

## Course Material for B.Ed. (Second Year)

### CC- 9, ASSESSMENT FOR LEARNING

#### UNIT -1 BASICS OF ASSESSMENT

##### COURSE OBJECTIVES

- To describe the meaning and role of assessment
- To know the principles of assessment practices
- To understand the assessment practices in various approaches of teaching
- To Differentiate different types of assessment
- To understand how to prepare report for assessment findings

##### WHAT IS MEASUREMENT?

Suppose there is a basket full of fruits. Let us count the fruits. There are 22 apples, 12 oranges, 16 papayas, 4 pine apples and 8 mangoes. In all there are 62 fruits in the basket. This counting is called enumeration.

Now, if someone asks “what is the total weight of the basket?” When the basket is weighed, we find that that is 5.8 kg. This weighting answers the question “How much”. So when we are trying to answer the question “How much” i.e. how much height, how much time, how much area, how much volume, how much pressure, how much water, how much electricity etc., we are dealing with measurement. Measurement answers the question “how much”. In education, student’s progress is measured in terms of marks or grades, teacher’s effectiveness as improvement and modification of the behaviour of his students etc.

In every measurement, three things are involved, Firstly a set of objects i.e. the thing, object or person to be measured, secondly a set of numbers and thirdly a rule or rules for the assignment of a number to each object.

Measurement may be defined as the assignment of one of a set of numbers to each of a set of persons or objects according to certain established rules.

##### DEFINITION

Measurement refers to the process of assigning numerals to events, objects etc. according to certain rules (Tyler, 1963).

Measurement consists of rules for assigning numbers to objects in such a way as to represent quantities of attributes (Nunnally, 1970).

Measurement of any kind is matter of determining how much or how little, how great or how small, how much more than or how much less than (Micheels& Karnes, 1950).

Measurement may be defined as the assignment of one of a set of numbers to each of a set of persons or objects according to established rules.(Lindeman and Merenda, 1979).

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Measurement is the assigning of numbers to things according to rules (Glass and Stanley, 1970).

## ASSESSMENT

### MEANING

Assessment plays a number of roles in the life of a student, some of which they may be more aware of than others. It's widely accepted that students' learning patterns, educational focus, and allocation of time will be directly influenced by assessment.

Educational assessment is the process of documenting, usually in measurable terms, knowledge, skills, attitudes and beliefs. Assessment can focus on the individual learner, the learning community (class, workshop or other organized group of learners), the institution, or the educational system as a whole (also known as granularity).

### DEFINITION

Assessment does more than allocate a grade or degree classification to students – it plays an important role in focusing their attention and, as Sainsbury & Walker (2007) observe, actually drives their learning.

Gibbs (2003) states that assessment has 6 main functions:

1. Capturing student time and attention
2. Generating appropriate student learning activity
3. providing timely feedback which students pay attention to
4. Helping students to internalise the discipline's standards and notions of equality
5. Generating marks or grades which distinguish between students or enable pass/fail decisions to be made
6. Providing evidence for other outside the course to enable them to judge the appropriateness of standards on the course. That may be relied on for making decisions.

According to Evangeline Harris Stefankis (2002), "The word assess comes from the Latin *assidere*, which means **to set beside**. Literally then, **To assess** means **to sit beside the learner**".

According to Fenton (1996), "Assessment is the collection of relevant information

Assessment for Learning focuses on the opportunities to develop students' ability to evaluate themselves, to make judgements about their own performance and improve upon it. It makes use of authentic assessment methods and offers lots of opportunities for students to develop their skills through formative assessment using summative assessment sparingly.

## EVALUATION

### MEANING

Evaluation = measurement + judgment

It refers to the value or judgement (the quality or worth) we attach to the magnitude or quantity of the achievement of the student. It answers the question “what value that how much is”. It is thus qualitative. Measurement tells “how much” and evaluation tells “what value or worth that how much is”. Measurement tells quantity, and evaluation refers to quality.

In education, we never measure or evaluate people i.e. students or teachers. We measure or evaluate characteristics or properties of people, their scholastic potential, knowledge of algebra, honesty, perseverance, ability to teach and so forth.

## **DEFINITION**

To evaluate something is to appraise its quality, a determination of its worth (Popham,1988).

Evaluation is meant appraisal or assessment with respect to some standard (Singh).

Evaluation is a process wherein the parts, processes or outcomes of a programme are examined to see whether they are satisfactory, particularly with the reference to the programme, stated objectives, our own expectations, our own standards of excellence (Tuckman, 1975).

Evaluation is the process of delineating, obtaining and providing useful information for judging decision alternative (Stufflebeam).

Evaluation in education is a process by which we form judgment about the value of the educational status or achievement of students (Hill and Dressel).

## **ROLE OF ASSESSMENT IN LEARNING**

Assessment plays a major role in how students learn, their motivation to learn, and how teachers teach.

Assessment is used for various purposes.

**Assessment *for* learning:** where assessment helps teachers gain insight into what students understand in order to plan and guide instruction, and provide helpful feedback to students.

**Assessment *as* learning:** where students develop an awareness of how they learn and use that awareness to adjust and advance their learning, taking an increased responsibility for their learning.

**Assessment *of* learning:** where assessment informs students, teachers and parents, as well as the broader educational community, of achievement at a certain point in time in order to celebrate success, plan interventions and support continued progress.

Assessment must be planned with its purpose in mind. Assessment *for*, *as* and *of* learning all have a role to play in supporting and improving student learning, and must be appropriately balanced. The most important part of assessment is the interpretation and use of the information that is gleaned for its intended purpose.

Assessment is embedded in the learning process. It is tightly interconnected with curriculum and instruction. As teachers and students work towards the achievement of curriculum outcomes,

assessment plays a constant role in informing instruction, guiding the student's next steps, and checking progress and achievement. Teachers use many different processes and strategies for classroom assessment, and adapt them to suit the assessment purpose and needs of individual students.

## **FORMATIVE AND SUMMATIVE ASSESSMENT**

Formative assessments are commonly said to be for learning because educators use the results to modify and improve teaching techniques during an instructional period, while summative assessments are said to be of learning because they evaluate academic achievement at the conclusion of an instructional period. Or as assessment expert Paul Black put it, "When the cook tastes the soup, that's formative assessment, when the customer tastes the soup, that's summative assessment."

## **DEFINING FORMATIVE AND SUMMATIVE ASSESSMENTS**

The terms "formative" and "summative" do not have to be difficult, yet the definitions have become confusing in the past few years. This is especially true for formative assessment. In a balanced assessment system, both summative and formative assessments are an integral part of information gathering. Depend too much on one or the other and the reality of student achievement in your classroom becomes unclear.

**Summative Assessments** are given periodically to determine at a particular point in time what students know and do not know. Many associate summative assessments only with standardized tests such as state assessments, but they are also used at and are an important part of district and classroom programs. Summative assessment at the district/classroom level is an accountability measure that is generally used as part of the grading process. The list is long, but here are some examples of summative assessments:

- State assessments
- District benchmark or interim assessments
- End-of-unit or chapter tests
- End-of-term or semester exams
- Scores that are used for accountability for schools and students (report card grades).

The key is to think of summative assessment as a means to gauge, at a particular point in time, student learning relative to content standards. Although the information that is gleaned from this type of assessment is important, it can only help in evaluating certain aspects of the learning process. Because they are spread out and occur *after* instruction every few weeks, months, or once a year, summative assessments are tools to help evaluate the effectiveness of programs, school improvement goals, alignment of curriculum, or student placement in specific programs. Summative assessments happen too far down the learning path to provide information at the classroom level and to make instructional adjustments and interventions *during* the learning process. It takes formative assessment to accomplish this.

**Formative Assessment** is part of the instructional process. When incorporated into classroom practice, it provides the information needed to adjust teaching and learning while they are happening. In this sense, formative assessment informs both teachers and students about student understanding at a point when timely adjustments can be made. These adjustments help to ensure student's achieve, targeted standards-based learning goals within a set time frame. Although formative assessment strategies appear in a variety of formats, there are some distinct ways to distinguish them from summative assessments.

One distinction is to think of formative assessment as "practice." We do not hold students accountable in "grade book fashion" for skills and concepts they have just been introduced to or are learning. We must allow for practice. Formative assessment helps teachers determine next steps during the learning process as the instruction approaches the summative assessment of student learning. A good analogy for this is the road test that is required to receive a driver's license. What if, before getting your driver's license, you received a grade every time you sat behind the wheel to practice driving? What if your final grade for the driving test was the average of all of the grades you received while practicing? Because of the initial low grades you received during the process of learning to drive, your final grade would not accurately reflect your ability to drive a car. In the beginning of learning to drive, how confident or motivated to learn would you feel? Would any of the grades you received provide you with guidance on what you needed to do next to improve your driving skills? Your final driving test, or summative assessment, would be the accountability measure that establishes whether or not you have the driving skills necessary for a driver's license—not a reflection of all the driving practice that leads to it. The same holds true for classroom instruction, learning, and assessment.

Another distinction that underpins formative assessment is student involvement. If students are not involved in the assessment process, formative assessment is not practiced or implemented to its full effectiveness. Students need to be involved both as assessors of their own learning and as resources to other students. There are numerous strategies teachers can implement to engage students. In fact, research shows that the involvement in and ownership of their work increases students' motivation to learn. This does not mean the absence of teacher involvement. To the contrary, teachers are critical in identifying learning goals, setting clear criteria for success, and designing assessment tasks that provide evidence of student learning.

One of the key components of engaging students in the assessment of their own learning is providing them with descriptive feedback as they learn. In fact, research shows descriptive feedback to be the most significant instructional strategy to move students forward in their learning. Descriptive feedback provides students with an understanding of what they are doing well, links to classroom learning, and gives specific input on how to reach the next step in the learning progression. In other words, descriptive feedback is not a grade, a sticker, or "good job!" A significant body of research indicates that such limited feedback does not lead to improved student learning.

## **PURPOSES OF ASSESSMENT**

### **Assessment drives instruction**

A pre-test or needs assessment informs instructors what students know and do not know at the outset, setting the direction of a course. If done well, the information garnered will highlight the gap between existing knowledge and a desired outcome. Accomplished instructors find out what students already know, and use the prior knowledge as a stepping off place to develop new understanding. The same is true for data obtained through assessment done during instruction. By checking in with students throughout instruction, outstanding instructors constantly revise and refine their teaching to meet the diverse needs of students.

### **Assessment drives learning**

What and how students learn depends to a major extent on how they think they will be assessed. Assessment practices must send the right signals to students about what to study, how to study, and the relative time to spend on concepts and skills in a course. Accomplished faculty communicate clearly what students need to know and be able to do, both through a clearly articulated syllabus, and by choosing assessments carefully in order to direct student energies. High expectations for learning result in students who rise to the occasion.

### **Assessment informs students of their progress**

Effective assessment provides students with a sense of what they know and don't know about a subject. If done well, the feedback provided to students will indicate to them how to improve their performance. Assessments must clearly match the content, the nature of thinking, and the skills taught in a class. Through feedback from instructors, students become aware of their strengths and challenges with respect to course learning outcomes. Assessment done well should not be a surprise to students.

### **Assessment informs teaching practice**

Reflection on student accomplishments offers instructors insights on the effectiveness of their teaching strategies. By systematically gathering, analyzing, and interpreting evidence we can determine how well student learning matches our outcomes / expectations for a lesson, unit or course. The knowledge from feedback indicates to the instructor how to improve instruction, where to strengthen teaching, and what areas are well understood and therefore may be cut back in future courses.

## **Role of grading in assessment**

Grades should be a reflection of what a student has learned as defined in the student learning outcomes. They should be based on direct evidence of student learning as measured on tests, papers, projects, and presentations, etc. Grades often fail to tell us clearly about “large learning” such as critical thinking skills, problem solving abilities, communication skills (oral, written and listening), social skills, and emotional management skills.

## **When student learning outcomes are not met**

Accomplished faculty focus on the data coming out of the assessments they complete before, during and at the end of a course, and determine the degree to which student learning outcomes are or are not met. If students are off course early on, a redirecting, reteaching of a topic, referral to student learning centers, or review sessions by the instructor may remediate the problem. Through careful analysis it is possible to determine the challenges and weaknesses of instruction in order to support student learning better. Some topics or concepts are notoriously difficult, and there may be a better approach to use. Perhaps a model, simulation, experiment, example or illustration will clarify the concept for students. Perhaps spending a bit more time, or going over a topic in another way will make a difference. If the problem is noticed late in the course, an instructor may plan to make any instructional changes for the next time the course is taught, but it is helpful to make a note of the changes needed at the time so that the realization is not lost.

Assessments are used for a wide variety of purposes in schools and education systems:

- **High-stakes assessments** are typically standardized tests used for the purposes of accountability—i.e., any attempt by federal, state, or local government agencies to ensure that students are enrolled in effective schools and being taught by effective teachers. In general, “high stakes” means that important decisions about students, teachers, schools, or districts are based on the scores students achieve on a high-stakes test, and either punishments (sanctions, penalties, reduced funding, negative publicity, not being promoted to the next grade, not being allowed to graduate) or accolades (awards, public celebration, positive publicity, bonuses, grade promotion, diplomas) result from those scores.
- **Pre-assessments** are administered before students begin a lesson, unit, course, or academic program. Students are not necessarily expected to know most, or even any, of the material evaluated by pre-assessments—they are generally used to (1) establish a baseline against which educators measure learning progress over the duration of a program, course, or instructional period, or (2) determine general academic readiness for a course, program, grade level, or new academic program that student may be transferring into.
- **Formative assessments** are in-process evaluations of student learning that are typically administered multiple times during a unit, course, or academic program. The general purpose of



formative assessment is to give educators in-process feedback about what students are learning or not learning so that instructional approaches, teaching materials, and academic support can be modified accordingly. Formative assessments are usually not scored or graded, and they may take a variety of forms, from more formal quizzes and assignments to informal questioning techniques and in-class discussions with students.

- **Summative assessments** are used to evaluate student learning at the conclusion of a specific instructional period—typically at the end of a unit, course, semester, program, or school year. Summative assessments are typically scored and graded tests, assignments, or projects that are used to determine whether students have learned what they were expected to learn during the defined instructional period.

## **PRINCIPLES OF ASSESSMENT**

1. Assessment should be valid Validity ensures that assessment tasks and associated criteria effectively measure student attainment of the intended learning outcomes at the appropriate level.
2. Assessment should be reliable and consistent There is a need for assessment to be reliable and this requires clear and consistent processes for the setting, marking, grading and moderation of assignments.
3. Information about assessment should be explicit, accessible and transparent Clear, accurate, consistent and timely information on assessment tasks and procedures should be made available to students, staff and other external assessors or examiners.
4. Assessment should be inclusive and equitable As far as is possible without compromising academic standards, inclusive and equitable assessment should ensure that tasks and procedures do not disadvantage any group or individual.
5. Assessment should be an integral part of programme design and should relate directly to the programme aims and learning outcomes Assessment tasks should primarily reflect the nature of the discipline or subject but should also ensure that students have the opportunity to develop a range of generic skills and capabilities.
6. The amount of assessed work should be manageable. The scheduling of assignments and the amount of assessed work required should provide a reliable and valid profile of achievement without overloading staff or students.
7. Formative and summative assessment should be included in each programme Formative and summative assessment should be incorporated into programmes to ensure that the purposes of assessment are adequately addressed. Many programmes may also wish to include diagnostic assessment.
8. Timely feedback that promotes learning and facilitates improvement should be an integral part of the assessment process Students are entitled to feedback on submitted formative assessment tasks, and on summative tasks, where appropriate. The nature, extent and timing of feedback for each assessment task should be made clear to students in advance.

9. Staff development policy and strategy should include assessment All those involved in the assessment of students must be competent to undertake their roles and responsibilities.

## **PRINCIPLES OF GOOD PRACTICE FOR ASSESSING STUDENT LEARNING**

### **1. The assessment of student learning begins with educational values.**

Assessment is not an end in itself but a vehicle for educational improvement. Its effective practice, then, begins with and enacts a vision of the kinds of learning we most value for students and strive to help them achieve. Educational values should drive not only what we choose to assess but also how we do so. Where questions about educational mission and values are skipped over, assessment threatens to be an exercise in measuring what's easy, rather than a process of improving what we really care about.

### **2. Assessment is most effective when it reflects an understanding of learning as multidimensional, integrated, and revealed in performance over time.**

Learning is a complex process. It entails not only what students know but what they can do with what they know; it involves not only knowledge and abilities but values, attitudes, and habits of mind that affect both academic success and performance beyond the classroom. Assessment should reflect these understandings by employing a diverse array of methods including those that call for actual performance, using them over time so as to reveal change, growth, and increasing degrees of integration. Such an approach aims for a more complete and accurate picture of learning, and therefore firmer bases for improving our students' educational experience.

### **3. Assessment works best when the programs it seeks to improve have clear, explicitly stated purposes.**

Assessment is a goal-oriented process. It entails comparing educational performance with educational purposes and expectations—these derived from the institution's mission, from faculty intentions in program and course design, and from knowledge of students' own goals. Where program purposes lack specificity or agreement, assessment as a process pushes a campus toward clarity about where to aim and what standards to apply; assessment also prompts attention to where and how program goals will be taught and learned. Clear, shared, implementable goals are the cornerstone for assessment that is focused and useful.

### **4. Assessment requires attention to outcomes but also and equally to the experiences that lead to those outcomes.**

Information about outcomes is of high importance; where students "end up" matters greatly. But to improve outcomes, we need to know about student experience along the way—about the curricula, teaching, and kind of student effort that lead to particular outcomes. Assessment can help understand which students learn best under what conditions; with such knowledge comes the capacity to improve the whole of their learning.

**5. Assessment works best when it is ongoing, not episodic.**

Assessment is a process whose power is cumulative. Though isolated, "one-shot" assessment can be better than none, improvement is best fostered when assessment entails a linked series of activities undertaken over time. This may mean tracking the progress of individual students, or of cohorts of students; it may mean collecting the same examples of student performance or using the same instrument semester after semester. The point is to monitor progress toward intended goals in a spirit of continuous improvement. Along the way, the assessment process itself should be evaluated and refined in light of emerging insights.

**6. Assessment fosters wider improvement when representatives from across the educational community are involved.**

Student learning is a campus-wide responsibility, and assessment is a way of enacting that responsibility. Thus, while assessment efforts may start small, the aim over time is to involve people from across the educational community. Faculty play an especially important role, but assessment's questions can't be fully addressed without participation by student-affairs educators, librarians, administrators, and students. Assessment may also involve individuals from beyond the campus (alumni/ae, trustees, employers) whose experience can enrich the sense of appropriate aims and standards for learning. Thus, understood, assessment is not a task for small groups of experts but a collaborative activity; its aim is wider, better-informed attention to student learning by all parties with a stake in its improvement.

**7. Assessment makes a difference when it begins with issues of use and illuminates questions that people really care about.**

Assessment recognizes the value of information in the process of improvement. But to be useful, information must be connected to issues or questions that people really care about. This implies assessment approaches that produce evidence that relevant parties will find credible, suggestive, and applicable to decisions that need to be made. It means thinking in advance about how the information will be used, and by whom. The point of assessment is not to gather data and return "results"; it is a process that starts with the questions of decision-makers, that involves them in the gathering and interpreting of data, and that informs and helps guide continuous improvement.

**8. Assessment is most likely to lead to improvement when it is part of a larger set of conditions that promote change.**

Assessment alone changes little. Its greatest contribution comes on campuses where the quality of teaching and learning is visibly valued and worked at. On such campuses, the push to improve educational performance is a visible and primary goal of leadership; improving the quality of undergraduate education is central to the institution's planning, budgeting, and personnel decisions. On such campuses, information about learning outcomes is seen as an integral part of decision making, and avidly sought.

**9. Through assessment, educators meet responsibilities to students and to the public.** There is compelling public stake in education. As educators, we have a responsibility to the publics that support or depend on us to provide information about the ways in which our students meet goals and expectations. But that responsibility goes beyond the reporting of such information; our deeper obligation-to ourselves, our students, and society-is to improve. Those to whom educators are accountable have a corresponding obligation to support such attempts at improvement.

## **PRINCIPLES RELATED TO SELECTION OF METHODS FOR ASSESSMENT**

There is a wealth of assessment methods used in higher education to assess students' achievements, but how to choose?

The primary goal is to choose a method which most effectively assesses the objectives of the unit of study. In addition, choice of assessment methods should be aligned with the overall aims of the program, and may include the development of disciplinary skills (such as critical evaluation or problem solving) and support the development of vocational competencies (such as particular communication or team skills.)

Hence, when choosing assessment items, it is useful to have one eye on the immediate task of assessing student learning in a particular unit of study, and another eye on the broader aims of the program and the qualities of the graduating student. Ideally this is something you do with your academic colleagues so there is a planned assessment strategy across a program.

When considering assessment methods, it is particularly useful to think first about what qualities or abilities you are seeking to engender in the learners. Nightingale et al (1996) provide eight broad categories of learning outcomes which are listed below. Within each category some suitable methods are suggested.

### **1. Thinking critically and making judgements**

(Developing arguments, reflecting, evaluating, assessing, judging)

- Essay
- Report
- Journal
- Letter of Advice to .... (about policy, public health matters..... )
- Present a case for an interest group
- Prepare a committee briefing paper for a specific meeting
- Book review (or article) for a particular journal
- Write a newspaper article for a foreign newspaper
- Comment on an article's theoretical perspective

### **2. Solving problems and developing plans**

(Identifying problems, posing problems, defining problems, analysing data, reviewing, designing experiments, planning, applying information)

- Problem scenario
- Group Work
- Work-based problem
- Prepare a committee of enquiry report
- Draft a research bid to a realistic brief
- Analyse a case
- Conference paper (or notes for a conference paper plus annotated bibliography)

### **3. Performing procedures and demonstrating techniques**

(Computation, taking readings, using equipment, following laboratory procedures, following protocols, carrying out instructions)

- Demonstration
- Role Play
- Make a video (write script and produce/make a video)
- Produce a poster
- Lab report
- Prepare an illustrated manual on using the equipment, for a particular audience
- Observation of real or simulated professional practice

### **4. Managing and developing oneself**

(Working co-operatively, working independently, learning independently, being self-directed, managing time, managing tasks, organising)

- Journal
- Portfolio
- Learning Contract
- Group work

### **5. Accessing and managing information**

(Researching, investigating, interpreting, organising information, reviewing and paraphrasing information, collecting data, searching and managing information sources, observing and interpreting)

- Annotated bibliography

- Project
- Dissertation
- Applied task
- Applied problem

## **6. Demonstrating knowledge and understanding**

(Recalling, describing, reporting, recounting, recognising, identifying, relating & interrelating)

- Written examination
- Oral examination
- Essay
- Report
- Comment on the accuracy of a set of records
- Devise an encyclopaedia entry
- Produce an A - Z of ...
- Write an answer to a client's question
- Short answer questions: True/False/ Multiple Choice Questions (paper-based or computer-aided-assessment)

## **7. Designing, creating, performing**

(Imagining, visualising, designing, producing, creating, innovating, performing)

- Portfolio
- Performance
- Presentation
- Hypothetical
- Projects

## **8. Communicating**

**(One and two-way communication; communication within a group, verbal, written and non-verbal communication, arguing, describing, advocating, interviewing, negotiating, presenting; using specific written forms)**

- Written presentation (essay, report, reflective paper etc.)
- Oral presentation
- Group work

- Discussion/debate/role play
- Participate in a 'Court of Enquiry'
- Presentation to camera
- Observation of real or simulated professional practice.
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## **COLLECTION OF ASSESSMENT INFORMATION**

The process of collecting, examining and using information about what students know and can do is the basis of effective teaching and learning.

The relationship between assessment, teaching and learning is dynamic and interactive. The act of gathering, analysing and using assessment information is integral to the teaching and learning process – without worthwhile assessment information teachers can only be certain that they have taught. They cannot be certain that their students have learned what they set out to teach, or that the teaching is relevant to the students' learning needs and interests.

When teachers have rich information about what their students know, can do and need to do next, they are able to involve students as active participants in their learning and assessment of their own learning. They are also in a position to consult parents and the school's communities about students' progress.

### **Assessment processes**

Assessment information is collected to determine students' achievement and their learning needs. It provides a basis for the analysis of progress and achievement of students over time and assists the diagnosis of individual learning needs.

### **The collection of assessment information**

Assessment includes information gathered from a wide range of sources and at different points in time. These sources can include:

- knowledge gained from parents about their child;
- teachers' knowledge drawn from their day-to-day interactions with students;
- results from teacher-designed classroom and school-wide tests;
- assessment at school entry or transition points;
- results from national standardised assessment tools such as PATs (Progressive Achievement Tests), as TTLE (assessment tools for teaching and learning) or the national exemplars;
- examination results; and
- national qualification results such as those from NCEA (National Certificates of Educational Achievement).

## **JUDGING AND SCORING OF STUDENT PERFORMANCE**

A rubric is a multi-purpose scoring guide for assessing student products and performances. This tool works in a number of different ways to advance student learning, and has great potential in particular for non-traditional, first generation, and minority students. In addition, rubrics improve

teaching, contribute to sound assessment, and are an important source of information for program improvement.

Various grading and reporting methods are used to: (1) communicate the achievement status of students to their parents and other interested parties; (2) provide information to students for self-evaluation; (3) select, identify, or group students for certain educational paths or programs; (4) provide incentives for students to learn; and (5) document students' performance to evaluate the effectiveness of instructional programs. Unfortunately, many schools try to use a single method of grading and reporting to achieve all of these purposes and end up achieving none of them very well.

Letter grades, for example, offer parents and others a brief description of students' achievement and the adequacy of their performance. But using letter grades requires the abstraction of a great deal of information into a single symbol. In addition, the cut-offs between grades are always arbitrary and difficult to justify. Letter grades also lack the richness of other, more detailed reporting methods such as narratives or standards-based reports.

Grading is a process of professional judgment—and the more detailed and analytic the grading process, the more likely it is that subjectivity will influence results. This is why, for example, holistic scoring procedures tend to have greater reliability than analytic procedures. However, being subjective does not mean that grades lack credibility or are indefensible. Because teachers know their students, understand various dimensions of students' work, and have clear notions of the progress made, their subjective perceptions can yield very accurate descriptions of what students have learned.

## **SUMMARIZATION AND INTERPRETATION OF RESULTS**

### **Methods of interpreting the results**

#### **1. Norm-referenced Interpretation**

It describes student's performance or progress in relation to others of the same peer group, age or ability. It may involve ranking or scaling a pupil to help with streaming classes. It may look at cross-school achievements to compare achievement in particular groups, subjects and years with local and national levels of attainment.

#### **Examples:**

1. Diya's score in the periodical exams is below the mean.
2. Ram ranked 5th in the unit test in Physics.
3. Sheela's percentile rank in the Math achievement test is 88.

#### **2. Criterion-referenced Interpretation**

It describes about the student performance according to a specified domain or clearly defined learning tasks e.g. divide three-digit whole numbers correctly and accurately, multiply binomial terms correctly. It is concerned with national examination and other assessment bodies. It is used in the assessment of vocational and academic qualifications. Results are given



on a pass/fail, competent/not competent basis. Results are conclusive and usually open to review.

Examples:

1. Helen can construct a pie graph with 75% accuracy
2. Heera scored 7 out of 10 in the spelling test
3. Riya can encode an article with no more than 5 errors in spelling

## **REPORTING OF ASSESSMENT FINDINGS**

Assessment is an ongoing and integral part of the teaching and learning process. Through this process schools are able to provide easy-to-understand reports to parents about individual student learning outcomes.

The type of assessment and report varies at different times during a student's school life. Formal reporting to parents will occur at least once every semester. Parents are encouraged to discuss their children's progress and needs with teachers at any time.

### **Purposes of Assessment Reports**

Historical Record

Support for planning and decision

Making for improvements

Public relations

Information dissemination

Document your contributions to the learning environment

To see how your efforts mattered

## **OVERVIEW OF GOOD PRACTICE IN COLLECTING AND USING ASSESSMENT INFORMATION**

‘Assessment in education is the process of gathering, interpreting, recording and using information about students’ responses to an educational task’. The assessment of student achievement (i.e. examining and using information about what students know and can do) is

the basis of effective teaching and learning. Unless teachers are knowledgeable about their students’ achievements and interests, they cannot be confident. Their teaching is supporting students to achieve their potential. ‘Overall the purpose of assessment is to improve standards, not merely to measure them.’

Effective assessment systems help schools to monitor students' progress and achievement, and enable them to design effective programmes. It is not a case of schools assessing more, but of using assessment information in a more planned and thoughtful manner.

Schools that demonstrated good practice:

- made certain that teachers had a shared understanding about the purpose of assessment;
- expected teachers to be knowledgeable about their students' achievements and interests;
- made certain that school managers, teachers and students were aware of the rationale for the decisions being made about assessment;
- gave teachers the opportunity for professional development in assessment;
- encouraged their teachers to use data effectively to improve their teaching;
- expected assessment information to be drawn from a wide range of sources: day-to-day interactions with students; analysis of students' work and from more formally designed and administered assessment tasks;
- made sure teachers were able to analyse both numeric and narrative assessment information and interpret the results so they were understood by all potential users of the information;
- encouraged teachers to use formative assessment strategies that ensured the purpose of activities was understood, and that students received effective and useful feedback;
- identified groups of students who needed extra assistance and what specific assistance was needed; monitored the students' progress; and gathered comprehensive school-wide data on their achievements;
- identified trends and patterns in students' achievements and compared the achievements of groups of students within the school;
- established clear expectations for achievement and assessment, including making collation and reporting easier so comparisons could be made to agreed achievement targets;
- promoted the philosophy that student learning drove assessment practices, not credit acquisition;
- established clear lines of communication and easily accessed support between school and home; and
- provided students and their parents with booklets and held information evenings to explain the NQF(National Quality Framework) requirements and assessment procedures, including appeals and opportunities for reassessment.

## **QUESTIONS FOR DISCUSSION AND REFLECTION**

1. Define evaluation
2. What is the role of assessment in learning?
3. What is summative assessment?
4. What are the principles of assessment practices?
5. How will you prepare a report for assessment findings?

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## UNIT-2 : ASSESSMENT FOR LEARNING IN CLASSROOM

### COURSE OBJECTIVES

- To know the principles of assessment practices
- To understand the types of assessment
- To describe about grading
- To understand the constructivist approach in assessment
- To point out the formative use of summative tests

### ASSESSMENT IN CONSTRUCTIVIST APPROACH

Three constructs emerge from the literature regarding constructivism and have implications for the learning environment. They are (1) learning is an active process, (2) the learner has prior knowledge, and (3) the learner takes responsibility for their own learning (Yager, 1991; Cobb et al 1992, Magoon, 1977; Hewson&Hewson, 1988).

These ideas can be operationalized by the following statements:

1. Assessments are in a meaningful context that is relevant or has emerging relevance to students (Brooks & Brooks, 1993).
2. The process of learning does not shut down during assessment (Brooks & Brooks, 1993).
3. Assessments are tailored to specific modules and teaching situations (Zahorik, 1995).
4. Assessments include higher order thinking skills, i.e., application, evaluation, analysis, synthesis (Burry-Stock, 1995; Yager, 1991).
5. Assessments include application of knowledge and comprehension (Zahorik, 1995).
6. A range of techniques is used in assessments (Burry-Stock, 1995; Zahorik, 1995).
7. Assessments focus on the big pictures on concepts and on issues and their accompanying facts and evidence (Zahorik, 1995).
8. Assessment includes inquiry (Brooks & Brooks, 1993; Yager, 1991).
9. Students go beyond initial information levels (knowledge and comprehension) through elaboration doing in-depth analysis of big ideas, issues and concepts (Brooks & Brooks, 1993).
10. Students solve problems in which they extend and re-conceptualize (accommodation) knowledge in new contexts (Brooks & Brooks, 1993; Osborne & Wittrock, 1983; Zahorik, 1995).
11. Students generalize (synthesis) experiences from earlier concrete experiences to understand abstract theories and applications (Brooks & Brooks, 1993; Osborne & Wittrock, 1983; Zahorik, 1995).
12. Students exhibit knowledge through application (Yager, 1991).
13. Students interact with each other in all circumstances including during assessments (Zahorik, 1995).

Assessment can be used to build understanding through reflection and iteration. There is great promise for deeper understanding and appreciation of the creative, generative process we call learning when a student is aware of scholastic expectations and understands how to effectively review and critique his or her own work. This process has three steps:

1. The teacher must help students understand from the outset the criteria by which their work will be judged.
2. Students must document their work process for the duration of the project or unit.
3. Through performance and feedback, students come to understand the complex nature of judging and improving upon one's work.

### **Assessment and constructivist classroom**

Constructivism is basically a theory - based on observation and scientific study - about how people learn. It says that people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences. When we encounter something new, we have to reconcile it with our previous ideas and experience, maybe changing what we believe, or maybe discarding the new information as irrelevant. In any case, we are active creators of our own knowledge. To do this, we must ask questions, explore, and assess what we know.

In the classroom, the constructivist view of learning can point towards a number of different teaching practices. In the most general sense, it usually means encouraging students to use active techniques (experiments, real-world problem solving) to create more knowledge and then to reflect on and talk about what they are doing and how their understanding is changing. Constructivist teachers encourage students to constantly assess how the activity is helping them gain understanding. By questioning themselves and their strategies, students in the constructivist classroom ideally become "expert learners." This gives them ever-broadening tools to keep learning. With a well-planned classroom environment, the students learn how to learn.

Constructivism transforms the student from a passive recipient of information to an active participant in the learning process. Guided by the teacher, students construct their knowledge actively rather than just mechanically ingesting knowledge from the teacher or the textbook. In the constructivist classroom, the focus tends to shift from the teacher to the students. The classroom is no longer a place where the teacher ("expert") pours knowledge into passive students, who wait like empty vessels to be filled. In the constructivist model, the students are urged to be actively involved in their own process of learning. The teacher functions more as a facilitator who coaches, mediates, prompts, and helps students develop and assess their understanding, and thereby their learning. One of the teacher's biggest jobs becomes asking good questions.

As is the case with many of the current/popular paradigms, you're probably already using the constructivist approach to some degree. Constructivist teachers pose questions and problems, then guide students to help them find their own answers. They use many techniques in the teaching process. For example, they may:

- prompt students to formulate their own questions (inquiry),
- allow multiple interpretations and expressions of learning (multiple intelligences),
- encourage group work and the use of peers as resources (collaborative learning).

## **Characteristics of assessment**

In the context of constructivist approach, assessments need to gauge the progress of students in achieving the three major learning outcomes of constructivist approach: conceptual understanding in science, abilities to perform scientific inquiry, and understandings about inquiry.

All learners come to a learning tasks with some relevant knowledge, feelings and skills. Meaningful learning occurs when the learners seeks to relate new concepts and propositions to relevant existing concept and propositions in her/his cognitive structure (Mintzes, Novak, Wandersee, 2000).

Constructivist approach to assessment is a formative rather than a summative. Its purpose is to improve the quality of student learning, not to provide evidence for evaluating or grading students. Assessment has to respond to the particular needs and characteristics of the teachers, students and science content. Assessment is context-specific: what works well in one class will not necessarily work in another.

Assessment is on-going process. Teachers get feedback from students of their learning. Teachers then complete the loop by providing students with feedback on the results of the assessment and suggestions for improving learning.

## **CONTINUOUS AND COMPREHENSIVE EVALUATION (CCE)**

C–Continuous C–  
Comprehensive E–  
Evaluation

Continuous stands for assessment of a student throughout the year, not just at the end of a term. It may be done formally or in an informal way using different techniques of evaluation . Comprehensive takes care of assessment of all round development of a child's personality. A child will be assessed not only in terms of his knowledge about a subject but his participation in other activities also. Broadly, we assess a child's growth in two areas – Scholastic and Co-scholastic. The term Scholastic refers to those aspects , which are related to intellect or the brain. It is related to the assessment of learners in curricular subjects. It includes assignments, projects, practical etc.

Continuous and Comprehensive Evaluation (CCE) refers to a system of school-based evaluation of students that covers all aspects of students' development. It is a developmental process of assessment which emphasizes on two fold objectives. These objectives are continuity in evaluation and assessment of broad based learning and behavioural outcomes on the other.

In this scheme the term 'continuous' is meant to emphasise that evaluation of identified aspects of students' 'growth and development' is a continuous process rather than an event, built into the total teaching-learning process and spread over the entire span of academic session. It means

regularity of assessment, frequency of unit testing, diagnosis of learning gaps, use of corrective measures, retesting and for their self -evaluation.

The second term `comprehensive' means that the scheme attempts to cover both the scholastic and the co-scholastic aspects of students' growth and development

### **Need of continuous comprehensive evaluation**

Continuous and Comprehensive Evaluation is intended to provide a holistic profile of the learner through assessment of both scholastic and non-scholastic aspects of education spread over the total span of instructional time in schools.

It helps to identify those positive attributes of the learner which are not usually assessed during the examinations conducted by the Board

As it is spread over a period of two years in class IX and X it provides several opportunities for the school to identify the latent talents of the learners in different contexts.

This document is supportive to the statement of marks issued by the Board after the examinations conducted by it.

### **Essential aspects of continuous comprehensive evaluation**

1. To provide a holistic profile of the learner through assessment of both scholastic and non-scholastic aspects of education
2. To identify the latent talents of the learners in different contexts.
3. To identify strategies for raising Student Achievement
4. To plan a Comprehensive Evaluation Program to Improving Schools
5. To suggest suitable tools and techniques for achieving continuous comprehensive evaluation.
6. Use Evaluation for Continuous School Improvement
7. Using evaluation as a tool for continuous improvement of the school and the students.
8. To suggest ways of strategies of sensitizing school administrators.

### **PROJECTS**

Project is a method of building a comprehensive unit around an activity which may be carried on in the school or outside.

A project is a whole hearted purposeful activity proceeding in a social environment.

- Use of Projects for assessment

- Assessment of:
  - Clear Planning and framework
  - Critical thinking and Reasoning
  - Execution
  - Creativity
- Assessment of understanding level of concept
- Assessing how students visualizing real objects and decision making
- Students' ability of engaging and building new knowledge.
- Assessing how student is cooperating with other students.
- Assessment of self- confidence and self-discipline
- Daily progress
- Assessment of teamwork
- Accuracy of report writing

## **SEMINARS**

What is a Seminar?

A seminar may be defined as a gathering of people for the purpose of discussing a stated topic. Such gatherings are usually interactive sessions where the participants engage in discussions about the delineated topic. The sessions are usually headed or led by one or two presenters who serve to steer the discussion along the desired path.

### **Purpose of a seminar**

A seminar may have several purposes or just one purpose. For instance, a seminar may be for the purpose of education, such as a lecture, where the participants engage in the discussion of an academic subject for the aim of gaining a better insight into the subject. Other forms of educational seminars might be held to impart some skills or knowledge to the participants. Examples of such seminars include personal finance, web marketing, real estate, investing or other types of seminars where the participants gain knowledge or tips about the topic of discussion.

## **ASSIGNMENTS**

Assignment refers to tasks assigned to students by their teachers to be completed outside of class. Common homework assignments may include a quantity or period of reading to be performed,



writing or typing to be completed, problems to be solved, a school project to be built or other skills to be practiced.

#### Assignment as Assessment Device

- Concept understanding
- Content organization
- Content presentation
- Analytic ability
- Synthesis of material
- Formulation of ideas
- Use of arguments
- Content accuracy
- Content quality (originality)
- Clear conclusion
- Overall clarity
- Grammar and Spelling
- Footnotes and Bibliography

### **PORTFOLIOS**

Portfolios are purposeful, organized, systematic collections of student work that tell the story of a student's efforts, progress, and achievement in specific areas. The student participates in the selection of portfolio content, the development of guidelines for selection, and the definition of criteria for judging merit. Portfolio assessment is a joint process for instructor and student.

Portfolio assessment emphasizes evaluation of students' progress, processes, and performance over time. There are two basic types of portfolios:

- A process portfolio serves the purpose of classroom-level assessment on the part of both the instructor and the student. It most often reflects formative assessment, although it may be assigned a grade at the end of the semester or academic year. It may also include summative types of assignments that were awarded grades.
- A product portfolio is more summative in nature. It is intended for a major evaluation of some sort and is often accompanied by an oral presentation of its contents. For example, it may be used as an evaluation tool for graduation from a program or for the purpose of seeking employment.

In both types of portfolios, emphasis is placed on including a variety of tasks that elicit spontaneous as well as planned language performance for a variety of purposes and audiences, using rubrics to assess performance, and demonstrating reflection about learning, including goal setting and self and peer assessment.

### **Portfolio characteristics:**

- Represent an emphasis on language use and cultural understanding
- Represent a collaborative approach to assessment
- Represent a student's range of performance in reading, writing, speaking, and listening as well as cultural understanding
- Emphasize what students can do rather than what they cannot do
- Represent a student's progress over time
- Engage students in establishing on-going learning goals and assessing their progress towards those goals
- Measure each student's achievement while allowing for individual differences between students in a class
- Address improvement, effort, and achievement
- Allow for assessment of process and product
- Link teaching and assessment to learning.

### **GRADING**

Grading in education is the process of applying standardized measurements of varying levels of achievement in a course. Another way the grade point average (GPA) can be determined is through extra-curricular activities. Grades can be assigned as letters (generally A through F), as a range (for example 1 to 6), as a percentage of a total number of questions answered correctly, or as a number out of a possible total (for example out of 20 or 100).

In some countries, all grades from all current classes are averaged to create a Grade Point Average (GPA) for the marking period. The GPA is calculated by taking the number of grade points a student earned in a given period of time of middle school through high school.<sup>[1]</sup> GPAs are also calculated for undergraduate and graduate students in most universities. The GPA can be used by potential employers or educational institutions to assess and compare applicants. A *cumulative grade point average* is a calculation of the average of all of a student's total earned points divided by the possible amount of points. This grading system calculates for all of his or her complete education career.

### **Evaluation and Grading System**

#### **Grades and the Basis for Assessment''**

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### Letter Grades and Grading Standards

“A” (80-100%)

“B” (70-79%)

“C” (60-69%)

“D” (50-59%)

“F” (0-49%)

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**“A” indicates Exceptional Performance:** comprehensive in-depth knowledge of the principles and materials treated in the course, fluency in communicating that knowledge and independence in applying material and principles.

**“B” indicates Good Performance:** thorough understanding of the breadth of materials and principles treated in the course and ability to apply and communicate that understanding effectively.

**“C” indicates Satisfactory Performance:** basic understanding of the breadth of principles and materials treated in the course and an ability to apply and communicate that understanding competently.

**“D” indicates Minimally Competent Performance:** adequate understanding of most principles and materials treated in the course, but significant weakness in some areas and in the ability to apply and communicate that understanding.

**“F” indicates Failure:** inadequate or fragmentary knowledge of the principles and materials treated in the course or failure to complete the work required in the course.

**“I” indicates Incomplete.**

**“W” indicates Withdrawal with permission.**

### Aegrotat Standing

Aegrotat standing (credit granted with incomplete course work) will be considered only in exceptional circumstances (usually only in cases of very serious illness) and if term work has been of high quality.

### Determination of Final Grades

- a. A student's grade in each course will be based upon the year's work and the final examination (if required);
- b. The instructor will discuss with the class the basis for assessment specifying the relative weight of each examination, test, in-class activity and written assignment;
- c. The instructor will also specify which assignments must be completed in order to receive a grade in the course; penalties for late assignments should be clearly stated in each course;
- d. The method of determining final grades is to be discussed with students within the time frame Senate has approved for late course registration;
- e. The instructor must inform students of their standing prior to the date for honourable withdrawal from the course. If no written term work has been evaluated by that date, the information shall be given in the form of a written statement of the student's standing;
- f. The instructor is required to return to students all written work, other than final examinations, which has been submitted for evaluation purposes. Students may discuss with their instructor the work presented, the comments made, and the grade assigned;
- g. Final evaluation submissions are not returned to students but are kept on file by the Office of the Registrar for six months after the publication of Grade Reports;
- h. For each course, faculty will enter their final grades into the Student Information System (SIS) within seven (7) days of the date a final exam was written for an on-campus course, and within fourteen (14) days of the date the final exam was written for alternative delivery courses. For courses where no final exam was scheduled, final grades must be submitted within seven (7) days of the last day of classes in the term. Once the Dean has approved the marks submission, grades will be available for viewing on the SIS. The Dean's signature of approval indicates that the marks submission is consistent with existing practices and policies of the Faculty. Revisions to any previously assigned grade are submitted in writing for the approval of the Dean, together with the reasons for such revisions. Grades are not official until they have been approved by the Dean and released by the Office of the Registrar;
- i. The final marks issued by the University are the only ones accepted as binding.

### **Incomplete Grades**

In exceptional circumstances, a student may request consideration for an Incomplete grade (I). Such request must be submitted, through the Instructor to the Dean, together with the reasons for the request.

Any student assigned an Incomplete grade must normally complete all course requirements within 30 days after the end of the examination period or the last day of the course if there is no final examination for that course. If after that period the course is not completed, a grade of zero will be assigned to those components not completed.

## **TYPES OF ASSESSMENT**

### **PERFORMANCE BASED ASSESSMENT OR ALTERNATIVE ASSESSMENT**

Performance-based assessment is similar to summative assessment, as it focuses on achievement. It is often aligned with the standards-based education reform and outcomes-based education movement. Though ideally they are significantly different from a traditional multiple choice test, they are most commonly associated with standards-based assessment which use free-form responses to standard questions scored by human scorers on a standards-based scale, meeting, falling below or exceeding a performance standard rather than being ranked on a curve. A well-defined task is identified and students are asked to create, produce or do something, often in settings that involve real-world application of knowledge and skills. Proficiency is demonstrated by providing an extended response. Performance formats are further differentiated into products and performances. The performance may result in a product, such as a painting, portfolio, paper or exhibition, or it may consist of a performance, such as a speech, athletic skill, musical recital or reading.

Alternative assessment, often called authentic, comprehensive, or performance assessment, is usually designed by the teacher to gauge students' understanding of material. Examples of these measurements are open-ended questions, written compositions, oral presentations, projects, experiments, and portfolios of student work. Alternative assessments are designed so that the content of the assessment matches the content of the instruction.

Effective assessments give students feedback on how well they understand the information and on what they need to improve, while helping teachers better design instruction. Assessment becomes even more relevant when students become involved in their own assessment. Students taking an active role in developing the scoring criteria, self-evaluation, and goal setting, more readily accept that the assessment is adequately measuring their learning.

Authentic assessment can include many of the following:

- Observation
- Essays
- Interviews
- Performance tasks
- Exhibitions and demonstrations
- Portfolios
- Journals
- Teacher-created tests
- Rubrics
- Self- and peer-evaluation

### **EVIDENCE BASED ASSESSMENT**

**Evidence-based assessment** (EBA) refers to the use of research and theory to guide the selection of constructs to be used for a specific **assessment** purpose and to inform the methods and measures used in the **assessment** process.

## **EXAMINATION BASED ASSESSMENT**

A **test** or **examination** (informally, **exam**) is an assessment intended to measure a test-taker's knowledge, skill, aptitude, physical fitness, or classification in many other topics. A test may be administered verbally, on paper, on a computer, or in a confined area that requires a test taker to physically perform a set of skills. Tests vary in style, rigor and requirements. For example, in a closed book test, a test taker is often required to rely upon memory to respond to specific items whereas in an open book test, a test taker may use one or more supplementary tools such as a reference book or calculator when responding to an item. A test may be administered formally or informally. An example of an informal test would be a reading test administered by a parent to a child. An example of a formal test would be a final examination administered by a teacher in a classroom or an I.Q. test administered by a psychologist in a clinic. Formal testing often results in a grade or a test score. A test score may be interpreted with regards to a norm or criterion, or occasionally both. The norm may be established independently, or by statistical analysis of a large number of participants.

### **Types of tests**

#### **Written tests**

Written tests are tests that are administered on paper or on a computer. A test taker who takes a written test could respond to specific items by writing or typing within a given space of the test or on a separate form or document.

In some tests knowledge of many constants or technical terms is required to effectively answer questions, like Chemistry or Biology.

A test developer's choice of which style or format to use when developing a written test is usually arbitrary given that there is no single invariant standard for testing. Be that as it may, certain test styles and format have become more widely used than others. Below is a list of those formats of test items that are widely used by educators and test developers to construct paper or computer-based tests. As a result, these tests may consist of only one type of test item format (e.g., multiple choice test, essay test) or may have a combination of different test item formats (e.g., a test that has multiple choice and essay items).

#### **Multiple choice**

In a test that has items formatted as multiple choice questions, a student would be given a number of set answers for each question, and the candidate must choose which answer or group of answers is correct. There are two families of multiple choice questions. The first family is known as the True/False question and it requires a test taker to choose all answers that are appropriate. The second family is known as One-Best-Answer question and it requires a test taker to answer only one from a list of answers.

There are several reasons to using multiple choice questions in tests. In terms of administration, multiple choice questions usually requires less time for test takers to answer, are easy to score and grade, provide greater coverage of material, allows for a wide range of difficulty, and can easily diagnose a test taker's difficulty with certain concepts. As an educational tool, multiple choice items test many levels of learning as well as a test taker's ability to integrate information, and it provides feedback to the test taker about why distractors were wrong and why correct answers were right. Nevertheless, there are difficulties associated with the use of multiple choice questions. In administrative terms, multiple choice items that are effective usually take a great time to construct. As an educational tool, multiple choice items do not allow test takers to demonstrate knowledge beyond the choices provided and may even encourage guessing or approximation due to the presence of at least one correct answer.

### **Alternative response**

True/False questions present candidates with a binary choice - a statement is either true or false. This method presents problems, as depending on the number of questions, a significant number of candidates could get 100% just by guesswork, and should on average get 50%.

### **Matching type**

A matching item is an item that provides a defined term and requires a test taker to match identifying characteristics to the correct term.

### **Completion type**

A fill-in-the-blank item provides a test taker with identifying characteristics and requires the test taker to recall the correct term. There are two types of fill-in-the-blank tests. The easier version provides a word bank of possible words that will fill in the blanks. For some exams all words in the wordbank are used exactly once. If a teacher wanted to create a test of medium difficulty, they would provide a test with a word bank, but some words may be used more than once and others not at all. The hardest variety of such a test is a fill-in-the-blank test in which no word bank is provided at all. This generally requires a higher level of understanding and memory than a multiple choice test. Because of this, fill-in-the-blank tests[with no word bank] are often feared by students.

### **Essay**

Items such as short answer or essay typically require a test taker to write a response to fulfill the requirements of the item. In administrative terms, essay items take less time to construct. As an assessment tool, essay items can test complex learning objectives as well as processes used to answer the question. The items can also provide a more realistic and generalizable task for test. Finally, these items make it difficult for test takers to guess the correct answers and require test takers to demonstrate their writing skills as well as correct spelling and grammar.

The difficulties with essay items are primarily administrative. For one, these items take more time for test takers to answer. When these questions are answered, the answers themselves are usually poorly written because test takers may not have time to organize and proofread their answers. In turn, it takes more time to score or grade these items. When these items are being scored

or graded, the grading process itself becomes subjective as non-test related information may influence the process. Thus, considerable effort is required to minimize the subjectivity of the grading process. Finally, as an assessment tool, essay questions may potentially be unreliable in assessing the entire content of a subject matter.

## **FEEDBACK THROUGH MARKING**

### **Feedback**

Feedback is the central function of formative assessment. It typically involves a focus on the detailed content of what is being learnt, rather than simply a test score or other measurement of how far a student is falling short of the expected standard. Nicol and Macfarlane- Dick, synthesising from the literature, list seven principles of good feedback practice:

1. It clarifies what good performance is (goals,criteria, expected standards);
2. It facilitates the development of self-assessment in learning;
3. It provides high quality information to students about their learning;
4. It encourages teacher and peer dialogue around learning;
5. It encourages positive motivational beliefs and self-esteem;
6. It provides opportunities to close the gap between current and desired performance;
7. It provides information to Teachers that can be used to help shape teaching.

Internal assessment is set and marked by the school (i.e. teachers). Students get the mark and feedback regarding the assessment. External assessment is set by the governing body, and is marked by non-biased personnel. Some external assessments give much more limited feedback in their marking.

## **PEER AND SELF ASSESSMENT**

### **Peer Assessment**

One of the ways in which students internalize the characteristics of quality work is by evaluating the work of their peers. However, if they are to offer helpful feedback, students must have a clear understanding of what they are to look for in their peers' work. The instructor must explain expectations clearly to them before they begin.

One way to make sure students understand this type of evaluation is to give students a practice session with it. The instructor provides a sample writing or speaking assignment. As a group, students determine what should be assessed and how criteria for successful completion of the communication task should be defined. Then the instructor gives students a sample completed assignment. Students assess this using the criteria they have developed, and determine how to convey feedback clearly to the fictitious student.

Students can also benefit from using rubrics or checklists to guide their assessments. At first these can be provided by the instructor; once the students have more experience, they can develop



them themselves. An example of a peer editing checklist for a writing assignment is given in the popup window. Notice that the checklist asks the peer evaluator to comment primarily on the content and organization of the essay. It helps the peer evaluator focus on these areas by asking questions about specific points, such as the presence of examples to support the ideas discussed.

For peer evaluation to work effectively, the learning environment in the classroom must be supportive. Students must feel comfortable and trust one another in order to provide honest and constructive feedback. Instructors who use group work and peer assessment frequently can help students develop trust by forming them into small groups early in the semester and having them work in the same groups throughout the term. This allows them to become more comfortable with each other and leads to better peer feedback.

## **SELF ASSESSMENT**

Students can become better language learners when they engage in deliberate thought about what they are learning and how they are learning it. In this kind of reflection, students step back from the learning process to think about their language learning strategies and their progress as language learners. Such self-assessment encourages students to become independent learners and can increase their motivation.

The successful use of student self-assessment depends on three key elements:

- Goal setting
- Guided practice with assessment tools
- Portfolios

### **Goal setting**

Goal setting is essential because students can evaluate their progress more clearly when they have targets against which to measure their performance. In addition, students' motivation to learn increases when they have self-defined, and therefore relevant, learning goals.

One way to begin the process of introducing students to self-assessment is to create student-teacher contracts. Contracts are written agreements between students and instructors, which commonly involve determining the number and type of assignments that are required for particular grades. For example, a student may agree to work toward the grade of "B" by completing a specific number of assignments at a level of quality described by the instructor. Contracts can serve as a good way of helping students to begin to consider establishing goals for themselves as language learners.

### **Guided practice with assessment tools**

Students do not learn to monitor or assess their learning on their own; they need to be taught strategies for self-monitoring and self-assessment. Techniques for teaching students these strategies are parallel to those used for teaching learning strategies. The instructor models the technique (use of

a checklist or rubric, for example); students then try the technique themselves; finally, students discuss whether and how well the technique worked and what to do differently next time.

In addition to checklists and rubrics for specific communication tasks, students can also use broader self-assessment tools to reflect on topics they have studied, skills they have learned, their study habits, and their sense of their overall strengths and weaknesses. An example of such a tool appears in the popup window.

Students can share their self-assessments with a peer or in a small group, with instructions that they compare their impressions with other criteria such as test scores, teacher evaluations, and peers' opinions. This kind of practice helps students to be aware of their learning. It also informs the teacher about students' thoughts on their progress, and gives the teacher feedback about course content and instruction.

### **FORMATIVE USE OF SUMMATIVE ASSESSMENT**

Both formative assessment (assessment *for* learning) and summative assessment have vital roles to play in the education of students, and although on the surface they may not seem to have much in common, there are identified ways they can work together to improve student learning.

Making formative use of summative assessment means using information derived from summative assessment to improve future student performance. For the teacher it involves:

- providing a range of assessment tasks and opportunities to make certain that a range of student learning styles are catered for
- teaching students to prepare more efficiently for summative assessment by making use of knowledge about themselves as learners
- making use of the results of summative assessment so that learning is emphasised.

For the student it involves:

- developing the ability to identify 'where I am now' and 'where I need to be'... and to prepare for summative assessment accordingly
- recognising that summative assessment experiences are an opportunity for further learning and a chance to improve future achievement.

### **QUESTIONS FOR DISCUSSION AND REFLECTION**

1. What is continuous and comprehensive evaluation?
2. Define portfolio
3. What is peer assessment?
4. What is project?
5. What is formative use of summative tests?

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## UNIT - 3: TOOLS AND TECHNIQUES FOR CLASSROOM ASSESSMENT

### OBJECTIVES:

- To understand the importance of teacher observations
- To know the impact of affective domain in learning
- To know the characteristics of Attitude Scales
- To develop skills on Checklists, Rating Scales and Rubrics
- To understand the principals of constructing test items

### OBSERVATION

Teacher observation is capable of providing substantial information on student demonstration of learning outcomes at all levels of education.

Teacher observation can be characterised as two types: incidental and planned.

*Incidental observation* occurs during the ongoing (deliberate) activities of teaching and learning and the interactions between teacher and students. In other words, an unplanned opportunity emerges, in the context of classroom activities, where the teacher observes some aspect of individual student learning. Whether incidental observation can be used as a basis for formal assessment and reporting may depend on the records that are kept.

*Planned observation* involves deliberate planning of an opportunity for the teacher to observe specific learning outcomes. This planned opportunity may occur in the context of regular classroom activities or may occur through the setting of an assessment task (such as a practical or performance activity).

### Arguments for Valuing Teacher Observation:

Teacher observation is an important but underutilised assessment technique. It is sometimes argued that teachers are unable to make appropriate and dependable assessment judgments from observations of students in natural settings.

An important argument in support of teacher observation is that teachers have access to a rich and diverse range of evidence on student learning outcomes from observations of their students; and that the capability of teachers to collect and interpret this range of evidence should be respected.

Otherwise, a rich source of evidence on student learning outcomes is being ignored. In any case, the issue is not whether teacher observations should be used — since they are necessarily used informally during teaching — but how teacher judgments can

be strengthened and improved so that they can be used for formal purposes, especially for reporting and certification

### **Collection and Recording of Evidence:**

All assessment requires the collection and recording of evidence of student learning. For the implementation of Council syllabuses, it has been recommended that the evidence focus on the demonstration of learning outcomes. Evidence is documentation that records, illustrates or confirms student demonstrations of learning outcomes.

Accountability and verification are key factors in assuring the quality of assessments.

**Accountability** (justification) means being able to explain and defend assessment judgments to students, their parent(s) and other teachers.

**Verification** (confirmation) means being able to revisit the foundations for assessment judgments being able to check their completeness, relevance and veracity.

Teacher observations are primarily directed at the observation of events, performances and activities. In some cases, an artefact may be produced as a consequence of the event, performance or activity. In other cases, no artefact is produced and the event, performance or process itself is the sole focus of attention. An artefact is something constructed by the student, for example, a worksheet, a piece of writing, a design, a painting, a composition, a webpage — in other words, a product of some kind. Teacher observation is not primarily concerned with the artefact itself but with the way in which the artefact was produced, that is, with the process.

### **Planning For Teacher Observation:**

Teacher observations cannot be useful without planning. Different types of evidence require different types of planning.

An essential requirement for all types of evidence is anticipating the kinds of learning outcomes that may be demonstrated. This is particularly important where observation is incidental and where judgments (rather than descriptions) are recorded. Council syllabuses provide a framework of learning outcomes that serve as the perceptual reference points for recognising the characteristics of student performance.

The framework of learning outcomes makes available to the teacher concepts and language for recognising and describing what a student knows and can do. Learning the structure, language and concepts of the framework therefore is a key aspect of planning for teacher observation, as it is too for teaching.

### **Factors Affecting Validity of Teacher Observations and What to Do About Them:**

Teacher observations will be valid to the extent that the evidence is appropriately recorded and interpreted, that is, whether: the recorded evidence accurately represents the observed student performance and the interpretation (judgment) of this evidence is justifiable.

### **SELF-ASSESSMENT**

Self-assessment could mean that students simply check off answers on a multiple-choice test and grade themselves, but it involves much more than that. Self-assessment is more accurately defined as a process by which students 1) monitor and evaluate the quality of their thinking and behaviour when learning and 2) identify strategies that improve their understanding and skills. That is, self-assessment occurs when students judge their own work to improve performance as they identify discrepancies between current and desired performance. This aspect of self assessment aligns closely with standards based education, which provides clear targets and criteria that can facilitate student self-assessment.

### **The Self-Assessment Process:**

Self-monitoring, a skill necessary for effective self-assessment, involves focused attention to some aspect of behaviour or thinking. Self-monitoring students pay deliberate attention to what they are doing, often in relation to external standards. Thus, self monitoring concerns awareness of thinking and progress as it occurs, and as such, it identifies part of what students do when they self-assess.

### **Implications for Practice:**

For classroom teachers, student self-assessment develops an awareness of which metacognitive strategies to use and when to use them. Teachers and students learn these skills when they establish clear learning goals and articulate evaluative criteria that enable students to assess their own work. Those practices engage students as they actively participate in the learning process and become more connected and committed to the learning outcomes. Student self-assessment also

mandates that teachers learn to pass the evaluative responsibilities to their students by scaffolding and modeling goal setting, evaluation, strategy adjustment, and reflection.

### **ANECDOTAL RECORDS**

Anecdotal records are systematically kept notes of specific observations of student behaviors, skills, and attitudes in the classroom. Anecdotal records provide cumulative information regarding progress, skills acquired, and directions for further instruction. Anecdotal notes are often written as the result of ongoing observations during the lessons but may also be written in response to a product or performance the student has completed. Systematic collection of anecdotal records on a particular student provides excellent information for evaluation of learning patterns and consistency of student progress. Well-kept anecdotal records provide a valuable, practical, and specific reference about a student.

Anecdotal notes are used to record specific observations of individual student behaviours, skills and attitudes as they relate to the outcomes in the program of studies. Such notes provide cumulative information on student learning and direction for further instruction. Anecdotal notes are often written as the result of ongoing observations during the lessons but may also be written in response to a product or performance the student has completed. They are brief, objective and focused on specific outcomes. Notes taken during or immediately following an activity are generally the most accurate. Anecdotal notes for a particular student can be periodically shared with that student or be shared at the student's request. They can also be shared with students and parents at parent-teacher-student conferences.

The purpose of anecdotal notes is to:

1. provide information regarding a student's development over a period of time
2. provide ongoing records about individual instructional needs
3. capture observations of significant behaviours that might otherwise be lost
4. provide ongoing documentation of learning that may be shared with students, parents and teachers.

## **CHECKLISTS, RATING SCALES AND RUBRICS**

Checklists, rating scales and rubrics are tools that state specific criteria and allow teachers and students to gather information and to make judgements about what students know and can do in relation to the outcomes. They offer systematic ways of collecting data about specific behaviours, knowledge and skills.

The quality of information acquired through the use of checklists, rating scales and rubrics is highly dependent on the quality of the descriptors chosen for assessment. Their benefit is also dependent on students' direct involvement in the assessment and understanding of the feedback provided.

The purpose of checklists, rating scales and rubrics is to:

- provide tools for systematic recording of observations
- provide tools for self assessment
- provide samples of criteria for students prior to collecting and evaluating data on their work
- record the development of specific skills, strategies, attitudes and behaviours necessary for demonstrating learning
- clarify students' instructional needs by presenting a record of current accomplishments.

### **Developing Checklists, Rating Scales and Rubrics**

- Use checklists, rating scales and rubrics in relation to outcomes and standards.
- Use simple formats that can be understood by students and that will communicate information about student learning to parents.
- Ensure that the characteristics and descriptors listed are clear, specific and observable.
- Encourage students to assist with constructing appropriate criteria. For example, what are the descriptors that demonstrate levels of performance in problem solving?
- Ensure that checklists, rating scales and rubrics are dated to track progress over time.
- Leave space to record anecdotal notes or comments.
- Use generic templates that become familiar to students and to which various descriptors can be added quickly, depending on the outcome(s) being assessed.
- Provide guidance to students to use and create their own checklists, rating scales and rubrics for self-assessment purposes and as guidelines for goal setting



Checklists usually offer a yes/no format in relation to student demonstration of specific criteria. This is similar to a light switch; the light is either on or off. They may be used to record observations of an individual, a group or a whole class.

Rating Scales allow teachers to indicate the degree or frequency of the behaviours, skills and strategies displayed by the learner. To continue the light switch analogy, a rating scale is like a dimmer switch that provides for a range of performance levels. Rating scales state the criteria and provide three or four response selections to describe the quality or frequency of student work.

Teachers can use rating scales to record observations and students can use them as self assessment tools. Teaching students to use descriptive words, such as always, usually, sometimes and never helps them pinpoint specific strengths and needs. Rating scales also give students information for setting goals and improving performance. In a rating scale, the descriptive word is more important than the related number. The more precise and descriptive the words for each scale point, the more reliable the tool.

Effective rating scales use descriptors with clearly understood measures, such as frequency. Scales that rely on subjective descriptors of quality, such as fair, good or excellent, are less effective because the single adjective does not contain enough information on what criteria are indicated at each of these points on the scale.

Rubrics use a set of criteria to evaluate a student's performance. They consist of a fixed measurement scale and detailed description of the characteristics for each level of performance. These descriptions focus on the quality of the product or performance and not the quantity; e.g., not number of paragraphs, examples to support an idea, spelling errors. Rubrics are commonly used to evaluate student performance with the intention of including the result in a grade for reporting purposes. Rubrics can increase the consistency and reliability of scoring.

### **Developing Rubrics and Scoring Criteria**

Rubrics are increasingly recognized as a way to both effectively assess student learning and communicate expectations directly, clearly and concisely to students. The inclusion of rubrics in a teaching resource provides opportunities to consider what demonstrations of learning look like, and to describe stages in the development and growth of knowledge, understandings and skills. To be most effective, rubrics should allow students to see the progression of mastery in the development of understandings and skills.

Rubrics should be constructed with input from students whenever possible. A good start is to define what quality work looks like based on the learning outcomes. Exemplars of achievement need to be used to demonstrate to students what an excellent or acceptable performance is. This provides a collection of quality work for students to use as reference points. Once the standard is established, it is easy to define what exemplary levels and less-than-satisfactory levels of performance look like. The best rubrics have three to five descriptive levels to allow for discrimination in the evaluation of the product or task. Rubrics may be used for summative purposes to gauge marks by assigning a score to each of the various levels.

### **ASSESSMENT TOOLS FOR AFFECTIVE DOMAIN**

The affective domain is a part of a system that was published in 1965 for identifying understanding and addressing how people learn. This describes learning objectives that emphasize a feeling tone, an emotion, or a degree of acceptance or rejection. It is far more difficult domain to objectively analyze and assess since affective objectives vary from simple attention to selected phenomena to complex but internally consistent qualities of character and conscience. Nevertheless, much of the educative process needs to deal with assessment and measurement of students' abilities in this domain.

### **ATTITUDE SCALES**

An attitude scale is a special type of questionnaire designed to produce scores indicating the intensity and direction (for or against) of a person's feelings about an object or event. Attitude scales are often used in attitude change experiments. One group of people is asked to fill out the scale twice, once before some event, such as reading a persuasive argument, and again afterward. A control group fills out the scale twice without reading the argument. The control group is used to measure exposure or practice effects. The change in the scores of the experimental group relative to the control group, whether their attitudes have become more or less favorable, indicates the effects of the argument.

#### **Some Important Characteristics of Attitude Scales**

- A questionnaire is prepared; by the items in the questionnaire assess the attitude of an individual towards a matter, thing, an object or system and score is allotted for each item.
- The individual is asked to express his response towards an object or system, on the basis of his responses, he is assigned a score which indicates the position.

- Some relevant and indirect statements can also be used to reveal the attitude.
- The scale also specifies the crucial shades of opinions.
- Most of the scales used are ordinal in nature, though there is attempt to treat the resulting data as intervally scaled.
- The simplest possible type of such scale has the respondent classifying the object/issue/product/himself into one among two dichotomous categories.
- The attitude measurement scales can be categorised into those which are unidimensional in nature and those which are multidimensional. The different type of single dimensional attitude measurement scales which are available are graphical and numerical scales, summated scales, paired comparisons, equal-appearing intervals.

## **MOTIVATION SCALES**

The Motivation Assessment Scale (MAS) is a rating scale that assesses functions of problem behavior in individuals with developmental disabilities through informant responses. It includes 16 questions and is comprised of four subscales that each represents a possible function of the behavior: attention, escape, sensory, and tangible. Each question has six response options (0 = never, 1 = almost never, 2 = seldom, 3 = half the time, 4 = usually, 5 = almost always, and 6 = always). Scores are calculated by summing the item ratings within a particular subscale/function and calculating the mean rating for that subscale. High scores for one or more of the subscales suggest that those functions may be maintaining the individual's problem behaviour although the authors of the instrument do not specify what constitutes a high score.

## **PRINCIPLES OF TEST ITEMS CONSTRUCTION**

### **Planning for the test:**

- Outline subject matter content to be considered as the basis for the test.
- identify learning outcomes to be measured by the test.
- Prepare table of specifications.
- Choose appropriate type(s) of test items for evaluation of learning outcomes as
- summarized in the table of specifications.

### **Preparing the test:**

- Write test items according to rules of construction for the type(s) chosen.
- Select the items to be included in the test according to table of specifications.

- Review and edit items according to guidelines.
- Arrange items: decide on a) grouping of items, b) sequence of items within groups, c) sequence of groupings.
- Prepare directions for the test; if necessary, prepare directions for individual items (e.g., matching type) or for sections (e.g., negative form of onebest response type).
- Decide on method of scoring.

**Analyzing and revising the test:**

- Perform test analysis to determine difficulty, discrimination and reliability.
- Retain, edit as necessary, or discard items on basis of analysis outcomes.
- Revise the test as a whole if necessary.

**QUESTIONS FOR DISUCSSION AND REFLECTION**

1. Explain the importance of teacher observations.
2. Give a brief note on anecdotal record.
3. Describe the characteristics of Attitude Scales.
4. Explain Rubrics with suitable examples.
5. List out the principals of constructing test items.

## **UNIT - 4: ISSUES IN CALSSROOM ASSESSMENT**

### **Objectives**

- To understand the major issues and commercialization of assessment
- To under about the poor test quality
- To know the reforms in assessment
- To know about open book and online examinations
- To know examination reforms reports

### **MAJOR ISSUES AND COMMERCIALIZATION OF ASSESSMENT**

#### **POOR TEST QUALITY**

##### **Validity**

Validity is arguably the most important criteria for the quality of a test. The term validity refers to whether or not the test measures what it claims to measure. On a test with high validity the items will be closely linked to the test's intended focus. For many certification and licensure tests this means that the items will be highly related to a specific job or occupation. If a test has poor validity then it does not measure the job-related content and competencies it ought to. When this is the case, there is no justification for using the test results for their intended purpose. There are several ways to estimate the validity of a test including content validity, concurrent validity, and predictive validity. The face validity of a test is sometimes also mentioned.

##### **Reliability**

Reliability is one of the most important elements of test quality. It has to do with the consistency, or reproducibility, of an examinee's performance on the test. For example, if you were to administer a test with high reliability to an examinee on two occasions, you would be very likely to reach the same conclusions about the examinee's performance both times. A test with poor reliability, on the other hand, might result in very different scores for the examinee across the two test administrations. If a test yields inconsistent scores, it may be unethical to take any substantive actions on the basis of the test. There are several methods for computing test reliability including test-retest reliability, parallel forms reliability, decision consistency, internal consistency, and interrater reliability. For many criterion-referenced tests decision consistency is often an appropriate choice.

##### **Fairness**

The fairness of an exam refers to its freedom from any kind of bias. The exam should be appropriate for all qualified examinees irrespective of race, religion, gender, or age. The test should not disadvantage any examinee, or group of examinees, on any basis other than the examinee's lack of the knowledge and skills the test is intended to measure. Item writers should address the goal of fairness as they undertake the task of writing items. In addition, the items should also be reviewed for potential fairness problems during the item review phase. Any items that are identified as displaying potential bias or lack of fairness should then be revised or dropped from further consideration.

### **Legal Defensibility**

For an exam program to have legal defensibility there must be evidence as to the test's quality that would stand up in a court challenge. You will need to be able to provide evidence that sound, professionally recommended guidelines were followed throughout the design, development, and maintenance of the exam program. Professional guidelines for testing are offered by the American Psychological Association (APA), American Educational Research Association (AERA), and the National Council on Measurement in Education (NCME). Studies should also be conducted to investigate and confirm that the test has reasonable degrees of validity, reliability, and fairness. Among the most important elements that courts look for are a well-conducted job analysis and strong content validity (that is, the items need to have a high degree of "job relatedness"). Finally, good documentation of the design, development, and analysis of the exam program should be collected and maintained.

### **OPEN BOOK AND ONLINE EXAMINATION**

#### **Open Book System Advantages and Disadvantages Advantages:**

Students are not required to engage in parroting of concepts, if they understand the concept they would answer correctly. This will remove tension of examination which has become integral part of normal education system. Those students who are intelligent but don't like to put in extra hard work in memorizing the concepts, facts and other data would enjoy this system. It is highly likely that more and more students would continue their education as the passing percentage would go up.

#### **Disadvantage:**

The students would stop studying and simply copy from the open book provided at the examination hall. It would be really tough to control the secret discussions between students who would cheat their way to success. The number of pass outs would increase and the students who pass out the exam of 12th board through open book would demand similar type of arrangement in higher studies and later on even in jobs they would demand the provision of open book. Simply imagine a surgeon who turns the pages of the book while performing surgery on his patients. Board examinations would lose their importance and no one would like to assess the ability and competence of an individual on the basis of marks or grade of the CBSE board.

## **ADVANTAGES AND DISADVANTAGES OF ONLINE TESTING**

### **Advantages**

- 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.

### **Disadvantages**

- 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.

### **EXAMINATION REFORMS IN INDIA**

“If we are to suggest one single reform in University Education, it should be that of examinations.”-Radha Krishnan Commission, 1948. Problem of examination is the most taxing problem of education. The unfortunate consequences of the present system of examinations are before our eyes. If we can solve it satisfactorily, there will be a great relief to the students and the very face of education will be different.



In order to reform the examination system in our country, the Mudaliar Commission laid stress on the use of objective type tests and internal assessment. Kothari commission too repeated these reforms. This Commission boldly suggested that the certificate of the student should bear his complete performance but there should be no remark to the effect that he has passed or failed in the whole examination. This is very good suggestion and can be easily implemented.

As the first practical step in changing the present pattern of examinations, the All India Council for Secondary Education was set up by the Central Ministry of Education in October 1995. It gave top priority consideration to resolve the problem of examination system. The well-known International Commission on Education sponsored by UNESCO in 1992, gave their valuable comments and suggestions for reforming the system of examination.

The National Policy on Education, 1986 emphasized on continuous and comprehensive evaluation and the introduction of semester system from the secondary stage.

The National Policy on Education, 1986 recommended a new approach to examinations in the following words:

1. "Assessment of performance is an integral part of any process of learning and teaching. As part of sound educational strategy, examinations should be employed to bring about qualitative improvement in education.

2. The objective will be to recast the examination system so as to ensure a method of assessment that is a valid and reliable measure of student development and a powerful instrument for Improving teaching and learning; in functional terms, this would mean:

(i) The elimination of excessive element of chance and subjectivity;

(ii) The de-emphasis of memorization;

(iii) Continuous and comprehensive evaluation that incorporates both scholastic and non-scholastic aspects of education, spread over the total span of instructional time.

(iv) Effective use of the evaluation process by teachers, students and parents

(v) Improvement in the conduct of examination;

(vi) The introduction of concomitant changes in instructional materials and methodology;

(vii) Instruction of the Semester system from the secondary stage in a phased manner, and

(viii) The use of grades in place of marks.

3. The above goals are relevant both for external examinations and evaluations within educational institutions. Evaluation at the institutional level will be streamlined and the predominance of external examinations reduced. A National Examination Reform Framework would be prepared to serve as a

set of guidelines to the examining bodies which would have the freedom to innovate and adapt the framework to suit the specific situations.”

The Programme of Action (POA) suggested several specific short- term and long-term measures for carrying out examination reform at the school level as well as at the university level. It also suggested that, “to formulate a national examination reform work the Department of Education would, inter-alia, constitute an inter institutional Committee with representations from UGC, NCERT, AICTE and state level organisations including Board of Secondary Education. ” the POA has also made some strategies for implementation

**(A) ELEMENTARY STAGE:**

1. The Minimum levels of Learning (MLLs) in language Tongue), Mathematics and Environmental Studies for classes 1 to V have been developed by MHRD at the national level. Similar exercise to develop these in the remaining area and classes of elementary curriculum will be carried out.
2. Since no detention policy is envisaged at the primary stage, the main function of evaluation will be diagnostic in nature so as to provide remedial help to the pupils.
3. The concerned agency in each state will prepare a flexible scheme of Continuous Comprehensive Evaluation (CCE) at the elementary stage, so as to make the evaluation process an integral part of teaching and learning at this stage.

**(B) SECONDARY STAGE:**

1. Each State Board will lay down expected levels of attainments at classes IX to XII and prescribe appropriate courses, of studies to accomplish these levels in terms of knowledge and / or comprehension, communication skills, understanding, application, analysis, synthesis, judgements etc.
2. In each state, the concerned agency will prepare a flexible scheme of continuous comprehensive Examination for the secondary/ senior secondary stage to suit a variety of specific situations obtaining in different regions and types of schools. Certain models have been developed by NCERT and other agencies which could be looked into for guidance.

**(C) HIGHER EDUCATION STAGE:**

1. Selection tests for admissions to all professional and technical courses will be conducted on an all-India basis.

2. Each University will prepare broad guidelines for grading to be followed by individual colleges/ institutions and departments under its jurisdiction. Orientation programmes may be organised to familiarize the teachers with the grading system.

3. The movement towards entrance tests for admission to institutions of higher education will be encouraged and promoted by UGC and State Government. The services of the National Evaluation Organisation (NEO) should be utilized by the university system for developing, designing and administering entrance tests for admission.

Besides the above strategies for different stages, the POA (1986) has also envisaged the following strategies which are common for all stages:

1. The emphasis will be laid on testing of expected levels of achievement of a variety of learning objectives in order to ensure due importance to higher abilities of understanding, application, analysis, synthesis, judgement and parallel parameters and not only to memory.

2. The Semester system introduced at the secondary stage and onwards should provide for flexibility in the combination of courses and accumulation of credits to enable the pupils to proceed at their own pace resulting in upward and horizontal mobility of the students across the country.

3. Appropriate courses in examination reform will be developed by Indira Gandhi National Open University through distance education mode in collaboration with NCERT for large scale training of different kinds and levels of personal.

4. An Examination Reform Centre will be established at the UGC for coordination, documentation and dissemination of information on examination reforms in higher education. Similarly, NCERT would perform this function at school stage.

5. Some laws will be introduced in the legislation regarding various malpractices connected with examinations. Such laws will make provision to prescribe the nature and type of punishment for various offences under the law.

6. A strong and coordinated effort should be made by the Centre and State Government regarding the monitoring and evaluation of the reforms in examinations and evaluation. Following up on NPE, 1986, NCERT conducted a National Seminar on Examination Reforms and issued certain guidelines to the States, principally covering the subjects of scaling and grading, continuous comprehensive internal evaluation, setting up of balanced question papers etc.

Examination reforms having been recommended consistently by various Committees and Commissions over the years, steps for the same have been taken differently in different states. Regarding examination reforms, the National Policy on Education Review Committee (NPERC) under the chairmanship of Acharya Ramamurty in 1990, exhaustively reviewed the observations and

recommendations made by different Committees and Commissions. During the course of the review, the NPERC also referred to the provision of NPE in regard to evaluation process and examination reforms. The NPERCA also presented the status of the examination reforms in different states at the University and school levels.

The NPERC states that “Examination reform cannot be construed as an isolated activity to bring about process orientation. It has to go as a package along with reform in the structuring of courses and flexibility for students to avail of the restructured courses according to their convenience.”

Following were the recommendations of nperc regarding the examination reforms:

1. The examination reform should be construed as a package.
2. The packages as a whole should be implemented instead of in piecemeal and ad hoc implementation of individual elements.
3. Implementation of the package suggested by the NPERC, bristled with practical problems such as the vast diversities in the education system and the wide spread apprehensions about the credibility of the internal evaluation process.
4. The need to constitute a high level National Examination Reforms Commission to coordinate and monitor and progress, in Examination Reforms at various levels. The NPERC came to the conclusion that the elements of examination reforms were implemented piece-meal and without due coordination and consequently the system of examination was dictating and distorting the character and quality of education.

The Central Advisory Board of Education (CABE) under the chairmanship of Sri N. Janardhan Reddy, former C.M. and Minister of Education, AP in 1991 reviewed the implementation of various parameters of NPE, taking into consideration the report of the NPERC and stated that. “Examination reforms have necessarily to be contextual and evolutionary. The essentiality of examination reforms cannot be overstated. We do feel that rather than leaving examination reforms to the individual initiatives and inclinations of the examining bodies, a strong and coordinated effort should be made by the Centre and the State Governments in this area. The ideal underlying the constitution of an Examination Reforms Commission is appealing. However, rather than creating yet another institution, we suggest that the NCERT and the UGC should play a lead role in promoting and guiding examination reforms in school and higher education systems respectively. Inter alia, the following measures are suggested “.

- (i) Preparation of status report of examination reform measures under/ taken by the examining bodies.

(ii) Preparation of a National Examination Reform, Framework to serve as a set of guidelines to the examining bodies which would have the freedom to innovate and adopt the framework to suit the specific situation.

(iii) Developing an effective mechanism for coordination, monitoring and evaluation of the implementation of the examination reforms by the different examining bodies.

(iv) Documentation and dissemination of innovations and measures for examination reforms.

From the above discussion, it is found that after the dawn of independence, when the slogan of reorientation of education came from all quarters, the case for examination reform received proper place. So reforms in examination have been a subject of serious discussion for long. Examination reform has been a subject of almost consistent consideration by various committees and commissions appointed by the Government of India from time to time.

The justification for examination reforms arises from academic considerations. "Examination along with teaching and learning, in fact, constitute the trinity of functions in the educational process. Examinations over the year have tended to be an instrument for testing memory. Learning has become a rather mechanical process of acquiring skills and teaching has been largely a process of coaching for examinations. The relationship between examinations and standards of teaching and learning are intimate. Improvement in any one of these aspects results in improvement of other aspects as well. Therefore, the objective of examination reform is to make it an instrument of good education."

Again the NPERC states that "Examination reforms also have their justification from the point of view of equity and social justice. The examination system tilts heavily in favour of the privileged, who have access to certain facilities; such as special teaching learning material, special coaching etc. It is inter alia, to rectify this inequitable tilt that examination reforms have been suggested."

The recommendations of various Committees and Commission focused attention on reforming examination. But most important is the review of the implementation of various parameters of NPE taking into consideration the report of the NPERC particularly in relation to examination reforms. Still then, the disease is too acute to find remedy in piece-meal reforms. Some revolutionary changes, as suggested by National Policy on Education, 1986 is the only solution.

### **QUESTIONS FOR DISCUSSION AND REFLECTION**

1. Discuss the major issues and commercialization of assessment.
2. List out advantages and disadvantages of open book examination.
3. Describe the important of reforms in assessment

4. Explain the procedure for online examinations.
5. Describe the various reports on examination reforms.

## **UNIT - V- ASSESSMENT IN INCLUSIVE PRACTICES**

### **OBJECTIVES**

The student-teachers will be able

- i. to acquire knowledge about differentiated assessment and culturally responsible assessment.
- ii. to understand the uses of tests for learner appraisal.
- iii. to know, understand, and construct the achievement test and diagnostic test.
- iv. to ensure fairness in assessment and to enhance confidence in learning.
- v. to gain knowledge about scoring key and marking scheme.

### **DIFFERENTIATED ASSESSMENT**

- Is not just a test at the end of a unit. It is ONGOING. Its purpose is to screen and identify those who need assistance or to help plan instruction. It provides feedback for both teacher and student.
- Reflects students learning, achievement, motivation and attitudes on instructionally relevant classroom instruction.
- Provides multiple ways for students to demonstrate their learning: test (individual as well as partner/group tests), observation, interviews, self-evaluations, and many other formats to be discussed in this section.

Identifies both what is right and what is wrong, and suggest how to fix what is wrong.

### **Assessment should be linked to**

- The method of performance
- Student learning styles
- The level of cognitive ability (Bloom's or another)
- Student skill level

## **Pre-Assessment**

Pre-Assessment: A formal or informal test administered to pinpoint what the learner knows about an upcoming standard, skill, topic or concept. The teacher analyzes the data to identify each student's background knowledge, prior experiences, abilities, interests, and attitudes in relation to the new learning.

The most useful pre-assessment data is gathered 1-2 weeks prior to planning the unit. This gives the teacher time to analyze each student's strengths and needs for the upcoming unit. The type of assessment is crucial because the results are used to plan lessons for individuals in the differentiated classroom. By identifying strengths and weaknesses ahead of time, the teacher works smarter, not harder.

### **Instructional Benefits of Using Pre-Assessment**

- Reveals the student's knowledge base related to the upcoming topic or skill .
- Pinpoints the learner's knowledge on standards, concepts and objectives.
- Reveals specific needs for re-teaching, grade-level instruction, or enrichment.
- Reveals student's interests, talents, attitudes, likes/dislikes, feelings/emotions.
- Guides the teacher in selecting or designing the most appropriate instructional strategies to accommodate identified individual and group needs.

### **Teacher's Role**

- Pre-assess students 1-2 weeks prior to new unit of study.
- Decide how pre-assessment tools will optimize planning for individual needs.
- Plan lessons and activities for individuals and small groups based on their current knowledge levels.
- Use pre-assessment as a promo for an upcoming topic or skill.
- Develop a repertoire of formal and informal pre-assessment tools, and let the data needed determine which tool to use in any given situation.

### **Student's Role**

- Show what you know and what you do not know so you can learn more.
- Search your memory bank to reveal experiences to link to the lesson
- Share personal knowledge and experiences related to the topic on the assessment.
- Realize any negative experience you had with a topic or skill in the past can be replaced with a positive experience.
- Identify areas of interest to explore during the upcoming study.

## **Formative Assessment**

### **Formative Assessments are**

**For Learning** – The purpose of formative assessment is to enhance learning not to allocate grade. Summative assessments are designed to allocate grades. The goal of formative assessment is to improve; summative assessment to prove.

**Embedded in Instruction** – Formative assessment are considered a part of instruction and the instructional sequence. What students and taught is reflected in what they are assessed.

### **They produce**

Non-threatening Results – Formative assessments are scored but not graded. Students mark their own work and are encouraged to raise questions about the assessment and the material covered by the assessment.

**Director and Immediate Feedback** – Results for formative assessments are produced on the spot; teachers and students get them immediately, Teachers get a view of both individual and class performances while students learn how well they have done.

**Structured Information** – Teachers can judge success and plan improvements based on the formative results. Students can see progress and experience success. Both teachers and students learn from the assessment results.

**Ways to Improve** – Summarized formative results provide a basis for the teacher to re-visit topics in the unit if necessary. Individual student response provides a basis for giving students additional experiences in areas where they performed less well.

## **Summative Assessment**

**Summative Assessments** are given periodically to determine at a particular point in time what students know and do not know. Many associate summative assessments only with standardized tests such as state assessments, but they are also used at and are an important part of district and classroom programs. Summative assessment at the district/classroom level is an accountability measure that is generally used as part of the grading process. The list is long, but here are some examples of summative assessments;

- Performance Tasks/Demonstrations
- Portfolio Review
- State assessments
- Districts benchmark or interim assessments
- End-of-unit or chapter tests
- End-of-term or semester exams
- Scores that are used for accountability for school(AYP) and students (report card grades)

Summative Assessments....

- Should reflect assessments that precede it
- Should match the material taught
- May determine a student's exit achievement
- May be tied a final decision, grade, or report.

The key is to think of summative assessment as a means to gauge, at a particular point in time, student learning relative to content standards. Although the information that is gleaned from this type of assessment is important, it can only help in evaluating certain aspects of the learning process. Because they are spread out and occur after instruction every few weeks, months, or once a year, summative assessments are a tool to help evaluate the effectiveness of programs, school improvement goals, alignment of curriculum, or student placement in specific programs. Summative assessments happen too far down the learning path to provide information at the classroom level and to make instructional adjustments and interventions during the learning process. It takes formative assessment to accomplish this.



## **Summative Assessment Ideas**

“Good summative assessment-tests and other graded evaluations –must be demonstrably reliable, valid, and free of bias” (Angelo and Cross 1993). As a greater number of provinces begin placing emphasis on summative assessment (Activities which assess the students’ mastery of a larger unit of material), there is a great opportunity for teachers to be creative. Summative assessments can not only evaluate the students’ knowledge base, but also tap into their creativity and allow for extra research.

Remember that many activities (such as creating a brochure) can be used at any grade level as long as the expectations are adjusted accordingly, or extra resources made available for the younger grades.

### **Arts-Based Assessments**

- Create a collage
  - Docudrama
  - Story board/Commercial
  - Brochure
  - Poster
  - Bulletin board design
  - Scrapbook
  - Encyclopedia of definitions, historical references, and images
  - Model-making/scale model
- Music. (Compose a pieces of music based on the topic  
Design and create a CD (choose music and design the CD cover) of the topic’s music)

### **Activity-Based Assessments**

Debate

- Recreate a historical debate
- Debate on the pros and cons of the topic

### **Thinking skills assessments**

Concept mapping

- Create a concept map of the terms and concepts learned in this unit

Map making

- Create a concept map of the terms and concepts learned in this unit.

Media analysis

- Comment on the portrayal of the topic in the media (articles, advertisements)  
Visual/Graphics organizer

Creative writing

- Write a work of fiction
- Creative writing

Reading response

Read an article on a given topic and write a response

Technology & Media- Based Assessments  
Multi-media presentation

Create a power point presentation based on research topic  
Create a presentation which includes visual effects, audio effects, and a physical demonstration.

### **What is a Grade?**

#### **From a learner's perspective, we should seek to ensure that grades**

Keep the success to effort ration in balance. Grade contribute to the student's sense that when they work hard, something good generally comes out of it.

Ensure that students develop a growth mindet. Grades, in conjunction with tasks and experiences, contribute to student trust that sustained effort and hard work make most things possible.

#### **From a parent's perspective, we should seek to ensure that grades**

Communicate clearly. A parent can trust that the grade is a very accurate representation of just what a student knows, understands and can do in a given subject, at a given time, based on clearly understood criteria.

Support the parents in supporting learning. Grades guide parents in what to do next to encourage student growth.

#### **From a measurement perspective, we should seek to ensure that grades are**

RELIABLE. If we were to use the same measure a couple of days, weeks, or months later, the results would be relatively the same for a given student.

VALID. We actually measured what we meant to measure.

(Ten Practices That Dilute a Grade's Validity and Effectiveness): Avoid!

1. Penalizing student's multiple attempts at mastery
2. Grading practice/home work as students come to know concepts. Feedback; not grades.
3. Withholding assistance (not scaffolding or differentiating) in the learning when it is needed.
4. Group grades
5. Incorporating non-academic factors(behavior, attendance, and effort)
6. Assessing students in way that do not accurately indicate student's mastery. Student responses are hindered by the assessment format.
7. Grading on a curve
8. Allowing extra credit
9. Defining supposedly criterion-based grades in terms of norm-referenced descriptions(above, average, average, etc.,)
10. Recording zeros for work not done.

### **Achievement, Diagnostic and prognostic Tests in Mathematics**

The process of instruction involves three important tasks namely teaching, learning and evaluation continuous evaluation has become an integral part of instruction so as to continually assess the achievements of the instructional objectives by the students the effectiveness of the learning experiences provided and the instructional strategy used by the teacher. A teacher has to devise and administer a variety of tools and techniques for evaluation. Though a teacher may have to use techniques and tools such as interview, observation, case study cumulative record, rating scale, and checklist for a variety of purposes, tests and examination constitute important means to evaluate the students performance. Test can be used with different objectives.

- I. For measuring achievement
- II. For diagnosis and
- III. For prediction

Based on the function served by tests, they can be broadly classified as achievement tests, diagnostic tests and prognostic test.

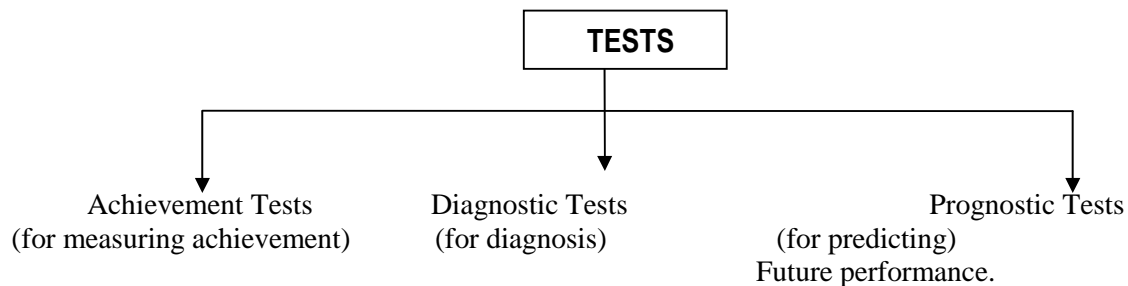


Fig 1 Classification of Tests

### **Achievement Tests**

The term achievement is often naively understood in terms of pupil's scores on a certain school subject. If for instance, a student is tested in two school subjects say Mathematics and Biological Science and in the former he gets 80% while in the latter he gets 60% marks, it is understood that his achievement in Mathematics is better than his achievement in biological science. In other words achievement means one's learning attainments, accomplishments, proficiencies etc. According to Denis Baron and Harold W. Bernard, the concept of achievement involves the interaction of three factors namely, aptitude for learning, readiness for learning and opportunity for learning. Achievement in education precisely speaking, implies one's knowledge, understanding or skills in a specified subject or a group of subjects.

Achievement test constitute an important tool of evaluation. It is necessary for the teacher to know how far the pupils have attained in a particular subject area the school evaluation programme, various forms and achievement test are used to measure the accomplishment of the pupils.

### **Definition**

According to Downie “Any test that measures the attainments or accomplishment of an individual after a period of training or learning is called an achievement test” Super D. E

### **Types of Achievements Tests**

Achievement tests as used in schools are of two types;

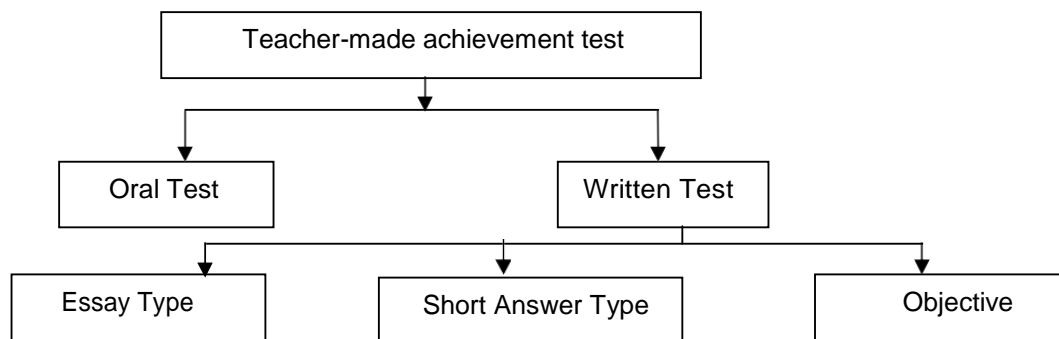
- Teacher-made achievements tests.
- Standardized achievement tests.

Teacher-made achievements tests are two types.

- Oral tests.
- Written or paper and pencil tests.

Written test can still further be classified as:

- Long answer or Essay type
- Short answer type
- Objective type



### **Oral Tests**

Oral tests are used extensively in the lower classes as well as in the high school. Most mathematical teachers make use of oral tests to develop the mental skills necessary for increasing speed and accuracy and habit formation.

### **Advantages of Oral Tests**

In the past, the classroom teacher relied very heavily on the oral work of his pupils in order to arrive at an estimate of the extent to which they mastered the work of his course. The value of the oral examination is quite apparent. Unlike the situation with written examination, which assumes that the examinee understands the questions, the oral examiner can pose a question and modify the same if it is not understood. Because of this flexibility, the examiner can probe the depth of student's understanding better through an oral test.

The probing results not only in a more specific answer but also gives some indication of the thought process used by the students in answering the questions. The teacher can ask for clarification, is needed oral tests help the teacher to evaluate how well a pupil can synthesise, integrate and organize

the materials that he learnt. It becomes a valuable tool for the diagnosis of pupil's difficulties. Skilful questioning by the teacher may help the pupil to apply known mathematical principles and formulae to a new situation. Oral tests are very valuable for a teacher of mathematics.

### **Disadvantages**

Nevertheless there are serious of oral examination which in habit its use. Probably the most prominent weakness is the unreliability of the oral tests. Such factors as lack of precision in actually conducting an oral examination. Failure to pre-plan the questions, prejudices of the teachers and so on serve to detract from the usefulness of this technique. Moreover, it is time consuming and it may be difficult to test each student over the entire are under study.

### **Written Tests**

Written test used by teachers for measuring pupil achievement may be classified as essay examination or short answer examination. The latter are often referred to as "objective" or "new type" tests.

### **Essay Type Tests**

The essay type examination may be defined as a relatively free written response to a problem situation or situations in which the written answer intentionally or unintentionally reveals evidence regarding the functioning of the pupil's mental powers as they have been modified by the particular acts of learning experience. Hence, the essay examination, when properly analysed by the scorer, reveals information regarding selected aspect of organization and functioning of the pupils to discuss, compare, give reasons and the like, requires the formulation of an extended verbal answer to the question. The essay examination has survived the continued criticism of the experts in educational measurement and remains an approach widely used by classroom teachers in achievement testing.

The relative popularity of the essay examination is not difficult to understand. The most widely used tests are those which are prepared, administered, scored and interpreted by the classroom teacher. They are generally constructed for use only with those pupils enrolled in the course taught by the teacher who prepares the tests. He may have many purposes in mind in administering the tests- to motivate the pupil, to determine the success with which he has taught a unit of subject matter, to encourage additional reading and so on.

### **Advantages of Essay Examination**

Higher mental processes such as application, analysis, synthesis, evaluation, formulating hypotheses, problem solving etc. can be easily tested by essay type examinations. It is rather impossible to test mental processes by objective type test. For example, a multiple choice type can serve only as a means for collecting evidence concerning how well the pupil can judge the tests of several alternative hypotheses such a higher mental process as formulating hypotheses through an objective type item. The student's ability to organize and express his ideas effectively is another objective possible for the teacher to direct the attention of the pupil to large segments and integrated units of the subject matter.

Essay examinations may be used to arrive at an estimate of the creative ability of the pupil

The pupils response to essay examination has also been looked upon as a source from which the teacher could gain some insight into his personality.

### **Limitations of Essay Type Examination**

#### **Lack of objectivity and Reliability is Scoring**

One of the important characteristics of any test is the consistency with which competent examiners evaluate the responses of the examinees. The principal criticism of the essay examination has been directed to this point that the evaluation of the answers to essay questions is not objective (i.e marked variability in the marks or grades allotted to the same paper by two or three examiners). This may be because the scorers disagree concerning the objective which is being measured, selection and presentation of facts, interpretation or use of language etc.,

#### **Influence of other extraneous elements (subjectivity)**

Extraneous elements like the moods of the examiners, impressions created by the examinee, use of flowery and attractive language, comparison of the answer scripts by the examiners et, can affect the scoring resulting in greater subjectivity.

### **Limited Sampling of the Content**

The essay examination has also been criticized on the grounds that the sampling of content or range of information tested is narrower than it is in objective examination.

### **Emphasis on Rote Memorisation**

Another criticism leveled against essay examinations constructed by teachers is that emphasis is placed upon the recall of more or less specific information which can be validly and reliably measured by objective type test items than by a free response essay examination. These type of tests rather encourage rote memorization.

### **Danger of Bluffing**

There is a danger of bluffing in the essay examination as the examiner can be easily misled by other extraneous elements such as flowery language, neat presentation etc, without presenting any substantial information as required by question.

### **Difficulty of Scoring**

Since the answers are not specific and uniform, scoring of essay type examination is a difficult task.

### **Selective Learning**

Essay type examination encourages selective learning as the sampling of the content is limited and it covers only a few selected content areas.

## **Suggestions for improving Essay Type Examination**

- Define the objective of tested by each easy
- Prepare structured questions instead of preparing one long answer question
- Use of scoring key
- Indicate clearly the direction and scope of the responses expected.

## **Short Answer Type Tests**

A question which can be answered in less than four steps may be called a short answer question. For example, the following questions will be treated as short-answer ones.

### **Advantage of short answer type tests**

- Short answer questions can be easily related to the objectives
- It can be more stimulating for pupils than essay type tests.
- Scoring is reliable and objective
- As the responses are of free response type, they give insight into student's thought process and can be used for diagnosis
- It can cover a wider content area and can achieve a more extensive sampling of the content than the essay type tests.

## **Objective Type Questions**

The easy examination requires formulation of an extended verbal answer to the questions objective type tests on the other hand consist of questions to which a pupil responds by the selection of one of several given alternative, or by giving or filling in a word or a phrase or by some other device which does not call for an extensive written response.

### *Advantage of Objective type Questions*

The objective type tests in comparison with essay examination, possess certain definite advantages.

*Samples:* objective type tests generally show much better coverage of total course content than do easy examinations.

*Reliability and Objectivity of Scoring:* In view of the fact that the objective type questions generally have only one acceptable response, objectivity of scoring is reliable. The objective type tests scoring by different competent examiners would result consistently in the same score.

*Difficulty in construction:* The preparation of objectives type test generally require considerably more time and resourcefulness than the development of an essay type test.

*Testing complex process:* In many classroom situation, the teacher is concerned not only with the correctness of the pupils' answers to a questions, but also with the correctness of the thought process involved in arriving at the correct answer. This and other higher mental abilities like

organization, expression, problem solving etc. cannot be measured through objective type tests. A comparison of objective type test and essay type examination is given in table 14.2.

Comparison of objective type test and Essay type Examination

<i>Aspects</i>	<i>Objective Type Test</i>	<i>Essay Type Examination</i>
Outcomes measured	Good for measuring learning outcomes of knowledge, comprehension and application-Inadequate for higher mental abilities and skills.	Inefficient for measuring knowledge, good for the assessment of comprehension, application and analysis. Best for the appraisal of synthesis and judgment.
Sampling of the content	The use of large number of items results in broad coverage which make representative sampling of the content feasible	Use of relatively small number of items results in limited coverage and sampling of content
Preparation of items	Difficult and time consuming	Relatively easier to construct
Scoring	Objective, easy and highly reliable	Subjective difficult and less reliable
Factors distorting student's scores	Distorted by reading ability and guess work	Distorted by writing ability and bluffing.
Probable effect on learning	Encourages students to remember, interpret and analyse the ideas of others	Encourages students to organize, integrate and express their own ideas

**Forms of Objectives Type of Test Items**

Objectives type test items can be broadly categorized into supply type and suggested response type. In supply type items, the testee is required to supply a free response to the test items whereas in suggested response type, as the name implies, alternative responses are suggested to the testee, requiring him to select the right response from the given responses. Table.14.3 shows the classification of the objective type test items.

**Table. 2 : Classification of the Objective type test items**

Supply type	Suggested response type
Completion type of fill in the Blanks	Alternative response type (True or False/ Right



	or Wrong/ Yes or No)
Very short answer	Multiple Choice
Question asking for a one word answer	Matching

### **Completion Type**

The completion type requires the pupil to complete the thought or a sentence by filling in the word or words that have been left or it directs him to respond to a question by writing his answer in the blank space provided. Because the pupil needs to decide upon his answer and then write it out, a test composed of completion items takes longer time to administer than the other forms of objective test.

The completion item, however offer a natural form of questioning. It can be used readily with material calling for specific information. These items are particularly useful for use in Mathematics and Science where the results of complex reasoning processes can be represented by a law, symbol or number.

#### Suggestions for writing completion type questions

- If possible, use a direct question, rather than the complicated declarative sentences.
- The blank must call for a single specific response or the question that can be answered by a unique word, number or symbol.
- Avoid using statements lifted directly out of the book, since this tends to overemphasize rote learning.
- In Computational problems specify the units in which the answer is to be given and also the degree of precision expected.

### **Multiple choice questions**

The multiple choice item consists of a stem which presents a problem situation and several alternatives, which provide possible solutions to the problem. The stem may be a question, or an incomplete statement. The alternatives include the correct answer and several plausible wrong answer called distracters. Their function is to distract those students who are uncertain of the answer.

Multiple-choice items typically include either four or five choices. The large numbers will of course reduce the student's chances of obtaining the correct answer by guessing.

#### Rules for constructing multiple choice questions

Design each question to measure an important learning outcome.

Present a single clearly formulated problem in the stem of the item.

State the stem of the question in simple clear language.

Put as much of the wording as possible in the stem of the question

Avoid repeating the same material over again in each of the alternatives

## Matching type Questions

The matching type is simply a modification of the multiple-choice form. Instead of listing the possible responses underneath each individual stem, a series of stems called premises is listed in one column and the responses are listed in another.

## **Preparation of a Teacher-made Achievement Test**

If the test is to serve as an efficient and effective tool of evaluation, its preparation should be based on a number of careful considerations. The preparation of a good test is a systematic process having well-defined stages. The important steps envisaged in the preparation of a good teacher-made test are

- Planning the test
- Preparation of a design
- Designing the test items.
- Reviewing and editing
- Arranging the items
- Providing directions
- Preparing the scoring key and marking scheme
- Administering the test and scoring
- Evaluation of the test.

### **Planning the test**

“Test planning encompasses all of the varied operations that go into producing the tests; but it must also involve careful attention to test difficulty, to type of test items, to directions to the examiner”. (Lindquist, E.F). We shall cover most of these considerations under the heading; preparation of design for the test or blueprint of the test.

### ***Preparation of design***

Designing is the first and most important step in the test construction. It is at this stage that we plan to build in the test the important qualities: validity, reliability, objectivity and practicability. In order to accomplish this, the test constructor has to take a number of decisions regarding selection of the objective, the selection of the content, form of questions, the difficulty level of test items and the weightages to be allotted to the objectives, to the content and the form of questions. The set of those decisions will be called the design of the test from an analogy with the work of an architect. Important decisions have to be taken concerning the following.

- i) Identification of the objectives and allotting weightage to the objectives

The most important step while planning a test, or any evaluation tool or technique for that matter, is the identification of the instructional objectives and stating them in terms of specific observable behavior. After the objectives are identified and stated, the test maker has to decide their relative weights in the test. The fundamental principle to be observed here is that the test should reflect the actual emphasis being given to various mental processes during instructions. Because of the intangibility of instructional process, there cannot be any fixed formula for assigning weights to

various objectives. But these weights will be by and large a function of time, effort and resources spent on their acquisitions as also for the importance for the society and the learning of the subject in terms of retention and transfer value. The simplest basis for assigning the weights could be the weight them in terms of time devoted for their achievements. Weightages could, of course be given in numerical terms distributing 10 points over the objectives, giving the greatest number to those that are to receive the greatest emphasis.

For the sake of illustration, given below (table 3) are objectives identified for teaching some units in mathematics and the weightage allotted to them.

Table 3

Sl.No.	Objectives	Mark allotted	Percentage
1	Knowledge	6	24
2	Understanding	7	28
3	Application	10	40
4	Skill	2	8
		25	100

ii) Selection of the content and allotting weightage to the content.

Content being the means through which objective are attained, it is become very necessary to decide the weights to be given to its different parts. As the whole syllabus cannot be covered through any single test, a convenient number of units can be selected for testing to represent the actual emphasis on them in instructions. In assigning relative weights to unit a learning experience? How much time was devoted to it during instruction? Although there are them on the time require to teach various units.

For the sake of illustration, given below is the table 4 indicating the weightages given to three units namely Polynomials, Functions and Quadrilaterals.

Table 4

Sl.No.	Objectives	Mark allotted	Percentage
1	Unit - I	10	24
2	Unit - II	8	36
3	Unit - III	7	40
		25	100

iii) Selection of the form of questions and giving weightage to the questions

The test-maker has to decide about the form of questions to be used, the number of questions to be chosen and the relative weightage to be given to each form. Perhaps a judicious combination of

the different forms will have to be used in achievement test. However, among the objective type questions, multiple choice may be given more weightage.

In the questions paper which is being taken for illustration, the weightage to different forms of questions could be as follows. (table 5)

Table 5 Weightages given to different forms of Questions

Sl.No.	Objectives	Mark allotted	Percentage
1	Essay (E)	6	24
2	Short answer (S )	9	36
3	Objective type (O)	10	40
		25	100

iv) Distribution of difficulty level

A decision also has 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. To get optimum discrimination through a test, most of its questions should be of average difficulty level. A few easy questions, to motivate the below average student and a few difficult ones to challenge the gifted should find a place in the question paper. If achievement can be assumed to be normally distributed, some weightages in terms of percentages can be suggested for easy, average and difficult questions as shown in table 14.7

<i>Sl.No.</i>	<i>Difficulty Level</i>	<i>Percentage</i>
1	Difficult Questions	15
2	Average Questions	70
3	Easy Questions	15
		100

v) Preparation of Blueprint: (Table of specifications)

Preparation of the blueprint refers to the final stage of the planning of a test. The blue-print is a three dimensional chart showing the weightage given to the objectives, content and the form of questions in terms of marks. It is also called a table of specifications as it relates outcome to the content and indicates the relative weight given to each of the various areas. The units or the content spread along the vertical axis while the objectives are listed on horizontal axis. Each column is further subdivided into column that indicate the forms of questions. Thus we get a number of cells, each cell having three dimensions, the objective, the content and the form of question. What is required on the part of the test maker is to fit in all the questions in different cells in such a way that the blueprint reflects the decisions of the designer. When this is done, also row and columns are balanced, and the blueprint is ready. It is illustrated in table.14.8

<i>Objective</i>	<i>Knowledge</i>			<i>Understanding</i>			<i>Application</i>			<i>Skill</i>			<i>Total</i>
	E	S.A	O	E	S.A	O	E	S.A	O	E	S.A	O	
Content													
Polynomial		1(2)		3(1)	1(1)			3(1)	1(1)				10
Functions		1(2)		3(1)	1(1)				1(2)				8
Quardilaternal		1(1)					4			2			7
	<b>5</b>			<b>8</b>			<b>10</b>			<b>2</b>			<b>25</b>

Note: The number inside the bracket indicates the number of questions and the number outside the bracket indicates the marks allotted to each question

### ***Uses of Blueprint***

*The preparation of the blueprint serves the following purposes. The blueprint .*

- helps to improve the content validity of the test.
- defines as clearly as possible the scope and emphasis of the test.
- relates objectives to the content.
- Gives greater assurance that the test will measure learning outcomes and course content in a balanced manner.
- lays before the tester a complete picture of the test he is going to prepare.

### **Designing the test items**

When the blueprint is ready the next step is to prepare or select the items. Write the test items according to the table of specifications. Take each cell of the blueprint and draft an item taking care of the various dimension, the objective content and the form as laid down in the blueprint. Some other decisions taken while designing the test, particularly the one concerning the distribution of difficulty level has to be implemented at this stage itself. It is also desirable to prepare more items than the requirement of the cells of the blueprint since defects are likely to become apparent in some items during the later review. The additional items will make it easier to maintain the distribution of items reflected in the table of specifications.

### ***Reviewing and Editing***

The pool of items for a particular test after being set aside for a time for a time can be reviewed with the help of experts. A more careful evaluation of the items can be made by considering them in the light of each of the following questions.

- Does each item measure an important learning outcome included in the table of specification?
- Is each item present a clearly formulated task?
- Is the item stated in simple, clear language?
- Is the item free from extraneous clues?
- Is the difficulty of the item appropriate for the students to be tested?
- Does each item fit into one of the cells of blueprint?

### ***Arranging the item***

When the final selection of the items has been completed and they are ready to be assembled into a test, a decision must be made concerning the best item arrangement. The following suggestions provide guideline for this purpose.

- The items should be arranged so that all items of the same type are grouped together.
- The items should be arranged in the order of increasing difficulty.

- It may be desirable to group together items which measure the same learning outcomes or the same subject matter content.

### **Providing Directions**

Directions constitute an inseparable part of a test. The directions for an achievement test should be simple and concise and yet contain information concerning each of the following: (1) purpose of the test (2) time allowed to complete the test (3) how to record the answers (4) whether to guess when in doubt the answer (5) marks allotted for each question as also for each section of the test.

### **Preparation of scoring key and marking scheme**

When the test has been assembled and ready to administer, it becomes necessary to prepare some other important accessories in the form of scoring key for objective type questions and marking scheme for supply-type questions, such as short answer and essay type questions.

### **Scoring key**

Scoring key refers to the prepared list of answers to a given set of objective questions. The examiner compares the answers given by the students with those in the scoring key and thus arrives at the marks to be awarded to the students.

### **Correction of Guessing**

The test constructor while preparing the scoring key may feel like reducing to zero the gain in the score expected to result from guess work. This is popularly called correction for guessing.

The generalized formula for correcting for guessing is

$$S = R - \frac{kw}{n-k} \text{ where}$$

S = Score, w = Number of wrong responses, R = Number of right responses.

N = Number of suggested responses for a single item

K = Number of responses to be selected or marked for each item.

In the case of True or False items,  $S = R - W$  (since  $n=2$   $k=1$ )

In the case of multiple choice questions where only one correct answer is expected the generalized formula reduces to

$$S = R - \frac{W}{n-1}$$

### **Marking Scheme**

In the preparation of marking scheme in mathematics it will be desirable not only to analyse the solution into important stages and to distribute marks over them but each stage may be looked upon from the point of view of the method involved as also from expected accuracy. The marks for each stage, therefore, may be divided into two components: marks for the method and those for accuracy.

A marking scheme is essential because it indicates

- The number of steps or learning points expected in the answer.
- The outline of each point or step expected in the answer.

- iii. The weightage of each point or each step
- iv. The level of accuracy expected of each step

Administering and scoring the test

At this step, it is important to make sure that all student know exactly what is expected of them and to provide them with the most favourable conditions for taking the test. After the administration of the test, the scoring can be done with the help of the scoring key and marking scheme.

### **Evaluating the test**

Evaluating the test helps the teacher to ascertain the following:-

- Was the test very easy or very difficult?
- Was the test too long or too short?
- Were the directions clear specific?
- Was the test practicable and feasible?
- Did the items measure the intended objectives?
- Were the items clear and unambiguous:
- Were the distracters effective?
- Do the items discriminate among the different levels of achievers?
- What are the misconceptions formed by the student?

Evaluation can be done at two level

- i. Question-wise analysis
- ii. Item analysis

Questions-wise analysis is done by analyzing each questions according to objective, specification, content, question type, estimated difficulty level and time required. This helps the teacher is assessing the effectiveness of the test item with reference to the objectives and other requirements in the blueprint. This also gives and insight into the difficulties encountered by students in taking the test.

Item analysis is process by which a test maker evaluates the effectiveness of the test item in term of (i) the difficulty level of the test items (ii) discriminating power of test items and (iii) the effectiveness of the distracters. For item analysis the teacher arranges the test papers in the ascending order of marks and analysis is done for 27% of the students on the high and low students' responses to each item are analysed for the student in upper and lower groups. Other than the purposes mentioned above, item analysis has several other benefits too.

It provides useful information for class discussion of the test.

It provides data for helping the students to improve their learning

It provides insight and skill which lead to the preparation of better tests on future occasions.

### **Characteristics of good achievement test**

The following are the qualities of a good achievement test.

**Reliability:** Reliability of a test is its trustworthiness or its consistency. It is defined as “the consistency with which a test measures what it intends to measure”.

Validity: Validity means purposiveness. Validity of a test is the “accuracy with which a test measures what it intends to measure”.

Objectivity: A test is said to be highly objective if the score assigned are not affected by the judgment, personal opinion or bias of the scores.

- i. Inform and construction.
- ii. In the way it is administered
- iii. In the use of norms

Differences between teacher-made tests and standarised tests are listed table 6

<b>Teacher – made tests</b>	<b>Standardized tests</b>
Based on content and objective specific to the class taught by the teacher	Based on content and objectives common to many schools covering a wide area
May deal either with a specific limited topic or skill or with large segments knowledge and skill.	Deals with large segments of knowledge or skill, usually only with a few items appraising any one skill or topic
Developed usually by one teacher with little or no outside help	Developed with the help or experts
Has moderate or low reliability	Has high reliability
Limited usually to the class or a single school as a reference group.	Provide norms for various groups that are broadly representative of performance throughout the country

## **DIAGNOSTIC TEST**

### **Need for diagnostic test**

Most standardized and teacher-made achievement tests are designed to give an indication of how far the student has progressed towards the accomplishment of specific objectives measured by the test. These objectives, however are grouped in broad categories. They cover a broad area and result in a total score which reflects overall achievement in the area tested. Thus the teachers can say that a pupil is doing well in arithmetic or poorly in difficulty. It will identify students who are having relative difficulty in an area, but it will not identify the causes of the difficulty. Such survey(achievement) tools serve a useful function, but in order to help the student with a disability, the teacher will need to analyse the nature of the difficulty and the causes for the trouble. There are tests which have been devised to provide information about the specific nature of pupil’s difficulties in given subject areas. These tests are called diagnostic tests. Any test can be used as diagnostic test in a limited way by examining student’s performance in the individual items which make up the test rather than on the test as a whole. Thus diagnostic test yield measures of highly related abilities underlying achievement in a subject. They are designed to identify particular strengths and weaknesses of the part of the individual child and with reasonable limits to reveal the underlying causes. The diagnostic test attempts to bread a complex skill like computation into measures of theses sub-skills. Such measures can help the teacher locate the sources of difficulty using which constructive action can be taken.

Educational Diagnosis



As is obvious, the term diagnosis has been borrowed from the medical professions where it implies “identification of disease by means of patients’ symptoms”. The word diagnosis is used more or less in the same sense in education. The only difference perhaps is that in medical diagnosis it is physical or an organ breakdown that is examined, while in educational diagnosis it is the failure of the process of education or learning that is located and attended to be remedied. We may say that educational diagnosis is “the determination of the nature of learning difficulties and deficiencies”. Of course, it cannot stop only at the identification of weakness in learning but has to go a little deeper to locate their causes and also suggest remedies for getting rid of them.

### **Level of Diagnosis**

Good diagnosis moves hand in hand with good teaching and a teacher should be as much concerned with it as with the latter. Ross and Stanley have identified five levels of diagnosis, which are, (1) who are the pupils having trouble? (2) where are the errors located?

(3) why did the errors occur? (4) what remedies are suggested? and (5) how can the errors be prevented? The first four are grouped as corrective diagnosis and the last is known as preventive diagnosis. Most of the diagnosis resorted to by teachers will be corrective in nature by which measures are taken to make up the deficiencies while the highest form will remain preventive diagnosis with the help of which deficiencies are prevented from occurring. The immediate concern of the teacher may be corrected. The corrective diagnosis can be done at the following levels.

- Classification
- Finding the nature of difficulties
- Providing remedial measures
- Preventing the difficulties from occurring

These levels are in fact the steps in the total process of education diagnosis and are all interrelated.

### **Classification**

It is the process of sorting out students into groups particularly of underachievers and lower achievers. The reference point for each student, should rightly be his own expected achievement and students have to be classified with regard to their levels of expected achievement. If they have crossed their level, some enrichment programme may be planned to help them improve their achievement further.

### **Finding the nature of difficulties**

In this level of diagnosis the specific areas of difficulties have to be identified. Achievement test, unit test, etc. can be used for this purpose as they cover as many learning points as possible. The item wise analysis of such tests helps in locating the weaknesses of the students. If most of the student do poorly on a particular learning point, it is an indication that something is wrong with the instruction relating to that point. But this type of analysis give no ideas regarding to causation of these errors which will have to be sought by other means.

### **Finding the causes of difficulties**

This is the most difficult state in diagnosis. The main difficulty of this stage lies in the fact that a test appraises only the product of learning and not the process of learning. They may establish where the breakdown in learning has taken place but can seldom reveal anything about the causes of it. These causes are generally varied and complex in nature. We have to seek them in different areas, some of which need not be connected in any way with classroom instruction or school. Broadly speaking, underachievement may be due to factors with the students, or environmental factors, outside the control of the students or a combination of the two.

Most of the causes internal to the students, may however be located in the areas of scholastic aptitude, retardation of basic skills, study habit, physical factors and emotional factors. Tools such as interviews, checklists, rating scales, questionnaire etc. can be used to locate the causes of the difficulties.

### **Remediation**

After identifying the causes of the difficulties, the next stage is planning and applying remedial measures. There is however, no set pattern and no cut-and-try formula for remediation. In some cases, it may be a simple matter of review and reteaching. In others, an extensive effort to improve motivation, correct emotional difficulties and overcome deficiencies in work and study habits may be required. The hard fact is that, for two students having the same learning difficulty may have suffered it, because of different causes and may have to be tackled differently. Moreover, since each individual is unique, remedial programmes have to be planned accordingly. Obviously, the planning of remedial programmes will differ considerably from individual to individual.

Despite the different methods and techniques needed in remediation, there are certain guiding principles that apply to all subject areas and provide a framework in which the teacher can operate.

- Remediation should be accompanied by strong motivational programme.
- Remediation should be individual in terms of the psychology of learning.
- There should be continuous evaluation giving the pupil a knowledge of results.
- Remediation programme may not always need a separate time allocation. But they will always need some extra work for both the teachers and the affected students.

### **Prevention**

Prevention is better than cure in education as elsewhere. A programme of diagnostic testing should help an imaginative teacher in getting insight into the type of possible errors that are likely to occur in learning, their possible causes and the ways of preventing them in future. Thus educational does not and should not end at remedial measures, but also should become a means for improving instruction, modifying curriculum and also for refining instructional material and strategies. The real importance is rather in the prevention of its reappearance elsewhere under similar conditions. Any weakness identified should form the basis for decisions relating to reducing the probability for their recurrence in the future.

### **Construction of Diagnostic Test**

Diagnostic tests may be standardized or teacher-made, diagnostic test will be more effective and economical than standardized tests. The norms which constitute a strong point with standardized

tests are not called for in diagnosis as the purpose is to discover the weaknesses of individual students rather than compare their achievements.

The designing of a diagnostic test is significantly different from a survey test. A teacher require must more data on the specific difficulties of the pupils. Diagnostic test have. It also requires a more detailed content analysis. The unit on which a diagnostic test is based should be broken into learning points with an attempt not to omit any of them. The diagnostic procedure is based on the assumption that mastery of the total process can be no stronger than that of the weak link in the chain of related concepts or skills. Accordingly, each concept, skill or learning point called into play in the test process in identified at the time of designing and then measured.

As far as a diagnostic test is concerned, it is not very important to know the relative importance of the various learning point as it is in the case of survey tests. We are not to decide their relative weightage. The basic principles is to cover all of them to give an unbroken sequence. Perhaps for each learning point, an adequate number of questions will have to be given to provide decisive evidences.

All the forms of questions can be employed for testing different learning points. As we want to collect evidence on all the points, it is desirable to use either short answer or objective type questions. Supply type of questions seem, however, to have an edge over selection type because they reveal the process of thinking in addition to the product of thinking. Such questions for in the responses. It appears, therefore, that for diagnostic test, short answer involving one or two steps are preferred especially in subject like mathematics. Whatever be the form of questions, they should in general be easy ones.

No rigid time limit needs be specified in the case of diagnostic tests. Diagnosis should be individualized as much as possible and every student should be allowed as much time as he reasonably needs.

It may be noted that as we do not have to relate content and process, the preparation of a blueprint may altogether be avoided in a diagnostic test. The items are designed so as to throw light on the weakness of the students and therefore the questions have to be specifically related to the learning points. The scope of the answer or the level of precision expected should also be made clear.

After the items on different learning points are written, they have to be assembled into a test. The basis of arranging test items in a diagnostic test is entirely different from other tests. There appears to be a good deal of justification in favour of clubbing questions around learning points even when they are of different forms. The learning points themselves can be arranged in increasing order of their complexity. If they are so arranged, the students do not have to change their mental sets very frequently. Moreover, this arrangements also helps in analyzing the response of students with a view identify their weaknesses, which is one of the important tasks in diagnostic testing.

To complete the test, sent of instruction may be drafted. It should also be provided with a scoring key and marking scheme. Finally the test is edited and reviewed to weed out inaccuracies or lapses of wording etc.,

The step in the construction of a diagnostic test can be summarized as follows.

Identified of the problem areas  
Detailed content analysis

Listing all the learning points  
Arranging the learning points in the logical sequence  
Writing test items. (preferably two or three items of free response type) for each learning point)  
Clubbing the items around the learning points.  
Providing a scoring key and a marking scheme.  
Providing the time limit as required by individual students.  
Administration of the test.  
After administering the test, the following procedure may be followed for analyzing the performance and identify the weaknesses.  
Item-wise analysis of the performance of each student.  
Qualitative and qualitative analysis for identifying the strengths and weakness  
Identification of the causes of learning difficulties  
Preparation of a diagnostic chart of each student  
Planning and implementing highly individual remedial programmes  
Evaluating the effectiveness of the programme.

### **Uses of diagnostic Test**

The following are the uses of diagnostic test.

The diagnostic tests

- Point out inadequacies in specific skills.
- Locate areas in which individual instruction is required
- Furnish continuous information in order that learning activities may be most productive of desirable outcomes.
- Serve as a basis for improving instructional methods, instructional materials and learning procedures.

### **Ensuring fairness in assessment**

*Fairness* is a concept for which definitions are important, since it is often interpreted in too narrow and technical a way. We set fairness within a social context and look at what this means in relation to different groups and cultures. Similarly, we are using *educational assessment* in a more inclusive way than is often the case; we include tests, examinations, teachers' judgments or evaluations ('assessment' in the United Kingdom) of student performance. We then explore *bias* in measurement and how it relates to validity, as well as the broader concept of *equity*. Finally, three examples of approaches to ensure fairness are given.

### **Seven Steps to Fair Assessment**

If we are to draw reasonably good conclusions about what our students have learned, it is imperative that we make our assessments—and our uses of the results—as fair as possible for as many students as possible. A fair assessment is one in which students are given equitable opportunities to demonstrate what they know (Lam, 1995). Does this mean that all students should be treated exactly the same? No! Equitable assessment means that students are assessed using methods and procedures most appropriate to them. These may vary from one student to the next, depending on the student's

prior knowledge, cultural experience, and cognitive style. Creating custom tailored assessments for each student is, of course, largely impractical, but nevertheless there are steps we can take to make our assessment methods as fair as possible.

1. Have clearly stated learning outcomes and share them with your students, so they know what you expect from them. Help them understand what your most important goals are. Give them a list of the concepts and skills to be covered on the midterm and the rubric you will use to assess their research project.

2. Match your assessment to what you teach and vice versa. If you expect your students to demonstrate good writing skills, don't assume that they've entered your course or program with those skills already developed. Explain how you define good writing, and help students develop their skills.

3. Use many different measures and many different kinds of measures. One of the most troubling trends in education today is the increased use of a high-stakes assessment— often a standardized multiple-choice test—as the sole or primary factor in a significant decision, such as passing a course, graduating, or becoming certified. Given all we know about the inaccuracies of any assessment, how can we say with confidence that someone scoring, say, a 90 is competent and someone scoring an 89 is not? An assessment score should not dictate decisions to us; we should make them, based on our professional judgement as educators, after taking into consideration information from a broad variety of assessments.

Using "many different measures" doesn't mean giving your students eight multiple-choice tests instead of just a midterm and final. We know now that students learn and demonstrate their learning in many different ways. Some learn best by reading and writing, others through collaboration with peers, others through listening, creating a schema or design, or hands-on practice. There is evidence that learning styles may vary by culture (McIntyre, 1996), as different ways of thinking are valued in different cultures (Gonzalez, 1996). Because all assessments favor some learning styles over others, it's important to give students a variety of ways to demonstrate what they've learned.

4. Help students learn how to do the assessment task. My assignments for student projects can run three single-spaced pages, and I also distribute copies of good projects from past classes. This may seem like overkill, but the quality of my students' work is far higher than when I provided less support.

Students with poor test-taking skills may need your help in preparing for a high-stakes examination; low achievers and those from disadvantaged backgrounds are particularly likely to benefit (Scruggs & Mastropieri, 1995). Performance-based assessments are not necessarily more equitable than tests; disadvantaged students are likely to have been taught through rote memorization, drill, and practice (Badger, 1999). Computer-based assessments, meanwhile, penalize students from schools without an adequate technology infrastructure (Russell & Haney, 2000). The lesson is clear: No matter what kind of assessment you are planning, at least some of your students will need your help in learning the skills needed to succeed.

5. Engage and encourage your students. The performance of "field-dependent" students, those who tend to think more holistically than analytically, is greatly influenced by

faculty expressions of confidence in their ability (Anderson, 1988). Positive contact with faculty may help students of non-European cultures, in particular, achieve their full potential (Fleming, 1998).

6. Interpret assessment results appropriately. There are several approaches to interpreting assessment results; choose those most appropriate for the decision you will be making. One common approach is to compare students against their peers. While this may be an appropriate frame of reference for choosing students for a football team or an honor society, there's often little justification for, say, denying an A to a student solely because 11 percent of the class did better. Often it's more appropriate to base a judgement on a standard: Did the student present compelling evidence? summarize accurately? make justifiable inferences? This standards-based approach is particularly appropriate when the student must meet certain criteria in order to progress to the next course or be certified.

If the course or program is for enrichment and not part of a sequence, it may be appropriate to consider growth as well. Does the student who once hated medieval art now love it, even though she can't always remember names and dates? Does another student, once incapable of writing a coherent argument, now do so passably, even if his performance is not yet up to your usual standards?

7. Evaluate the outcomes of your assessments. If your students don't do well on a particular assessment, ask them why. Sometimes your question or prompt isn't clear; sometimes you may find that you simply didn't teach a concept well. Revise your assessment tools, your pedagogy, or both, and your assessments are bound to be fairer the next time that you use them.

### **Spreading the Word**

Much of this thinking has been with us for decades, yet it is still not being implemented by many faculty and administrators at many institutions. Our challenge, then, is to make the fair and appropriate use of assessments ubiquitous. What can we do to achieve this end?

- Help other higher education professionals learn about fair assessment practices. Some doctoral programs offer future faculty studies in pedagogy and assessment; others do not. Encourage your institution to offer professional development opportunities to those faculty and administrators who have not had the opportunity to study teaching, learning, and assessment methods.
- Encourage disciplinary and other professional organizations to adopt fair assessment practice statements. A number of organizations have already adopted such statements, which can be used as models. Models include statements adopted by the Center for Academic Integrity (McCabe & Pavela, 1997); the Conference on College Composition and Communication (1995); the Joint Committee on Standards for Educational Evaluation (1994); the Joint Committee on Testing Practices (1988); the National Council on Measurement in Education (1995); and

the first National Symposium on Equity and Educational Testing and Assessment (Linn, 1999); as well as AAHE (1996). (See Assessment Policies, below). • Speak out when you see unfair assessment practices. Call for the validation of assessment tools, particularly those used for high-stakes decisions. Advise sponsors of assessment practices that violate professional standards, and offer to work with them to improve their practices. • Help improve our assessment methods. Sponsor and participate in research that helps create fairer assessment tools and validate existing ones. Collaborate with assessment sponsors to help them improve their assessment tools and practices. Help develop feasible alternatives to high-stakes tests. • Help find ways to share what we already know. Through research, we have already discovered a great deal about how to help students learn and how to assess them optimally. With most of us too busy to read all that's out there, our challenge is finding effective ways to disseminate what has been learned and put research into practice.

As we continue our search for fairness in assessment, we may well be embarking on the most exhilarating stage of our journey. New tools such as rubrics, computer simulations, electronic portfolios, and Richard Haswell's minimal marking system (1983) are giving us exciting, feasible alternatives to traditional paper-and-pencil tests. The individually custom-tailored assessments that seem hopelessly impractical now may soon become a reality. In a generation—maybe less—it's possible that we will see a true revolution in how we assess student learning, with assessments that are fairer for all . . . but only if we all work toward making that possible.

## **Assessing the Assessments: Fairness, Accuracy, Consistency, and the Avoidance of Bias**

### **Introduction**

Fairness, accuracy, consistency and the elimination of bias are important concepts in the first element of NCATE Unit Standard 2, Assessment and Unit Operations. The rubric for that element reads:

The unit takes effective steps to eliminate sources of bias in performance assessments and works to establish the fairness, accuracy, and consistency of its assessment procedures.<sup>1</sup>

1.) define the concepts of fairness, accuracy, consistency, and the elimination of bias; and 2.) provide examples of how institutions can ensure that their assessments adequately reflect these concepts.

### **Fairness:**

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<sup>1</sup> The concepts of fairness, accuracy, consistency, and the elimination of bias are also discussed in the second item of the NCATE Transition Plan. The relevant paragraph indicates: "Assessments must be fair, accurate, and consistent. To ensure this, the unit may need to provide time and resources for the review of curricula to ensure that candidates have the opportunity to learn the materials assessed. In addition, the unit must provide time and resources for piloting assessments, developing benchmarks, ratings assessments, and analyzing the extent to which the assessments were successful in measuring targeted candidate knowledge, skills, and dispositions."

Assessments are fair when they assess what has been taught. Candidates should be exposed to the knowledge, skills, and dispositions which are measured in the assessments. Without this type of exposure, it is not fair to expect candidates to have mastered the material.

One example of how institutions can demonstrate fairness in their key assessments is through curriculum mapping (e.g., a chart that shows where in the curriculum candidates have the opportunity to learn and practice what is specified in the standards). Institutions should identify where in the curriculum candidates have had the opportunity to learn and practice the material being assessed.

In addition, fairness also means that candidates understand what is expected of them on the assessments. To this end, instructions and timing of assessments should be clearly stated and shared with candidates. In addition, candidates should be given information on how the assessments are scored and how they count toward completion of programs.

### **Accuracy:**

Assessments are accurate when they measure what they purport to measure. To this end, the assessments should be aligned with the standards and/or learning proficiencies that they are designed to measure. Three characteristics that determine alignment of assessments with standards are:

- (a) the same or consistent categories of content appear in the assessments that are in the standards;
- (b) the assessments are congruent with the complexity, cognitive demands, and skill requirements described in the standards; and
- (c) the level of effort required, or the degree of difficulty is consistent with standards and reasonable for candidates who are ready to teach or take on other professional responsibilities.

The assessments should be aligned with the knowledge, skills, and dispositions being assessed. For example, a pencil-and-paper test is not an appropriate assessment of classroom skills, but may be an efficient way to document candidate knowledge of different instructional approaches and when to use them. A classroom observation may not be the best way to assess a candidate's content knowledge,<sup>2</sup> but may with structured scoring guides be a useful way to evaluate candidates' dispositions.

Accuracy is closely related to the statistical term "validity." However, establishing validity requires statistical analysis beyond what is called for in the NCATE standards. Most institutions already employ several activities that ensure accuracy of assessments.<sup>3</sup> One activity is simply reviewing

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<sup>2</sup> For further information on the appropriateness of assessments, see [www.ncate.org/institutions/article\\_commission.asp?ch=87](http://www.ncate.org/institutions/article_commission.asp?ch=87) and choose "Commissioned papers on Development of Assessment Systems and Aggregating Data," then select Stiggins, *Specifications for a Performance-based Assessment System for Teacher Preparation*

<sup>3</sup> For further information on reviewing the accuracy of assessments, see [http://www.ncate.org/resources/assessment/assessment\\_examples.pdf](http://www.ncate.org/resources/assessment/assessment_examples.pdf)



assessments to ensure alignment and appropriateness, and documenting the review. This can happen once a year at a staff meeting, or in programmatic committees, or could be done by one person and discussed with a larger group.

Accuracy can also be supported by documenting the relationship between assessment results and candidate performance on related assessments, grades, and program completion.

### **Consistency:**

Assessments are consistent when they produce dependable results or results that would remain constant on repeated trials. Essentially, in approaching consistency, the standards are requiring that the assessments and results be trustworthy. In other words, if the same information were assessed on different occasions, with no intervention, and the results were largely the same, then the assessment could be said to be consistent.

Consistency is closely related to the statistical term “reliability.” However, NCATE consciously chose not to use the term “reliability” because the concept can be adequately addressed with methods that can be inclusive of, but also other than statistical analysis.

Institutions can document consistency through providing training for raters that promote similar scoring patterns, using multiple raters, conducting simple studies of inter-rater reliability, and/or by comparing results to other internal or to external assessments that measure comparable knowledge, skills and/or dispositions.

### **Avoidance and Elimination Bias**

Closely related to accuracy is the elimination of bias. To ensure that the results of assessments adequately reflect what candidates know and can do, it is important to remove any contextual distractions and/or problems with the assessment instruments that introduce sources of bias and thus adversely influence candidate performance. Contextual distractions include inappropriate noise, poor lighting, discomfort, and the lack of proper equipment. Problems with assessments include missing or vague instructions, poorly worded questions, and poorly reproduced copies that make reading difficult.<sup>4</sup>

The elimination of bias also means that the assessments are free of racial and ethnic stereotypes, poorly conceived language and task situations, and other forms of cultural insensitivity that might interfere with candidate performance and unintentionally favor some candidates over others. Further, the elimination of bias includes consistent scoring of assessments and vigilant efforts not to discriminate against groups of candidates.

Ultimately, it is important that units evaluate assessments and assessment conditions and eliminate as many sources of bias as possible. While the standards use the term “eliminate,” in fact, it is best to *avoid* sources of bias as the assessments are being developed.

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<sup>4</sup> For a list of additional sources of bias, see [www.ncate.org/institutions/article\\_commission.asp?ch=87](http://www.ncate.org/institutions/article_commission.asp?ch=87) and choose “Commissioned papers on Development of Assessment Systems and Aggregating Data,” then select Stiggins, *Specifications for a Performance-based Assessment System for Teacher Preparation*, p.9,13.

NCATE believes that institutions must address these issues of fairness, accuracy, consistency and the avoidance/elimination of bias as an integral component of the development and implementation of a high quality assessment system. If institutions do not adequately address these issues, then the quality of the assessment system can be legitimately questioned, and the data derived from the assessments may not sufficiently address the elements in Standard 1.

Experts suggest that many assessments, in particular higher-stakes summative assessments, shift student focus and effort away from the learning process itself and towards the assessment instrument. In their view, reliance on such instruments often misdirects student motivation towards achieving high test scores rather than more meaningful learning outcomes. As a result, the processes that should be valued—learning, skill development, growth in knowledge—are displaced by the measurement instruments themselves, which in many cases are not valid indicators of those primary processes. Expert informants cited studies suggesting that standardized tests and grades have been shown to undermine motivation among students who struggle, and that even in the case of high-performing students, many summative assessments produce the wrong kind of motivation—the desire for high grades/scores rather than the desire to improve skills or increase knowledge. Low grades and scores are especially problematic because they give students the idea that they are poor learners, which de-incentivizes future learning.

Public assumptions about the relationship between assessments, grades and student motivation stand in marked contrast to those of experts. For our public informants, grading systems function as a necessary and effective means of incentivizing student achievement and punishing poor performance. While informants were at times able to speak of children's capacity to love learning and the learning process for their own sake, they were largely unable to imagine of a formal educational system operating with grades. Instead, assessments and grades were deemed necessary to student motivation and positive educational outcomes.

Notable, both experts and public recognize the assessments and their by-products carry motivational power for students. But beyond that basic overlap, their perspectives diverge dramatically as the public largely fails to consider how assessments often distort motivation away from learning and can depress motivation overall.

The public's model of assessments and grades as a motivational system is closely linked to a cultural model of education as a competitive arena, where students strive to outdo each other in test scores and grades, and in setting themselves up as desirable candidates for college and careers. In this respect, the idea that grades serve a positive motivational function is consistent with a broader acceptance of competition in American society, and with the idea that each individual must learn to compete in the marketplace of skills and knowledge. From this perspective, the idea that assessments motivate students is desirable, and there is little reason to distinguish motivations that actually improve learning from those that do not.

## **QUESTIONS**

- i. Describe the concept of differentiated learning.
- ii. How will you ensure fairness in assessment?
- iii. Explain the qualities of a good test.
- iv. What is a blueprint? How will you construct a blueprint for two units in your subject?
- v. What is meant by culturally responsive assessment? explain.

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## Unit - VI -ASSESSMENT FOR INCLUSIVE SCHOOLS

### OBJECTIVES

The student - teachers will be able to

- i. understand how to assess the disabled children
- ii. assess their performance outcomes
- iii. apply various strategies to assess their performance
- iv. know and understand the process of feedback
- v. analyse their feedback

### Assessing the disabled/ to identify special educational needs

Whilst there are clear differences in the ways assessment information is collected and used in countries, the necessity to precisely identify an individual pupil's special educational needs is

recognized in all countries. All countries have clear legal procedures for the initial identification of the educational needs of pupils who are experiencing difficulties. However, how these needs are identified differs and each country has its own set of procedures for initial identification of needs.

Initial assessment of pupils who are thought to have SEN can have two possible purposes: - Identification linked to an official decision to 'recognise' a pupil as having educational needs that require additional resources to support their learning; - Informing learning programmes, where assessment is focused upon highlighting strengths and weaknesses the pupil may have in different areas of their educational experience. Such information is often used in a formative way – perhaps as the starting point for Individual Education Plans (IEPs) or other target setting approaches – rather than as a one off, baseline assessment.

In different ways, most countries have 'graduated' approaches to the identification of a pupil's SEN. There may be clearly defined stages in a process that begins with mainstream class teachers highlighting and attempting to address difficulties, then involving other specialists in the school and finally specialists from external support services.

This sequence of collecting information about a pupil's strengths and weaknesses that is increasingly detailed and more specialised is often linked to the involvement of professionals who come from different specialist areas - health, social and psychological - and who can carry out different forms of assessment (often diagnostic tests) that give particular insights into a pupil's functioning in different areas. In all countries, to one degree or another multi-disciplinary teams are involved in assessment linked to initial identification of special educational needs.

In all countries, assessment with the purpose of initial identification of SEN applies to pupils in all educational settings - inclusive and segregated. However, pupils with SEN in inclusive settings might also be included in assessment procedures that pupils in segregated schools may or may not be involved in. These are described below.

## **Feed back**

Why is feedback so important? Good quality, comprehensive, timely feedback is a very important factor in driving student learning. Assessment should provide feedback to students on their progress towards the achievement of learning outcomes. Feedback will enable students to realise where they have done well and indicate what they could improve on, as well as justifying the grade/mark of summative assessments.

It is important that feedback is timely. If you provide feedback too soon, it may disrupt the student's reflective process. However, it is far more common that feedback is provided too late when it is no longer salient to the student. Feedback should not be held off until the end of a year/semester, as the student is unlikely to benefit from it once the task is complete and they have moved on to a new one. We'll explain more about the importance of formative feedback later in this guide.

The benefits of successful feedback set in the context of learning outcomes are many. For example, successful feedback will: • build confidence in the students, • motivate students to improve their learning; • provide students with performance improvement information, • correct errors, • identify strengths and weaknesses

Making feedback more effective As an educator, there are many ways to improve the quality of your feedback to make it more effective for the learner. Simple things like not always using ticks to indicate a good point are recommended as students will be more motivated by short words or phrases such as “good work” or “true”. Feedback should be specific – don’t just say ‘good’, explain why, in what respects. It should also be constructive, encouraging, honest, and supportive; and where possible it should be frequent and substantial. Successful feedback should clearly indicate to the student:

1. What aspects of their assessed work are successful, and why ?
2. What aspects of their assessed work are less successful, and why?
3. How the student could improve this particular piece of work?
4. How the student could do more successful work in future?.

Feedback is also timely, a fact we lecturers often overlook. It should not be provided too soon, as it could prevent students reflecting on their work; neither should it be provided too late when it is no longer salient to the student. How many times have students thought they were progressing just fine at interim assessment stages only to find out at the final assessment stage that their work was not up to the level the feedback they received led them to believe? Clear and appropriate assessment criteria, that are available to students before their assessment and can be consulted afterwards, go a long way in helping to address this problem.

Feedback can be time-consuming, but there are ways to make it more efficient.

- Consider the nature of the feedback students will need to master the concepts and skills for each assignment. How detailed does it have to be? Should it be individual or can it be group feedback? Can it be oral or does it have to be written?
- Use the track and edit tool in Word to speed up feedback and comments on student essays and reports.
- Consider using or creating generic feedback forms.
- Consider audio-taping feedback for learners.
- Provide more detailed solution sets to reveal the appropriate underlying reasoning, to identify potentially misunderstood concepts or principles, and to elaborate how common student errors followed from these misunderstandings.

Using Computer-Assisted Assessment (CAA) Computer-Assisted Assessment is a fast and efficient way to provide immediate feedback to the learner, and to save time on tutor marking. Computer Assisted Assessment is typically formative, in that it helps students to discover whether they have learned what the educator intended.

Computer Assisted assessment is a broad term for the use of computers in the assessment of student learning.<sup>1</sup> Various other forms exist, such as Computer-Aided Assessment, Computerised Assessment, Computer Based Assessment (CBA) and Computer-Based Testing. Online Computer

Based Assessment has existed for a long time in the form of Multiple Choice Questions (MCQ's).<sup>2</sup> Computer Based Assessment is commonly directly made via a computer, whereas Computer Assisted Assessment is used to manage or support the assessment process.

### ***Key Questions in Planning***

#### Classroom Assessments

Just as teachers have numerous instructional techniques and strategies from which to choose, a variety of methods are available for assessing learning. The selection of particular assessment methods should be determined in response to several key questions. These questions are incorporated in the chart. "Classroom Assessment Planning : Key Questions".

The first questions concern learning outcomes, or the intended results of our teaching: What do we want students to understand and be able to do? Learning outcomes typically fall into three categories: (1) declarative knowledge –what we want students to understand (facts, concepts, principles, generalizations); (2) procedural knowledge what we want students to be able to do (skills, processes, strategies); and (3) attitudes, values or habits and mind – how we would like students to be people with respect, avoid impulsive behavior). The choice of specific assessment methods should be determined in large part by the nature of the learning outcomes being assessed (Marzano, Pickeing, & McTighe, 1993). For example, if we want students to demonstrate the capacity to write an effective persuasive essay, then our assessment should involve gathering samples of persuasive writing and evaluating them against specified criteria. In this case, a multiple-choice test would be ill-suited to measure the intended outcome. Likewise, if we wish to develop student's ability to work cooperatively on research project, then we would assess group processes and products as well as individual performance.

In addition to considering outcomes, we need to raise questions related to the purpose(s) and audience(s) for classroom assessments: Why are we assessing? How will the assessment information be used? For whom are the assessment results intended? The purpose(s) and audience(s) for assessments influence not only the methods selected, but the ways in which the classroom assessment results are communicated. For example, if we wish to provide parents of a primary-grade student with an interim report of progress in language arts, we might arrange a conference to describe the child's reading skills in terms of a development profile and re-view a work folder containing samples of her writing.

### **THE FRAMEWORK OF ASSESSMENT APPROACHES AND METHODS.**

Given identified outcomes, purposes, and audiences, how might we assess student learning in our classrooms? The "framework of Assessment Approaches and methods" offer a systematic guide to the purposeful selection of assessment methods.

Each of the five columns in the framework identifies an assessment approach and contains examples of specific assessment methods corresponding to that approach. Given the focus of this articles on performance-based assessment, we'll skip the first column (selected-response formats) and concentrate on the approaches in the second through fifth columns of the framework. We'll describe each general approach, examine the strengths and limitations of each, and provide vignettes of teachers using particular assessment methods in their classrooms.

## **Performance –Based Assessment**

By performance-based assessment, we are refereeing to assessment activities that directly assess student understanding and proficiency. These assessment allow students to construct a response, create a product, or perform a demonstration to show what they understand and can do. Since they call for students to apply knowledge and skills rather than simply to recall and recognize, performance-based assessments are more likely to reveal student understanding. They are well suited to assessing application of content-specific knowledge, integration of knowledge across subject areas, and lifelong learning competencies such as effective decision making, communication and cooperation (Shepard, 1989).

## **Performance Assessment**

Using performance assessments, teachers are able to directly observe the application of desired skills and knowledge. Performance assessments can be among the most authentic types of student assessments since they can replicate the kinds of actual performance occurring in the world outside of school. Performances have been widely used to assess learning in certain disciplines, such as vocal and instrumental music, physical education, speech, and theater, where performance is the natural focus of instruction. However, teachers in other subjects can routinely include performances such as oral presentations, demonstrations, and debates, as part of a broad array of assessment methods.

The evaluation of performances becomes instructionally valuable when students apply the scoring tools for peer and self-evaluation. Such involvement helps students to internalize the elements of quality embedded in the criteria. Many teachers have observed that students are motivated to put forth greater effort when they perform before “real” audiences of other students, staff, parents, or expert judges. In addition to the influences on students, schools often benefit from positive public relations when students perform for the community.

Despite their positive features, performance assessments can be time-and labour-intensive for students and teachers. Time must be allocated for rehearsal as well as for the actual performances. The evaluation of performances is particularly susceptible to evaluator biases, making fair, valid and reliable assessment a challenge.

## **QUESTIONS**

1. Explain why feedback is so important
2. How will you identify the special education needed children?
3. Explain the framework of assessment approaches.
4. How will you integrate ICT on assessing various types of learners?
5. Explain how technology will improve for early intervention of Mentally Retarded Children?

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## **UNIT – 7**

### **PHILOSOPHICAL AND EDUCATIONAL UNDERPINNINGS OF ASSESSMENT**

#### **Course objectives**

The student teacher will be able to

1. understand the RTE act and its relationship with curriculum, pedagogy and teachers.
2. know the Non-detention policy and its problem.
3. identify the educational underpinnings of assessment.
4. analyse the merits of competitive exams.
5. know the various dimensions of assessment.

#### **No competitive exams**



There should not be any competitive examinations to assess the performance of the students. The students feel inferior if they got low marks in a competitive examination. Even though, the students who were from remote area and socially disadvantaged groups are talented. Majority of the students were not aware of competitive examinations. Considering the students from this group the government has decided not to have any competitive examination.

### **Non Detention Policy**

The 'No Detention Policy' is a Govt. of India's initiative according to which no student can be detained in one standard for more than one academic year. It was being talked of implementing it up to class XI but is valid till class VIII only. The Right to Education Act (RTE), 2009 makes provisions for free and compulsory education for children between 6 and 14 under Article 21A of the Indian Constitution. This article was inserted into Part-III (Fundamental Rights) in the constitution via the 86th Constitutional amendment of the constitution. Under this policy, the students up to class VIII are automatically promoted to the next class without being held back even if they do not get a passing grade. The policy was implemented as part of the Continuous and Comprehensive Evaluation (CCE) under the RTE Act in 2010 to ensure all-round development of students. The concept of CCE imported from the West, which emphasises on evaluating a child through the year, and not just based on performance in one or two term exams.

### **Problems in NDP**

The poor learning outcomes of schools are caused by many factors of learning. One of them is the pupil-teacher ratio. Many government schools in India are facing acute shortage of teachers. And the available teachers are burdened with non-school activities. Until the desired pupil-teacher ratio is achieved, it is unreasonable to expect CCE and NDP to succeed. Other factor responsible for poor learning outcomes is the lack of trained teachers. Lack of training has caused the confusion among the teachers on what their role is in implementation of CCE guidelines. Teacher training must be revised in line with the requirements of CCE. Instead of strengthening the foundation to implement the reforms, bringing back the old pass-fail system threatens to undermine the egalitarian promise of the RTE.

### **Right to Education**

The Constitution (Eighty-sixth Amendment) Act, 2002 inserted Article 21-A in the Constitution of India to provide free and compulsory education of all children in the age group of six

to fourteen years as a Fundamental Right in such a manner as the State may, by law, determine. The Right of Children to Free and Compulsory Education (RTE) Act, 2009, which represents the consequential legislation envisaged under Article 21-A, means that every child has a right to full time elementary education of satisfactory and equitable quality in a formal school which satisfies certain essential norms and standards.

Article 21- A and the RTE Act came into effect on 1 April 2010. The title of the RTE Act incorporates the words ‘free and compulsory’. ‘Free education’ means that no child, other than a child who has been admitted by his or her parents to a school which is not supported by the appropriate Government, shall be liable to pay any kind of fee or charges or expenses which may prevent him or her from pursuing and completing elementary education. ‘Compulsory education’ casts an obligation on the appropriate Government and local authorities to provide and ensure admission, attendance and completion of elementary education by all children in the 6-14 age group. With this, India has moved forward to a rights based framework that casts a legal obligation on the Central and State Governments to implement this fundamental child right as enshrined in the Article 21A of the Constitution, in accordance with the provisions of the RTE Act.

### **The RTE Act provides**

- Right of children to free and compulsory education till completion of elementary education in a neighbourhood school.
- It clarifies that ‘compulsory education’ means obligation of the appropriate government to provide free elementary education and ensure compulsory admission, attendance and completion of elementary education to every child in the six to fourteen age group. ‘Free’ means that no child shall be liable to pay any kind of fee or charges or expenses which may prevent him or her from pursuing and completing elementary education.
- It makes provisions for a non-admitted child to be admitted to an age appropriate class.
- It specifies the duties and responsibilities of appropriate Governments, local authority and parents in providing free and compulsory education, and sharing of financial and other responsibilities between the Central and State Governments.
- It lays down the norms and standards relating inter alia to Pupil Teacher Ratios (PTRs), buildings and infrastructure, school-working days, teacher-working hours.
- It provides for rational deployment of teachers by ensuring that the specified pupil teacher ratio is maintained for each school, rather than just as an average for the State or District or Block, thus ensuring that there is no urban-rural imbalance in teacher postings. It also

provides for prohibition of deployment of teachers for non-educational work, other than decennial census, elections to local authority, state legislatures and parliament, and disaster relief.

- It provides for appointment of appropriately trained teachers, i.e. teachers with the requisite entry and academic qualifications.
- It prohibits
  - (a) physical punishment and mental harassment;
  - (b) screening procedures for admission of children;
  - (c) capitation fee;
  - (d) private tuition by teachers and
  - (e) running of schools without recognition,
- It provides for development of curriculum in consonance with the values enshrined in the Constitution, and which would ensure the all-round development of the child, building on the child's knowledge, potentiality and talent and making the child free of fear, trauma and anxiety through a system of child friendly and child centred learning.

### **Questions**

1. What do you mean by Non detention policy? Discuss the merits of Non detention policy.
2. Explain the problems in NDP.
3. Define RTE act and describe its relationship with curriculum, pedagogy and teachers.
4. Explain the various dimensions of Assessment.
5. Discuss the merits and demerits of Competitive exams.

## **UNIT – 8**

### **PARTICIPATORY APPROACH**

#### **Course objectives**

The student teacher will be able to

1. know the participatory approach and its benefits
2. understand the process involved in participatory approach
3. know the advantages of participatory assessment
4. develop community monitoring of assessment.
5. point out the key issues in teacher autonomy in assessment.

## **Participatory Assessment**

Participatory assessment is a means of building partnerships with people from certain communities of all ages and backgrounds. The partnership is fostered through structured discussions and dialogue.

Participatory assessments may include holding separate discussions with women, girls, boys and men, in order to:

- gather accurate information on the specific problems that they face,
- get information about the underlying causes of those problems,
- understand the capacities of various persons within the community,
- hear their proposed solutions to their problems.

## **A Major Benefit of Participatory Assessment**

One of the most beneficial aspects of participatory assessments is the fact that it helps mobilize communities to take collective action to improve their own quality of life. Participatory assessments also form the basis for the implementation of a rights and community-based approach.

## **Advantages of Participatory Assessment**

- Less time grading and more time for student interaction
- Greater class participation
- Positive classroom experiences
- Learning

## **Steps for conducting participatory assessment**

- Step 1: Reviewing existing information
- Step 2: Mapping diversity
- Step 3: Methods of enquiry
- Step 4: Selecting themes
- Step 5: Facilitating discussions
- Step 6: Systematizing the information gathered
- Step 7: Follow-up actions
- Step 8: Comprehensive analysis and prioritization

- Step 9: Recording meetings
- Step 10: Participatory planning workshop

### **Community-based approach**

A community-based approach motivates women, girls, boys and men in the community to participate in a process which allows them to express their needs and to decide their own future with a view to their empowerment. It requires recognition that they are active participants in decision-making. It also seeks to understand the community's concerns and priorities, mobilizing community members and engaging them in protection and programming. The focus is on helping refugees organize themselves to solve their own problems. The role of UNHCR is to support the building, rebuilding and strengthening of communities' capacities to respond to protection risks and to make decisions over access to and use of resources. Participatory assessment is carried out in the spirit of shared responsibility for enhancing protection of all members of the community and is an essential component of community-based work.

### **Teacher autonomy in Assessment**

Teacher autonomy has become an important aspect of the teacher professionalism. An autonomous teacher will be able to produce autonomous learners are also able to be independent implementers of government policies in particular education policies. Queensland Studies Authority (2010) outlined the importance and benefit of SBA in the education system claiming that: - The students are able to improve their learning to the optimum, - The students constant and detailed feedback and suggestions to improve, - Teachers have the opportunity to use variety of assessment techniques, - Teachers are able to improve on their assessment knowledge and techniques, - Teachers are able to adopt the curriculum and assessment to the students local needs The role of the teacher in this teaching environment demands more independence as they should be free to determine the best remedy for their students learning problem. Teachers are the best person to determine their students need and address their learning problems. Teacher's responsibility in SBA is viewed as an important aspect in the T&L process. Integration of assessment in the T&L process would help the teachers in identifying their students' immediate learning problem and help the teachers to provide real-time solution to overcome the problem.

### **Questions**

1. Explain Participatory approach.
2. Describe the process involved in participatory approach.

3. Explain the advantages of participatory assessment.
4. Explain community monitoring of assessment.
5. Describe the teacher autonomy in assessment.

## **UNIT – 9**

### **PREVALENT PRACTICES OF ASSESSMENT**

#### **Course objectives**

#### **The student teachers will be able to**

- ✓ understand the drawbacks of present assessment system;
- ✓ analysis assessment for better learning;
- ✓ understand assessment for confidence building;

- ✓ develop building self-confidence; and
- ✓ know assessment for creative learning.

## **INTRODUCTION**

In a rapidly changing world, the education system in India is re-shaping and refreshing itself day by day. The most sensitive part of curriculum change is change in the Assessment and Evaluation system. For quality assurance and for maintaining public confidence, links with authorities like International Assessments for Indian Schools and distinguished foreign institutions are thought to be vital. The Government of the Republic of India through the Ministry of Human Resource Development is the controlling authority of the assessment systems and procedures. The Educational Boards and Councils in different states and union territories are applying their own strategies to assess and evaluate the learners keeping a similarity with the standard and norms as used in CBSE and ICSE. A number of national levels Councils NCTE, IMC, AICTE, NCERT etc. are also directly involved in this system. It seems that assessment will continue to be a contentious issue and Indian students will continue to take part in the national and international tests. The key factor for the system and the educational institutions is to establish equilibrium between measuring and assessing achievements and the practical consequences on the teaching -learning process. Because the educated members of the élite society are no longer of the opinion that the learners should be assessed through global standard norms and criteria, some Universities and Academic Institutions of national and international reputation are introducing their own admission tests.

## **PRESENT EDUCATION SYSTEM**

The present system of assessment and evaluation for school education in India is exam based. Therefore, it focuses only on cognitive learning outcomes and in the process co-curricular domains are neglected, even though co-curricular areas are an equally important and significant part of child development. Even in curricular areas the focus is on rote learning and memorization, characterized by a neglect of higher mental abilities such as critical thinking, problem solving and creative ability. In India, The National Curriculum Framework – 2005 developed on the basis of 21 position papers has looked into every aspect of school education. The document states that examinations require systemic reforms in the context of evaluation and assessment. The high failure rates, increasing number of school drop outs, unhealthy competition, stress, nervous breakdowns and suicides among learners make it imperative for Indian educationists to look into the evaluation system of the country which is at present examination oriented.

## **DRAWBACKS OF PRESENT ASSESSMENT SYSTEM**

Assessment is the process of documenting, usually in measurable terms, knowledge, skills, attitudes and beliefs. Evaluation is an important aspect of any education system. Student learning can be improved through well-planned procedures of evaluation that are inbuilt in the teaching learning process. Many times teachers attempt to assess the progress of learning while teaching in the classroom – sometimes deliberate and at times spontaneous. Thus evaluation is considered as an integral part of teaching learning process. Evaluation is a process of collecting, analyzing and interpretation of the evidences about students' progress in cognitive and non-cognitive areas. On the basis of these evidences teacher could take certain decisions to improve classroom practices for enhancing the attainment levels among students. Evidences are collected, analyzed and interpreted through some tools and techniques. **Tests** are most prominent tools to collect evidences about the progress of learning among learners.

**Observation** is an important technique used to collect evidences of development in specifically co-scholastic areas. Tests provide the marks or grades and observation gives an idea or impression. Evaluation is a decision-making process that intends to lead students towards better performance and consequently helps to bring about qualitative improvement in education. It is both process and product. When we talk about the evaluation process, it mainly focuses on teachers as the teacher has to decide why, what, when and how to evaluate and how to make sense of it. The thoughtful teacher uses the information of students' results as guide to improve his/her own teaching practices. The performance of learners in scholastic areas can either be evaluated during the process of instruction or after completion of instruction in a regular temporal sequence. The former is formative evaluation and the latter is summative evaluation. The evaluation in scholastic areas is mostly focused on the attainment of instructional as well as educational objectives. Some of the important purposes of evaluation are:

- to know the efficacy of instruction, to determine the rate of progress of learners,
- to predict success of learners in their future scholastic endeavors,
- to know the attainment of instructional and educational objectives,
- to motivate learners for better learning,
- to diagnose the weaknesses,
- to provide continuous record of achievement,
- to place students in rank order and
- to increase self confidence among students

The process of evaluation involves in selection of suitable tools and techniques for collecting evidences to know the progress of performance among learners.



In spite having advantages, following could be the draw backs of the present System.

- It would be tough to measure or calculate the exact marks.
- Work load of teachers would be increased a lot.
- Regular teaching would be affected.
- Mobility or transferring of students from one institution to another one would be problematic.
- Maintaining compatibility among main subject's papers and soft papers would be challenging one.
- Offering more than one programme of different nature simultaneously would be challenging one.
- Extra burden would be experience by the institution.
- Mastery over concerned subject would be hampered.
- Problems of indiscipline would be happened as full liberty or choices of students are given maximum importance.
- Different nature and standard of institution will forced problem in maintain the equality in terms of mobility of students as everyone would desire to move from sub standard institution or university to standard one.
- It may pose problems in maintaining the cumulative record of every student.
- Seriousness of students will go away from the examination as much weightage is given to continuous or internal assessment and evaluation.
- Most of the time will have to be consumed for setting papers for different type of examinations.
- It will call to increase the infrastructure to house or accommodate the students.
- Equalisation of performance through it may discourage the gifted and talented students.
- Research work and innovation would get hampered, as most of the time teachers have to be involved in setting papers and making arrangement for the examinations.
- Chance of subjectivity would be maximum, as internal evaluation has 40 % weightage.

### **ASSESSMENT FOR BETTER LEARNING**

Assessment should help the learners move beyond their ability by providing them with constructive feedback about their strengths and weaknesses. Assessment cannot stand by itself and any language assessment should give students an opportunity to demonstrate what they know and can do with language. "First and foremost, assessment must encourage students to reflect on their

own reading and writing in productive ways, to evaluate their own intellectual growth, and to set goals.” (IRA/NCTE Joint Task Force on Assessment, 1994, p. 13)

Through constant interaction with students, teachers can assess the learner’s work and the wide range of work presented by different students makes the assessment easier.

Assessment for better learning can take various forms such as:

**Self assessment** which enables students to monitor their own progress against specific objectives and evidence from their own work.

**Peer assessment** which helps to improve learning and to develop social and cooperative skills.

**Teacher's assessment** which progress and strengths are recognised, difficulties diagnosed and strategies to overcome them planned.

## **ASSESSMENT FOR CONFIDENT BUILDING**

No matter what your self-confidence level is right now, you can probably improve it. But you need to believe in yourself and your capabilities before anyone else will.

Bandura's theory of self-efficacy is a great place to start looking for ways to improve the way you see your abilities. According to the theory, there are four sources of self-efficacy:

- Mastery experiences – things you have succeeded at in the past.
- Vicarious experiences – seeing people who are similar to you succeed.
- Social persuasion – hearing from others that you're capable.
- Emotional status – staying positive, and managing stress.

Three of these sources (the first, second, and fourth) are within your control, so we'll look at them more closely. However, while we can't force people to say good things about us (the third source), we can increase the likelihood of receiving positive feedback by being more confident in general.

Layering assessment on top of it all can create a maelstrom of stress.

How can we help students feel in control, confident and willing to approach learning new material? How can we help them feel poised for success on assessments and confident with new material?

### **1. Say It Out Loud**

When students encounter material for the first time, it is helpful if they can talk it out with a peer or teacher. This might be in the form of dealing with a vocabulary word, a scientific concept, a math problem, or a verb tense in a world language. The verbal processing that takes place in conversation with a trusted peer or teacher settles the learner, provides an opportunity to try out the language associated with the new topic, and arms him or her with confidence. Through trial, error and immediate feedback, the student now feels more confident setting out on his or her own to tackle the topic.

### **2. Brain Dump**

After learning new material for a set period of time, have students do a brain dump on a blank piece of paper. This serves the purpose of helping the student realize that learning and knowledge acquisition *have* been happening. It helps to raise student confidence and is also a useful approach for the teacher to receive feedback and see where gaps exist. Consider using this valuable approach with students as soon as they receive an assessment, before attempting to answer any questions. For some students, holding the information inside their head can cause anxiety and confusion. Taking a deep breath, dumping the information on a blank page, and seeing what it looks like prepares the student for success on the assessment. This brain dump then serves as a study guide.

### **3. Not All in a Straight Line**

For many students, learning is not linear. On an assessment, one of the keys to remember is that the first question might not be the best place to start. Sometimes, a student will look at the first question on an assessment and panic, thinking he or she knows nothing. That can derail the rest of the assessment. Instead, students should take a holistic approach, spend some time scanning the entire assessment, and look for a positive entry point where they feel most confident. Similarly, as teachers consider the entry point for learning new material, recognizing that each child may have a different entry point is important, so being multi-modal is critical.

### **4. Be Visual or Musical**

The artist and the musician live inside each student, and tapping into that creative side can unleash the student to learn and acquire knowledge. I can still recall the scene from the 1970s sitcom *Happy Days* when the musically talented character, Potsie, is trying to study for his biology test. The information is overwhelming him, and he doesn't know where to begin -- until he realizes that putting the vocabulary in the form of a song will help him master the material. Potsie soars from that point on as a student, and the viewer feels his newfound confidence. His teacher can't believe that he actually learned the material, so Potsie proves him wrong by performing the song, "Pump Your Blood."

## **ASSESSMENT FOR CREATIVE LEARNERS**

India's educational system is modelled on the mass education system that developed in the 19th century in Europe and later spread around the world. Tracing the roots of the movement, the goal is clear — to condition children as “good” citizens and productive workers. This suited the industrial age that needed the constant supply of a compliant workforce with a narrow set of capabilities. The educational environment even today resembles factories with bells, uniforms and batch-processing of learners. They are designed to get learners to conform.

From an economic standpoint, the environment today is very different. In a complex, volatile and globally interconnected world, new-age skill-sets are essential. *Wired* magazine estimated that 70 per cent of today's occupations would become automated by the end of this century. What will be the role of humans in this new economy? Linear, routine thinking will have no advantage. It calls for flexibility, adaptation, new thinking, paradigm shifts, and innovation — and that is the language of creativity. Creativity is an essential 21st century skill.

From a scientific perspective, creativity is an aptitude for new, original and imaginative thinking. Let us consider some key aspects of an educational system with creativity at its core

**Outcomes:** In a creative educational system, the infinite range of human abilities and talents finds an equal place. Creative learning produces growth in both cognitive and affective dimensions and leads to the production of outcomes that are rich and complex, original and expressive. There is a harmonious development of body, mind and spirit. Outcomes include the development of higher-order thinking skills, creativity, problem-solving ability, self-awareness and aesthetic sensibilities.

**Pedagogy:** Several studies suggest that the innate creativity and curiosity of children are lost in the conventional schooling methods. In creative classrooms, the teacher and students are participants in

the learning process. Pedagogies take into account the diversity of learning styles, involve all the senses and body, and are fundamentally experiential in nature. Learning about the environment challenges students to use complex thinking, provide time to think and play with new ideas and encounter knowledge in varied ways to lead to personal and meaningful insights. Classrooms are playgrounds for exploration, inquiry and reflection.

**Assessments:** Current assessment mechanisms largely rely on a one-time, high-stake standardised testing measuring a narrow range of abilities. Studies indicate that gifted students underachieve in these assessments, and up to 30 per cent of high school dropouts may be highly gifted. Assessments that nurture creativity are built for intrinsic motivation and enable growth on one's unique path. They are flexible, cover diverse dimensions and rely extensively on self-assessment. They encourage students to raise questions, probe, create possibilities and give play to imagination.

**Content:** Today, there is an inbuilt hierarchy of content in education. For the 21st century economy, content knowledge has little meaning without the skills of creativity, problem-solving, and human connection. In a creative system, any kind of creative potential has an equal chance of blossoming, be it in languages, maths, art or any other. Creative thinking, imagination and expression are the core focus across all content. There is cross-pollination of subjects and an infusion of art, aesthetics and design into the mainstream.

Globally, there is a growing body of thinkers, parents and educators concerned with the system. Creativity, design thinking and metacognition are being recognised as 21st century skills. Finland went against the tide in its education policies and has generated interest for its high scores. It follows a highly decentralised and flexible structure with high-quality teachers who have autonomy over curriculum and student assessments. There is no standardised testing, and teaching is a coveted profession.

A nation's educational system can unfold from its innate strengths, and uniqueness. India can take inspiration from its days of educational and intellectual excellence. Learning was infused with music, art and poetry. Higher-order thinking, self-awareness, deep inquiry, aesthetics, intuition, discussions and debates were integral to education. Creativity in many ways was pervasive in the goals, methods and content of education.

## **QUESTIONS**

1. Elucidate the drawbacks of present assessment system.
2. Describe the assessment for better learning.
3. How can you build your students self-confidence?
4. Write about assessment for creative learning.
5. How can you help pupils feel in confident and willing to approach new learning?

## UNIT 10

### REPORTING QUANTITATIVE ASSESSMENT OF DATA

#### Course objectives

#### The student teachers will be able to

- ✓ know the performance assessment and benefits;
- ✓ utilize the reflective journal and advantages;
- ✓ obtain knowledge of student portfolios;
- ✓ obtain knowledge of measures of central tendency; and
- ✓ understand correlation and advantages.

#### INTRODUCTION

In its simplest terms, a performance assessment is one which requires students to demonstrate that they have mastered specific skills and competencies by performing or producing something. Advocates of performance assessment call for assessments of the following kind: designing and carrying out experiments; writing essays which require students to rethink, to integrate, or to apply information; working with other students to accomplish tasks; demonstrating proficiency in using a piece of equipment or a technique; building models; developing, interpreting, and using maps; making collections; writing term papers, critiques, poems, or short stories; giving speeches; playing musical instruments; participating in oral examinations; developing portfolios; developing athletic skills or routines, etc.

Invariably, proponents of performance assessment also advocate the use of student portfolios. In doing so, they also remind us that a portfolio is more than a folder stuffed with student papers,

video tapes, progress reports, or related materials. It must be a purposeful collection of student work that tells the story of a student's efforts, progress, or achievement in a given area over a period of time. If it is to be useful, specific design criteria also must be used to create and maintain a portfolio system.

## **REFLECTIVE JOURNAL**

A reflective journal is a means of recording ideas, personal thoughts and experiences, as well as reflections and insights a student have in the learning process of a course. In addition to the demands of a typical written assignment (e.g. able to give definition on concepts, demonstrate basic understanding of course materials), reflective journal requires the students to think more deeply, to challenge their old ideas with new incoming information, to synthesize the course materials they have learnt into their personal thoughts and philosophy, and also to integrate it into their daily experiences and future actions. The benefits of the reflective learning process are usually accumulated over a period of time, in which the students usually show a series of developmental changes, personal growth and changes in perspectives during the process.

## **ADVANTAGES OF REFLECTIVE JOURNAL**

- **Active learning** - The process of reflection encourages the students to take the initiative to be active, self-driven; allows individual learner to explore concepts and ideas in relation to their thoughts and feelings from different perspectives. Students can become independent thinkers through the practice and to enable themselves to solve various problems on their own.
- **Understanding the progress of students** - Reflective journals provide good opportunities for teachers to gain better understanding about how the students think and feel about the course, and the learning progress of the students throughout the course, which will eventually enhance the students' learning process.
- **Improving writing skills** - Writing reflective journals can involve students in a new form of writing which they may not have a chance to experience in the past. This exposure can bring out improvement in students' writing skills.

- **Freely expressing personal views and criticizing of one-self** - Reflective journal assignments provide the platform for students to freely express what they think and feel about the course and their learning process, and also promote their expression of ideas, personal experiences and opinions. This is an ideal place for students who are generally not willing to speak up in the classes and tutorials to express themselves.
- **Enhance critical thinking and creativity** - The process of self-reflection enhances the development of critical thinking skills among students when they relate their knowledge to real world issues. It can help students develop their creativity and a questioning attitude towards different issues and problems.

## STUDENT PORTFOLIO

A student portfolio is a compilation of academic work and other forms of educational evidence assembled for the purpose of (1) evaluating coursework quality, learning progress, and academic achievement; (2) determining whether students have met [learning standards](#) or other academic requirements for courses, grade-level promotion, and graduation; (3) helping students reflect on their academic goals and progress as learners; and (4) creating a lasting archive of academic work products, accomplishments, and other documentation. Advocates of student portfolios argue that compiling, reviewing, and evaluating student work over time can provide a richer, deeper, and more accurate picture of what students have learned and are able to do than more traditional measures—such as [standardized tests](#), quizzes, or final exams—that only measure what students know at a specific point in time.

Portfolios come in many forms, from notebooks filled with documents, notes, and graphics to online digital archives and student-created websites, and they may be used at the elementary, middle, and high school levels. Portfolios can be a physical collection of student work that includes materials such as written assignments, journal entries, completed tests, artwork, lab reports, physical projects (such as dioramas or models), and other material evidence of learning progress and academic accomplishment, including awards, honors, certifications, recommendations, written evaluations by teachers or peers, and self-reflections written by students. Portfolios may also be digital archives, presentations, blogs, or websites that feature the same materials as physical portfolios, but that may also include content such as student-created videos, multimedia presentations, spread sheets, websites, photographs, or other digital artefacts of learning.

Online portfolios are often called *digital portfolios* or *e-portfolios*, among other terms. In some cases, blogs or online journals may be maintained by students and include ongoing reflections



about learning activities, progress, and accomplishments. Portfolios may also be presented—publicly or privately—to parents, teachers, and community members as part of a [demonstration of learning](#), [exhibition](#), or [capstone project](#).

It's important to note that there are many different types of portfolios in education, and each form has its own purpose. For example, “capstone” portfolios would feature student work completed as part of long-term projects or final assessments typically undertaken at the culmination of a middle school or high school, or at the end of a long-term, possibly multiyear project. Some portfolios are only intended to evaluate learning progress and achievement in a specific course, while others are maintained for the entire time a student is enrolled in a school. And some portfolios are used to assess learning in a specific subject area, while others evaluate the acquisition of skills that students can apply in all subject areas.

The following arguments are often made by educators who advocate for the use of portfolios in the classroom:

- Student portfolios are most effective when they are used to evaluate student learning progress and achievement. When portfolios are used to document and evaluate the knowledge, skills, and work habits students acquire in school, teachers can use them to adapt instructional strategies when evidence shows that students either are or are not learning what they were taught. Advocates typically contend that portfolios should be integrated into and inform the instructional process, and students should incrementally build out portfolios on an ongoing basis—i.e., portfolios should not merely be an idle archive of work products that's only reviewed at the end of a course or school year.
- Portfolios can help teachers monitor and evaluate learning progress over time. Tests and quizzes give teachers information about what students know at a particular point in time, but portfolios can document how students have grown, matured, and improved as learners over the course of a project, school year, or multiple years. For this reason, some educators argue that portfolios should not just be compilations of a student's best work, but rather they should include evidence and work products that demonstrate how students improved over time. For example, multiple versions of an essay can show how students revised and improved their work based on feedback from the teachers or their peers.
- Portfolios help teachers determine whether students can apply what they have learned to new problems and different subject areas. A test can help teachers determine, for example, whether students have learned a specific mathematical skill. But can those students also apply that skill to a complex problem in economics, geography, civics, or history? Can they use it to conduct a statistical analysis of a large data set in a spread sheet? Or can they use it

to develop a better plan for a hypothetical business. (Educators may call this ability to apply skills and knowledge to novel problems and different domains “[transfer of learning](#)”). Similarly, portfolios can also be used to evaluate student work and learning in non-school contexts. For example, if a student participated in an internship or completed a project under the guidance of an expert mentor from the community, students could create portfolios over the course of these learning activities and submit them to their teachers or school as evidence they have met certain learning expectations or graduation requirements.

- Portfolios can encourage students to take more ownership and responsibility over the learning process. In some schools, portfolios are a way for students to critique and evaluate their own work and academic progress, often during the process of deciding what will be included in their portfolios. Because portfolios document learning growth over time, they can help students reflect on where they started a course, how they developed, and where they ended up at the conclusion of the school year. When reviewing a portfolio, teachers may also ask students to articulate the connection between particular work products and the academic expectations and goals for a course. For these reasons, advocates of portfolios often recommend that students be involved in determining what goes into a portfolio, and that teachers should not unilaterally make the decisions without involving students. For related discussions, see [student engagement](#) and [student voice](#).
- Portfolios can improve communication between teachers and parents. Portfolios can also help parents become more informed about the education and learning progress of their children, what is being taught in a particular course, and what students are doing and learning in the classroom. Advocates may also contend that when parents are more informed about and engaged in their child’s education, they can play a more active role in supporting their children at home, which could have a beneficial effect on academic achievement and long-term [student outcomes](#).

## **ASSESSING REFLECTIVE JOURNAL AND STUDENT PORTFOLIOS**

### **Assessment of the reflective diaries**

The assessment of the diaries was based on the quality of the evidence presented in the selected items in relation to the three objectives of the module, and in particular the reflection on current assessment practice based on theories. To explore the students’ perceptions and views on this new assessment approach, 18 students were randomly selected for interviews after the assessment. During the interviews, students were invited to talk about their views on the portfolio assessment

approach, their experience in preparing the portfolios, and their perceptions of the effects of portfolio assessment on their learning.

### **How to design a good Reflective Journal Assessment?**

- Consider the types of reflective journals that fit your course (if students are inexperienced with reflective journals, the structured form would be more ‘student-friendly’ because specific questions and guidelines are available)
- Make sure there are clear ideas about expectations and assessment criteria given to the students. (e.g. What can students put in their journals? What is the definition of ‘reflection’? What is the approximate length for each journal entry?)
- Try to make students understand the purpose and benefits of reflective journals at the very beginning
- Make sure that teachers have explained and discussed the policies concerning privacy and confidentiality of information with students
- Decide the regularity of journal entry (e.g. weekly, monthly)
- Provide timely feedback to students

### **WHAT IS PORTFOLIO ASSESSMENT?**

Portfolio assessment is an assessment form that learners do together with their teachers, and is an alternative to the classic classroom test. The portfolio contains samples of the learner's work and shows growth over time. An important keyword is reflection: By reflection on their own work, learners begin to identify the strengths and weaknesses of their own work (self-assessment). The weaknesses then become improvement goals. In portfolio assessment it is the quality that counts, not the quantity. Another keyword is *learning objectives*. Each portfolio entry needs to be assessed with reference to its specific learning objectives or goals.

Different schools may create different forms of portfolios. Some schools create portfolios that are a representative sample of the learners' work, while other schools use the portfolios as an assessment tool that can be an alternative to classical classroom tests and standardized teacher evaluation.

## Portfolio Assessment

Portfolio approaches to assessing literacy have been described in a wide variety of publications (Flood & Lapp, 1989; Lamme & Hysmith, 1991; Matthews, 1990; Tierney, Carter, & Desai, 1991; Valencia, 1990; Wolf, 1989) so that many descriptions of portfolios exist. Generally speaking, a literacy portfolio is a systematic collection of a variety of teacher observations and student products, collected over time, that reflect a student's developmental status and progress made in literacy.

## Instructional Outcomes

A portfolio is not a random collection of observations or student products; it is systematic in that the observations that are noted and the student products that are included relate to major instructional goals. For example, book logs that are kept by students over the year can serve as a reflection of the degree to which students are building positive attitudes and habits with respect to reading. A series of comprehension measures will reflect the extent to which a student can construct meaning from text. Developing positive attitudes and habits and increasing the ability to construct meaning are often seen as major goals for a reading program.

## Multiple Products Collected over Time

Portfolios are multifaceted and begin to reflect the complex nature of reading and writing. Because they are collected over time, they can serve as a record of growth and progress. By asking students to construct meaning from books and other selections that are designed for use at various grade levels, a student's level of development can be assessed. Teachers are encouraged to set standards or expectations in order to then determine a student's developmental level in relation to those standards (Lamme & Hysmith, 1991).

## Variety of Materials

Portfolios can consist of a wide variety of materials: teacher notes, teacher-completed checklists, and student self-reflections, reading logs, sample journal pages, written summaries, audiotapes of retellings or oral readings, videotapes of group projects, and so forth (Valencia, 1990). All of these items are not used all of the time.

## Student Involvement

An important dimension of portfolio assessment is that it should actively involve the students in the process of assessment (Tierney, Carter, & Desai, 1991).

#### Effective Means of Evaluating Reading and Writing

There are many ways in which portfolios have proven effective. They provide teachers with a wealth of information upon which to base instructional decisions and from which to evaluate student progress (Gomez, Grau, & Block, 1991). They are also an effective means of communicating students' developmental status and progress in reading and writing to parents (Flood & Lapp, 1989). Teachers can use their record of observations and the collection of student work to support the conclusions they draw when reporting to parents. Portfolios can also serve to motivate students and promote student self-assessment and self-understanding (Frazier & Paulson, 1992).

#### Brings Assessment in Line with Instruction

Portfolios are an effective way to bring assessment into harmony with instructional goals. Portfolios can be thought of as a form of "embedded assessment"; that is, the assessment tasks are a part of instruction. Teachers determine important instructional goals and how they might be achieved. Through observation during instruction and collecting some of the artifacts of instruction, assessment flows directly from the instruction (Shavelson, 1992).

Portfolios can contextualize and provide a basis for challenging formal test results based on testing that is not authentic or reliable. All too often students are judged on the basis of a single test score from a test of questionable worth (Darling-Hammond & Wise, 1985; Haney & Madaus, 1989). Student performance on such tests can show day-to-day variation. However, such scores diminish in importance when contrasted with the multiple measures of reading and writing that are part of a literacy portfolio.

#### Valid Measures of Literacy

Portfolios are extremely valid measures of literacy. A new and exciting approach to validity, known as consequential validity, maintains that a major determinant of the validity of an assessment measure is the consequence that the measure has upon the student, the instruction, and the curriculum (Linn, Baker, & Dunbar, 1991). There is evidence that portfolios inform students, as well as teachers and parents, and that the results can be used to improve instruction, another major dimension of good assessment (Gomez, Grau, & Block, 1991).

## MEASURES OF CENTRAL TENDENCY

A measure of central tendency is a single value that attempts to describe a set of data by identifying the central position within that set of data. As such, measures of central tendency are sometimes called measures of central location. They are also classed as summary statistics. The mean (often called the average) is most likely the measure of central tendency that you are most familiar with, but there are others, such as the median and the mode.

The mean, median and mode are all valid measures of central tendency, but under different conditions, some measures of central tendency become more appropriate to use than others. In the following sections, we will look at the mean, mode and median, and learn how to calculate them and under what conditions they are most appropriate to be used.

### ARITHMETIC MEAN

The arithmetic mean is the most common measure of central tendency. It is simply the sum of the numbers divided by the number of numbers. The symbol " $\mu$ " is used for the mean of a population. The symbol "M" is used for the mean of a sample. The formula for  $\mu$  is shown below:

$$\mu = \Sigma X/N$$

where  $\Sigma X$  is the sum of all the numbers in the population and  
N is the number of numbers in the population.

The formula for M is essentially identical:

$$M = \Sigma X/N$$

where  $\Sigma X$  is the sum of all the numbers in the sample and N is the number of numbers in the sample.

As an example, the mean of the numbers 1, 2, 3, 6, 8 is  $20/5 = 4$  regardless of whether the numbers constitute the entire population or just a sample from the population.

Table 1 shows the number of touchdown (TD) passes thrown by each of the 31 teams in the National Football League in the 2000 season. The mean number of touchdown passes thrown is 20.4516 as shown below.

$$\begin{aligned}\mu &= \Sigma X/N \\ &= 634/31 \\ &= 20.4516\end{aligned}$$

Table 1. Number of touchdown passes.

37 33 33 32 29 28 28 23 22 22 22 21 21 21 20 20
19 19 18 18 18 18 16 15 14 14 14 12 12 9 6

Although the arithmetic mean is not the only "mean" (there is also a geometric mean), it is by far the most commonly used. Therefore, if the term "mean" is used without specifying whether it is the arithmetic mean, the geometric mean, or some other mean, it is assumed to refer to the arithmetic mean.

### **MEDIAN**

The *median* is also a frequently used measure of central tendency. The median is the midpoint of a distribution: the same number of scores is above the median as below it. For the data in Table 1, there are 31 scores. The 16th highest score (which equals 20) is the median because there are 15 scores below the 16th score and 15 scores above the 16th score. The median can also be thought of as the 50th [\*percentile\*](#).

#### *COMPUTATION OF THE MEDIAN*

When there is an odd number of numbers, the median is simply the middle number. For example, the median of 2, 4, and 7 is 4. When there is an even number of numbers, the median is the mean of the two middle numbers. Thus, the median of the numbers 2, 4, 7, 12 is  $(4+7)/2 = 5.5$ . When there are numbers with the same values, then the formula for the third definition of the 50th percentile should be used.

### **MODE**

The mode is the most frequently occurring value. For the data in Table 1, the mode is 18 since more teams (4) had 18 touchdown passes than any other number of touchdown passes. With

continuous data such as response time measured to many decimals, the frequency of each value is one since no two scores will be exactly the same. Therefore the mode of continuous data is normally computed from a grouped frequency distribution. Table 2 shows a grouped frequency distribution for the target response time data. Since the interval with the highest frequency is 600-700, the mode is the middle of that interval (650).

**Table 2. Grouped frequency distribution.**

Range	Frequency
500-600	3
600-700	6
700-800	5
800-900	5
900-1000	0
1000-1100	1

### Measures of Dispersion

Measures of central tendency, Mean, Median, Mode, etc., indicate the central position of a series. They indicate the general magnitude of the data but fail to reveal all the peculiarities and characteristics of the series. In other words, they fail to reveal the degree of the spread out or the extent of the variability in individual items of the distribution. This can be explained by certain other measures, known as 'Measures of Dispersion' or Variation.

We can understand variation with the help of the following example :

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Series 1	Series 11	Series III
10	2	10
10	8	12
10	20	8
-----		
$\Sigma X = 30$	30	30



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In all three series, the value of arithmetic mean is 10. On the basis of this average, we can say that the series are alike. If we carefully examine the composition of three series, we find the following differences:

- (i) In case of 1st series, three items are equal; but in 2nd and 3rd series, the items are unequal and do not follow any specific order.
- (ii) The magnitude of deviation, item-wise, is different for the 1st, 2nd and 3rd series. But all these deviations cannot be ascertained if the value of simple mean is taken into consideration.
- (iii) In these three series, it is quite possible that the value of arithmetic mean is 10; but the value of median may differ from each other. This can be understood as follows ;

<b>I</b>	<b>II</b>	<b>III</b>
10	2	8
10 Median	8 Median	10 Median
10	20	12

The value of Median' in 1st series is 10, in 2nd series = 8 and in 3rd series = 10. Therefore, the value of the Mean and Median are not identical.

- (iv) Even though the average remains the same, the nature and extent of the distribution of the size of the items may vary. In other words, the structure of the frequency distributions may differ even though their means are identical.

### **Meaning of Dispersion**

Simplest meaning that can be attached to the word 'dispersion' is a lack of uniformity in the sizes or quantities of the items of a group or series. According to Reiglemen, "Dispersion is the extent to which the magnitudes or quantities of the items differ, the degree of diversity." The word dispersion may also be used to indicate the spread of the data.

In all these definitions, we can find the basic property of dispersion as a value that indicates the extent to which all other values are dispersed about the central value in a particular distribution.

### **Properties of a good measure of Dispersion**

There are certain pre-requisites for a good measure of dispersion:

1. It should be simple to understand.

2. It should be easy to compute.
3. It should be rigidly defined.
4. It should be based on each individual item of the distribution.
5. It should be capable of further algebraic treatment.
6. It should have sampling stability.
7. It should not be unduly affected by the extreme items.

### **Types of Dispersion**

The measures of dispersion can be either 'absolute' or "relative". Absolute measures of dispersion are expressed in the same units in which the original data are expressed. For example, if the series is expressed as Marks of the students in a particular subject; the absolute dispersion will provide the value in Marks. The only difficulty is that if two or more series are expressed in different units, the series cannot be compared on the basis of dispersion.

'Relative' or 'Coefficient' of dispersion is the ratio or the percentage of a measure of absolute dispersion to an appropriate average. The basic advantage of this measure is that two or more series can be compared with each other despite the fact they are expressed in different units. Theoretically, 'Absolute measure' of dispersion is better. But from a practical point of view, relative or coefficient of dispersion is considered better as it is used to make comparison between series.

### **Methods of Dispersion**

Methods of studying dispersion are divided into two types :

(i) **Mathematical Methods:** We can study the 'degree' and 'extent' of variation by these methods. In this category, commonly used measures of dispersion are :

- (a) Range
- (b) Quartile Deviation
- (c) Average Deviation
- (d) Standard deviation.

(ii) **Graphic Methods:** Where we want to study only the extent of variation, whether it is higher or lesser a Lorenz-curve is used.

### **Mathematical Methods**

**(a) Range**

It is the simplest method of studying dispersion. Range is the difference between the smallest value and the largest value of a series. While computing range, we do not take into account frequencies of different groups.

Formula: Absolute Range =  $L - S$

Coefficient of Range =

where, L represents largest value in a distribution

S represents smallest value in a distribution

We can understand the computation of range with the help of examples of different series,

**(i) Raw Data:** Marks out of 50 in a subject of 12 students, in a class are given as follows:

12, 18, 20, 12, 16, 14, 30, 32, 28, 12, 12 and 35.

In the example, the maximum or the highest marks obtained by a candidate is '35' and the lowest marks obtained by a candidate is '12'. Therefore, we can calculate range;

$L = 35$  and  $S = 12$

Absolute Range =  $L - S = 35 - 12 = 23$  marks

Coefficient of Range =

**(ii) Discrete Series**

-----

Marks of the Students in Statistics (out of 50)	(X)	No. of students (f)
Smallest	10	4
	12	10
	18	16
Largest	20	15

-----

**Total = 45**

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Absolute Range =  $20 - 10 = 10$  marks

Coefficient of Range =

**(iii) Continuous Series**

	<b>X</b>	<b>Frequencies</b>
	10 – 15	4
S = 10	15 – 20	10
L = 30	20 – 25	26
	25 – 30	8

Absolute Range =  $L - S = 30 - 10 = 20$  marks

Coefficient of Range =

Range is a simplest method of studying dispersion. It takes lesser time to compute the ‘absolute’ and ‘relative’ range. Range does not take into account all the values of a series, i.e. it considers only the extreme items and middle items are not given any importance. Therefore, Range cannot tell us anything about the character of the distribution. Range cannot be computed in the case of “open ends” distribution i.e., a distribution where the lower limit of the first group and upper limit of the higher group is not given.

The concept of range is useful in the field of quality control and to study the variations in the prices of the shares etc.

**(b) Quartile Deviations (Q.D.)**

The concept of ‘Quartile Deviation does take into account only the values of the ‘Upper quartile (Q3) and the ‘Lower quartile’ (Q1). Quartile Deviation is also called ‘inter-quartile range’. It is a better method when we are interested in knowing the range within which certain proportion of the items fall.

'Quartile Deviation' can be obtained as :

(i) Inter-quartile range =  $Q_3 - Q_1$

(ii) Semi-quartile range =

(iii) Coefficient of Quartile Deviation =

Calculation of Inter-quartile Range, semi-quartile Range and Coefficient of Quartile Deviation in case of Raw Data

Suppose the values of X are : 20, 12, 18, 25, 32, 10

In case of quartile-deviation, it is necessary to calculate the values of  $Q_1$  and  $Q_3$  by arranging the given data in ascending or descending order.

Therefore, the arranged data are (in ascending order):

$X = 10, 12, 18, 20, 25, 32$

No. of items = 6

$Q_1 =$  the value of item = = 1.75th item

= the value of 1st item + 0.75 (value of 2nd item – value of 1st item)

=  $10 + 0.75 (12 - 10) = 10 + 0.75(2) = 10 + 1.50 = 11.50$

$Q_3 =$  the value of item =

= the value of  $3(7/4)$ th item = the value of 5.25th item

=  $25 + 0.25 (32 - 25) = 25 + 0.25 (7) = 26.075$

### **Advantages of Quartile Deviation**

Some of the important advantages are :

(i) It is easy to calculate. We are required simply to find the values of  $Q_1$  and  $Q_3$  and then apply the formula of absolute and coefficient of quartic deviation.

(ii) It has better results than range method. While calculating range, we consider only the extreme values that make dispersion erratic, in the case of quartile deviation, we take into account middle 50% items.

(iii) The quartile deviation is not affected by the extreme items.

### **Disadvantages**

(i) It is completely dependent on the central items. If these values are irregular and abnormal the result is bound to be affected.

(ii) All the items of the frequency distribution are not given equal importance in finding the values of  $Q_1$  and  $Q_3$ .

(iii) Because it does not take into account all the items of the series, considered to be inaccurate. Similarly, sometimes we calculate percentile range, say, 90th and 10th percentile as it gives slightly better measure of dispersion in certain cases.

(i) Absolute percentile range =  $P_{90} - P_{10}$ .

(ii) Coefficient of percentile range =

This method of calculating dispersion can be applied generally in case of open end series where the importance of extreme values are not considered.

### (c) Average Deviation

Average deviation is defined as a value which is obtained by taking the average of the deviations of various items from a measure of central tendency Mean or Median or Mode, ignoring negative signs. Generally, the measure of central tendency from which the deviations are taken, is specified in the problem. If nothing is mentioned regarding the measure of central tendency specified then deviations are taken from median because the sum of the deviations (after ignoring negative signs) is minimum.

#### Computation in case of raw data

(i) Absolute Average Deviation about Mean or Median or Mode =

where:  $N$  = Number of observations,

$|d|$  = deviations taken from Mean or Median or Mode ignoring signs.

(ii) Coefficient of A.D. =

#### Steps to Compute Average Deviation :

(i) Calculate the value of Mean or Median or Mode

(ii) Take deviations from the given measure of central-tendency and they are shown as  $d$ .

(iii) Ignore the negative signs of the deviation that can be shown as  $|d|$  and add them to find  $\sum |d|$ .

(iv) Apply the formula to get Average Deviation about Mean or Median or Mode.

**Example :** Suppose the values are 5, 5, 10, 15, 20. We want to calculate Average Deviation and Coefficient of Average Deviation about Mean or Median or Mode.

**Solution :** Average Deviation about mean (Absolute and Coefficient).

-----

(x)	Deviation from mean d	Deviations after ignoring signs   d
5	- 6	6 =
5	- 6	6 where N = 5. SX = 55
10	+ 1	1
15	+ 4	4
20	+ 9	9
$\Sigma X = 55$		$\Sigma   d   = 26$

### Calculation of Median

#### Advantages of Average Deviations

1. Average deviation takes into account all the items of a series and hence, it provides sufficiently representative results.
2. It simplifies calculations since all signs of the deviations are taken as positive.
3. Average Deviation may be calculated either by taking deviations from Mean or Median or Mode.
4. Average Deviation is not affected by extreme items.
5. It is easy to calculate and understand.
6. Average deviation is used to make healthy comparisons.

#### Disadvantages of Average Deviations

1. It is illogical and mathematically unsound to assume all negative signs as positive signs.
  2. Because the method is not mathematically sound, the results obtained by this method are not reliable.
  3. This method is unsuitable for making comparisons either of the series or structure of the series.
- This method is more effective during the reports presented to the general public or to groups who are not familiar with statistical methods.

#### (d) Standard Deviation

The standard deviation, which is shown by greek letter  $\sigma$  (read as sigma) is extremely useful in

judging the representativeness of the mean. The concept of standard deviation, which was introduced by Karl Pearson has a practical significance because it is free from all defects, which exists in a range, quartile deviation or average deviation.

Standard deviation is calculated as the square root of average of squared deviations taken from actual mean. It is also called root mean square deviation. The square of standard deviation i.e.,  $s^2$  is called 'variance'.

### Calculation of standard deviation in case of raw data

There are four ways of calculating standard deviation for raw data:

- (i) When actual values are considered;
- (ii) When deviations are taken from actual mean;
- (iii) When deviations are taken from assumed mean; and
- (iv) When 'step deviations' are taken from assumed mean.

#### (i) When the actual values are considered:

$\sigma = \sqrt{\frac{\sum X^2}{N} - (\bar{X})^2}$  where, N = Number of the items,  
or  $\sigma^2 = \frac{\sum X^2}{N} - (\bar{X})^2$  = Given values of the series,  
= Arithmetic mean of the series

We can also write the formula as follows :

$\sigma = \sqrt{\frac{\sum X^2}{N} - (\bar{X})^2}$  =

#### Steps to calculate $\sigma$

- (i) Compute simple mean of the given values,
- (ii) Square the given values and aggregate them
- (iii) Apply the formula to find the value of standard deviation

**Example:** Suppose the values are given 2, 4, 6, 8, 10. We want to apply the formula

$\sigma =$

**Solution:** We are required to calculate the values of N,  $\sum X^2$ . They are calculated as follows :

X	$X^2$
2	4
4	16
6	36
8	64
10	100

$$N = 5 \quad \sum X^2 = 220$$



$\sigma =$

Variance  $(\sigma)^2 =$

=

**(ii) When the deviations are taken from actual mean**

$\sigma =$  where, N = no. of items and  $x = (X - )$

**Steps to Calculate  $\sigma$**

(i) Compute the deviations of given values from actual mean i.e.,  $(X - )$  and represent them by x.

(ii) Square these deviations and aggregate them

(iii) Use the formula,  $\sigma =$

**Example :** We are given values as 2, 4, 6, 8, 10. We want to find out standard deviation.

X	$(X - ) = x$	$x^2$
2	$2 - 6 = -4$	$(-4)^2 = 16$
4	$4 - 6 = -2$	$(-2)^2 = 4$
6	$6 - 6 = 0$	$= 0$
8	$8 - 6 = +2$	$(2)^2 = 4$
10	$10 - 6 = +4$	$(4)^2 = 16$
<b>N = 5</b>		<b><math>\sum x^2 = 40</math></b>

**(iii) When the deviations are taken from assumed mean**

$\sigma =$

where, N = no. of items,

$dx =$  deviations from assumed mean i.e.,  $(X - A)$ .

A = assumed mean

**Steps to Calculate :**

(i) We consider any value as assumed mean. The value may be given in the series or may not be given in the series.

(ii) We take deviations from the assumed value i.e.,  $(X - A)$ , to obtain dx for the series and aggregate them to find  $\sum dx$ .

(iii) We square these deviations to obtain  $dx^2$  and aggregate them to find  $\sum dx^2$ .

(iv) Apply the formula given above to find standard deviation.

**Example :** Suppose the values are given as 2, 4, 6, 8 and 10. We can obtain the standard deviation as:

-----

X	dx = (X - A)	dx <sup>2</sup>
2	- 2 = (2 - 4)	4
assumed mean (A) 4	0 = (4 - 4)	0
6	+ 2 = (6 - 4)	4
8	+ 4 = (8 - 4)	16
10	+ 6 = (10 - 4)	36
-----		
N = 5	∑dx = 10	∑dx <sup>2</sup> = 60
-----		

**(iv) When step deviations are taken from assumed mean**

$\sigma =$

where, i = common factor, N = number of item, dx (Step-deviations) =

**Steps to Calculate :**

- (i) We consider any value as assumed mean from the given values or from outside.
- (ii) We take deviation from the assumed mean i.e. (X - A).
- (iii) We divide the deviations obtained in step (ii) with a common factor to find step deviations and represent them as dx and aggregate them to obtain ∑dx.
- (iv) We square the step deviations to obtain dx<sup>2</sup> and aggregate them to find ∑dx<sup>2</sup>.

**Example :** We continue with the same example to understand the computation of Standard Deviation.

X	d = (X - A)	dx = and i = 2	dx <sup>2</sup>
2	- 2	1	1
A = 4	0	0	0
6	+ 2	1	1
8	+ 4	2	4
10	+ 6	3	9
N = 5	Sdx = 5	Sdx <sup>2</sup> = 15	

s = where N = 5, i = 2, dx = 5, and Sdx<sup>2</sup> = 15

s =

Note : We can notice an important point that the standard deviation value is identical by four methods. Therefore any of the four formulae can be applied to find the value of standard deviation.

But the suitability of a formula depends on the magnitude of items in a question.

Coefficient of Standard-deviation =

In the above given example,  $s = 2.828$  and  $n = 6$

Therefore, coefficient of standard deviation =

### **Advantages of Standard Deviation**

- (i) Standard deviation is the best measure of dispersion because it takes into account all the items and is capable of future algebraic treatment and statistical analysis.
- (ii) It is possible to calculate standard deviation for two or more series.
- (iii) This measure is most suitable for making comparisons among two or more series about variability.

### **Disadvantages**

- (i) It is difficult to compute.
- (ii) It assigns more weights to extreme items and less weights to items that are nearer to mean. It is because of this fact that the squares of the deviations which are large in size would be proportionately greater than the squares of those deviations which are comparatively small.

## **CORRELATION**

In the earlier chapters we have discussed univariate distributions to highlight the important characteristics by different statistical techniques. Univariate distribution means the study related to one variable only we may however come across certain series where each item of the series may assume the values of two or more variables. The distributions in which each unit of series assumes two values is called bivariate distribution.

In a bivariate distribution, we are interested to find out whether there is any relationship between two variables. The correlation is a statistical technique which studies the relationship between two or more variables and correlation analysis involves various methods and techniques used for studying and measuring the extent of relationship between the two variables. When two variables are related in such a way that a change in the value of one is accompanied either by a direct change or by an inverse change in the values of the other, the two variables are said to be correlated. In the correlated variables an increase in one variable is accompanied by an increase or decrease in the other variable. For instance, relationship exists between the price and demand of a commodity because keeping other things equal, an increase in the price of a commodity shall cause a decrease in

the demand for that commodity. Relationship might exist between the heights and weights of the students and between amount of rainfall in a city and the sales of raincoats in that city.

These are some of the important definitions about correlation. Croxton and Cowden says, “When the relationship is of a quantitative nature, the appropriate statistical tool for discovering and measuring the relationship and expressing it in a brief formula is known as correlation”.

A.M. Tuttle says, “Correlation is an analysis of the covariation between two or more variables.” W.A. Neiswanger says, “Correlation analysis contributes to the understanding of economic behavior, aids in locating the critically important variables on which others depend, may reveal to the economist the connections by which disturbances spread and suggest to him the paths through which stabilizing forces may become effective.”

L.R. Conner says, “If two or more quantities vary in sympathy so that the movements in one tends to be accompanied by corresponding movements in others than they are said be correlated.”

### **Utility of Correlation**

The study of correlation is very useful in practical life as revealed by these points.

1. With the help of correlation analysis, we can measure in one figure, the degree of relationship existing between variables like price, demand, supply, income, expenditure etc. Once we know that two variables are correlated then we can easily estimate the value of one variable, given the value of other.
2. Correlation analysis is of great use to economists and businessmen, it reveals to the economists the disturbing factors and suggest to him the stabilizing forces. In business, it enables the executive to estimate costs, sales etc. and plan accordingly.
3. Correlation analysis is helpful to scientists. Nature has been found to be a multiplicity of interrelated forces.

### **Difference between Correlation and Causation**

The term correlation should not be misunderstood as causation. If correlation exists between two variables, it must not be assumed that a change in one variable is the cause of a change in other variable. In simple words, a change in one variable may be associated with a change in another variable but this change need not necessarily be the cause of a change in the other variable. When there is no cause and effect relationship between two variables but a correlation is found between the two variables such correlation is known as “spurious correlation” or “nonsense correlation”. Correlation may exist due to the following:

**Pure change correlation:** This happens in a small sample. Correlation may exist between incomes and weights of four persons although there may be no cause and effect relationship between incomes and weights of people. This type of correlation may arise due to pure random sampling variation or because of the bias of investigator in selecting the sample.

2. When the correlated variables are influenced by one or more variables. A high degree of correlation between the variables may exist, where the same cause is affecting each variable or different cause affecting each with the same effect. For instance, a degree of correlation may be found between yield per acre of rice and tea due to the fact that both are related to the amount of rainfall but none of the two variables is the cause of other.

3. When the variable mutually influence each other so that neither can be called the cause of other. All times it may be difficult to say that which of the two variables is the cause and which is the effect because both may be reacting on each other.

### **Methods of studying correlation**

There are different methods which helps us to find out whether the variables are related or not.

1. Karl Pearson’s Coefficient of correlation.
2. Rank Method.

**(1) Karl Pearson’s Co-efficient of Correlation.** Karl Pearson’s method, popularly known as Pearsonian co-efficient of correlation, is most widely applied in practice to measure correlation. The Pearsonian co-efficient of correlation is represented by the symbol  $r$ .

According to Karl Pearson's method, co-efficient of correlation between the variables is obtained by dividing the sum of the products of the corresponding deviations of the various items of two series from their respective means by the product of their standard deviations and the number of pairs of observations. Symbolically,  $r = \frac{\sum xy}{N s_x s_y}$  where  $r$  stands for coefficient of correlation ... (i) where  $x_1, x_2, x_3, x_4, \dots, x_n$  are the deviations of various items of the first variable from the mean,  $y_1, y_2, y_3, \dots, y_n$  are the deviations of all items of the second variable from mean,  $\sum xy$  is the sum of products of these corresponding deviations.  $N$  stands for the number of pairs,  $s_x$  stands for the standard deviation of X variable and  $s_y$  stands for the standard deviation of Y variable.  $s_x = \sqrt{\frac{\sum x^2}{N}}$  and  $s_y = \sqrt{\frac{\sum y^2}{N}}$ . If we substitute the value of  $s_x$  and  $s_y$  in the above written formula of computing  $r$ , we get  $r = \frac{\sum xy}{\sqrt{\sum x^2} \sqrt{\sum y^2}}$ . Degree of correlation varies between + 1 and -1; the result will be + 1 in case of perfect positive correlation and - 1 in case of perfect negative correlation.

Computation of correlation coefficient can be simplified by dividing the given data by a common factor. In such a case, the final result is not multiplied by the common factor because coefficient of correlation is independent of change of scale and origin.

**Illustration :** Calculate Co-efficient of Correlation from the following data:

X	50	100	150	200	250	300	350
Y	10	20	30	40	50	60	70

**Solution:** of correlation coefficient.

**Solution :** = and =

X	x	x <sup>2</sup>	Y	y	y <sup>2</sup>	xy
3	-3	9	9	-4	16	12
4	-2	4	11	-2	4	4
6	0	0	14	+1	1	0
7	+1	1	15	+2	4	2
10	+4	16	16	+3	9	12
$S_x = 30$	0	30	$S_y = 65$	0	34	30

$r = \frac{\sum xy}{\sqrt{\sum x^2} \sqrt{\sum y^2}} = \frac{30}{\sqrt{30} \sqrt{34}}$

$r =$

The value of  $r$  indicates that there exists a high degree positive correlation between lengths and weights.

**Short-cut Method:** To avoid difficult calculations due to mean being in fraction, deviations are taken from assumed means while calculating coefficient of correlation. The formula is also modified for standard deviations because deviations are taken from assumed means. Karl Perason's formula for short-cut method is given below :

$$r = \text{or } r =$$

**Illustration :** Compute the coefficient of correlation from the following data :

Marks in Statistics    20 30 28 17 19 23 35 13 16 38

Marks in Mathematics 18 35 20 18 25 28 33 18 20 40

**Solution :**

#### **Direct Method of Computing Correlation Coefficient**

Correlation Coefficient can also be computed from given X and Y values by using the below given formula:

$$r =$$

The above given formula gives us the same answer as we are getting by taking durations from actual mean or arbitrary mean.

**Illustration :** Compute the coefficient of correlations from the following data :

Marks in Statistics    20 30 28 17 19 23 35 13 16 38

Marks in Mathematics 18 35 20 18 25 28 33 18 20 40

**Solution :**

<b>Marks in Statistics X</b>	<b>Marks in Mathematics Y</b>	<b>X<sub>2</sub></b>	<b>Y<sup>2</sup></b>	<b>XY</b>
20	18	400	324	360
30	35	900	1225	1050
28	20	784	400	560
17	18	289	324	306
19	25	361	625	475
23	28	529	784	644
35	33	1225	1089	1155

13	18	169	324	234
16	20	256	400	320
38	40	1444	1600	1520
<b>SX = 239</b>	<b>SY = 255</b>	<b>SX<sup>2</sup> = 6357</b>	<b>SY<sup>2</sup> = 7095</b>	<b>SXY = 6624</b>

Substitute the computed values in the below given formula,

$r =$

$=$

$=$

### Properties of Coefficient of Correlation

Following are some of the important proportion of  $r$  :

- (1) The coefficient of correlation lies between  $-1$  and  $+1$  ( $-1 \leq r \leq +1$  )
- (2) The coefficient of correlation is independent of change of scale and origin of the variable X and Y.
- (3) The coefficient of correlation is the geometric mean of two regression coefficients.

$r =$

**Merits of Pearson's coefficient of correlation:** The correlation of coefficient summarizes in one figure the degree and direction of correlation. Value varies between  $+1$  and  $-1$ .

**Demerits of Pearson's coefficient of correlation:** It always assumes linear relationship between the variables; in fact the assumption may be wrong. Secondly, it is not easy to interpret the significance of correlation coefficient. The method is time consuming and affected by the extreme items.

**Probable Error of the coefficient of correlation:** It is calculated to find out how far the Pearson's coefficient of correlation is reliable in a particular case.

P.E of coefficient of correlation =

where  $r$  = coefficient of correlation and  $N$  = number of pairs of items.

If the probable error calculated is added to and subtracted from the coefficient of correlation, it would give us such limits within which we can expect the value of the coefficient of correlation to vary. If  $r$  is less than probable error, then there is no real evidence of correlation.

If  $r$  is more than 6 times the probable error, the coefficient of correlation is considered highly significant.

If  $r$  is more than 3 times the probable error but less than 6 times, correlation is considered significant



but not highly significant.

If the probable error is not much and the given  $r$  is more than the probable error but less than 3 times of it, nothing definite can be concluded.

(4) **Rank Correlation** : There are many problems of business and industry when it is not possible to measure the variable under consideration quantitatively or the statistical series is composed of items which can not be exactly measured. For instance, it may be possible for the two judges to rank six different brands of cigarettes in terms of taste, whereas it may be difficult to give them a numerical grade in terms of taste. In such problems, Spearman's coefficient of rank correlation is used. The formula for rank correlation is :

$$r = \text{or}$$

where  $r$  stands for rank coefficient of correlation.

$D$  refers to the difference of ranks between paired items.

$N$  refers to the number of paired observations.

The value of rank correlation coefficient varies between  $+1$  and  $-1$ . When the value of  $r = +1$ , there is complete agreement in the order of ranks and the ranks will be in the same order. When  $r = -1$ , the ranks will be in opposite direction showing complete disagreement in the order of ranks. Let us understand with the help of an illustration.

**Illustration** : Ranks of 10 individuals at the start and at the finish of a course of training are given :

Individual : A B C D E F G H I J

Rank before : 1 6 3 9 5 2 7 10 8 4

Rank after : 6 8 3 7 2 1 5 9 4 10

Calculate coefficient of correlation.

**Solution** :

Individual Rank before Rank after ( $R_1 - R_2$ )

	R1	R2	D	D <sup>2</sup>
A	1	6	-5	25
B	6	8	-2	4
C	3	3	0	0
D	9	7	2	4
E	5	2	3	9
F	2	1	1	1

G	7	5	2	4
H	10	9	1	1
I	8	4	4	16
J	4	10	-6	36
N	= 10		SD2 = 100	

By applying the formula,

$r =$

When we are given the actual data and not the ranks, it becomes necessary for us to assign the ranks. Ranks can be assigned by taking either the highest value as one or the lowest value as one. But if we start by taking the highest value or the lowest value we must follow the same order for both the variables to assign ranks.

## GRAPHS AND DIAGRAMS

Statistics helps make data understandable to people. Computers can understand lists easily; humans cannot. While statistical values, like averages and medians, can relay some information, they do not show patterns in a set of data. Graphs and diagrams do.

Humans are able to detect complex patterns. In fact, humans are often better able to see patterns than modern computer programs. When presented with a graph or a diagrams, people can often see trends. These trends can be upward or downward, and they can even be cyclical. If the data is presented on a table, however, detecting these patterns is far more difficult.

The aesthetics of information matters as well. When trying to attract investors, people will have more luck if they can present attractive graphs and charts. Visual information matters in media as well, and newspapers and online sites will often take time to present information in an aesthetically pleasing manner. Computers make the process of creating and customizing graphs and diagrams far easier than even before, which has made them more popular.

### **Diagrams and graphs are extremely useful because of the following reasons:**

1. Diagrams and graphs are attractive, impressive and save time.
2. They make data representation simple and have universal utility.
3. They make comparison possible and give more information.

**Questions:**

1. Describe the advantages of reflective journal.
2. How to design a good Reflective Journal Assessment?
3. Write the meaning, types and methods of dispersion.
4. Describe the methods of correlation and utilities.
5. Elucidate assessment of reflective journal and student portfolios.

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