ability to recognize the organization of the elements, systematic arrangements and structure that holds the communication together this involves the ability to make explicit and implicit and implicit relationship among the ideas in a communication.

ACTION VERBS FOR STATING SPECIFIC LEARNING OUTCOMES:

Breakdown diagram, differentiate, discriminate distinguish, identify, illustrate, infer, outline, point out, relate, select, separate, subdivide.

EXAMPLES:

1. The pupil differentiates refraction of a light and reflection of light.

2. The pupil outlines the importance of heuristic method in teaching physical science.

3. The pupil discriminates between an acute angle and an obtuse angle.

4. The pupil illustrates allotropes of sculpture.

5. The pupil selects an appropriate method to factories a given expression.

(V) SYNTHESIS: Refers to the ability to put together parts and elements into a new a whole or unified organization learning outcomes in this area stress creative behavior with major emphasis on the formulation of new patter or structures.

1. Production of Unique Communication: Refers to the ability to Develop a communication in which the writer speaker attempts to convey ideas, and or experiences to others.

2. Production of a plan or proposed set of operations: Refers to the ability to develop and propose a plan of work or operations and it should satisfy requirements of the task which may be given to others. Or he may develop himself.

3. Derivation of a set of abstract relations: Refers to the ability to develop a set of abstract relations with to classify or explain particular data or phenomena or the deduction or propositions and relations from a set of basic, refer propositions or symbolic representations.

Action verbs for stating specific learning outcomes:

Categorize, Combine, Compile, compose, create, devise, design, explain, generate, modify, organize, plan, rearrange, reconstruct, relate, reorganize, revise, rewrite, summaries, tell, write.

1. The pupil tells the theme of the poem in his own words.

2. The pupil writes explanative sentence with correct punctuation.

3. The pupil categorises elements accordingly to their valiancy

4. The pupil summarises his view points on new policy on education 1986

5. The pupil devises a procedure to find the factorial of a given number

(VI) Evaluation: Refers to the ability to judge the value of ideas, procedures, methods materials etc. Using appropriate criteria .learning out come in this level are highest in the cognitive hierarchy because they contain elements of all the other categories with conscious value judgment based on clearly defined criteria

1. Judgement in terms of internal evidences refers to the ability to judge logical accuracy, internal consistency of a given material

2. Judgement in terms of external evidences refers to the ability to judge the value of a given material with reference to selected or remembered criteria

Action verbs for stating specific learning out comes
Appraise, complete, interpret, conclude, contrast, criticise, describe, discriminate, explain, justify, relate, summarize support

Examples :
1. The pupil interprets a graph showing the relationship between temperature and pressure

2. The pupil compares the properties of natural numbers with those of real numbers

3. The pupil contrasts the religious policies of Ashoka and Aurangzeb.

4. The pupil justifies the need to prescribe science for all

5. The pupil supports the new economics principles of India.

Taxonomy of the cognitive hierarchy:
(I) Knowledge
1. Knowledge of species
    - 1.1. Knowledge of terminology
    - 1.2. Knowledge of specific facts
2. Knowledge of ways and means dealing with species
    - 2.1. Knowledge of conversion
    - 2.2. Knowledge of trends and sequence
    - 2.3. Knowledge of classification and categories
    - 2.4. Knowledge of criteria
    - 2.5. Knowledge of methodologies
3. Knowledge of universals and abstractions in a field
    - 3.1. Knowledge of principles and generalization
    - 3.2. Knowledge of theories and structures

(II) Comprehension

1. Translation
2. Interpretation
3. Extrapolation

(III) Application

(IV) Analysis

1. Analysis of elements
2. Analysis of relationship
3. Analysis of organizational principles

(V) Synthesis

1. Production of a Unique Communication
2. Production of proposed set of operations
3. Derivation of a set of Abstract Relations

(VI) Evaluation

1. Judgment in terms of internal evidence.
2. Judgment in terms of external criteria.

THE AFFECTIVE DOMAIN&ITS CLASSIFICATIONS -DAVID .R.KATHWHOL-1964

Krathwhol and his associates built a classification for the affective domain. The educational objective of this domain is concerned with feelings, emotions or the degree of acceptance or rejection. This taxonomy is related to the learner's interests, attitudes, values, appreciation and adjustments.

The marked differences between the objectives of cognitive domain and affective domain that

1. The correct response to a cognitive domain is the same for all respondents whereas in affective domain the response depends on the social situation the learner and the type of question etc.
2. The emphasis in the cognitive domain is on knowledge where as in affective domain the emphasis is on feelings rather than knowledge.
3. Objectives under the cognitive domain are stated very precisely and clearly. Whereas objectives under the affective domain are not stated very precisely and clearly it is difficult to describe behavior under this domain because internal feelings and emotions are not as clear as overt behaviors manifestations.
4. The testing procedures for cognitive domain are standardized where as the testing procedures for defective's domain are still not standardized.

5. It is that unlike most cognitive objectives, affective objectives cannot be attained in the relatively short instructional period and that therefore they cannot be evaluated in the school setting.
6. Affective objectives aim at certain characteristics which unlike cognitive objectives, are considered to be private rather than universal.

David R.Krathwhol classifies the affective objectives in to five level of learning's and are arranged in an hierarchy they are.

1. Receiving. 2. Responding, 3. Valuing, 4. Organization,
5. Characterization by a value of value Complex.

1. Receiving: Refers to the learner's sensitivity to the existence of certain stimuli. So that he is willing to receive or attend to the stimuli. The is the lowest level and the leading outcome is interest.

1.1. Awareness: refers to giving appropriate opportunity to the learner to be merely conscious of stimuli.

1.2. Willingness to receive: refers to the willingness to tolerate a given stimulus, not to avoid it at best, learner is willing to take notice of the stimulus and give it his attention towards.

1.3. Controlled or selected attention: refers to the behavior – controlling element of the learner, controls his attention the stimuli so that the favored stimulus is selected and attended to despite, competing and distracting stimuli.

Action verbs for stating specific learning outcomes:
Ask, choose, describe, follows, hold, identify locate, name, point to so select, give, perceive, favor, listen, attend, accept.

2. Responding:

Acquiescence in Responding: At this level there is the element of compliance or obedience which distinguishes the behavior from other level. Here, the learner starts making the response, but he has not fully accepted the necessary for doing so.

2.1 Willingness to respond: refers to the learner's capacity for voluntary activity. In this category the learner is sufficiently committed for exhibiting the behavior that he does voluntarily or on his own.

2.2 Satisfaction in Response: at this level the learner's voluntary behavior in responding is accompanied by feeling of satisfaction. Here the learner enjoys or finds pleasure in doing activities.

Action verbs for stating specific learning outcomes:
Answer, assist, confirm, discuss, perform, receive, read, and write, lists, state, record, report, talk.

3. Valuing: Refers to the value or worth a learner attaches to a phenomenon. Valuing results not by the desire to obey or comply but the learner's commitment to the underlying value that guides his behavior has been slowly internalized or accepted by the learner as his own criterion of worth. The learning outcome at this level is related to appreciation.

3.1 Acceptance of a value: refers to the sense of responsibility for listening and to participate in an activity. This includes the behavior related to consistency of response to a phenomenon with which the belief or attitude is identified.

3.2 Preference for a value: Refers to the behavior which reflects not only the acceptance of the value but commitment to the value to pursue it to his cause.

3.3 Commitment: the learner who displays behavior at this level is clearly perceived as holding value he tries to convince others and seeks converts to his cause.

Action verbs for stating specific learning outcomes:
Accepts, complete study, initiate, join, follow, explain, propose, report, differentiate.

4. Organization: As the learner successively internalizes value; he encounters situations for which more than one value is relevant. thus necessity arises for 1) organizing the values into a system ii) determining the interrelationship among them and iii) finding which will be the dominant and pervasive one learning outcomes at this level related to attitude.

4.1 **Conceptualization of a value:** it is the learner's desire to evaluate the thing appreciated. Here, he is permitted to see how the value relates to those that the value already holds.
4.2 **Organization of a value:** here the learner's behavior is to bring together the different values into a systematic relationship with one another.

Action verbs for stating specific learning outcomes:
Adhere, alter, arrange, combine, defend, generalize, integrate, modify, organize, relate.

5. Characterization by a value or value complex : At this level the learner consistently acts in accordance with the values that he has

internalized. This category indicates. the development of characteristics "lifestyle with consistent and predictable behavior on a value system that the learner has developed .the learning outcomes and this area related to habit formation or adjustment.

5.1 generalizised set: It refers to an internal consistency to a system of attitudes and values at a particular moment that a learner has to display.

5.2 charecterisation: This level is concerned with the ones view of the universe or ones philosophy of life.

Action verbs for stating specific learning outcomes:
Act, discriminate, display, influence, listen, perform, practice, propose quality, quest on, revise, serve, solve, use, verify.

Affective Domain Hierarchy:

1.0. Receiving

1.10. Awareness
1.20. Willingness to receive
1.30. Controlled or selected attention

2.0. Responding

2.10. Acquiescence in responding
2.20. Willingness to respond
2.30. Satisfaction in response

3.0. Valuing

3.10. Acceptance of a value
3.20. Preference for a value
3.30. Commitment

4.0. Organization

4.10. Conceptualization of a value
4.20. Organization of a value system

5.0. Characterization by a value or value complex

5.10. Generalized set
5.20. Characterization

PSYCHO-MOTOR DOMAIN
-ANITA J. HARROW

Psychomotor domain deals with abilities and sills, which are physical in nature but activated by inter mental process. t is mostly concerned with a variety of learning activities like hand writing speech, physical education, laboratory science, industrial, arts, vocational and technical education.
Harrows classification has six major categories;

1. Reflex movement

2. Basic –fundamental movement
3. Perceptual abilities
4. Skilled movements
5. Physical abilities
6. Non-discursive communication

1. Reflex movements: It occurs without our conscious effort. Any actions which are elicited in response to some stimuli without our conscious volition on the part of the learner. These movements are involuntary in nature and are functional at birth. They are developed through maturation.

1.1 **Segmental:** Any actions, which involve one spinal segment. E.g. Flexion, stretch.
1.2 **Inter-Segmental:** Any movements which involve more than one spinal segment.
E.g. Alters foot patterns.
1.3 **Supra-Segmental:** Any movements which require the participation of the brain center along with the path ways of the spinal cord and the muscles of the limbs and the trunk for observable movement to occur, e.g., Supporting, shifting, Behavior activity, Flexing, extension, stretch, postural adjustments.

Action Verbs: Respond, react, blink, withdraw, run.

2. Basic-Fundamental Movements: Any inherent movement patterns which are formed by the combination of reflex movements, and are the basic for complex skilled movement emerge without training.

2.1 Locomotor: Any movements and actions which includes those Behavior that change the stationery performing ambulatory person. The basic walking, running, jumping, gliding.

2.2 Non- Locomotor: Any actions, which are characterized by motion around the body axis and involves limbs of the body or portion of the trunk.
Ex: Pushing, pulling, swaying, bedding, twisting.

2.3 Manipulative: Any movements, which are preformed by the hand and fingers.
Ex. Typing, drawing, crayon work, handling, griping.
Action verbs: Walk, run, move, skip, jump, hold, and catch.

3. Perceptual Abilities: perceptual abilities refer to the discrimination in the five-sense of perceptions namely seeing, touching, hearing, smelling, and tasting and the co-ordination of the sense perceptions wherever necessary. interpretation of stimuli form various modalities

providing data for the leaner to make adjustment to his environment. The outcomes are observable in all purposeful movement.

3.1 Kinesthetic Discrimination: Making bodily adjustments by the recognition of the feeling of sensation.

3.2 Visual Discrimination : Ability to discriminate the objects recognizing it by the sense of seeing.

3.3 Auditory Discrimination : Ability to receive and differentiate between various sounds and their corresponding pitch and intensity.

3.4 Tactile Discrimination : Ability to determine the texture through touch.

3.5 Co-ordinated Abilities: Any activities, which involve two or more of the perceptual abilities and movement patterns and is primarily concerned with eye hand and eye. Foot co-ordinate abilities.

Behavioral activities: Following verbal instruction, dodging a moving ball, balancing the body, jump rove, punting, catching.

Action verbs: Discriminate find the differences, select, separate group.

4. Physical abilities: the function characteristics of the body strengths, which are essential to the development of highly skilled movements.

4.1 Endurance
Any activity, which requires stamina for long period of time.

4.2 Strength
Any activity, which requires muscular exertion

4.3 Flexibility
Any activity requires wide range of motions at hip joints.

4.4 Agility
Any activity, which require precise movements.

Behavioral Activities: Distance running, distance swimming weight lifting, wrestling, Touching toes, backbend, and ballet exercises.

Actions verbs: Bear with, hold, adopt, continuum carry.

5. Skilled movements: A degree of the when performing complex movement tasks, which are based up on inherent movement patterns.

5.1 Simple adaptive skill: Any skilled activities, which are build up on the inherent locomotors and manipulative movement patterns of basis fundamental movements.

5.2 compound Adaptive skill: Any skilled activities, which are built, up on the basic fundamental movements and incorporate the management of an implement or a tool.

5.3 Complex Adaptive skill: Any skills, which require greater mastery of the body mechanism that are obvious in sports, recreation, dance and fine arts.

Behavioral Activities: Sawing, Waltzing, Hockey, Golf tennis, Gymnastic twisting dives.

Actions verbs: Manipulate, draw, dance, sing, play, and speak.

6. Non-discursive communication: Communication through bodily movements ranging from facial expressions through sophisticated chorea graphics.

6.1 Expressive Movements: Movements composed of communication nature having body posture and carriage, gestures and facial expression. They are overt and express the learner's internal emotional stage.

6.2 Interpretive Movements: It is composed of aesthetic movements and creative movement.

Action verbs: Gesture, non-verbal, cues, understand non-verbal message.

Psychomotor domain-Hierarchy:

1. Reflex movements:
    - 1.1. Segmental
    - 1.2. Inter-Segmental
    - 1.3. Supra-Segmental
2. Basic-fundamental movements
    - 2.1. Locomotor
    - 2.1. Non-Locomotor
    - 2.1. Manipulative
3. Perceptual Abilities
    - 3.1. Kinesthetic Discrimination
    - 3.2. Visual Discrimination
    - 3.3. Auditory Discrimination
    - 3.4. Tactile Discrimination
    - 3.5. Co-ordinated Abilities
4. Physical Abilities.
    - 4.1. Endurance

4.2. Strength
4.3. Flexibility
4.4. Agility

5. Skilled Movements
   5.1. Simple adaptive skill
   5.2. Compound adaptive skill
   5.3. Complex adaptive skill.
6. Non- Discursive Communication.
   6.1. Expressive movements.
   6.2. Interpretive movements.

Check Your progress 2

1. Enumerate the classification and the sub-classifications of the cognitive domain.

2. What are the categories present in the Affective domain?

6.5 LET US SUM UP

In this unit, we have discussed the topics educational objectives, instructional objectives and the relationship between the two. As a teacher you should know exactly the concepts of educational objectives, instructional objectives. It will help you to plan your teaching accordingly and devise the evaluation tools. The different domains of Benjamin S. Bloom have been discussed in detail with its evaluation pattern.

6.6 UNIT- END EXERCISES

1. Prepare a lesson plan in your subject giving weightage to the instructional objectives.
2. Analyse the categories of Cognitive domain and identify the sub-categories that would best suit your subject.
3. Discuss with your colleagues as how the psycho-motor domain would be useful to you in your subject.
4. Explain the term evaluation approach and describe its procedures.
5. "Testing should be based on teaching". Discuss and illustrate this statement.

6.7 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1. An educational objective may better be defined "as a desired change in behaviour in a person that we try to bring about through education"
2. An instructional objective describes the specific teaching outcome, the behaviour required to perform it and determines the means for measuring or evaluating it.
3.

i. Educational goals tend-to identify generalised outcomes that are to be realised over an extended period of time whereas instructional objectives have an immediate intent.
ii. Instructional objectives specify learning outcomes more sharply than educational goals.

Check Your Progress 2

1.

(I) <u>Knowledge</u>

1. Knowledge of species
    - 1.1. Knowledge of terminology
    - 1.2. Knowledge of specific facts
2. Knowledge of ways and means dealing with species
    - 2.1. Knowledge of conversion
    - 2.2. Knowledge of trends and sequence
    - 2.3. Knowledge of classification and categories
    - 2.4. Knowledge of criteria
    - 2.5. Knowledge of methodologies
3. Knowledge of universals and abstractions in a field
    - 3.1. Knowledge of principles and generalization
    - 3.2. Knowledge of theories and structures

(II) Comprehension

1. Translation
2. Interpretation
3. Extrapolation

(III) Application

(IV) Analysis

1. Analysis of elements
2. Analysis of relationship
3. Analysis of organizational principles

(V) Synthesis

1. Production of a Unique Communication

2. Production of proposed set of operations
3. Derivation of a set of Abstract Relations

(VI) Evaluation

1. Judgment in terms of internal evidence.
2. Judgment in terms of external criteria.

2.

1.0. Receiving

1.10. Awareness
1.20. Willingness to receive
1.30. Controlled or selected attention

2.0. Responding

2.10. Acquiescence in responding
2.20. Willingness to respond
2.30. Satisfaction in response

3.0. Valuing

3.10. Acceptance of a value
3.20. Preference for a value
3.30. Commitment

4.0. Organization

4.10. Conceptualization of a value
4.20. Organization of a value system

5.0. Characterization by a value or value complex

5.10. Generalized set
5.20. Characterization

6.8 SUGGESTED READINGS

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UNIT VII - BLOOM'S APPROACH

7.1 INTRODUCTION

How many of you have ever been asked to write objectives as part of your planning and teaching? If you are teaching in a school, you probably have been called upon to state objectives specifying outcomes that your students can achieve. The fundamental for writing objectives is the knowledge of the Bloom's Taxonomy of Educational objectives.

In this unit, we have discussed the Bloom's evaluation approach for your knowledge.

7.2 OBJECTIVES

After going through this unit, you will be able to

- Acquire the knowledge of Bloom's Evaluation approach
- critically observe the evaluation pattern of Bloom's Taxonomy
- establish the relationship between teaching and testing activities
- apply the evaluation approach in real life situation

7.3 BLOOM'S EVALUATION APPROACH-MEANING AND DEFINITION-TECHNIQUES FOR EVALUATION OF BEHAVIOURAL MODIFICATION

The concept of evaluation approach is given by B.S. Bloom. His main emphasis was that testing should be based on teaching and booth these activities should be objective – centered. Today teaching is organized by using the evaluation approach. Under this approach yearly plan and unit plan are prepared. The education process is considered as tri- polar process. There are three Fundamental elements : 1. The educational objectives. 2. Learning experiences and 3. Change of behavior of evaluation approach.

The evaluation approach and educational process are closely related to each other. The effectiveness and appropriateness of educational process is ascertained by evaluation approach. All the activities of teaching are evaluated in terms of student performances, Which is known as changes of behavior. Therefore, in the present chapter main feature of evaluation approach have been described in detail.

Meaning and Definition of Evaluation Approach

The evaluation approach is a new concept in the discipline of education, which has revolutionized the process of education.

In this approach main emphasis has been given in realizing the objectives of education in behavioral terms.

Quillen and Huna have defined the term evaluation approach in the following manner:

"Evaluation is the process of gathering and interpreting evidences on changes in the behoviour of the students as they progress through school"

In evaluation approach teaching and testing activities are performed side by side. The term evaluation is used in broader sense the total process of teaching and learning. All the activities of the evaluation of a student performance does not confine to cognitive domains. The total change of behoviour of student is evaluated behaviour includes cognitive, affective and psychomotor behaviours. The educational process is evaluated in terms of change of behavior of students. Three types of activities are dine in the evaluation process.

1. How far the teaching objectives have been realized?
2. How are the learning experiences are effective?
3. What are the changes of behavior have occurred in the students?

B.S. Bloom has stated that education is tri- process. This process has been shown as follows

First step – Teaching objectives
Second step –Learning experiences.
Third step - Change of behaviour.

These three steps are closely related to each other and are performed in a sequence. The teaching and testing activities go side by side and these are objectives-centered. It is the main assumption of this approach that failure of the student is due to the in appropriateness of learning experience of teaching. Because it is the main responsibility of a teacher to bring desirable change among the students. Thus the change of behaviours are evaluated in terms of teaching objectives.

All the school subjects which are taught to them for providing learning experiences other activities which are organized in the school, are meant for learning experiences, but there should be directly related to the teaching objectives. In the following paragraphs an example has been given for using evaluation approach in teaching Geography.

Application for Evaluation Approach in Teaching

The following steps are used when teaching is organized with the help of evaluation approach.

(1) Formulation of teaching objectives.
(2) Providing learning experiences for realizing the teaching objectives, and
(3) Evaluation charge of behaviour of the student in the light of teaching objectives.

1. Formulation of Teaching Objective :

In this steps teacher has to identify his teaching objectives or development of a student and teaching objectives are one and same thing. Education objective can be broadly classified into two parts :

A. General EducationalObjectives :There are three types of educational objectives:

(1) Cognitive objectives,
(2) Affective objectives and
(3) Psychomotor objectives.

B. Specific Objectives or Content Objectives: These objectives are written in to behavioural terms, which are related to the content of a subject such as Hindi, Maths, History, Geography etc. These specific objectives are also known as teaching objective. Teaching objectives are psychological in nature whereas educational objectives are auctioned with the teaching objective in teaching process main emphasis is given in realizing behavioural objectives classified in the following parts:

(1) Knowledge Objective: In this objective the awareness and understanding of concept, facts principles, laws and theories is provided. The students are able to recongise, to recall and to evaluate these things.

(2) Skill Objective :It is the second teaching objective in which the learning experiences provided to enable the students for solving the problem related to their life situation. Student will be able to identify the cause and effect relationship of human activities or situations.

(3) Development of Attitude Objective : It is the third objectives of teaching in which right type of attitudes are developed towards the personal, social and national, problems.

(4) Knowledge Application : It is the fourth objective which concern with the application of acquired knowledge in his life situations.

(5) Development of Values: It is the main focus of education, that desirable values should be developed among the students, so that the student will be able citizen of nation. It is the highest objectives of education.

The behavioural objectives are used in organizing both teaching and testing activities. The following are the main behavioural objectives.

(A) The student is able to comprehend facts, principle and theory.

(B) The student is able to solve the day to day life problems.

(C) Student is able to understand and observe the facts, and realities of life.

(D) The student is able to evaluate the appreciate the elements of the human life.

(E) The students is able to understand the emotional integration and internationalism.

2. Learning Experiences:

It is the second step of evaluation approach. Those experiences which are helpful in achieving the teaching objective inside the classroom and outside the classroom are known as learning experiences. Thus all the learning experiences cannot be called as learning experiences. The following are the main aspects to the learning experiences :

(1) Teaching objective related to the topic.
(2) Outside of the courses.
(3) Teaching methods and techniques.
(4) Maxims of teaching and teaching aids.
(5) Text books and home work, and
(6) Role of teacher and relationship between teacher and students.

The teaching objectives are achieved by providing learning experiences to the students. The learning experiences are controlled by teaching objectives and text books of the subjects. Teaching can be made effective by creating appropriate learning experiences .These

experiences should provide the opportunities to do some activities themselves. The teaching activities should be objective centred, and student should be involved in some activities .John Dewey advocated that a major task of a teacher is to generate learning situation, which will motivate to the students for performing certain activities, which are related to the objectives. The teacher role is to organise and control all the teaching activities.

A teacher has to organise and create learning situations for providing experiences to the students according to their available resources. Teacher should behave to the students like philosopher, instructor and friend.

The learning experiences vary subject to subject. The different schools have the different resources. Therefore teacher has to plan according to his subject and available resources and prepare an outline of his teaching activity. A teacher has also to plan about the evaluation techniques for ascertaining the teaching objectives. In presentation of teaching content and preparing test for evaluation purpose, a teacher has to consider the needs and level of students in view of his teaching content.

He has to develop a sequence of teaching activities so that appropriate learning situations can be generated for providing learning experiences to the students. A teacher prepares his lesson plan for learning experiences. some model of lesson plans have been given in the chapter.

3. Change of Behaviours:

It is the third step of evaluation approach. The change of behaviours are related to all aspects of his personality. It includes both internal and external behaviours. There are three aspects of change of behaviour of students—cognitive, affective and psychomotor. The student achievements is of two types-cognitive achievement and non-cognitive achievement. The non-cognitive achievement includes interest attitude, values and - certain skills. These change of behaviours are evaluated in terms of teaching objectives formulated in the first step. A criterion test is used for this purpose.

There are three limitations of present examination system

(a) The examination tests are not related to learning experiences and change of behaviour. The main emphasis is given on rote memorization.

(b) The tests do not cover total teaching content, usually sampling is done.

(c) The tests are not objective. They are highly subjective.

In the evaluation approach these limitations are taken into consideration and following things are considered in preparing test:

1. The table of specification is prepared in which the content and objectives are outline.

2. The table provides a guide line for preparing a test on the content and teaching objectives.

3. An objective as well as essay type tests and other techniques are used.

Techniques of Evaluation:

There are various change of behaviour in have been discussed in techniques which are used to measure the evaluation approach. The main techniques the following paragraphs:

(1) Observation :- This technique is mostly used by the teacher to evaluate the performance interests, values and attitude towards their life problems. This technique is of lower classes mainly. The free and control observation is used.

(2) Rating Scale : The Rating scales are used for analysing, and measuring the attitude, values, towards the nation society and the world. The attitudes of the students are evaluated with the help of rating scales. It is used of higher class students.

(3) Oral Examination : It is the one of the most ancient techniques of examinations It is measuring both cognitive and student is best exanine-4 by this technique. It is highly used daily in every class at tile end of teaching. A provision is made in the lesson plan prepared by the trainees.

(4) Written Examination these can be classified into two types: (1) Essay type examination and (2) Objective type examination.

These two types of examinations are not contradictory to each other but they are complementary to each other for evaluation purpose. An objective type examination is used for measuring lower objectives of teaching, whereas an essay type is used for higher teaching objectives. Lao objective type has the objectivity in scoring purpose, whereas essay type of highly subjective and scoring. Thus objective type examination is highly reliable and valid whereas essay type has poor reliability and validity, change of behaviour can be best measured by using both type of tests. The essay type examination is defective, but it cannot be removed from examination system. It needs certain improvement and modification, which has been given in controlling teaching.

Application of Evaluation Approach in Teaching
Yearly and Unit plan

The application of evaluation approach has been illustrated with the help of Geography teaching examination. In using this approach all the three steps are followed. The content which is taught to the students is analysed psychologically to develop the sequence. The teaching and testing points are also determined. A three dimensional table is prepared for determining these points, one 4imension indicate the contents and other dimension teaching objective. The weightage is given on these points with the help of teaching periods. All such information are shown in a table. Gene ally these tables are of three types:

1. Yearly Plan or Semester Plan Table : Under this table information about content and teaching objectives are shown for the whole year or the whole semester.

2. Unit Plan Table Under this table details about the teaching points and the objectives are given of an unit of the content.

3. Lesson—Plan Table : Under this table teaching - points and specific objectives are given of a topic which is to be taught a period.

1. Yearly Plan or Semester Plan

A teacher has been assigned to teach Geography of India to secondary class or six class students. The course content is to be taken from the prescribed syllabus. The objectives of teaching are also determined in view of the need of the students and nature the content. Thus a yearly plan table is prepared.

Yearly plan table provides the information about the outline of the content of the course, the teaching objectives are to be realised and the total periods of teaching are assigned to the course.

Yearly Plan or Semester Plan table
Geography of India (Secondary Class)

S.no	Coaching objective talents	Knowledge	Skill	Knowledge Application	Interest Attitude	Total Periods
1	Location and physical conditions	4	½	½	3	8
2	Climate and Vegetation	6	1	2	3	12

3	Animals arid other species	2	1/1	½	2	5
4	Minerals	2		½	1½	4
5	Human and occupations	5	1	1 ½	4½	12
6	Transportation trades	5	1	½	2 ½	9
	Total	24	4	5 ½	16 ½	50

The yearly plan table indicates that Geography of India course content is to be completed in total fifty period. This table further reveal that the main emphasis has been given to knowledge objective, as 24 periods are assigned to this objective. The second major objective is the interest and attitude, a 16 periods are allotted to this objective. The knowledge application is the third and skill objective is the fourth.

2. Unit Plan Table

Unit plan table provides the information about the unit of the content regarding the structure of the unit content and teaching objectives are to be realized.

The unit plan is the part of the yearly plan. A unit plan has been prepared for the unit i.e. Physical Geography of India, which is the first unit of yearly plan. The unit plans are also prepared with the help of two dimensional table one dimension indicates the structure of unit content and other dimension the teaching objectives. A unit plan is prepared for physical "Geography of India",

Unit Plan Table

Unit - Physical Geography of India-Secondary Class

S.No	**Teaching Objective Contents**	**Knowledge**	**Skill**	**Knowledge Application**	**Interest and attitude**	**Total period**
1	Mountain region	1	¼	¼	½	2
2	Plateau region	½		¼	¼	1
3	Plain region	1	¼	¼	½	2
4	Coastal region	½		¼	¼	1
	Total periods	3	½	1	1 ½	6

A unit plan table reveals that the unit-Physical Geography of India is taught and completed within 6 periods of class room teaching. It may also be noted from the table that three periods are assigned knowledge objective, 1-5 period for interest and attitude, 1 period for knowledge application and 1/2 period for skill objective.

3. Lesson-Plan Table

A teacher has to plan a lesson to be taught within a period of class room teaching. He has to select a topic which is to be covered within a period of 45 minutes duration. The topic is also analysed in terms of the element of the topic of teaching points. The teaching objectives and their weightage are also determined in terms of time (minutes) is allotted to them.

A topic (mountain region) is to be taught to secondary level students. The above topic is analysed in terms of element and objectives are to be achieved. The weightage to these points is given on the basis of time. A lesson plan table is also known as content analysis table; A content analysis table is prepared for the topic "Mountain region of India" Content Analysis Table

Topic—Mountain Region of India

Teaching Points	**Teaching Objectives**	**Knowledge**	**Skill**	**Knowledge Application**	**Interest & Attitude**	**Total time in minutes**
1	Location of Mountain	8			2	10
2	Types of Mountain	10			2	12
3	Advantages of Mountain	5		2	3	10
4	Disadvantages of Mountain	8	1	2	2	13
	Total	31	1	4	9	45 Mts.

The content analysis table indicates that the topic mountain region of India is taught and completed within 45 minute duration in classroom teaching. The table also reveals that the 31 minutes are allotted for knowledge objective, 9 minutes for Interest and Attitude, 4 minutes knowledge application and one minute for skill objective of teaching. The table also provides the sequence of presentation of elements of the topic.

These tables provide the guidelines to the teacher regarding the course of content, unit of content, and the topic of the content. The yearly plan is completed with the help of lesson plan. These tables are also provide the basis for preparing examination tests which can be made objective centred. Thus, these table are used 'for teaching as well as testing, and both can be made objective centred.

In using the lesson plan for classroom teaching, a teacher should also be able to select appropriate teaching methods technique devices and teaching aids, which are appropriate for realizing teaching objectives.

Precautions in using Evaluation Approach

The following precautions should be taken in using the evaluation approach in teaching school subject

1. The teaching objectives should be identified clearly in terms of Bloom's Taxonomy.

2. Teaching objectives should be written in behavioural term or in terms of change of behaviours.

3. The content should be analysed into elements and these should be arranged in psychological sequence.

4. The teaching and testing point should be determined beforehand.

5. The learning experiences should be shown or created which are conductive for desirable change in behaviour of the students.

6. There should be co-ordination between teaching and testing with the help of teaching objectives.

7. A teacher should have an understanding and ability for selecting appropriate teaching methods, technique, teaching aids, so that teaching objectives can be realised.

8. The three step of evaluation approach-Education objective, learning experiences and change of behaviour are related to each other and also modifiable.

9. The tests used in evaluation approach should be reliable and valid.

10. An appropriate testing situation-Essay type, objective type and short answer type should be used but these tests should be objective centred. Thus criterion tests should be used in evaluation approach.

Limitations of Evaluation Approach

Following are the main limitations of the evaluation approach

1. It requires training and understating for using in class

2. The content analysis and the identification of the objectives is not objective.

3. There is no standard criteria for determining teaching and testing points.

4. The yearly plan and unit plan are prepared by a teacher, so it has subjectivity.

5. The teachers do not take interests in using evaluation approach in class room teaching. It is used only by teacher in training programme.

6. It is difficult to write the objectives in behavioural term of in change of behaviour of the students.

LEARNING EXERCISE

1. Explain the term evaluation approach and describe its procedures.
2. "Testing should be based on teaching". Discuss and illustrate this statement.

3. Differentiate between learning experiences and change of behaviour. Describe the main feature of criterion tests.

4. Indicate the need and importance of yearly plan and unit plan for co-coordinating teaching and testing activity.

5. Write short note on the following

   (a) Teaching objective and Educational objective.
   (b) Achievement test and criterion test.
   (c) Techniques of evaluation.
   (d) Characteristics of evaluation approach.

6. Define the term 'Task Analysis. Differentiate among Job-analysis, content analysis and skills analysis. Illustrate your answer with examples.
7. Define the 'Objective'. Distinguish between educational objectives and teaching objectives.

8. Discuss the taxonomy of 'Conative domain'. Describe the procedure for writing objectives in behavioural terms.

9. Describe the RCEM approach for writing objectives in behavioural terms and differentiate with Robert Mager's approach. Illustrate your answer with examples.

10. Write short notes on the following

    (a) Taxonomy of affective domain

(b) RECM approach for objectives
(c) Integration of mental domain5
(d) Unit plan of teaching
(e) Evaluation approach to teaching.

7.4 COORDINATION OF TEACHING AND TESTING ACTIVITIES

Testing and teaching are not separate entities. Teaching has always been a process of helping others to discover "new" ideas and "new" ways of organizing that which they learned. Whether this process took place through systematic teaching and testing, or whether it was through a discovery approach, testing was, and remains, an integral part of teaching.

The term "test" is viewed here as any of a variety of techniques that can capture what a person knows in response to a question. This includes standardized tests of achievement and aptitude, less formal paper-and-pencil tests, performance tests, and the like. Tests, whatever form they take, require a response that is considered "correct." Measures of attitude, personality, and interest would not fall under this definition.

Classroom assessment is among an instructor's most essential educationaltools. When properly developed and interpreted, assessments can helpteachers better understand what their students are learning.

Co-ordination of Teaching and Testing Activities

In evaluation approach testing is based on teaching. The learning experiences are provided with the, help of teaching activities, and testing is done for evaluating the change of behaviours of the students. Thus the teaching and testing activities are made objectives centred. After completing yearly plan and unit plan, the test is administered. The weightage for teaching objectives is g with the help of teaching periods, and same weightage is given in preparing a test with the help of number of items. The concept of evaluation approach in teaching may be illustrated with the help of following table.

Evaluation Approach

Teaching objectives	Learning experiences	Change of Behavours
Knowledge objective	Lecture or question answer method, home assignment and study	1. Oral test 2. Written test 3. Observation
Skill Objective	Demonstration, practical work, reading, writing, speaking, performance	1. Observation 2. Practical test.
Knowledge-Application Objective	Discussion on some problem, use of knowledge words, termsand concepts understand cause-effect.	1. Written test 2. Oral test
Interest attitude, value objective	Linking, with life situation,life adjustment Lecture, question-answer discussion,	1. Rating 2. inventory 3. Observation.

The concept of evaluation is applied with help of yearly plan and unit plan. The testing items are prepared with the yearly plan and unit plan. This concept is illustrated with help of the following table.

Table. Co-ordination between Teaching and Testing

	Teaching Objective	Unit Plan		Yearly Plan	
		Teaching Pds.	Testing items	Teaching Pds.	Testing items
1	Knowledge	3	6	24	48
2	Skill	½	1	4	8
3	Knowledge application	1	2	5.5	11
4	Interest and attitude	1 ½	3	16.5	33
	Total	6	12	50	100

This table indicates that same weightage is given to testing items s the weightage is given for teaching objectives in terms of teaching periods. The same proportion is to be maintained in testing situation in terms of number of items. Three types-essay type, objective type and short answer type items are included in the test. The higher objectives are tested with the help of essay type of items. A criterion test is prepared rather than achievement test. In using the evaluation approach in teaching, the following precautions should be observed.

It is necessary on the part of the teacher to bring a relationship between the teaching and the evaluation procedures. The testing tools or devices must be prepared or decided in such a way that it correlates with the content taught and the methods used. This coordination between these two is very important on the part of the teacher.

Check Your progress 1

3. Write any three techniques of evaluation.

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4. Write any two limitations of Evaluation approach.

What are the teaching objectives involved in theco-ordination between Teaching and Testing?

7.4 LET US SUM UP

In this unit, we have discussed the different domains of Benjamin S. Bloom in detail with its evaluation pattern. The techniques of evaluation approach and application of the same have been discussed elaborately for the understanding of the learner. Also the Co-ordination between Teaching and Testing activities have been explained citing Year and Unit plan.

7.5 UNIT- END EXERCISES

1. Explain the term evaluation approach and describe its procedures.
2. "Testing should be based on teaching". Discuss and illustrate this statement.

7.6 ANSWERS TO CHECK YOUR PROGRESS

Check Your progress 1

1. Observation, Rating Scale and Oral Examinations
2. i. It requires training and understanding for using in the classrooms ii. The content analysis and identification of the objectives is not objective.
3. Knowledge, Skill, Knowledge application and interest and attitude.

NOTES

7.7 SUGGESTED READINGS

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UNIT VIII - SCHOLASTIC ACHIEVEMENT TEST (SAT)

8.1 INTRODUCTION

As a teacher one is involved directly in the evaluation of the learner. This unit is concerned with this very important activity of teachers. Teachers teach and help the students to learn. The learning that takes place is to assessed by the teacher. It also gives feedback to the teacher as how he or she has taught the lesson. This feedback comes with the help of a tool, generally an achievement test. It is designed to evaluate a unit during teaching learning process. Hence the tool should be an appropriate tool of measurement.

Also no single type of tool can be reliable, valid, comprehensive, objective and practicable for evaluating different objectives of education. Therefore we are going to learn about the different characteristics of a good test in this unit.

8.2 OBJECTIVES

After going through this unit, you will be able to,

- discuss the purpose of achievement test
- describe the steps involves in constructing an achievement test
- explain how the design and blue-print of an achievement test are prepared

- write a variety of questions- objective, short answer and essay
- prepare a sample achievement test question paper with the marking scheme
- describe how an achievement test should be administered
- score an achievement test and interpret test scores
- enlist the different characteristics of a tool
- describe the procedure to find out validity, reliability of a given tool
- state the relationship between validity and reliability
- identify reliable and valid tool

8.3 PURPOSE OF SCHOLASTIC ACHIEVEMENT TEST

Achievement tests are usually used for the following purposes in classroom.

- To measure whether students possess the pre-requisite skills needed to succeed in any unit or whether the students have achieved the objectives of the planned instruction.
- To monitor students' learning and to provide ongoing feedback to both students and teachers during the teaching-learning process.
- To identify students' learning difficulties – whether persistent of recurring.
- To assign grades.

8.4 PREPARATION OF SCHOLASTIC ACHIEVEMENT TEST- PLANNING, PREPARATION, DESIGNING THE TEST ITEMS, REVIEW AND EDITING, ARRANGING THE TEST ITEMS, PROVIDING DIRECTIONS, PREPARING SCORING KEY AND MARKING SCHEME, ADMINISTERING TEST AND SCORING, EVALUATING THE TEST

Achievement test is the most frequently use devaluation tool in the educational setting belonging to the paper pencil category. The term achievement has a much broader meaning and refers to the acquisition of all the behavioural changes belonging to the cognitive, affective and psycho-motor domains. But in the classroom situation, an achievement test is one that measure pupil's accomplishment resulting from learning instruction in the class. It is designed to measure a pupil's grasp of some body of knowledge or his proficiency in schools.

PREPARATION

This preparation of a good test is a systematic process having well defined stages. They are

1. Planning of the test
2. Writing the items
3. Arranging the items
4. Providing the directions
5. Preparing the Scoring Key and Marking Scheme
6. Reviewing and Editing

1. Planning the Test

The planning encompasses all of the varied operations that go into producing the test.

a) Preparation of the design:

Designing is the first and most important step in test construction. It is at this stage that we plan to build in the test, the important qualities like validity, reliability, objectivity and practicability. In order to accomplish that, the test constructor has to make a number of decisions. The test constructor should work like an architect. The architect makes a plan in which he considers the purpose of the building, the site on which it is to be erected within the available funds. Then he selects materials and methods of construction. Likewise, the constructor considers the purpose of the test and the students' population for whom it is meant. He takes into account what has been taught and how. Accordingly he takes a number of preliminary decisions. The set of these tests will be called the design of the test. Important decisions which will have to be taken concern with the following

Weightages to the process Objectives

The first important step while planning the test or any evaluation tool for that matter is the identification of instructional objectives and giving weightages to them. There is no cut and derived formula for assigning weightage to various objectives. But these weightages will be by and large a function of time, effort and resource spent on their acquisition and the learning of the subject in terms of retention and transfer value.

Sl. No	Objectives	Marks	Percentage
1 2 3 4	Knowledge Understanding Application Skill		
	Total		

Weightage to the Content

Content being the means through which process objectives are obtained, it becomes necessary to decide the weightages to be given to different part of it. In assigning relative weights to units, a number of factors will have to be taken into consideration. How important is the unit in the total learning experience? How much time was devoted to it during instruction? What relative importance do specialists attach to it?

Sl. No	Content/ Topic	Marks	Percentage
1 2 3			
	Total		

Weightage to the Forms of Questions

There are two issues to be decided at this stage. What type of questions should be used and what should be their relative weightages. Theoretically the longer the test, the more reliable it is. Therefore while planning the test attempt should be made to increase the length of the test by decreasing the long answer questions and at the same time increasing the short answer questions and objective type questions.

Sl. No	Type of questions	Marks	Percentage
1 2 3	Essay Short Answer Objective		
	Total		

Distribution of the Difficulty Level

A decision has also to be taken concerning the distribution of difficulty level. The distribution of difficulty level in a test will depend upon the purpose of the test as also on the group of students for whom it is designed.

b) Preparation of the Blue-Print

A number of isolated decisions about the weightages to process objectives, Content, and Forms of Questions have been taken during the designing of the test. A distribution of questions has now to be evolved so that all these decisions are fully related and can be implemented. As the architect concretizes his decisions in the form of a blue-print, the test should also concretize most of his decisions in the form of a two way chart which is analogously called as Blue-Print.

Objectives / Form of Questions / Contents	Knowledge			Understanding			Application			Skill			Total
	O	SA	E	O	SA	E	O	SA	E	O	SA	E	
1													
2													
3													
Sub Total													
Total													

Note: Please mention the Total Number of Questions outside the parenthesis and Total marks inside the parenthesis in each cell.

O - Objective type Questions
SA - Short Answer type Questions
E - Essay type Questions

2. Writing the test items

Keeping in mind those consideration and suggestions which are to be followed while writing the items, the tester has to produce flawless items which fulfill the requirements of the blue-print. He should take up each cell and draft an item taking care of various dimensions, the process objectives, Content and the form of Questions as laid down in the blue-print.

3. Arranging the items

When all the questions have been prepared as required by the blue-print, they have to be assembled into a test. It is now generally agreed that if different forms of questions are being used in the same test.

4. Providing Directions

This constitute an inseparable part of a test. Poorly planned directions often cause loss of reliability of the test. The directions should be simple and concise and yet adequate enough to give full information to the students.

5. Preparation of the Scoring Key and Marking Scheme

These are needed to facilitate an objective scoring. Scoring key refers to a prepared list of answers to a given set of objective type questions.

In objective type questions there is no partial correct or partially incorrect answers. So, in case of fully correct answer or fully incorrect answers, there cannot be any difficulty in scoring them. The subjectivity in scoring comes in only for supply (essay type) answers as different examiners are likely to view the error or the importance of correct steps differently. It is in order to control this subjectivity while

scoring that a well throughout plan has to be worked out where by crucial stages in the answer of a problem are identified and marks are allotted to them depending upon their importance, intrinsic difficulty and the time required. Such a plan giving the distribution of marks over various steps in the answer may be called the marking scheme.

6. Reviewing and Editing

The final task in the preparation of an achievement test before it is sent for printing comprises editing and reviewing .the purpose is to see whether the test satisfies all the decisions taken during the designing and to weed out technical flaws in subject matter and inaccuracies or defects in wording if any**.**

Check Your progress 1

1. List the steps in the preparation of an achievement test question paper.

8.5 CHARACTERISTICS OF GOOD MEASURING INSTRUMENT - VALIDITY, RELIABILITY, OBJECTIVITY, ADEQUACY, PRACTICABILITY, DISCRIMINATION INDEX

Any measuring instruments must fulfill certain conditions. This is true in all spheres, including educational evaluation. A test is judged for its adequacy, efficiency and consistency as measuring instrument on the basis of its validity, reliability, adequacy, practicability, objectivity and discrimination. All these qualities are interdependent; they effect each other.

(a) Validity:

It refers to the degree of consistency or truthfulness .Validity of a test may be defined as "The accuracy with which a test actually measures what it claims to measure".

It is the test is meant to examine the understanding of scientific concept; it should do only that and should not be attended for other abilities such as his style of presentation, sentence patterns or grammatical construction.

Validity is specific rather than general criterion of a good test. Validity is a matter of degree. It may be high, moderate or low.

Types of Validity:

Five different kinds of validity are found in literature.

1. Face-validity, 2.Content validity, 3.Validity construct, 4.Concurrent validity, 5.Predictive-validity.

1. Face-validity: refers to what the test seems or appears to measure but it does not refer what the test actually measures.

2. Content validity: It refers to the extent to which the test measures the subject matter content and the behavioral changes under consideration .For example, It can be said that a test constructed to measure knowledge of chemistry is valid only when it measures both the objectives and the subject matter content of chemistry. Test items should be well chosen so that the question paper is a good example of all the questions that can be asked in the subject. No one area of the subject matter should be unduly over stressed at the expense of others, unless it is relatively more important.

3. Construct validity: It refers to the extent to which the test measures a specific characteristic of the individual.(it is used in such tests as those of study habits, skill appreciations, understanding or interpretation of data. A concept in a new theory is called construct. Test of personality, verbal ability, mechanical aptitude, critical thinking and so on, are validated in terms of their construct.

4. Concurrent validity: Tests are said to have concurrent validity when they can distinguish between two or more groups of individuals whose status at the time of testing is different. For example, Minnesotta Multi-phasic Personality Inventory, distinguishes between persons with personality disorder and the normal ones.

5. Predictive validity: It refers to the accuracy with which a test indicates future outcome in a particular area, as evidenced by correlations between scores on the test and future criterion measures.

Factors affecting the validity of a test

1. Lack of clarity indirection: If directions do not indicate to the pupil how to respond the test items the validity of a test is reduced.

2. Language difficulty: When vocabulary is too hard for the students, even if they know the answer, they may not understand the question.

3. Medium of expression: Students may know the answer but unable to express it when the medium of expression is not familiar with them.

4. Difficulty level of items: When questions are too easy or too difficult it would not discriminate among pupils; thereby the validity of a test will be lowered.

5. Poor test items: Sometimes the question itself may give the clue for the students to answer. The alert student answers it correctly thus this test-item examines not the knowledge of the student, but his all.

6. Time limit: When too little or too much time is given, the test fails to do its task. It will measures not the knowledge of the student by his speed of writing.

7. Inadequate coverage : When questions from many topics are omitted inadequate sampling results, which in turn affect validity.

8. Halo effect : When a teacher gets a good over-all impression of a student, he tends to give him high score. This lowers the validity of the test.

9. Influence of Extraneous factors : in an essay items, the examiner is usually influenced by style of writing, grammar mistakes, length of the answer, hand-writing and organisation of the matter. Thus the score is not a measure of achievement along there by it reduces the validity of the test.

In all the above circumstances, the test measure something different from what is intended by the test. Hence validity is lowered.

(b) RELIABILITY

It is the trustworthiness. Reliability of a test may be defined as "The degree of consistency among test scores".

The term "Reliability" in evaluation refers to the consistency of scores obtained by the same individuals on different occasions or with different sets of equivalent items. It is a statistical concept and is expressed as correlation co-efficient called reliability co-efficient.

FACTORS AFFECTING RELIABILTY

1. Length of the test : Lengthening the test makes it more Reliable. This means that a longer test enable us to have a more adequate sample of questions.

2. Objectivity in scoring : Answer to essay type tests allows the individual opinion of the examiners to influence scores. When subjectivity set in reliability of the test suffers. Objective type tests in general give more reliable results.

3. Range of talent: A test is found to be more reliable when given to a group of the students with varying levels of achievements. When most of the students are equal in achievement, tests are found to be unreliable.

4. Difficulty of the test: When test are too easy or too difficult, they tend to give scores of law reliability. In such case scores do not differ among themselves very much.

5. Ambiguous wording of questions: When questions are phrased ambiguously, every one interprets them in different ways at different time, such test becomes less reliable.

6. Testing conditions: Conditions may change while administering and scoring the test. These changes like change in time limit, change in instruction, fluctuation in interest and attention make the test less reliable.

7. Optional questions: Introducing optional questions reduces the common base on which all the students compared. This in turn makes the test reliable.

METHODS OF ESTABLISHING RELIABILITY

1. Test-retest Method: The same test given to the same group on two occasions. Now the reliability coefficient between the two sets is calculated. If this index is high enough, the test is said to be reliable. But the condition to be followed when using this method is that.

The students for whom the test is administered have not remembered more, have not grown matured or have not learnt something new during the time that elapsed between the first trial and second trial of the test. This method gives the coefficient of equivalence.

2. Equivalent forms or parallel forms method : Two separate but equivalent forms of test are administered to the same group of individuals on two occasions under similar conditions. The reliability co-efficient between the scores of the two forms is calculated. It gives the coefficient of equivalence and stability.

3. Split-half method: The test is split into two halves (usually by pooling the odd-numbered items or even numbered items) as equivalent in difficulty and content . The two sets of scores of a group of students are taken and the correlation between them is determined. The reliability co-efficient of the whole test is calculated by "SPEARMAN-BROWN-Formula".

$$\text{Reliability of total test} = \frac{2 * \text{reliability of half test}}{1 + \text{reliability of half test}}$$

4. Kuder- Richardson formula method (K-R 21) : (co-efficient of internal consistency or method by internal consistency or method by

rational equivalence). In this method the reliability of the test candidate each item as a test in itself.

The simple way by approximating the degree of correlations among items on a test is given by K-R 21 formula as below.

$$\text{Reliability } R = \frac{n}{n-1}\left(1 - \frac{\Sigma pq}{\sigma^2}\right)$$

n- Number of questions
p- Number of right answer
q- Number of wrong answer

Check Your Progress 2

1. Define Validity.

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2. Define Reliability.

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3. What are the methods of establishing reliability?

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(3) Objectivity: (Scorer reliability) A test is said to be objective when the examiner's personal opinion or judgment does not affect the scoring. Objectivity of a test refers to "The degree to which equally competent scores obtain the same result". Objectivity is always relative never absolute.

The objectivity of a test can be increased by

1. Using more objective type test items.
2. Making essay type test items more unambiguous, well-constructed, giving specific directions which could establish a frame work within which students can operate.
3. Preparing marking scheme.
4. Setting realistic standard.
5. Asking two independent examiners to evaluate the test and using the average score of the two as the final score.

Objectivity in a test makes for the elimination of biased opinion or judgment of the person who scores it. Objective judgments are accurate and hence tend to be reliable

There are two aspects of objectivity

a. Scoring of the test: The personal judgment of the individual who corrects the test and his fancies should not be a factor of affecting the score. After the key has been out, there should be no. question as to whether an item is right or wrong or partial right or partial wrong.

b. Interpretation of the test items by the student: As regards of the test items well- constructed items should lend themselves to one and only one interpretation by the student.

(4) Adequacy (Balanced and fair): A test is said to adequate only if it is balanced and fair; the aim of teaching is not merely to enable the students to repeat what has been taught. Apart from knowledge there are several types of skills that can be considered as outcomes of teaching. A test must examine these skills also. The test constructor must measure all the educational attainments of students by including test items that measure various outcomes of teaching.

(5) Discriminating power: The basic function of all educational measurement is to place individuals in a defined scale in accordance with differences in their achievements. A good measuring instrument should detect or measure small differences in the achievement of students and thus discriminate between the good and the bad students.

The discriminating power of test items refers to the degree to which it discriminates between good and bad students in a group.

$$\text{Discrimination Index} = \frac{RU - RL}{\frac{1}{2} N}$$

RU-No.of correct responses from the upper group;
RL-No.of correct responses from the lower group;

N-Total No. of pupil who attempted them. It is usually expressed as decimal.

(6) Practicability: Practicability relates to the practical aspects by the test respect of administration, scoring and economy. Practicability of a test refers to the extent to which the measuring instrument can be successfully employed by the teacher and school administrators without an unnecessary expenditure of time and energy. Practicability of the test depends upon the following factors.

a. Ease of Administration: Administrability of a test involves the person who administers the test and the pupil taking the test .A test when it is fully ready for being administered, should be conducted easily by any one. The instructions given in a test paper are to be easily understood pupils and the person who administer it. They should be clear, precise and definite and should cover the such aspects as preparation, distribution and collection of test material as for as the

administrator is concerned. Direction to the pupils should cover the test as a whole and each separate part of the test.

b. Ease of scoring: The result of a test possessing scorability should be obtainable in a simple and rapid manner. The test is subjected to accurate scoring even by person not conversant with the content. No algebraic manipulation should be required to get the scores. There are 3 important factors which facilitate the scorability of a test. They are objectivity, adequate key and scoring direction.

c. Ease of interpretation: The raw scores of a test should be easily converted into meaningful derived scores .It should be feasible to interpret the results with the competence of class room teachers. No specially trained personnel should be required in order that the results may be interpreted avidly.

d. Economy: A good testing tool should not be very expensive and time spend on it should be very minimum. So a good test should necessarily be easily, constructed administrated and interpreted on an economical basis without incurring too much by an expenditure in terms of money, time and energy.

e. Availability of equivalent forms of a test : Equivalent forms of a test must be available, It measures the same aspects of behaviour by using test items which can similar in content , level of difficulty etc. Equivalent forms are important to measure the effects of teaching a particular course.

Check Your Progress 3

1. Define Objectivity.

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2. When is a test said to be adequate?

8.6 LET US SUM UP

In this unit, we presented the Purpose of Scholastic Achievement Test and the preparation of scholastic Achievement test. The steps involves in the preparation of the Scholastic achievement test had also been discussed. Also presented were the essential criteria of a good evaluation tool. In that context, we discussed the important

criteria, namely, Validity, Reliability, Objectivity, Adequacy, and Discrimination Index.

There are different types of validity namely, face Validity, Content validity, concurrent validity, construct Validity and Predictive Validity. You have also learnt about the methods of establishing the reliability as well, .i.e., test-re-test method, Split-half method, Equivalent or parallel form method and Kuder Richardson Formula.

Also we saw the brief description of the Objectivity, adequacy, Discrimination Index, and Practicability.

8.7 UNIT END EXERCISES

1. State the purpose of Achievement test.
2. Construct an achievement test question paper in major subject following the steps in the construction of an achievement test.
3. Write a brief note on the characteristics of a good tool.

8.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1.

1. Planning of the test
2. Writing the items
3. Arranging the items
4. Providing the directions
5. Preparing the Scoring Key and Marking Scheme
6. Reviewing and Editing

Check Your Progress 2

1. Validity of a test may be defined as "The accuracy with which a test actually measures what it claims to measure".
2. Reliability of a test may be defined as "The degree of consistency among test scores".
3.
    i. Test-retest Method
    ii. Equivalent form or parallel form Method
    iii. Split-Half Method
    iv. Kuder-Richardson Method

Check Your Progress 3

1. Objectivity of a test refers to "The degree to which equally competent scorees obtain the same result".
2. The test is said to be Adequate if it is Balanced and Fair.

8.9 SUGGESTED READINGS

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UNIT IX – EXAMINATION SYSTEM-I

9.1 INTRODUCTION

In this unit you are going to learn about the present system of examination. Reforms have been done in the present examination system by various governmental bodies. The National Policy on Education and the Programme of Action has also hinted upon the examination reforms. We are going to learn about the various suggestions given by NCERT in the line examination reforms. The new trends like online examinations and Open book examinations are also going to be dealt in detail in the following pages.

9.2 OBJECTIVES

After going through this unit, you will be able to

- analyse the present examination system
- enumerate the examination reforms suggested by NCERT
- internalise the use of reforms in examination system
- differentiate between test and examination
- describe the status of present examination system
- list the advantages and disadvantages of present examination system

9.3 EXAMINATION: MEANING, TYPES, OBJECTIVES OF EXAMINATION, TEST AND EXAMINATION

Examinations and its Importance

The examinations have been in existence since times immemorial. To close down examinations would be to give the signal for educational saturnalia", observed Sir Michael Sadler.

Similarly, J.C. Mathuremphasises the value of examinations when he writes, "Even in the idealised picture of society portrayed in H.G. Well's Utopia, examinations find an important place."

The Secondary Education Commission has also observed, "Nevertheless examinations and especially external examinations have a proper place in any scheme of education. External examinations have stimulating effect both on the pupils and on the teachers by providing well defined, goals and. objective standard of evaluation, To the pupil the examinations give a goal towards which he should strive and a stimulus urging him to attain that goal in a given time thereby demanding steady and constant effort. This; makes the purpose clear and the method of approach definite. He is judged by external and objective tests on which both he and others interested in him can depend. And, finally, it gives him a hallmark recognised by all.

Functions of Examinations

1. To evaluate the achievement of the students.
2. To help in diagnosis.
3. To help in prognosis.
4. To act as motivators.
5. To measure the efficiency of the teachers and of the school.
6. To give uniformity, of standards.
7. To measure fitness for admission to higher courses.
8. To help in selection by competition.
9. To help in guidance. .
10. To acquaint the, parents with the progress of their wards
11. To measure personality.

Epithets given to traditional system of examinations.

1. A bane of educational system.
2. A begetter of rivalry and strife.
3. A blood sucker.
4. A dead hand of education.
5. A glorification of memory.
6. A growing tyranny.
7. A necessary evil.
8. A presumptuous attempt to gauge the depth of human ignorance.
9. An enemy of true education.
10. An incubus.
11. An obstacle to learning.

Demerits of examinations

1. Examinations lack definite aim.
2. There is a major element of chance.

3. Examinations lower educational standards as the entire energy of students and teachers is spent in preparing for the examination. Stress is laid on spoon feeding and not on understanding.
4. Examinations tempt the students to adopt unfair means to gain success.
5. Subjective attitudes of examiners influence marking.
6. Examinations put heavy strain upon the students who burn the midnight oil near the examination days.
7. Failures in examination leads to frustration and even to suicides in some cases.
8. Examinations ignore the development of personality of the students.

TYPES OF EXAMINATION

Examination system is the test of the knowledge acquired. In the present set-up of education it is this very system which helps us to ascertain the efficiency of a student in a particular subject. Examination are of two types:

(a) Written or theoretical, and
(b) Oral

Written tests are 'essay type tests'. Probably it is the, type àf test which makes the students feel unhappy and nervous about their examination days. Various scholars have given various epithets to this type of examination. Some of these are given

1. A bane of educational system
2. A blood sucker
3. An necessary evil
4. An obstacle to learning
5. An enemy of true education etc.,

Examinations are conducted to measure the achievement. This measure of achievement is known as evaluation or examination. Unless we are able to have proper assessment and evaluation of the achievement. The achievement becomes meaningless. This process helps a person to improve his achievement. This is what shall be more clear from the following lines:

"Evaluation signifies a "wider, more comprehensive and continuous - process "of assessing student progress. It is integrated with the whole task of education and its purpose is to improve instruction and not merely to measure its achievement. In its highest sense evaluation brings out the factors that are inherent, in student growth such as proper attitude and, understanding."

"Evaluation is a relatively new technical term introduced to designate a more comprehensive concept of measurement that is

applied in conventional test and examinations. ... The emphasis in-measurement is upon single aspects of Subject matter. achievement or specific skills and abilities. ... The emphasis in evaluation is upon board personality changes and major objectives of an educational programme. This includes not only the subject-matter achievement it but also attitudes, interests, Ideals, ways of thinking, work habits and personal and social abilities."

In others words, it means that it is the evaluation examination that helps not only the improvement of the achievement but also improvement of different traits of personality.

Examination and Evaluation

It appears desirable at this point to subject this explanation to a further elaboration and clarification. The best way of doing this appears to be, to attempt a comparison of the concepts of Examinations and Evaluation because one is often confused with the other.

Criteria	**Examinations**	**Evaluation**
Purpose facts covered	Assessment of the level of achievement	Improvement of the level of achievement and growth. Diagnosis, remediation, enrichment and improvement of competencies.
Personality facts covered	Mainly scholastic aspects of personality—academic achievement—covered	Both scholastic and cc-scholastic aspects personality covered—interests, attitudes, personal and social qualities, health status, as also proficiency in outdoor activities etc. over and about academic achievement.
Evaluation Techniques	Mainly written and practical examination	Observation, interviews, and other unconventional techniques, besides written, oral and practical examinations.
Evaluation Tools	Mainly questions and question papers	Rating scales, inventories, interview schedules, profiles besides questions and

		question papers.
Periodicity	In periodical strokes as - events	A continuous affair ii1t into the total teaching-learning process as an integral part.
Student Status	An incognito roll number	An individual of flesh and blood.
Uses of Test Results	Assessment, classification certification of students	Further improvement of performance levels of students.

It is hoped that the above table will not only clarify the common confusions but help us in understanding of the two concepts of Examinations and Evaluation, bringing to the fore the realisation that evaluation is a much broader term than examination, that it does not only consist of periodical events but is a continuous process, that it goes much beyond classification and certification of students only in regard to the academic achievement but aims at the diagnosis of the strengths and weaknesses of the students and the remediation/ enhancement and enrichment of achievement. Evaluation thus ought to be conceived as an exercise concerned with the process of engineering development and growth in the various facets of the personality of students in both scholastic and co-scholastic aspects.

Check Your Progress 1

1. What are the types of Examination?

9.4 PRESENT EXAMINATION SYSTEM ,EXAMINATION REFORMS, NCERT AND EXAMINATION REFORMS

Examinations have been proverbially described as the bane of our educational system. Successive commissions and committees on education have emphasised the need for examination reform and suggested specific measures towards this end. The University Education Commission (1948) went so far as to say: "We are convinced that if we are to suggest any single reform in university education, it would be that of examinations." (p. 328.)

The Mudaliar Commission on Secondary Education (1952-53) also recognised the lack of validity, reliability and objectivity in examinations. Much was not, however, done to remove the defects of

the examination system until 1958 when the erstwhile All India Council for Secondary Education which had always recognised the importance of improving examinations as a means of improving the quality of education, set up the Central Examination Unit to organise programmes of examination reform at the secondary stage.

With the establishment of the National Council of Educational Research and Training, the Central Examination Unit along with the All-India Council for Secondary Education became its part and has, ever since, been working vigorously to refine and improve examinations. Efforts have been mainly concentrated at the stage of secondary education, although some work has also been taken up at other stages of education.

To overcome the shortcomings of public examinations as well as school evaluation, the Central Examination Unit located in the NCERT developed a comprehensive programme of examination reform to meet the educational social and psychological points of view. It was aimed at (i) improvement of written, practical and oral examinations, (ii) introduction of internal assessment procedures on scientific lines, and (iii) bringing about consequential changes, as for example in curriculum and textbooks, etc. Chief proposals for the improvement of written examinations comprised: (i) improvement of questions, (ii) improvement of question-papers to ensure reliability, validity and objectivity, (iii) improvement of scoring procedures, and (iv) improvement of the mechanics of examinations. The programme of examination reform was suitably phased out to ensure easy and effective implementation. In the first phase it was proposed to concentrate all the efforts on external examination, in the second phase it was proposed to cover internal assessment procedures and then finally to tackle the rest of the problems.

There is a good deal of discussion about secondary and higher secondary education and the examination system these days. The drawbacks of the extreme importance given to marks in the examinations are there for all to see. The main purpose of education is to educate students and help them appreciate the better points of the knowledge that is being imparted to them. However, that seems to have been short-changed right now with the added emphasis on grades and marks. The system needs to be one that enables students to truly learn what they are being taught and internalize it and not just mug it up for a few days or months. It needs to be more long term than what the situation is at present. At the same time it also needs to be practical so that the students' abilities are properly tested.

NCERT AND EXAMINATION REFORMS

The NCERT suggests the following reforms

1. There should be more varied modes of assessment, including oral testing and groupwork evaluation. This is extensively discussed in the section on CCE and Teacher Empowerment. Suffice it to say, here, that as sensitive teachers usually pick these unique strengths and weaknesses of students, one should utilize their insight in assessment and empower them and the system of internal assessment. At the same time, to prevent its abuse by schools (as is currently the case in practical exams), internal assessment must be graded on a relative, not an absolute, scale and must be moderated against the marks obtained in the external exam. External moderation of internal assessment through mandatory random sampling is strangely absent at present. The consequences are predictable: abuse of the system by schools is rampant, the end-users have little faith in it, and boards, aware of this, usually report internally assessed marks separately, thus allowing them to be ignored.

2. Do not expect everything of everybody in every subject. One can appreciate the rationale for not having different curricula for different types of schools and types of students. (As has been argued—most forcefully in Maharashtra—this would perhaps create a hierarchy within the same exam board and create two classes of learners.) But, just as we allow students and schools some element of choice in the choosing of their subjects, they should have the choice of picking one of two levels within that subject. Of, say, six subjects, every student would choose to do 3 (or 4) exams at the higher level and 3 (or 2) exams at the standard level. Though set on the same curriculum, higher-level exams would have a larger component of high-order-skill testing and demand greater speed, conceptual understanding, and depth of insight than the standard-level exams. Not only would the above reform cater for different kinds of learners and allow different levels of testing, it would also reduce overall student stress levels. It is well known that students experience greatest stress before and during their most 'difficult' subject exam. Secondly, this reform, when applied to Mathematics and English, two subjects with the lowest pass rates in most boards, will also improve the overall pass rate. As envisioned by us, standard-level Mathematics for the tenth grade would be designed for students who will not pursue Maths and the sciences further. It would focus on computation, algebra, areas, financial Maths, and interpretive statistics— quantitative methods that will equip them for life. Trigonometry, set theory, logarithms, geometrical proofs, volumes, and more technical topics within mathematics will either feature only in higher-level mathematics (if there are two syllabuses), or comprise less than 20% of the standard level paper (if there must be a common syllabus). Likewise, English could be examined at three levels: the most basic level would seek the ability to comprehend and communicate in English and would have a substantial oral-tested component. The intermediate level would be a test of standardized

English, seeking correctness of grammar, spelling, syntax, etc. in addition to comprehension and communication. The highest level would, in addition, test skills of literary analysis. A similar three-level format could, indeed, be adapted for all languages. Every student should be expected to test for one language at the highest level and another (or two, in some states) at any level.

3. Flexibility in when exams are taken: If it is accepted that learners learn at different paces, there is no reason, other than administrative convenience, to test them after two years of higher secondary course in all subjects simultaneously. We recommend that students be allowed to clear some (up to two, perhaps) subjects at the end of the XI^{th} (or the IX^{th} grade for the secondary exam). This would not only reduce stress a year later but also make for better long-term learning—and cause very little inconvenience to exam boards. Allowing students to take another two exams in the middle of the XII^{th} (or the X^{th} for secondary exam) would require boards to depart from their once-a-year schedules (barring re-takes) but would lead to a more learner-friendly system. In general, every student should be given a three-year window within which all the subjects must be passed (or scores improved). In any one exam session students should have a choice of taking no exam, all exams, or a few exams. This reform besides allowing for learning and testing to take place when a student is ready for it (rather than when the board decrees it on a one size-fits-all principle), also works towards social justice. A large number of exam candidates are trying to hold down a fulltime or part-time job while doing their exams. A large number of these students do not get through because they do not get more than a week off before the exams— hardly sufficient time for preparation for all subjects. Allowing them, for instance, to do two subjects in each of the three sessions would greatly enhance their performance. In the long run, the system must gradually move toward on-demand exams (they are usually done online, internationally) taken when the candidate is ready, rather than at the convenience of the system. We suggest a small beginning of this in computer science exams as a pilot project and its future extension to Maths and physics exams.

4. Enhanced reporting of performance (or Comparing apples with apples): Along with the absolute mark (or grade) in each subject, it is now very easy, given computer-based registration, to provide information of relative performance on the mark sheet. We recommend that percentile rank be given with respect to (a) the entire universe of candidates in that subject, (b) all candidates in that school, and (c) all candidates in that block. A student from a disadvantaged area with low-quality educational infrastructure who scores, say, 70% (absolute marks) would attain a percentile rank on 95% within her block—a commendation that deserves mention. A South Mumbai student at an

elite school who also attains 70% may, likewise, attain a percentile rank of only 50% within the school and 60% within the block. While there is no way to ensure that colleges, junior colleges, and professional courses at universities will pay attention to these parameters of relative merit (and it would be hard to argue that merit, in education, is not a relative concept), in their admission process it is important to make this percentile-rank data accessible to these end-users.

Check Your Progress 2

1. What are the reforms in examinations suggested by NCERT?

9.4 LET US SUM UP

We have discussed the topic Examination in detail and the present status of examination with its reforms. NCERT has suggested some examination reforms. Online examination is an emerging trend in the higher education setup. Its advantages and limitations were discussed in this unit. Also, the requirements for online exam is discussed. One of the other trends is the open Book Examinations. You have also learnt about open book examinations, its types, advantages and limitations.

9.5 UNIT END EXERCISES

1. Analyse the present day examination system in your district.
2. Is online exam possible for your subject? How?
3. What are the precautions should you take to conduct an open book examiantion?

9.6 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1.

(a) Written or theoretical, and
(b) Oral

Check Your Progress 2

1.

1. There should be more varied modes of assessment, including oral testing and groupwork evaluation.
2. Do not expect everything of everybody in every subject.
3. Flexibility in when exams are taken

4. Enhanced reporting of performance

9.7 SUGGESTED READINGS

Bloom, Benjamin S., et al., (1971). *Handbook on Formative and Summative Evaluation in Student Learning.* Mc Craw Hill, USA.

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NOTES

UNIT X – EXAMINATION SYSTEM-II

10.1 INTRODUCTION

In this unit you are going to learn about the reforms in the present system of examination. Reforms have been done in the present examination system by various governmental bodies. The National Policy on Education and the Programme of Action has also hinted upon the examination reforms. We are going to learn about the various suggestions given by NCERT in the line examination reforms. The new trends like online examinations and Open book examinations are also going to be dealt in detail in the following pages.

10.2 OBJECTIVES

After going through this unit, you will be able to

- analyse the online examination system
- internalise the use of reforms in examination system
- explain online examination
- describe the requirements for the online examination
- list the advantages and disadvantages of online examination
- define open book examinations
- describe the types of online examination

10.3 ON-LINE EXAMINATION: MEANING, ADVANTAGES, LIMITATIONS, REQUIREMENTS FOR ON-LINE EXAM

Online examination systems seek to efficiently evaluate the exam partakers thoroughly through a fully automated system that not only saves time but also give fast results. The Online examination system helps to completely automate the old manual procedure of

conducting exams. Usually it is done through a Web Based Online Examination Software or and Intranet variant. It also significantly eliminates the need for monitoring while the exam is being taken. All instructions are displayed to the exam taker before the tests begin.

MAJOR ADVANTAGES OF ONLINE EXAMINATION

- Security and confidentiality
- Accessibility and Flexibility
- Cost saving
- Time management
- Statistical analysis
- Online Exam can be managed in auto surveillance mode where web camera connected to the system would take snapshot of the student appearing for the exam. This would ensure that same student is appearing for the exam and system is able to keep track on student during exam. Online Exam can be managed in auto surveillance mode where web camera connected to the system would take snapshot of the student appearing for the exam. This would ensure that same student is appearing for the exam and system is able to keep track on student during exam.
- Although creating online tests is labor-intensive, once a test is developed in Blackboard, it is relatively easy to transfer it and repeat it in other Blackboard courses.
- Blackboard allows for a high degree of customization in the feedback students get in response to each answer that they submit. As an instructor, you could leverage this tool as another way to engage with students about course content.
- Online tests are asynchronous and can be accessed on a variety of devices. If students buy the Blackboard mobile app, they can even take a test from their smartphone. The flexibility offered by online testing can be a great solution for learners with busy schedules or when unexpected class cancellations occur.
- While it is hard to prevent cheating, Blackboard tests do offer many settings for instructors to randomize questions, impose test taking time limits, and restrict attempts. However, make sure to explain all the settings to students before they begin taking the test.
- Testing in an online environment can be a lot more interactive than traditional paper and pen tests. Instructors can embed multimedia in test questions to provide more engaging assessments. For example, students may be asked to identify a particular area of an image by directly clicking on it instead of having to answer in written form.
- In all likelihood, students are already using online tools as study aids for their courses. Instructors can better serve students by

providing them with custom made study aids like online practice tests, rather than entrusting students to rely on outside resources that may not be valid sources of information.

- For objective question types like multiple-choice, Blackboard will automatically grade student responses, saving time for the instructor and providing more immediate feedback to students.
- Online tests can be more accessible to students with disabilities who have assistive technologies built into their computers than hand written tests are.

LIMITATIONS OFON-LINE EXAM

- Unlike collaborative, project-based online assessments, multiple choice or essay tests online can feel even more impersonal than they do in the classroom which may contribute to an online student's sense of isolation.
- While it is tempting to use the multiple choice quizzes provided by the textbook publisher, these types of assessments lack creativity and may not be suitable to the specific needs of your learners.
- Creating online tests in Blackboard can be very tedious and time-consuming. It is not as easy as simply uploading the Microsoft Word version of your test. Instead, instructors have to copy and paste each question's text and each individual answer's text into Blackboard, mark the correct answers, and customize feedback and setting options.
- Some students will not be accustomed to taking quizzes and tests online, and they may need some hand-holding early in the semester before they feel comfortable with the technology.
- Cheating on an online test is as simple as opening up another window and searching Google or asking a classmate for the correct answers. Furthermore, cheating on online multiple choice tests is near impossible for the instructor to prevent or catch.
- Though the technology that makes online tests possible is a great thing, it can also cause problems. If you do online testing, have a back-up plan for students who have technical difficulties and be ready to field some frantic emails from students who have poor internet connections or faulty computers.
- Highly dependent on honor system; hard to catch cheating. A group of students can take turns taking test first to share answers with others in the group raising their overall grade.
- Hard or difficult to ask questions or contest answers
- Can be slow responding due to connection speed (i.e., dial-up would limit the use of graphics or media files)

REQUIREMENTS FOR ON-LINE EXAM

To effectively deliver an examination, 3 major components have to be catered for efficiently. Theyare:

1. Creation of exams – Obviously, an exam will have to be created. Examiners can create exams online. The contents also have to be kept securely until the examination starts.
2. Supervision of examination – Students have to be efficiently identified, and screened to ensure that they so not compromise the standards of the exams.
3. Marking of the exams. Marking is the ultimate stage in any examination as it determines the success or failure of the candidate. It is the stage that dictates the next level of success and achievement in life.

Check Your Progress 1

1. What are the advantages of the On-line Examinations?

10.4 OPEN BOOK EXAMINATION (OBE): MEANING, TYPES, OBJECTIVES, ADVANTAGES, LIMITATIONS

An "Open book examination" is one in which examinees are allowed to consult their class notes, textbooks, and other approved material while answering questions. This practice is not uncommon in law examinations, but in other subjects, it is mostly unheard of. Radical and puzzling though the idea may sound to those who are used to conventional examinations, it is ideally suited to teaching programmes that especially aim at developing the skills of critical and creative thinking.

Open-book examinations are similar to traditional examinations. The major difference is that in open-book examinations, students are allowed to bring their textbooks, notes or other reference materials into the examination situations. Teachers may also assign a standard set of teaching materials or a standard set of examination questions to their students before the examination, so that students can prepare in advance with the assigned resources.

Structure of Open-book Examination

There are various ways of arranging an open-book examination in a course. The following approaches are some examples:
Students are allowed to bring or to have access to resources and references during an examination.

Questions are given to students prior to the examination and students can utilize their prepared resources in the examination.

Another format can be setting the examination in a take-home format. Take-home questions can be handed out to students. These take-home questions can be essay questions, short answer questions and multiple choice questions. Students then have to return the examination paper within a specified period of time without getting help from other people.

TYPES OF OPEN BOOK EXAMINATIONS

There are two kinds of open book examinations, the restricted type and the unrestricted type.

In the restricted type of open book examinations, students are permitted to bring into the examination room one or more specific documents approved by the course instructor, In the restricted open book examination, students may be permitted to consult printed documents such as the logarithmic tables, dictionaries, or complete works of Shakespeare, but no handwritten material or printed documents which have not had prior approval. One may also need to make sure that the printed documents that students bring do not contain any scribbles on the margin. In this type of examination, the approved documents function more or less as appendices to the question paper itself. These examinations are not radically different from closed book examinations. They do not present any special problems, irrespective of the nature of the course.

In the unrestricted type of open book examinations, students are free to bring whatever they like. There are no restrictions on what the students can bring in an unrestricted open book examination. They may bring any books (with or without scribbles on the margin), lecture handouts of the course instructor, or their own handwritten notes. The use of such examinations presupposes certain teaching strategies and types of questions. In particular, it demands that the course focuses on a set of intellectual skills, rather than on the information content, and that no content based questions be asked in the examination. If the course instructor has concentrated on handing down currently available knowledge, and the question paper contains traditional content based questions like “Write an essay on the difference between British and American English”, the use of the unrestricted open book examinations would be disastrous. When used properly, it will be pointless for

students taking the unrestricted open book examinations to consult any material they have brought, because the questions will be designed in such a way the answers will not be found in the textbooks, handouts or class notes. An intelligent student who has had the experience of such examinations once will not bother to bring anything for the next examination, since he or she will know that no prepared material will be of any use. The use of these examinations then acts as symbolic gesture that makes the students realise the nature of the course and the examinations, and shocks them into a mode of studying that does not involve cramming.

ADVANTAGES OF OPEN-BOOK EXAMINATION

- Less demanding on memory (regurgitation of memorized materials) because it is no longer necessary for students to cram a lot of facts, figures and numbers for open-book examination
- Provides a chance for students to acquire the knowledge during the preparation process of gathering suitable learning materials rather than simply recalling or rewriting it
- Enhances information retrieval skills of students through finding the efficient ways to get the necessary information and data from books and various resources
- Enhances the comprehension and synthesizing skills of students because they need to reduce the content of books and other study materials into simple and handy notes for examination

DISADVANTAGES OF OPEN-BOOK EXAMINATION

- Difficult to ensure that all students are equally equipped regarding the books they bring into the exam with them, because the stocks of library books may be limited and also some books may be expensive to students
- More desk space is needed for students during the examination because students often need lots of desk space for their textbooks, notes and other reference materials
- Sometimes students may spend too much time on finding out which parts of the books to look for answers instead of applying the knowledge, practical skills and reasoning ability
- A lot of students are unfamiliar with open-book examinations. They must be provided with clear procedures and rules.

Check Your progress 2

1. What is an Open Book Examination?

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2. What are the two types of Open Book Examination?

10.5 LET US SUM UP

NCERT has suggested some examination reforms. Online examination is an emerging trend in the higher education setup. Its advantages and limitations were discussed in this unit. Also, the requirements for online exam are discussed. One of the other trends is the open Book Examinations. You have also learnt about open book examinations, its types, advantages and limitations in this unit.

10.6 UNIT END EXERCISES

1. Discuss the limitations and requirements of an online examinations
2. Critically analyse the advantages and disadvantages of Open book examinations

10.7 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1.

1. Security and confidentiality
2. Accessibility and Flexibility
3. Cost saving
4. Time management
5. Statistical analysis
6. Online Exam can be managed in auto surveillance mode

Check Your Progress 2

1. An "Open book examination" is one in which examinees are allowed to consult their class notes, textbooks, and other approved material while answering questions.

NOTES

2. The Restricted type and the unrestricted type.

10.8 SUGGESTED READINGS

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UNIT XI – CONSTRUCTION OF OBJECTIVE TYPE TEST ITEMS

11.1 INTRODUCTION

The behavioral changes and growth of pupil can be evaluated through different techniques.For testing knowledge, information and understanding the following tests is used oral test, essay type tests, short-answer type tests and objective type tests.In objective tests students are not required to write much just they have to indicate whether a particular answer is correct or not objective tests are needed for several purposes i.e., measurement of intelligence, aptitude interest, achievement etc. Hence we are going to learn about the objective type test items and its types in detail in this unit.

11.2 OBJECTIVES

After going through this unit, you will be able to,

- discuss the purpose of objective type test items
- explain the different types of objective type test items
- construct objective type test items
- analyse the use of objective type test items
- list the steps involved in the preparation of objective type test items
- score an objective type test and interpret the scores
- discuss the different types of objective type test items
- construct recall or recognition type items

11.3 OBJECTIVE TEST ITEMS –MEANING – STANDARDIZED-TEACHER MADE OBJECTIVE TEST ITEMS - COMPARISON BETWEEN TEACHER MADE OBJECTIVE TEST AND STANDARD OBJECTIVE TEST ITEMS

Based on the psychological principles there evolved a new type of test called objective type tests or 'New type of tests'. These objective tests try to test the objectivity of the students. In objective tests students are not required to write much just they have to indicate whether a particular answer is correct or not. Objective tests are needed for several purposes i.e., measurement of intelligence, aptitude interest, achievement etc.

Characteristics of objective test

1. **Objectivity**: These tests try to test the objectivity. They attempt to do away with the subjective elements of essay tests. They also help the examiner to be free from subjectivity.
2. **Validity**: These objective tests keep up the validity of tests.
3. **Reliability** objective type tests sustains the consistency in scoring thus promoting reliability of a test for example the marks scored by a student shall be the same at the hands of any or all examiners in any objective test.
4. **Simple to mark**: Objective test are easy to mark. Marking does not take long time.
5. **Easy use by teachers**: Any Teacher having minimum knowledge about the objective test may use them with confidence.
6. **Economy of time**: Objective tests take much less time compared to essay type tests to answer and to score. The Examinees are in a position to answer a good number of questions, within a short time. The examiners are also able to evaluate a large number of answer books with the help of a scoring key.

Advantages of objective tests

1. **Objectivity:** These tests are objective. The subjectivity of the examiners does not influence these tests.
2. **Reliability**: These tests are reliable. It the test is administered repeatedly on pupil or a group of pupils, the results obtained every time show correlation.
3. **Validity**: These tests measure for what these are made. Hence these tests are valid.
4. **Comprehensibility**: These tests measure the entire subject area. Hence these tests are more useful than the essay type tests.

5. **Utility**: These tests are more useful because of its objective nature and easy scoring. Objective tests are of utility in all fields or areas.
6. **Practicability**: These tests consume less time, on the part of examiner and examinee.
7. **Elimination of bluffing**: The element of bluffing is eliminated in objective tests.
8. **Easy to score**: In essay type tests, evaluation of scripts takes much time, but objective type tests take a few hours to score them.
9. **Administrability** : The administration of these tests is very simple for teachers. Since their directions are easy to understand, hence, the pupils follow them very easily.
10. **Minimum use of language**: The test requires minimum use of language. Thus, language does not prove a hurdle or help in getting more or less scores.
11. **Extensive testing**: As the number of items is quite large, the examiner gets an opportunity to have them spread more evenly over the topics to be covered. In this test, the examiner can test the pupils strong and weak points.

Demerits of objective type tests.

Many psychologist and contributors to education feel that there are certain aspects of learning and thinking that objective tests cannot measure accurately. Hence, new type of tests has the following demerits.

1) Encourage guessing: As answers are suggested in the item, it encourages guessing.
2) Difficulty in construction: The number of question in the objective type tests is many. Only experienced, competent and efficient teachers can construct these questions. Thus, the construction of questions in these tests is very difficult.
3) Lack of organization of thought: In these tests, pupils answer smaller questions. This does not develop either their imagination and original thinking or their capacity of organising their thought in a sequence.
4) Leads to unfair means: Students may use unfair means, like whisper answer or make some gestures to complete the test.
5) Sometimes these tests are not diagnostic.
6) Difficulty of Measuring Mental Abilities: In essay type tests, it is easy to measure the thought, logic and criticism powers of the pupils. In objective tests, the measurement of these abilities cannot be done.

Check Your Progress 1

1. Enumerate the Characteristics of an objective type test.

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2. List a few Advantages of an objective type test.

11.4 STEPS OF CONSTRUCTION OF OBJECTIVE TYPE TESTS- PLANNING, PREPARATION, TRY-OUT, EVALUATION OF TEST

The steps involved in the construction of the objective type test items are Planning, Preparation, Try-out and Evaluation. These steps are discussed in the following pages along with the types of objective type test items.

11.5 TYPES OF ITEMS OF AN OBJECTIVE TEST- RECALL TYPE-RECOGNITION TYPE- ADVANTAGES AND LIMITATIONS

Objective type tests can be classified into two broad categories according to the nature of responses required by them.

(a) Supply/Recall Type

(b) Selection or Recognition Type

SUPPLY/RECALL TYPE

Supply type items are those in which answers are not given in the question. The students supply their answer in the form of a word, phrase, number or symbol. These items are also called as 'free response' type items. According to the method of presentation of the problem these items can be divided into two types viz.,

(1) Short answer type (2) Completion type

Example

SHORT ANSWER TYPE:

In which year the first battle of Panipat was fought? 152.6 A.D.

COMPLETION TYPE

The first battle of Panipat was fought in the year 1526 A.D.

In the first case the pupil has to recall a response from his past experience to a direct question. These type, of questions are useful in mathematics and physical science. But in the second case the pupil may be asked to supply a word, or words missing from a sentence. So, in completion type, a series of statements are given in which certain important words or phrases have been omitted and blanks are supplied for the pupils to fill in.

Principles of Constructing Recall Type Items : If the recall type items are constructed with the following principles then it will be more effective and it will function as intended.

1. The statement of the item should be so worded that the answer will be brief and specific.

The statement of the problem should be such that it conveys directly and specifically what answer is intended from the student.

Example

Poor: Where did Gandhiji born?

Better: Name the town where Gandhiji was born? 1!

2. The statement of the item should not be taken directly from the text books:

Sometimes when direct statements from text books are taken to prepare, a recall type item it becomes more general and am biguous.

3. While presenting a problem preference should be given to a direct question than an incomplete statement

A direct question is less ambiguous and natural than an incomplete statement.

Example

Poor: The battle of Palassey was fought in

Better: In which year the battle of Palassey was fought?

4. When tie answer is a numerical unit the type of answer wanted should beindicated

When learning outcomes ‘like knowing the proper unit, knowing the proper amount are expected at that time it must be clearly stated that in which unit the pupils will express their answer. Specially in arithmetic computations the units in which the answer is to be expressed must be indicated.

Example:

Poor : The normal body temperature of human being is -(94.8F)

Better : The normal body temperature of human being is .. Farenheit.

Poor : If one chocolate costs 25 paise what is the cost of 5 chocolates ? (Rs. 1 Ps. 25)

Better : Ifone chocolate costs 25 paise what is the, cost of 5 chocolates? Rs. Paise—(Rs .1 Ps 25)

5. The length of the blanks for answers should be equal in size and in a column to the right of the question

If the length of the blanks vary according to the length of the answer then it will provide clues to the pupils to guess the answer. Therefore the blanks of equal size should be given to the right hand margin of the test paper.

Example:

Poor : Total number chromosomes in human cell is — 46

The power house of the cell is known as

(Mitochondria)

Better :Total number of chromosomes in human cell is The power house of the cell is known as

6. One completion type item should include only one blank.

Sometimes too many blanks affect the meaning of the statement and makes it ambiguous. So that in completion type items too many blanks should not be included.

Example.

Poor : The animals those who have—(feather) and lay— (eggs) are known as—(aves).

Better : The animals those who have feather and lay eggs are called

Uses of recall type items.:

Several learning outcomes can be measured by the recall type items. Some common uses of recall type items are as following.

- It is useful to measure the knowledge of terminology
- It is useful to measure the knowledge of specific facts. It is useful to measure the knowledge of principles.
- It is useful to measure, the knowledge of methods and procedures.
- It is useful to measure the ability to interpret simple data.

- It is useful to measure the ability to solve numerical problems.

Advantages of recall type items

- It is easy to construct
- Students are familiar with recall type items in day to day class room situations.
- 'Recall type items have high discriminating value. In well prepared recall type items guessing factors are minimised.

Limitations of recall type items:

- These items are not suitable to measure complex learning outcomes. . -
- Unless care is exercised in constructing the recall items,. the scoring is apt to be subjective.
- It is difficult to measure complete understanding with the simple recall and completion type items.
- The student may know the material being tested but have difficulty in recalling the exact word needed to fill in the blank.
- Sometimes misspelt words put the teacher in trouble judge whether the pupil responded the item correctly not.
- Simple recall item tends to over-emphasize verbal facility and the memorization of facts.

(B) SELECTION/RECOGNITION TYPE

In the recognition type items the answer is supplied to the examinee along with some distracters. The examinee has to noose the correct answers from among them. So that these tests are known as 'Selection type'. As the answer is fixed and given so some call it 'Fixed response type' items. The recognition type test items are further classified into, following types.

i. True-False/Alternate Response Type
ii. Matching Type
iii. Multiple Choice Type
iv. Classification or Rearrangement Type.

TRUE FALSE ITEMS

True false items otherwise known as alternate response items consists of a declaratory statement or a situation where the pupil is asked to mark true or false, right or wrong, correct or incorrect, yes or no, agree or disagree etc. Only two possible choices are given to pupils. These items measure the ability of the pupil to identify the correct statements of facts, definition of terms, statement of principles and the like

Principles of Constructing True False Items

While formulating the statements of the true false items the following principles should be followed. 'So that the items will be free from ambiguity and unintentional clues.

1. Determiners that are likely to be associated with a true or false statement must be avoided.

Broad general statements like usually, generally, often and sometimes gives a clue that the statements may be true. Statements like always, never, all, none and only which generally pear in the false statements give clue ft the students in responding it.

Example:

Poor : T F = Usually the Prime minister of India takes his office for five years.

Poor T F = Always the Prime minister of India takes his office for five years.

2. Those statements having little learning significance should be avoided.

The statements having little significance sometimes compel the students to remember minute facts at the expense of more important knowledge and understanding.

3. The statements should be simple in structure. 'While preparing statements for the true false items long, complex sentences should be avoided because it acts as an extraneous factor which interfere in measuring knowledge or understanding.

Example:

Poor : The sex cell spermatozoa which is a male sex cell consists of two types of chromosomes like X and Y chromosome.
(T,F)

Better Male sex cell spermatozoa consists of X and Y chromosomes. (T, F)

4. Negative statements, especially double negative statements should not be used.

Double negative statements make the item very much ambiguous. Sometimes it is found that the students over: look the negative statements.

Example

Poor : The angles .of an equilateral triangle are unequal (T,F)

Better : The angles of an equilateral triangle are equal (T,F)

5 The item should be based on a single idea

One item should include only one idea. We can obtain an efficient and accurate measurement of students achievement by testing each idea separately

Example : .

Poor: The son of Humayun Akbar who wrote Ain-i-Akbari has preached a religion known as Din-i-Ilhai. (T, F)

Better: Akbar has preached a religion known as Din-i-Ilhai. - (T,F)

6. False statements should be more in number than true statements.

Pupils like more to accept than challenge therefore giving more false statements we can increase discriminating power the test and reduce the guessing.

7. The length of the true statements and false statements should be equal in size.

Uses of True False Items

True false Items are useful to measure varied instructional objectives. Some of the common uses of true false items are given below.

- It is used to measure the ability to identify the correctness of the statements, facts, definitions of terms etc.
- True false items are useful in measuring the ability to distinguish facts from opinion.
- It is useful to measure knowledge concerning the beliefs held by an individual or' the values supported by an organization or institution.
- True false items are useful to measure the understanding of cause and effect relationship.
- It is useful to measure the ability of the students for logical analysis.

Advantages of True-false Items:

- True-false items provide a simple and direct means of measuring essential outcomes.
- the important learning outcomes can be tested eventually well with true-false items like other Objective type items.
- The probability of an examinee achieving a high score on a true false test by guessing blindly is extremely low It uses few statements directly from text books.
- It possesses very powerful discriminating power.
- It is easy to construction.

Limitations of True-False Items

- As there are only two alternatives so it encourages guessing.
- Many of the learning outcomes measured by true-false items can be measured more efficiently by other items.
- A true false item is likely to be low in reliability when the number of items are less.
- The validity of these items are questionable as the students may guess the uncertain items consistently true or false.
- It does not Possess any diagnostic value.

Matching Items

Matching items occur in two columns along with a direction on the basis of which the two columns are to be matched. It consists of "two parallel columns with each word, number or symbol in one column being matched to a word, sentence or phrase in the other column." The first column for which matching is made are called as 'Premises' and the second column from which the selections are made are called Responses'. On the basis of which the matching will be made are described in the 'Directions'. The students may be asked to match the states with their respective capitals, historical events with dates, kings with their achievements etc.

Example

Direction-Match the dates in the column 'B' with the respective events in column 'A' by writing the number of the item in 'B' in the space provided. Each date in column 'B' may be used once; more than once or not at all.

A	**B**
India got her independence	(i) 1526
Sepoy Mutiny	(ii) 1857
Black whole tragedy	(iii) 1919
First battle of Panipath	(iv) 1942
Death of Mahatma Gandhi	(v) 1947
	(vi) 1948

Principles of Constructing Matching Items

Matching exercises are very much useful when it is properly arranged. While preparing a matching item care should be taken to

prevent irrelevant clues and ambiguity of direction. The following principles help to prepare effective matching exercises.

1. Homogeneous premises and responses should be given in one matching exercise.

In order to function a matching exercise properly the premises and responses of any matching cluster should be homogeneous. Therefore one matching exercise may include kings and their achievements, inventors and their inventions, explorers and their discoveries, countries and its best productions etc.

Direction On the .line to the left of each achievement listed in column A write the king's name in the column B who is noted for that achievement. The name of the kings in the column 'B' may be used once, more than once, or not at all.

A	**B**
Sun temple of Konark	A. ChodagangaDev
Tajmahal	B. KapilendraDev
Jagganath temple of PURI	C. LangulaNarashina Dev.
	D. Sahajahan

2. The list of Premises and Responses, should be short

In order to maintain the homogenity of items it must be short listed. Experts are of the opinion that 4 to 5 premises should be matched with 6 to 7 responses. Certainly there should not be more than ten in either column.

3.The longer phrases should be used as premises and shorter as responses:

It enables to take the test efficiently. It enables examinees to read the longer premise first and then write the response rapidly.

4.The premises and responses should be unequal in number :

The number of responses should be more or fewer than the premises. The students should be instructed in the direction that response may be used once, more than once or not at all. This is the best method to reduce guessing in matching exercises.

5.Responses should be arranged in logical order

In responses the numbers should be arranged sequentially from low to high. The words should be arranged in alphabetical order.

6. Directions should clearly explain the intended basis for matching:

To avoid ambiguity and confusion clear direction about the basis for matching must be given. It will also reduce testing time because the examinee need not to read all the premises and responses to understand the basis for matching.

7. One matching exercise must be given on one page of the test paper.

Uses of Matching item

- Useful in measuring the relationship between two things like dates and events, persons and their achievements, terms and definitions, authors and books, instruments and uses etc.
- It is used to measure the ability to relate the pictures with words.
- It. is useful to measure the ability to identify positions on maps, charts or diagrams.

Advantages of Matching, Items

- Matching items are easy to construct.
- Large amount of related factual material can be measured within a short period.
- Guessing factor is minimum in a carefully and properly constructed matching item.
- These items are equally reliable and valid like other objective type items.

Limitations of Matching Item

- It is limited to test the factual information only.
- It is not efficient to measure the complete understanding and interpretation ability of the pupils
- Always it is not possible to find a good number of homogeneous items.
- It is inferior to multiple-choice item in measuring application and judgment aspects of students' learning.

MULTIPLE CHOICE TYPE ITEMS

Multiple choice type items are the most widely used objective type test items these items can measure almost all the important leaning outcomes coming under knowledge, understanding and application it can also measure the abilities that can be tested by means of any other item-short answer, true false, matching type or essay type.

In multiple choice type items a problem is presented before the student with some possible solutions. The statement of the problem

may be presented in a question form or in ax1 incomplete sentence form. The suggested solutions are presented in words, numbers, symbols or phrases. The statement in a multiple choice type item' is known as 'stem' of the item. The suggested solutions are called as alternatives, or choices of options. The correct alternative is called as the answer and the other alternatives are known as distractors or decoys or foils in the test- the examinees are directed to read the stem and to select the correct answer.

Example

Sentence completion form Encircle the letter behind the correct answer.

The apparatus used for measuring the density of liquid things is called

(a) Thermometer (b) Barometer

(c) Pyrometer d) Lactometer

(e) Hygrometer.

Question form: Encircle the letter behind the correct answer

Which one of the following cities is the capital of United Kingdom?

(a) Lankashire (b) London

(c) Lords (d) Manchester

(e) Edinburgh

Principles for Constructing Multiple Choice Type items

As we have discussed the multiple choice type items have a tide applicability in educational measurement. Therefore care Lust be taken in constructing multiple choice type items to enhance its applicability and quality. Construction of multiple choice type items include two major functions.

(a) Construction of the stem

(b) selecting ideal alternatives.

The following principles will help the test maker in this direction.

1. Formulate the stem that clearly represent the definite problem. In a multiple choice item a question or an incomplete statement should include the complete problem in it. It must indicate what the student has to select from the alternatives.

Example:

Poor : Bhubaneswar is the

(a) Pink City of India.

(b) Biggest City of India.

(c) Temple City of India.

(d) the largest Populated City in India. Better

Better : The temple city of India is

(a) Jaipur

(b) Delhi

(c) Banaras

(d) Bhubaneswar

In the first example it is not clear; what answer the test maker expects from the test maker. The alternatives are -very much lacks in homogenity. But in the second example it is clearly indicated that the test maker wants to know which is this temple city of India. The alternatives are also homogeneous in nature.

2. The item stem should material: The item should include as it should be free from irrelevant that which is short, easily read and problem be free from irrelevant the complete problem as well materials; The best item is clearly indicate the complete problem.

Example

Poor : Jaipur situated in Rajasthan also the capital of Rajasthan is known as

(a) Temple City of India.

(b) Pink City of India.

(c) Thickly populated city of India.

(d) City situated at highest altitude

Better : Which city is known as Pink City of India.

(a) Jaypur
(b) Bangalore
(c) Chandigarh
(b) Calcutta

But sometimes when our main thrust is to measure the problem solving ability exceptionally we use irrelevant materials. Because it helps us to know whether the student is able to identify the relevant material to solve the given problem or not.

3. Avoid the use of questions or exact problems used during instruction : The exact questions discussed during the class-room instruction should be avoided. The questions should be novel and unique.

4. Negative statements should only be used when it is required : Items that are negatively stated, sometimes put the

examinee in confusion. It is easy to construct a negatively stated item by picking text book statement and turning it into a negative statement. But sometimes it is desirable to phrase the stem question to ask not for the correct answer, but for the incorrect answer.

5. There should not be any grammatical link between the stem and the alternatives : Sometimes the grammatical link between the stem and alternatives give clue to answer the question:

Example

Poor The famous psychologist I Pavlov is a

(a) American (b) Indian

(c) Russian (d) African

Better : The famous psychologist I. Pavlov belongs to which country?

(a) America (b) India

(c) Russia (d) U.K.

6. All the distractors should be homogeneous in nature: All the distractors should be so framed that each distractor seems to be correct answer. Students those who have not achieved the desired learning out-come, the distractor should be more attractive for them. This distracting power of the distractors can be judged, from the number of examinees elected it. If a distracter is not attempted by anybody it should be eliminated or revised.

7. Avoid the verbal association between the stem and e correct answer : Sometimes verbal association between the stem and the correct answer provide an irrelevant clue to answer the question. Rather the item can be made effective by making the distractors verbally associated with the stem instead the correct answer.

Example

Poor : To get the data about the developmental works of your locality which agency you will consult.

(a) Panchayat office (b) Local block office

(c) Tahsildar office (d) Agriculture office.

Better. Which agency you will consult to get the data of Developmental works of your locality

(a) Panchayat office (b) Block office

(c) Tahasildar office (d) Local Agricultural office

8. All the alternatives should be equal in length: There is a tendency to express the correct answer in a greater length than other

alternatives. This provides a clue to choose the alternative as correct answer.

9. The correct answer should be clear, concise, correct id free of clues.

10. The responses 'all of the above' and 'none of the love' should only be used when it is appropriate: Sometimes the responses like 'all of the above' or 'none of the above' added as the final alternative.

The response 'all of the above' forces the student to consider all the alternatives and increase the difficulty of the items. But the case of this response as the correct answer is appropriate, when all the preceding alternatives are entirely correct to the item.

The response 'none of the above' is used either as the correct answer or as a distractor. Sometime to avoid the dis4ractor which are more difficult than the correct answer the alternatives are added.

Example:

Misuse of the response:

Which one of the following is not an example of are

(a) Crow (b) Eat

(c) Parrot (d) None of the above.

(Here the examinee may answer 'd' as the correct response)

Better use of the response :

Which word is misspelt.

(a) Permanent (b) Temperament

(c) Cantonment (d) None of the above

ii. When other item types are more effective then multiple-choice type item should not be used When other items proved effective to measure learning outcome at that time unnecessary favour should not be shown to multiple choice items. There are also some learning out-comes which cannot be measured by multiple choice items in that case other item types like—short answer, true false or matching type may be used.

12. Number of alternatives in each item need not to be same.

Uses of Multiple Choice Items

Multiple choice items have an wide applicability in measuring students achievements. Except some special learning outcomes like ability to organise, ability to present ideas all other learning outcomes can be measured by multiple choice items. It is adaptable to all types of

instructional objectives viz. Knowledge, understanding and application. Following are some of the common uses of multiple choice type items.,

To measure knowledge of terminology

Multiple choice type items can be used to, measure the knowledge of terminology. A student is asked to select either the accurate definition of the term or the accurate term for a given definition.

Example

Which one of the following central tendency indicate exact midpoint of the distribution.

(a) Mode (b) Median

(c) Mean

To measure knowledge of specific facts

Knowledge of specific facts can be measured with multiple choice type test items, like dates, name, places etc.

Example

Who was the first Primeminister of India

(a) Sardar Patel (b) M K Gandhi

(c) J.N. Nehru (d) Mrs. India Gandhi

When did Orissa become a separate state

(a) 1935 (b) 1936

(c) 1937 (d) 1938

To measure knowledge of principles

Multiple choice type tests are very much useful to measure knowledge of principles.

Example

The law of effect in learning explains

(a) the effect of stimulus on learning

(b) How learning affects the learner

(c) effect of learning on stimulus.

To measure knowledge of methods and procedure

Methods and procedures related to laboratory experiment, teaching learning process, communication process, procedures regarding the function of a government, bank or organisation can be best measured by the multiple choice type items.

Example

Which one of the following method is best suitable to teach best in class-VI

(a) Lecture Method (b) Experimental Method

(c) Discussion Method (d) Story Telling Method

To measure the ability to apply the knowledge facts and principles in solving problems.

In order to know the understanding level of the students they must be asked to identify correct application of fact or principles.

Multiple choice type items can be used to measure this ability to apply.

Example:

The principle of surface tension explains that

(a) the shape of the liquid molecule.

(b) how liquid passes from the surface to other surface.

(c) the upper and the lower meniscus .of the fluid in capillary tube.

To measure the ability to interpret cause and effect relationship

One way to measure the understanding level is to ask the students to show the cause and effect relationships. Here the examinee is presented with some specific cause and effect relationships in the stem and some possible measures in the alternatives. The student has to nd out the correct reason

Example:

A piece of ice will not submerge in water because.

a. Low density of ice than water.
b. Equal density of ice and water.
c. High density of ice than water.
d. None of the above

Advantages of Multiple Choice Items

- Multiple choice items are very .much flexible. So that it can be used to measure a variety of learning objectives—knowledge, understanding and application areas.
- It is free from ambiguity and vagueness if carefully constructed.
- Chance of guessing is low than the true-false items.
- It does not require homogeneous items like matching exercises.
- It is more reliable than the true-false items as the number of alternatives are more.

- It is easy to construct quality tests with multiple items. It possess objectivity in scoring.

Limitations of Multiple Choice Items

- It is limited to learning outcomes at the verbal level only. As it is a paper-pencil test it only measures what the pupils know and understand about the problem situation but does not measure how the pupil performs in that problem situation.
- It is not effective to measure learning outcomes requiring the ability to recall, organise, or represent ideas.

It is not completely free from guessing. Guessing factor is more in multiple choice type items than the supply type items.

Check Your Progress 2

1. What are the two major types of Objective type questions?

11.6 LET US SUM UP

We have discussed the objective type test items in detail in this unit. The different types of objective type test items were also discussed with the principles of constructing those items.

This unit is of great practical utility for all practising teachers.

11.7 UNIT END EXERCISES

1. Construct an objective type test paper of 50 items choosing a unit from your subject..

11.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1
1.

i) Validity
ii) Reliability
iii) Objectivity
iv) Simple to Mark
v) Easy to use
vi) Economy in use

2.

i) Comprehensibility
ii) Utility
iii) Practicability
iv) Administrability
v) Validity
vi) Reliability
vii) Objectivity

Check Your Progress 2

1.

(a) Supply/Recall Type

(b) Selection or Recognition Type

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UNIT XII - ANALYSIS AND INTERPRETATION OF SCORES I

12.1 INTRODUCTION

Data are gathered on various attributes in order to ascertain the performance of the individual or group of individuals. This helps in better understanding of the individuals or group of individuals. A measure of central tendency represents average and gives concise description of the performance of the group as a whole so as to allow comparability of groups in terms of physical performance. Measures of central tendency are thus used to interpret the nature of scores obtained by the group in general.

In this present unit, you are going to study about the meaning and the importance of the measures of central tendency.

12.2 OBJECTIVES

After going through this unit, you will be able to

- explain the meaning of measures of central tendency
- calculate mean, median and mode for grouped and ungrouped data
- give example of situations where mode serves as meaningful measure
- enumerate educational situations where mean is most appropriate measure of central tendency
- select an appropriate measures of central tendency as per the nature of data and purpose in hand

12.3 IMPORTANCE AND ESSENTIALS OF INTERPRETATION OF SCORES

Any learned person likes to read the literature in his/her field Even a teacher has to read a lot While going through this literature, one comes across statistical symbols concepts and ideas A study of statistics helps one to draw ones own conclusions from them rather than accepting the writers inferences As a teacher, you have to use tests and other tools for assessing the achievement level and other behaviour of the children With the help of simple statistical methods interpretation of scores becomes much more meaningful If a teacher is interested in understanding research work, he needs more extensive skills in statistical methods

The language of mathematics and statistics permits the most exact kind of description. These disciplines also force us to be definite and exact in our procedures and in our thinking. Statistics enable us to summarise our results in meaningful and convenient form. They enable us to draw general conclusions according to accepted rules and say to what extent faith should be placed in such generalisations. Under conditions we know and have measured statistics enables us to predict, what is likely to happen It also enables us to analyse some of the causal factors of complex events.

IMPORTANCE OF THE ORGANISATION OF DATA

When a set of data contains only a few entries, a simple listing of the, observations might be sufficient for interpreting the data. But usually in our schools, the number of children in a class is large, so the simple listing of the observations may not be sufficient for the interpretation of data pertaining to the entire class, Here the- data are usually organized into groups called classes and presented in a table which gives the number of observations in each group. Such a table gives a better overall view of the distribution of data and enables one to rapidly assess important characteristics of the data.

The study of Interpretation of Scores is indispensable for teachers. A class room teacher requires it for:

- knowing the performance of his students in different subjects
- comparing their achievements with students of other institutions
- identifying those students who require his help in order to secure more marks
- selecting them for admission to higher courses or for jobs based on. their performance in entrance/competitive examinations.
- developing norms for achievement and psychological tests
- constructing and standardising scholastic ability tests etc.,

12.4 MEASURES OF CENTRAL TENDENCY-ARITHMETIC MEAN, MEDIAN AND MODE

(I) THE MEAN

A set of scores of academic achievement represent the -level of academic performance of an individual student in a group. As there is a representation of an individual student's academic performance, so is the level of representation of the group as a whole. The statistical method by which we get the level of representation of the group as a whole is called the Mean.

Mean is computed by summing up all the individual scores and dividing the result by the total number of scores. If X stands for the individual score, the mean would be computed by the formula

$$\overline{X} = \frac{\sum X}{N}$$

Where $\sum X$ is the sum of all the individual scores in group;

N is the number of scores in the group;

$\overline{X}$ is the mean.

Computation of the Mean for Ungrouped

Consider the academic achievement scores of 10 students in a group:

While the individual scores like 76, 65 etc. represent the level of academic achievement of individual students concerned, the Mean 54 represents the level of academic achievement of the group as a whole.

Sometimes the individual scores are compared to this Mean to describe the position of particular student with regard to the group as a whole. This gives us useful information whether a particular student is above or below the group mean, with regard to the achievement. In this way we can classify the group into subgroups like the students who scored above the mean and the students who scored below the mean: In the example cited, 5 students are above the mean and 5 students are below the mean.

Note that, if the scores are arranged in order, the position of the mean in the dispersion is in the center. In the following example

23, 25. 27, 39 (54) 65, 70, 76, 83

The mean is 54. Thus the mean provides a central value of the dispersion.

Computation of Mean for Grouped Data (Discrete series)

Consider the data: 42, 42, 42, 42, 50, 50, 50, 50, 61, 61, 61, 61, 80, 80, 31, 31.

This data can be grouped as found under columns 'X' and 'f.

X	F	fX
31	2	62
42	3	126
50	4	200
61	3	183
80	2	160
	$\sum f = 49$	$\sum fX = 731$

$$\overline{X} = \frac{\sum fX}{N}$$

$$= \frac{731}{14} = 52.21 \text{ (two decimals)}$$

This method of computing the mean is useful to find the mean for a large group, and where the data is given in frequency distribution.

Computation of Mean for Grouped Data with Class Intervals (Continuous Series)

When the data is very large, or the data is in a continuous variable, the data will be brought under the class interval form. The following table shows one such data (under columns 'class interval' and 'fX and the calculation of mean for such data.

Class interval	**F**	**Mid-point (X)**	**fX**
10-19	4	14.5	58.0
20-29	7	24.5	171.5
30-39	12	34.5	414.0
40-49	15	44.5	667.5
50-59	6	54.5	327.0
60-69	5	64.5	322.5
	$\sum f = 49$		$\sum fX = 1960.5$

In this form of data we do not take the exact 'x' values but only the class interval under which each 'X' value falls. We take the mid-value of the class interval as the corresponding 'X' value. While fading the mean of this distribution, we multiply this mid–value by its corresponding frequencies and divide the summation by total number of cases $(\sum f)$. As the mid-Val is an approximation of the X' values, the mean we obtain in this method is also an approximate measure.

$$\overline{X} = \frac{\sum fX}{N}$$

$$= \frac{1960.5}{4} = 40.01 \text{ (two decimals)}$$

(II)THE MEDIAN

It is not a necessary condition that the number of student a who score above the mean is equal to the number of students who score below the mean. There are occasions where there may be many students above the mean and few students below the mean. In these circumstances we want to know the value above and below which the number of students fail. This value is called the median.

To put in other words median is a value in the dispersion above which 50% of the values and below which 50% of the values fall. That is, this median value cuts the dispersion into two halves. Accordingly, the median like the mean gets a central position in the dispersion.

Consider the example 3, 3, 4, 4, 4, 4. 4, 6, 7, 2, 1 In order to this dispersion into two halves we must find the middle man. Since there are 11 students, 6th student is the middle man in this group. Since we are concerned with position we must arrange the values in order. Therefore, keeping the values in ascending order (or descending order), we have to pull out the 6th value in the dispersion. Keeping the above dispersion in ascending order, we get:

1, 2, 3, 3, 4, 4, 4, 4, 4, 6, 7

The score of the 6th man is 4 and if there are even number of students, say 12, then the median value of them is 6th $\left(\frac{12}{2}+1=6\text{th}\right)$ and the 7^{th} man $\left(\frac{12}{2}+1=7\text{th}\right)$. We get two values as median values. But make it a single value by averaging the two.

Consider the following example:

Data: 'Is., 65, 45, 40, 43, 25, 67. 89, 70, 25, 82, 90

Ordered data: 25, 25, 40, 43, 45, 65, 67, 70, 78, 79, 82, 90

The Middle men: $\frac{12}{2}+1=6\text{th}$ and $\frac{12}{2}+1$ = 7^{th} men, and their scores are 65 and 67.

Average = $\frac{65+67}{2}=66$

Median value = 66

In general, If there are odd number of observations in a data we find the middle man by the formula $\frac{N+1}{2}$ and If there -are even number of observations we find the two middle men by the formulas $\frac{N}{2}$ and $\frac{N}{2}$+1, N being the number of observations. When there are two middle men, we average their values to give the median value.

Computation of Median value for Grouped Data

Consider the following data:

X	f	cum f
25	3	3
27	5	8 (median lies)
34	2	10
45	2	12
60	1	13
	13	

Since there are 13 students the 7th student $\left(\frac{13+1}{2}=7\text{th}\right)$ is the middle man. The 7th man is in the group in which each student scores 27. The score of the 7th man is 27. Therefore the median value is 27. If there are even number of students in the grouped data we have to find the values of the two middle men and average them as it was done in the ungrouped data.

Computation of Median value for Grouped Data with Class interval

In the following example the method of computation of median value for grouped data for grouped data the class Interval is explained Since the scores are provided in the class interval, we cannot find the

exact median value, but only the class interval which contains the median value.

Class interval	f	cum f
10-19	4	4
20-29	7	11
30-39	12	23
40-49	15	38 (median lies)
50-59	6	44
60-69	5	49
	49	

In this dispersion the middle man is $\frac{49+1}{2}$ = 25^{th} man. The 25^{th} man has scored in between 40 and 49. This class interval contains the median value. This class interval is known as median class.

The Median is obtained by the formula

$$\text{Median} = l + \left[\frac{\frac{N}{2} - cum\ f1}{f_q}\right] x\ i$$

where 1 is the lower limit of the class interval in which the median falls.

i is the length of the class interval

cum. f1 is the cumulative frequency upto the class interval which contains the quartile.

f_q is the frequency of the class interval which contains the quartile.

N is the number of scores

Using the formula, we get:

$$\text{Median} = 39.5 + \left[\frac{\frac{49}{2} - 23}{15}\right] x\ 10$$

$$= 39.5 + 1$$

Median = 40.5

(III) THE MODE

We always assign more Importance to the majority, as majority is an important concept in our day to day life as also in our class-room. In aset of scores of academic achievement of a group of students, we are interested to know what score was scored by majority of students. This value is known as the mode. Therefore, the mode is the value in the dispersion which has the highest frequency.

Computation of the Mode in an Ungrouped Data

Consider the set of scores of academic achievement of 12 students.

8, 8, 8, 4, 3, 3, 3, 5, 5, 9, 9, 8

This can be rearranged

In this dispersion, 8 was scored by majority of students. That is, 8 has the highest frequency. Thus 8 is the mode value of the dispersion.

Sometimes if there are two values occurring with same frequency, we say that there are two mode values. We call that dispersion as bimodal dispersion.

Computation of the Mode value for Grouped Data

Consider the following frequency distributions

X	F
25	7
39	15
40	22
62	20
93	6

In this dispersion the value 40 occurs 22 items. That is 40 has the highest frequency. Therefore 40 is the mode value of this dispersion

Unless there is something unusual in the dispersion like more number high scores or more number of low scores the mean the median and the mode values lie in the center of the dispersion. Since, all these three measures are found in the center of the dispersion they are called the measures of central tendency.

If we compute the mean the median and the mode for a given dispersion of academic achievement scores it gives answers for three important questions The mean answers the question as to the effectiveness of the group as a whole The median answers which value

cuts the dispersion into two halves The mode answers the question which score was scored by majority of the students.

Check Your Progress 1

State the formula for finding the mean, median.

12.5 LET US SUM UP

We have discussed the three measures of central tendency, their computational procedures and relative importance of each one of them in different educational situations. Each one of them has situations for its best use and limitations. So one has to take a conscious decision about their applicability.

12.6 UNIT END EXERCISES

1. Calculate the mean, median, and mode for the following frequency Use the Short cut Method in computing the mean.

(1)Scores	F		(1)Scores	F
70-71	2		90-94	2
68-69	2		85-89	2
66-67	3		80-84	4
64-65	4		75-79	8
62-63	6		70-74	6
60-61	7		65-69	11
50-59	5		60-64	9
56-57	4		55-59	7
54-55	2		50-54	5
52-53	3		45-49	0
50-51	1		40-44	2
	N=39			N=56

12.7ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1.

Mean, $\overline{X} = \frac{\sum fX}{N}$

Median = $l + \left[\frac{\frac{N}{2} - cum\ f1}{f_q} \right] x\ i$

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UNIT XIII - ANALYSIS AND INTERPRETATION OF SCORES II

13.1 INTRODUCTION

Data are gathered on various attributes in order to ascertain the performance of the individual or group of individuals. This helps in better understanding of the individuals or group of individuals. A measure of dispersion gives the scatteredness or the dispersion.

Apart from measures central tendency, another important characteristic of the distribution is the variability. It is equally necessary to know about the variability of the data, which may be concentrated or scattered around the measures of central tendency.

In this present unit, you are going to study about the meaning and the importance of the measures of variability and Correlation.

13.2 OBJECTIVES

After going through this unit, you will be able to

- explain the meaning of measures of dispersion
- understand the concept of dispersion
- differentiate between measures of central tendency and measures of dispersion
- state the importance of measures of dispersion
- calculate Q for given data.
- use appropriate measures of dispersion in classroom situation for the improvement of teaching-learning process.
- define correlation
- interpret the results obtained
- discuss the importance of correlation

13.3 MEASURES OF VARIABILITY- RANGE, QUARTILE DEVIATION, STANDARD DEVIATION, AND MEAN DEVIATION

Our investigation into the set of scores of a group of students still continues, but in a different view. Given the set of scores, the teacher is interested in finding out how the scores vary, because, it points out the fact whether the students in a group are more or less alike, or whether there are wide individual differences among the students with regard to the particular ability measured. This knowledge will help the teacher in some way to decide the method of teaching. If he does not find much individual differences the group is homogeneous and he can adopt a single teaching method to the whole group. If he finds much individual differences, the group is heterogeneous. Then he can bifurcate the class into bright and dull groups and follow two different methods — one for the bright students and the other for the dull students. Thus the 'measures of variation' indicate to what extent the Individuals in the group differ from one another with regard to the ability measured. Range, Quartile Deviation, Mean Deviation, and Standard Deviation are, some of the measures of Variations.

(I) THE RANGE

The following data shows the dispersion of Numerical ability scores of 10 students: 89, 76, 54, 54, 67, 76, 35, 47, 57, 60.

In this dispersion, the scores vary from 35 to 89. That is the minimum score obtained by the students is 35 and the maximum score is 89. Other scores lie in between the two. That is, the scores run from 35 to 89. The difference between these two limits is called the range.

Range = Maximum value - Minimum value

Range = 89 - 35 = 54.

Consider another set of scores 87, 86, 83, 85, 85, 89, 80, 80, 84, 81 This vanes from 80 –to 89. Range = 89 -80 = 9. We realise that the second group has a very narrow variation while the first one has a wide variation we can say that the students are more alike in the second group than in the first group.

(II) QUARTILE DEVIATION

Even though the computation of range is easy, it will, not provide an accurate information, about the variation of the-scores. Let us look at the following example:

Class A:	3, 3, 3, 3, 4 ,4, 4,9	Range.= 9 - 3 = 6
Class B:	3, 3, 3, 3, 4, 4, 4,4	Range = 4 - 3 = 1

In the above example, even though the range provides different variation measures, (i.e. 6 and 11,-we observe that the two dispersions

have more or less the same scores except 9 in the right extreme of the first group. The only one extreme value (i.e. 9) in the first group considerably changes the value of the range. Therefore the range is a crude measure and is highly affected by the extreme values.

In such circumstances, to provide a more accurate measure of variation, we make use of Inter-Quartile-Range or Quartile Deviation IQD) in which the extreme scores are neglected. In this procedure, the dispersion is divided into four quarters. First quartile or QI is the value below which 25% of the values lie and above which the remaining 75% of the values lie. The second quartile is the median. (Remember while finding the median, we cut the dispersion into two halves). The Third quartile (Q3) is the value below which 75% of the values lie and above which 25% of- the values lie.

The difference between Q3 and Q 1 gives the inter-quartile range. Half of this value is the Semi-inter-quartile range or what is called the Quartile Deviation. Semi-inter-quartile Range as the name suggests. is the midpoint of Inter-quartile range. It is obtained by the formula

$$QD = \frac{Q_3 - Q_1}{2}$$

Now let us calculate the QD for the following distribution:

Class interval	**frequency**	**Cumulative frequency**
1-10	4	4
11-20	8	12
21-30	11	23 (Q1 lies)
31-40	15	38 (Q2 lies)
41-50	12	50 (Q3 lies)
51-60	6	56
61-70	3	59

The first quartile (Q1) is obtained by the formula

$$Q1 = 1 + \left[\frac{\frac{N}{4} - \text{cum f1}}{f_q} \right] \text{x i}$$

where 1 is the lower limit of the class interval in which the quartile falls.

i is the length of the class interval

cum f1 is the cumulative frequency upto the class interval which contains the quartile.

f_q is the frequency of the class interval which contains the quartile.

N is the number of scores

Using the formula, we get:

$$Q1 = 21 + \left[\frac{\frac{59}{4} - 12}{23}\right] \text{x } 10$$

$$= 21 + 1.19$$

$$= 22.19$$

$$Q3 = 1 + \left[\frac{\frac{3N}{4} - \text{cum f1}}{f_q}\right] \text{x i}$$

$$= 41 + \left[\frac{\frac{3(59)}{4} - 38}{50}\right] \text{x } 10$$

$$= 41 + 1.25$$

$$= 42.25$$

Inter –quartile Range is = Q3-Q1

$$= 42.25 - 22.19$$

$$= 20.06$$

Semi –inter –Quartile Range or

$$\text{Quartile Deviation (QD)} = \frac{Q3 - Q1}{2}$$

$$= \frac{42.25 - 22.19}{2}$$

$$= 10.03$$

The Quartile Deviation is easy to calculate and easy to understand. One important drawback of QD is that, like range, QD is not based on the observations (scores) of the dispersion nor is it capable

of further algebraic treatment. It is affected to a considerable extent by the fluctuations of the scores. That is, a change in the value of a single item may in certain cases affect the QD value considerably Despite all these defects, QD may give an approximate idea of the extent of variabflft3, in dispersion.

(III) MEAN DEVIATION

We have seen that all the scores are not involved in the calculation of QD. In order to overcome this defect, statisticians use another method called Mean Deviation (MD). It gives a better variation measure than QD.

To find out the Mean Deviation, the deviation of each score from the mean of the group is found out (difference between the score and the mean and the average of these deviation scores is the mean deviation.

Here only the numerical value of the deviation scores are taken into account but the sign is ignored

Mathematically,

$$MD = \frac{\sum I(X - \overline{X})I}{N}$$

Note: Two vertical lines standing on the numerator indicate that the sign of the deviation scores is ignored.

This method gives somewhat more accurate measure of variation of the dispersion than the Range or Quartile Deviation. The MD is rigidly defined and its value is precise and definite. It is based on all the observations in the data. It is not affected very much by the values of extreme scores. However this measure of variation is not in common use and generally variation is studied through Standard Deviation.

(IV) STANDARD DEVIATION

When calculating the mean deviation, the difference between the individual score and the mean may be plus or minus. To rule out the effect of this sign. these differences are squared. Then the average of the squared values is obtained. This value is. called the "mean square" or "variance". The square-root of this value gives the "Standard Deviation (SD)". To state in brief the SD is the square root of the arithmetic average of the squares of the deviation measured from the mean.

The method of calculation of Mean Deviation (see upto 5 columns) and the Standard Deviation (upto 6 columns) is illustrated in the following example. (For want of space the computation MD and SD

are not presented for ungrouped data and grouped data, for the principle of the calculation is the same. Students may practice such

Class interval	**Mid-point**	**f**	**x=$(X-\overline{X})$**	**fx**	**fx^2**
1-10	5.5	4	-29	-116	3364
11-20	15.5	8	-19	-152	2888
21-30	25.5	11	-9	-99	891
31-40	35.5	15	-1	-15	15
41-50	45.5	12	11	132	1452
51-60	55.5	6	21	126	2646
61-70	65.5	3	31	93	2883
			$\sum fx = 733$		$\sum fx^2 = 14139$

The mean was computed using the method illustrated earlier the heading 'Computation of the mean for grouped data with interval under class.

$$M.D = \frac{\sum fx}{N}$$

$$= \frac{733}{59} = 12.42 \text{ (two decimals)}$$

$$S.D = \sqrt{\frac{\sum fx^2}{N}}$$

$$= \sqrt{\frac{14139}{59}}$$

= 15.48 (two decimals)

Like the Mean Deviation, the Standard Deviation possesses the merit of rigid definition and this value is always definite. It is based on all the observations of the data. It is amenable to algebraic treatment. It is less affected by the fluctuations of sampling.

Uses of SD in our Class-room Situation

The SD is the most stable index of variability and is customarily employed in experimental work and in research studies. Suppose that a class of 10th standard students has a mean of 65 with SD of 2.75 in Mathematics and a mean of 58 with SD of 7.52 in English tests, we can compare the variability of students ability m these two subjects We can

compare the variability of scores in te5 of Coefficient of Variation which the SD is used

$$V = \frac{100 x SD}{\overline{X}}$$

In the above example, the coefficient of variation in Mathematics is $V_m = \frac{100(2.75)}{65} = 4.23$ and the coefficient of variation in English is $V_e = \frac{100(7.52)}{58} = 12.96$

From these results we understand that the students are nearly three times more variable in English scores when compared to Mathematics scores. The greater the variation the wider the variability and the individual difference is wider. On the other hand, the lesser the coefficient of variation the narrower the variability and the the individuals are more or less alike in the ability measured. The above results indicate that students are more or less alike in mathematical ability, but- widely differ in the English talent.

Since coefficient of variation is concerned only with the variability of scores, it may be used to compare scores on different scales. For example the variation in intelligence test scores can be compared with the variation in Mathematics test scores though the scales used to measure the abilities are different.

13.4 COEFFICIENT OF CORRELATION –SPEARMAN BROWN'S RANK DIFFERENCE METHOD

CORRELATION

The concept of correlation refers to a relationship between two morel variables and is exemplified by the statement that those variables e co-related. Correlational research is most often conducted when it is not feasible to systematically manipulate the independent variables. Examples abound in Educational and Social Psychology where it is difficult to manipulate the variables systematically

Positive and Negative Correlation

The index of correlation is symbolised by r and its precise value

indicates the degree to which two variable are (linearly) related. The value that r may assume varies between +1.00, through zero, to -1.00. A value of + 1.0 indicates a perfect positive correlation between two variables and a value of -1.0 indicates a perfect negative correlation individual a positive.

Given measures on two variables for each individual a positive correlation exists if as the value of one variable increases, the value of

the other one also increases. If there is no exception the correlation will be high and possibly even perfect and if there are relatively few excePti0n5 it will be positive but not perfect. The correlation between intelligence and academic achievement is an example for a positive correlation because we know that as the scores in intelligence test increase the scores on academic achievement also increase.

The following table shows Fictitious Scores on Intelligence Test and Academic Achievement to illustrate positive correlation.

RANK CORRELATION

When the variables are in ordinal data or ranks a deferent kind of method is employed to find out the correlation between two variables called Rank correlation method. This correlation coefficient is also known as **Spearman rho correlation**. The formula for Spearman rho is

$$= 1 - \frac{6 \sum D^2}{n(n^2 - 1)}$$

Where D is the difference between each ranked pair of scores

D^2 is the sum of the squares -of the differences (I)), and
n is the number of pairs of scores.

Suppose that a researcher is attempting to determine the relationship between perceived leadership in class and perceived Intelligence level as ranked by the class teacher. The following table illustrates how the obtained ordinal scale variables are used to calculate the Spearman rho correlation Table showing the Spearman rho correlation between Leadership and Intelligence

Leadership rank	**Intelligence rank**	**D**	**D^2**
1	2	-1	1
2	7	-5	25
3	1	2	4
4	3	1	1
5	9	-4	16
6	4	2	4
7	10	-3	9
8	8	0	0
9	6	3	9
10	4	6	36
			$\sum D^2 = 105$

Spearman rho = $1 - \frac{6 \sum D^2}{n(n^2 - 1)}$

$$= 1- \frac{6(105)}{10(10^2-1)}$$

$$= 1- \frac{630}{990}$$

$$= 0.36$$

Check Your Progress 1

State the formula for finding the range, Quartile Deviation, Mean Deviation and StandardDeviation.

13.5 LET US SUM UP

We have discussed the three measures of dispersion, their computational procedures and relative importance of each one of them in different educational situations. Each one of them has situations for its best use and limitations. So one has to take a conscious decision about their applicability in different places.

The property which denotes the extent to which the values are spread about the central value is called dispersion. The measure of dispersion is a distance along the scale of measurement. Measure of relationship of paired variables is quantified by a co-efficient of correlation. The co-efficient of correlations value between -1.0 to +1.0. The correlation co-efficient is very useful in educational evaluation, standardizing tests and in making prediction.

13.6 UNIT END EXERCISES

1. Calculate the Q and S.D for the frequency distributions given in Question Number 1.

2. For the following list of test scores,

52, 50, 56, 68, 65, 62, 57,70

(a) Find the Mean and σ

(b) Add 6 to each score and recalculate Mean and σ

(c) Subtract 50 front each score, and calculate Mean and σ

(d) Multiply each score by 5 and compute Mean and σ

3. Find the Spearman's Correlation co-efficient for the following scores of students

Students	Scores in Physics	Scores in Mathematics
A	8	10
B	7	8
C	9	7
D	5	4
E	1	5
F	3	3

13.7 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

Range = Maximum Value – Minimum value

$$Q = \frac{Q_3 - Q_1}{2}$$

Mean Deviation, MD = $\frac{\sum I(X - \overline{X})I}{N}$

S.D = $\sqrt{\frac{\sum fx^2}{N}}$

13.8 SUGGESTED READINGS

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UNIT XIV - ANALYSIS AND INTERPRETATION OF SCORES III

14.2 INTRODUCTION

So far from the above unit you have learnt how to organise a distribution of scores and how to describe its shape, central value and variation. You have calculated the measures of central tendency to describe the central value of the frequency distribution. Al you have found the measures of variability to find the variation.

The present unit presents the concept and use of Normal Probability Curve in relation to the educational evaluation, the graphical representation of data namely, Histogram, Frequency Polygon and Cumulative frequency curve.

14.3 OBJECTIVES

After going through this unit, you will be able to

- Explain concept of Normal Probability Curve
- Enumerate the properties of Normal Probability Curve
- Recognise the various divergence in Normal Curves
- Justify the significance of Skewness and Kurtosis in the educational measurement and educational evaluation
- Appreciate the advantages of graphical representation of data
- Use appropriate graphical representation, for the data obtained by you in the classroom
- Interpret the data given in the graphical representation

14.4 NORMAL PROBABILITY CURVE- PROPERTIES AND USES

The concept of Normal Distribution

Carefully look at the following frequency distribution, which a teacher has obtained after examining 150 students of class IX on a Science achievement test.

Class Interval	Tallies	Frequency
85-89	I	1
80-84	II	2
75-79	~~IIII~~	5
70-74	~~IIII~~ II	7
65-69	~~IIIIIII~~	10
60-64	~~IIIIIIIII~~ I	16
55-59	~~IIIIIIIIIIII~~	20
50-54	~~IIIIIIIIIIIIIIIIIII~~	30
45-49	~~IIII IIIIIIIIII~~	20
40-44	~~IIII IIIIIII~~ I	16
35-39	~~IIII IIII~~	10
30-34	~~IIII~~ II	7
25-29	~~IIII~~	5
20-24	II	2
15-19	I	1
		150

Are you able to find some special trend in the frequencies shown the column 3 of the above table? Probably yes. The concentration of maximum frequency (f=30) is at the central value of distribution and frequencies gradually taper off symmetrically on both the sides of this value. If we draw a frequency polygon with the help of the above distribution, we will have a curve in the shape of a 'Bell' which will be symmetrical on both the sides.

If you compute the values of Mean, Median and Mode, you will find that these three are approximately the same.
(M=Med= Mode= 52).

This Bell shaped curve technically known as Normal Probability Curve or Simply Normal Curve and the corresponding frequency distribution of scores having equal values of all three measure of central tendency, is known as Normal Distribution. This normal curve has greater significance in mental and educational measurement. In measurement of behavioural aspects, the normal probability curve has been often used as reference curve.

PROPERTIES

The properties of Normal Probability Curve are:

1. The Normal Curve is Symmetrical.

The Normal Probability Curve (NPC) is symmetrical about the ordinate of the central point of the curve. It implies that the size, shape and slope of the curve on one side of the curve is identical to that of the other. In other words the left and right values to the middle central point are mirror images, as shown in figure below.

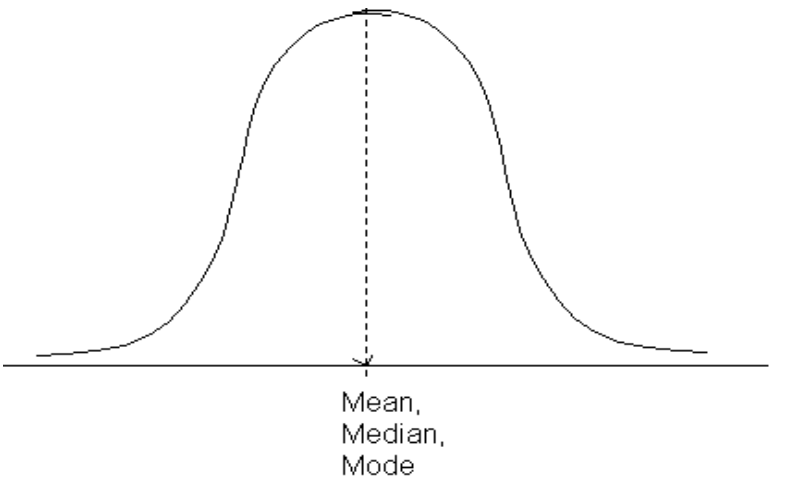


Fig. The Normal Curve is Symmetrical

2. The Normal Curve is Unimodal

Since there is only one point in the curve which has maximum frequency the normal probability curve is unimodal, i.e. it has only one mode.

3. The Maximum ordinate occurs at the Centre

The maximum height. of the ordinate always occurs at the central point of the curve that is, at the mid-point.

4. The Normal Curve is Asymptotic to the X-axis

The Normal Probability Curve approaches the horizontal axis asymptotically i.e.; the curve continues to decrease in height on both ends away from the middle point (the maximumordinate point); but it never touches the horizontal axis. Its ends extend from minus infinity**(-** ∞**)**to plus infinity (+ ∞**)** as shown in figure.

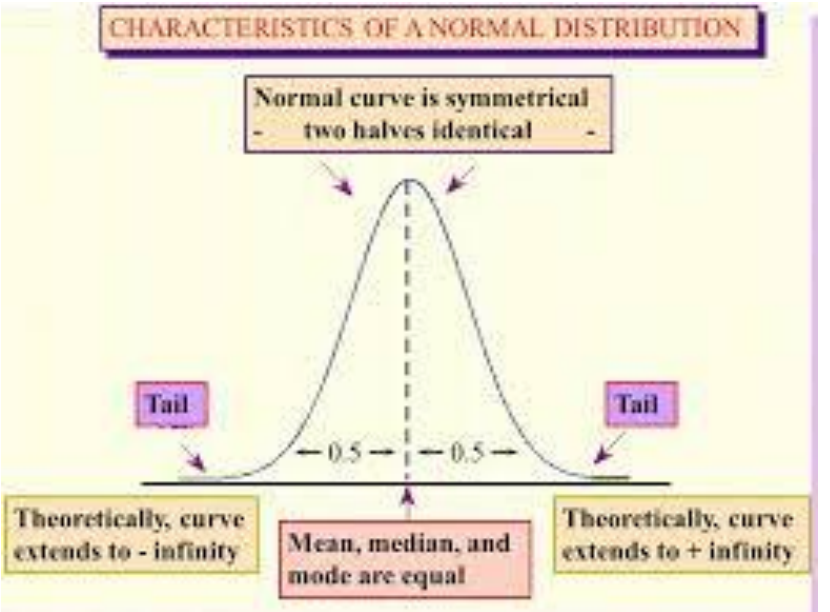


Fig. The Normal Curve is Asymptotic to the X-axis

5. The Height of the Curve declines Symmetrically

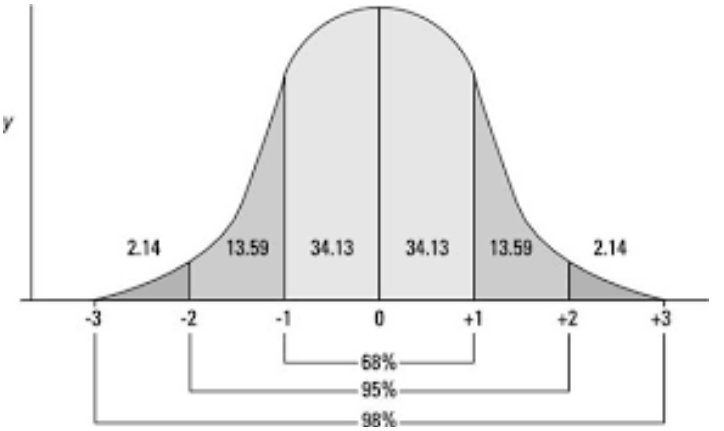
In the normal probability curve the height declines symmetrically in either direction from the maximum point.

6. **The Points of Influx occur at Point ±1 Standard Deviation (± 1 σ)**

The normal curve changes its direction from convex to concave at a point recognized as point of influx. If we draw the perpendiculars from these two points of influx of the curve on horizontal axis, these two will touch the axis at a distance one Standard Deviation unit above and below the mean (+ 1 σ).

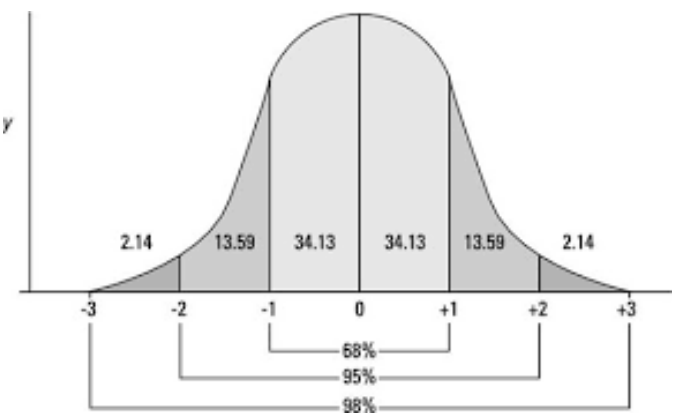
7. The Total Percentage of area of the Normal Curve within Two Points of Influxation is fixed

Approximately 68.26% area of the curve falls within the limits of 1 standard deviation uniform the mean as shown in figure.



8. The Total Area under Normal Curve may be also considered 100 percent Probability

The total area under the normal curve may be considered to approach 100 percent probability. The area between Mean and any point deviation given in terms-of a -.distance is always the same as shown in figure. The percentage area of these distances is known.



9. The Normal Curve is Bilateral

The 50% area of the curve lies to the left side of the maximum central ordinate and 50% lies to the right side. Hence the curve is bilateral.

10. The Normal Curve is a Mathematical Model in Behavioural Sciences

The curve is used as a measurement scale. The measurement unit of this scale is **±σ** (the unit standard deviation).

USES OF NPC

There are number of uses normal curve in the field of educational measurement and evaluation. They are:

1. to determine the percentage of cases (in a normal distribution) within given limits or scores

2. to determine the percentage of cases that are above or below a given score or reference point
3. to determine the limits of scores which include a given percentage of cases
4. to determine the percentile rank of a student in his own group
5. to find out the percentile value of a student's percentile rank
6. to compare the two distributions in terms of overlapping
7. to determine the relative difficulty of test items
8. dividing a group into sub-groups according to certain ability and assigning grades
9. to test the hypotheses and levels of significance
10. to divide a group into a given number of sub-groups based on a trait which follows normal distribution
11. used to convert raw scores z- scores and t-scores.

Check Your Progress 1

1. Define a Normal Probability Curve.

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2. Mention the Properties of Normal Probability Curve.

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1. List a few uses of a Normal Probability Curve.

14.5 SKEWNESS AND KURTOSIS

Divergence in Normality (The Non Normal Distribution)

In a frequency polygon or histogram of test scores, usually the first thing that strikes one is the symmetry or lack of it in the shape of the curve In the normal curve model, the mean, the median and the mode all coincide and there is perfect balance between the right and left values of the curve Generally two types of divergence occur in the normal curve

i) Skewness

ii) Kurtosis

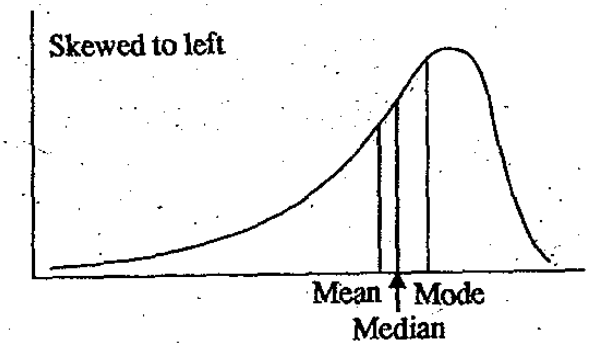
Skewness

A distribution is said to be Skewed when the mean and median fall at different points in the distribution and the balance i.e., the point of center of gravity is shifted to one side or the other to left or right In a normal distribution the mean equals the median exactly and there is no skewness.

There are two types of skewness which appear in the Normal Curve

a) Negative Skewness
b) Positive Skewness
c) Negative Skewness

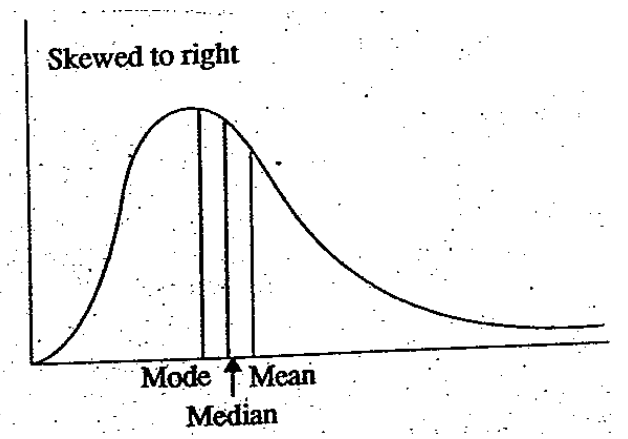
Distribution is said to be skewed negatively or to the left, when scores arc massed at the high end of the scale i.e the right side of the curve and are spread out gradually towards the low end i.e. the left side of the curve. In a negatively skewed distribution the value of median will be higher than that of the, value of the mean. Can you think why Would it be so



Neative Skewness

b) Positive Skewness

Distributions are skewed positively or to the right, when scores are massed at the low, i.e. the left end of the scale, and are spread out gradually toward the high or right end as shown in the figure below.



Positive Skewness

Kurtosis

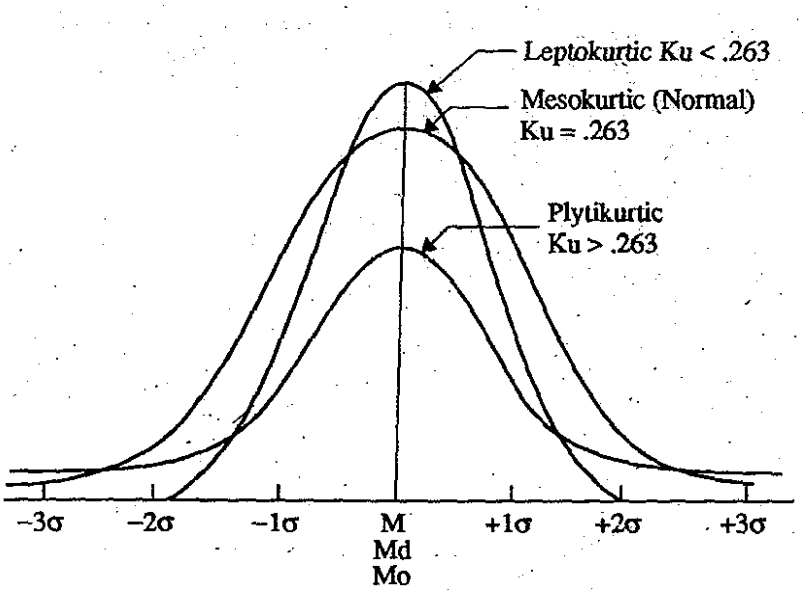
The term Kurtosis refers to the divergence in the height of the curve specially in the peakedness there are two types of divergence in the peakness of the curve.

There are two types of skewness which appear in the Normal Curve

i. Leptokurtosis
ii. Mesokurtosis
iii. Platykurtosis

Purpose you have a normal curve winch is made up of a steel wire suppose you push both ends of the wire curve together. What would happen to the shape of the curve? Probably our answer may be that by pressing both the ends of the wire curve, the curve, become more iced i.e. its top becomes more beaked than the normal curve and scatteredness the scores or of' the curve shrink towards the center

Thus in a Leptokurtic distribution, the frequency is more peaked at the centre than in normal distribution curve.



Kurtosis in the Normal Curve

b) Platykurtosis

Now, suppose we put a heavy pressure on the top normal curve made from the steel wire. What would be the change in the shape of the curve? Probably the top of the curve would become more flat than that of the normal.

Thus a distribution of flutter peak than of the normal distribution is known as platykurtic distribution.

When the distribution and related curve is normal, the value of kurtosis is .263 (Ku .263). If the value of the Ku is greater than .263, the distribution and related curve obtained-will be Platykurtic. When the value of Ku is less than .263, the distribution and related curve obtained will be Leptokurtic.

Factors Causing Divergence in the Normal Curve/Normal Distribution

The reasons why distributions exhibit skewness and kurtosis are numerous and often complex, but a, careful analysis of the data can often throw some light on the asymmetry. Some-of the common causes are:

1. Selection of the Sample .

Selection of the subjects (individuals) can produce skewness, and kurtosis in the distribution. If the sample size is small or sample is biased one skewness is possible in the distribution of scores obtained on the basis of selected sample or group of individuals

The scores made by small and homogeneous group are likely to yield narrow, and leptokurtic distribution. Scores from small and highly heterogeneous group yield platykurtic distribution

2. Unsuitable or Poorly Made Tests

If the measuring tool of test is inappropriate for the group on which it has been administered, or poorly made, 'the asymmetry is-likely to occur in the distribution of scores if a test is too easy, scores will pile up at the high end of the scale, whereas when the test is too difficult, scores will pile up at the' low and of the scale.

3. The Trait being Measured is Non-Normal

Skewness or Kurtosis will appear when there is a real lack of normality in the trait being measured. e.g. interests or attitudes.

4. Errors in the Construction and Administration of Tests

A poorly constructed test may cause asymmetry in the distribution of the scores. Similarly, while administrating the test, unclear instruction, error in timings, errors in the scoring practice thud Jack of motivation to complete the test may cause skewness in the distribution.

Check Your Progress 2

1. Define Skewness.

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2. Define Kurtosis.

14.6 GRAPHICAL REPRESENTATION OF DATA – IMPORTANCE OF GRAPHICAL REPRESENTATION OF DATA-TYPES OF GRAPHICAL REPRESENTATION, LIMITATIONS

Graphical representation of Data

After studying this unit you would be able to

1. Know about frequency distribution
2. Identify the advantages of distribution of the raw data in -a frequency distribution
3. Prepare an array of scores .
4. 4 Determine the width of the class intervals
5. Locate the true lower and upper limit of the intervals
6. Draw Histogram and Frequency polygon:
7. Explain cumulative frequency
9. Draw cumulative frequency curve
10. Differentiate between cumulative percentage curve (O'give) and cumulative frequency curve.

Whenever experiments are conducted in laboratories, data were collected from subject. Scores were obtained from tests. Observations were recorded from events etc. These data are a collection of number of observation of a presented and this process of recording the number of observation of a particular score is called as frequency distribution. In other words, it is explained as "Frequency distribution shows a tallying of the number of times each scores. Value (or interval of score values) occur in a group of scores. The advantage of distributing the raw data in a frequency distribution is that data could be meaningfully interpreted and summed up through a single score for interpretation. Statistics could be applied on the frequency distribution of data. But the limitation of the frequency distribution is that the originally of the score

is lost. There is every possibility for occurrence of error because of frequency distribution i.e., when the width of the class interval is ordered there is more scope for committing error and if the width is very mall the error may be at minimum level. When calculators and computers are used for data analysis there is no need for frequency distribution.

Let us consider a situation in Class A. A test on numerical ability was given to 25 students. Their scores are given below:

21	17	18	31	23
41	31	24	41	34
31	23	32	25	31
22	23	26	23	17
31	31	41	18	26

How would you arrange the above scores? There are many ways of arranging these scores. The first method could be arranging then in order i.e. either in ascending or in descending order. Now let us suppose that some scores are distributed in ascending order i.e. we have prepared an array of scores.

14	17	17	18	18		21
22	23	23	23		24	25
26	26	31	31	31	31	31
32	32	34		41	41	41

The above frequency distribution may be represented with class intervals. Any frequency distribution could be provided through a class Interval. Higher the width of the class interval, higher will be the error lesser the width of the class Interval, lesser will be the error. While forming any frequency distribution, decision is to be taken regarding the size and number of class intervals. Larger the number of class intervals, the representation of the scores will be adequate.

This frequency distribution describes the scores, tallies and the frequency of the particular score. The sum of the frequencies is. 25. Hence the total number of scores is verified.

If the class intervals are smaller, the representation of the scores will be smaller. As a first step we have to determine range in the distribution of scores.

Determination of Range

In the above distribution the lower score is 14 and the highest score 41. The range is the difference between the maximum score and theta minimum score. The range is 41-14=27

Fixing about the class intervals

There is no hard and fast rule in determining the sizes of the class intervals But usually the number of class intervals are fixed between 10 and 20 depending upon the total number of frequencies The number of class interval is dependent upon the size of the width of the class interval Usually the widths are taken in units of 1 2 3 4 5 10 and 20 etc. depending upon the number of class interval wanted.

After the arrangement of array the scores are tallied the tallies are counted and they are expressed as frequencies

Score	Tally	Frequency
14	1	1
17	11	2
18	11	2
21	1	1
22	1	1
23	1111	4
24	1	1
25	1	1
26	11	2
31	1111	4
32	11	2
34	1	1
41	111	3
	N	25

For example, in the frequency distribution cited above, the range is 27, and we prefer to have 10 class intervals for our data. Then the width of the class intervals would be 27/10 i.e., 2.7 we can have a round number of 3.

Starting point of the distribution

In the illustration cited above the lowest score is 14 and the highest score is 4. We have determined to have 10 class intervals of width 3 units. So the lowest interval may be started either from 14 or from 13, 12, 11 etc. Let us assume that we start the interval from the score 13.

Class Interval	Tally	Frequency
40-42	111	3
37-39		0
34-36	1	1
31-33	11	2
28-30		0
25-27	111	3
22-24		0
19-21	1	1
16-18	1111	4
13-15	1	1
	N	25

It is found that between the interval 12 and 15, there is scare, between 16 and 18 there are 4 scores, between 19 and 21, there is likewise the number of scores within the above class intervals are noted against and the sum of the frequencies are noted against the total number of frequencies.

In the above frequency distribution, the intervals are noted as discrete value like 13,1:5 17,13, etc. If we want to have higher level of accuracy, real limits of the class intervals could be used for this purpose example, the illustration cited above e the interval 13-15 has the true limit as 12. 5-15.5 likewise-the interval 16—18 could be expressed a 15.5-18.5 as the true Interval in order to facilitate accuracy and continuity.

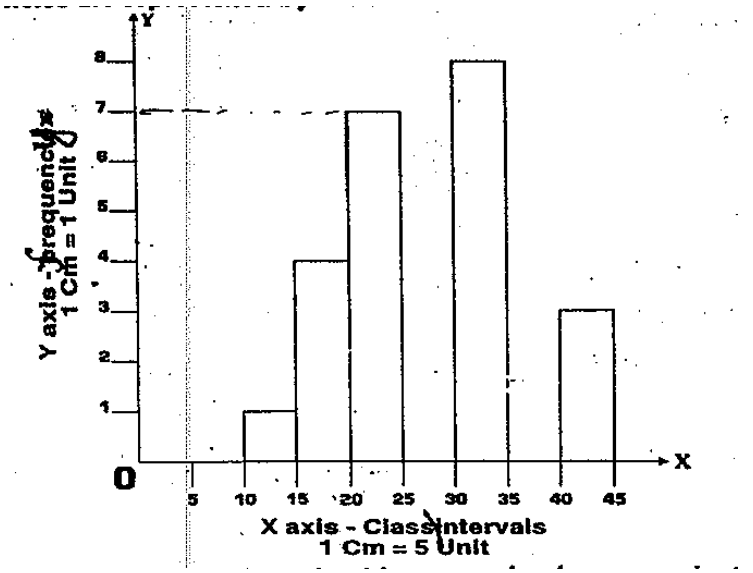
The mid-point of the class interval could be computed by finding the average between the lower and upper limit of the intervals and the width of the class interval is the difference between the true upper and true lower.

14.7 HISTOGRAM, FREQUENCY POLYGON, CUMULATIVE FREQUENCY CURVE

Histogram

It is a pictorial representation of vertical bars with equal base. The height of the vertical bars may be of different dimensions. It is called as bar graph. It is also called as frequency histogram.

In a histogram, base the is represented by close intervals and the frequencies are represented by vertical lines.



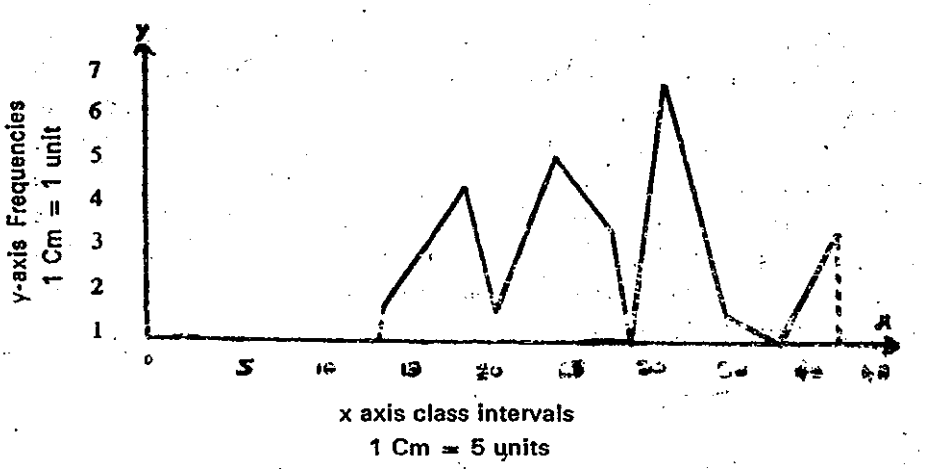
With the above data the histogram is drawn against plotting class intervals along with the frequencies.

The base line is represented by the class intervals of the frequency distribution' and 'the vertical line by the frequencies. The vertical line is drawn as a rectangular bar instead of a line to represent vertical bars. The base line denoted b X-axis and the vertical line is denoted by Y-axis.

Frequency Polygon

It is called as a many sided figure. It is the other form of histogram. If a figure is represented b' the' class interval and frequencies as a many sided figure, it is called as a frequency polygon. For drawing polygon the graph paper would be very convenient. A polygon is a closed figure and its ends always touch the base line. The scale in the graph is usually taken in such a way that height of the polygon is approximately on 60 75 percent of the total width. Keeping in this mind, scores for x-axis and y-axis are conveniently chosen. In the frequency polygon, points are plotted, by interpolating the midpoint of the class intervals and the frequencies of that particular class interval. In addition to the plotting of the points/ dots, two more dots are at the addition of the first interval and the last at the addition of the last interval. Then all these points are joined. This gives the picture of a closed frequency polygon.

A frequency polygon is better represented than a histogram. It gives the clear conception of the contour of the distribution. For the purpose of comparison one frequency polygon may be drawn by overlapping the same with the same base. In the event of unequal number of N_1 the same could be represented by percentages for comparison.



The above frequency polygon seems to be jagged in its shape. It is not uniform and smooth. It is also irregular. If the data are more, we can also see the possibility of getting a smoothened frequency curve. The frequency polygon could also be smoothened. This smoothened polygon could be obtained by having moving or running averages i. e., for every Interval, the existing frequency would be added with the prefixing and suffixing frequency of the Intervals and their averages are taken. This average frequency is called as the smoothened frequency of that particular class interval.

This process could be repeated again in order to get more smoothened.

Now we will see a polygon, where the total frequencies that fall below certain points in the measuring scale i.e., the frequencies are expressed as cumulative frequencies . "The cumulative frequency corresponding to any lass interval is the number of cases within that interval plus all the cases Intervals lower to it on the scale"

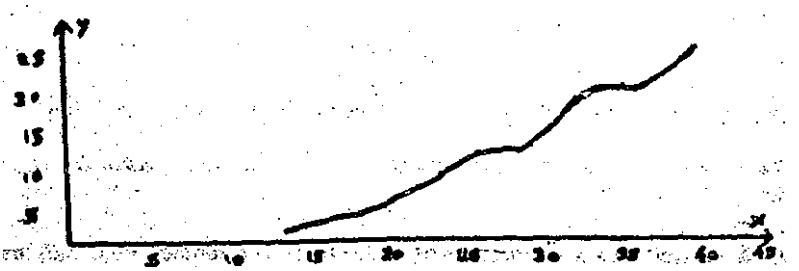
Cumulative Frequency Curve

In the table cited earlier frequencies with corresponding class intervals are represented Now the cumulative frequencies are calculated it is the process of adding of frequencies from the lowest class interval lit the existing frequency distribution This addition is repeated from the lowest class interval to the highest class Interval When one reaches the highest class interval, with addition, then it equals the total number of frequencies.

While drawing a cumulative frequency curve, points are plotted against the exact, upper limits of the classes with cumulative frequencies or with cumu1ive percentage frequencies. Cumulative frequencies are computed i.e. in the lowest class interval 13-15, the true higher limit is 1 5-5. There is 1 frequency below the score of 15-6, in the interval 16-18, the true higher limit is 185, there are 144.1) 5 frequencies below the point 18-5. Likewise the frequencies re added

from the lowest interval to the highest interval. The computed cumulative frequencies are tabulated and there are 25 frequencies that are below the true highest limit of 42-5.

A figure drawn on the basis of cumulative frequencies is called as a cumulative frequency curve. The cumulative frequencies could also be converted into cumulative percentage. If the curve is drawn on the basis of cumulative percentages, then it is called an O'give. This curve facilitates to compute or determine percentage and percent ranks.

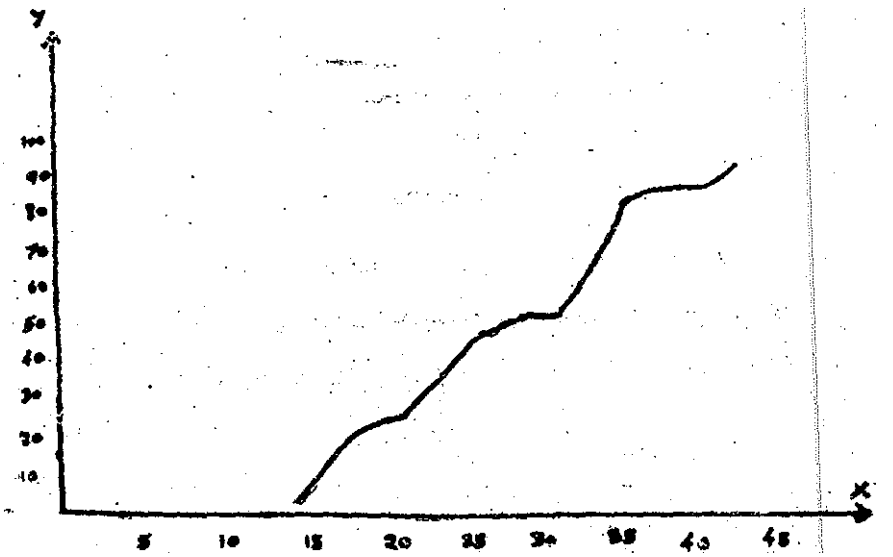


x axis class intervals 1 cm = 5 units

y axis cumulative frequencies 1 cm = 5cm

C.I.	**f**	**cf**	**cf in percentages**
40-42	3	25	100
37-39	0	22	88
34-36	1	22	88
31-33	7	21	84
28-30	0	14	56
25-27	3	14	56
22-24	5	11	44
19-21	1	6	24
16-18	4	5	20
13-15	1	1	4

Cumulative percentage curve or ogive



x axis class intervals — y axis percentage

1 cm = 5 units — 1 cm = 10 units

Check Your progress 3

1. List some of the difficulties faced by you while preparing Histogram.

14.8 LET US SUM UP

The normal distribution is a very important concept in the behavioural sciences because many variables used in behavioural research are assumed to normally distribute.

Normal curve is very helpful in educational evaluation and measurement. It provides relative positioning of the individual in a group. It can also be used as a scale of measurement in behavioural sciences.

The normal distribution is a significant tool in the hands of a teacher, through which he or she can decide the nature of the distribution of the scores obtained on the basis of measured variable. He or she can judge the difficulty level of the test items in the question paper and finally he or she may know about his or her class, whether it is homogeneous to the ability measured or it is heterogeneous one.

14.9 UNIT END EXERCISES

1. Take some frequency distribution and prepare frequency polygons. Study the normalcy in the distribution. If you obtain non-normal distribution, determine the type of skewness and Kurtosis.

14.10 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1. Normal Probability Curve is the bell shaped curve obtained for a distribution havingmaximumfrequency near the central value of distribution and the frequency graduallytapering off symmetrically on both the sides.

2.
   1. The Normal Curve is Symmetrical.
   2. The Normal Curve is Unimodal
   3. The Maximum ordinate occurs at the Centre
   4. The Normal Curve is Asymptotic to the X-axis

3.
   1. to determine the percentage of cases (in a normal distribution) within given limits or scores
   2. to determine the percentage of cases that are above or below a given score or reference point
   3. to determine the limits of scores which include a given percentage of cases
   4. to determine the percentile rank of a student in his own group
   5. to find out the percentile value of a student's percentile rank
   6. to compare the two distributions in terms of overlapping
   7. to determine the relative difficulty of test items

Check Your Progress 2

1. A distribution is said to be skewed, if the point of centre of gravity is located on one side of the distribution. i.e., away from the centre of the scale of measurement.
2. A distribution is said to be negatively skewed if the scores are concentrated at the higher end of the measurement scale and it is said to be positively skewed if the scores are concentrated at the lower end of the measurement scale.

14.11 SUGGESTED READINGS

Agarwal, Y.P., (1990). *Statistical Methods- Concepts, Applications and Computations.* Sterling Publishers Pvt, Ltd, New Delhi.

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Guilford, J.P & Benjamin F., (1973). *Fundamental Statistics in Psychology and Education.* Mc Craw Hill BookCo.,New York.

Hannagan, T.J.,(1982).*Mastering Statistics.* The Macmillan Press Ltd. Surrey.

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MODEL QUESTION PAPER

B.Ed.,

Educational Evaluation

Part-I

Write all the questions **10x2=20**

1. Write the importance of Evaluation.
2. What are functions of Educational objectives?
3. Define : Diagnostic test
4. List the devices used in observation
5. How will you calculate the difficulty level of an item?
6. Write short notes on Progress report.
7. Write the limitations of oral test
8. What are the uses of standard deviations?
9. Write the differences between primary and secondary data?
10. Calculate the median for the following data.7,6,13,21,8,5,3,10,26

Part-II

II. Write any five questions out of Eight **5x5=25**

11. Differentiate measurement and evaluation
12. Write short note on taxonomy of objectives in cognitive domain
13. Explain briefly about the types of Intelligence tests.
14. Describe Validity and its types
15. Explain the characteristics and good fool
16. Describe the main features of summative evaluation
17. Give factors affecting correlation
18. Find out the standard deviation for the following distribution.

Age	20 – 25	25– 30	30 - 35	35 -40	40 –45	45 - 50
No.of persons	170	110	80	45	40	35

Part-III

III. Write any two in the following internal choice 2x15=30

19. a) How will you construct criterion referenced tests.

or

b) Explain interview technique and its types

20. (a) Explain the types of assignments

(or)

(a) Compute the measures of central tendency for the following.

Class Interval	190 -194	185 -189	180 -184	175 -179	170 - 174	165 - 169	160 -164
Frequency	3	6	7	8	4	5	2