# Training of KRPs on Evaluation and Assessment Techniques for Upper Primary School Level in Science Subjects



## PAC 16.31

## Year – 2018-19

विद्यया ऽ मृतमश्नुते



एन सी ई आर टी
NCERT

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# APPROACH PAPER

With the changes in pedagogical concerns there is a definite shift in the evaluation techniques as well, which needs to be brought to the light of the state functionaries so as to begin with. The need for reducing the stress associated with examinations has been emphatically emphasized among various policy document like National Policy on Education (NPE 1986), and now National Curriculum Framework (NCF-2005) among others; however the positive result of it is yet to be observed in its true sense. The ill effects of examination are numerous and needs no further elaboration amongst all stages of education, the worst effected ones are the secondary and higher secondary stages. The primary and elementary stages are no exception to it. A time has come to take note of reducing the stress associated with evaluation in general and examination in particular.

*Evaluation,* which is a process of estimating and appraising the degree of achievement of educational objectives, occupies an important place in the area of education. If evaluation is broadly taken to mean investigating teaming situations and materials with a view to improving them, then a cognitive approach appears to pose three basic questions. What are the stages of the learning process? How they can be evaluated? What types of changes is it likely to lead to? The main contrast with other approaches to evaluation is that investigations am carried out during the learning process (i.e. Formative evaluation, forming an integral part of teaching-learning process so as to modify the teaching in the light of the results of evaluation), rather than just at the end of it (Summative evaluation is usually conducted at the end of the process and is terminal in nature and is used for the purpose of summation of results, mostly used for the purpose of grading, certification and promotion of students to the next grade level).

However a programme of evaluation does not end with just the summarization of results. While the purpose of evaluation should be diagnostic, that is to ascertain strength and weaknesses of the learner. Evaluation should also serve as a feedback mechanism, construed as a powerful instrument for improving teaching and learning process in order to take corrective and remedial measures It must lead to improvement of instructions, for the introduction of concomitant changes in instructional material and methodology of teaching; promote better learning, leading to curriculum change and to help to clarify the objectives and to provide for the basis for guidance in the light of evaluation. The ultimate objective of evaluation is to bring about qualitative improvement in education. It also provides the information to the parents about the quality of learning and the development and progress of their wards.

Instead of using it mainly as a grading device it should be used more as an effective feedback mechanism for the benefit of the learners, teachers and parents so that timely corrective and remedial measures could be taken. Retrieval of such feedback should be of immense use to the concerned agencies. Present processes of evaluation, which measure and assesses a very

limited range of faculties (in practice evaluation per se rarely goes beyond the scholastic or cognitive development), and are highly inadequate and do not provide for a complete picture of an individual's abilities or progress towards fulfilling the aims of education. Thus the tools employed for the process should be valid (accurate). reliable (dependable), objective (just) and practicable (feasible). In evaluation various procedure and tools of evaluation should be utilised to fully realise the objectives.

This limited purpose of evaluation, of providing feedback on scholastic and academic development, can be achieved only if the teacher is armed with not only the techniques of assessment but also the parameters for evaluation and the various tools that wig be. employed for the purpose.

**Purpose of Evaluation for the teachers:**

- To develop a sound understanding of the objectives to be achieved and techniques best suited for evaluation.
- To acquire the ability of evolving a sound philosophy of your own which can meaningfully interpret the various aspects of evaluation and factors related to it.
- To acquire the desired level of skills and competencies in planning and executing through observation and active participation of the learner.
- To get acquainted with the salient features and problems of education related to different stages.
- To acquire the knowledge of evaluation procedures and skills in developing and administering tools of evaluation.
- To plan and organise activities related to evaluation in a fresh manner.

There is a dire need to employ right technique or use an appropriate tool or a mode to assess the performance of the learner, making a judicious selection from among available tools and techniques such as observation schedules, rating scales, interview schedule, oral communications, interest inventories, anecdotal records etc. More and more informal means of evaluation are to be adopted in order to reduce the anxiety and fear experienced by the learners at all stages of school education. The principles of relevance and flexibility applicable to curriculum development need to be followed in evaluating the attainment of the learners. It is essential to collect evidences regarding /in relation to the objectives of the programme. Here the issues of concern would be:

- Tools and techniques to be employed to evaluate different aspects of the learner in a given situation.
- Methods used to obtain evidences so that a variety of expected outcomes can be incorporated in the scheme of evaluation. This would also involve the sampling of situations.
- Time incurred on such task.

These will help in locating the most appropriate tools of/for the assessment of each aspect implying on the usage of variety of tools available. The next step would be collection of evidences for evaluation. One of the most common techniques could be planned observation. Other could be interview, assessment of records of the process of execution and the outcome. In order to be able to collect usable evidence the role of selecting or developing appropriate tools is very crucial.

## Records and Reporting

The weakest aspect of our educational system is the maintenance of record of growth and development of the learner. It is common knowledge that a school record generally contains marks obtained by the learners in different scholastic areas being prominent. Neither the school nor the parents feel the need of keeping a track of the child's progressive attainment during the entire spawn of schooling. The concept of continuous and comprehensive evaluation during in recording, maintaining, and reporting of the data obtained needs no further elaboration. It will be therefore necessary to develop suitable performance for recording the progress of each and every learner in respect of scholastic and non-scholastic areas of learning.

## Grades versus Marks

Marks or grades represent condensed and highly abstract symbols, summarising and reporting the attainment of the learners. The controversy of marks versus grades has been an unsettled issue. The replacement of marks by grades is considered as an essential component of examination reform in the present perspective. Undue meaning is attached to small variations or differences in marks or percentages say interpreted for or against the learner thus the use of grades seems to offer a better alternative.

With the above mentioned background than it is expected that by organizing programme exclusively for Evaluation it would create a favorable climate for bringing about desirable reforms in examination as referred to by the NCF-2005.

The specific objectives of the programme are:

- *To impart training to the teachers for the effective implementation of evaluation pattern in the school system.*
- *To bring about desirable changes in the evaluation pattern of school children at primary level.*


**(Dr. Daksha M. Parmar)**
Programme Coordinator

# Time Table

| Date/ Day | Session I 9.30-11.30 a.m. | T E A  B R E A K  11.00 to 11.15 a.m. | Session II 11.15-12.45 p.m. | L U N C H  B R E A K  12.45 to 2.00 p.m. | Session III 2.00-3.30 p.m. | T E A  B R E A K  3.45 to 4.00 p.m. | Session IV 4.00-5.30 p.m. |
|---|---|---|---|---|---|---|---|
| 07/01/2019 | Registration and Inaugural & Expectations from the Participants | | Evaluation-Definition and scope **AK** | | Scheme of Examination-Need and Understanding **DP & SK** | | Cont.... **DP & SK** |
| 08/01/2019 | Assessment of Special Children **IBC** | | Assessment of Learning Outcomes at Upper Primary **LKT** | | Current Practices of Assessment in States - Presentation by participation **DP & SK** | | Cont.... **DP & SK** |
| 09/01/2019 | Tools and Techniques of evaluation **DP & SK** | | Cont.... **DP & SK** | | Assessment Rubrics - designing of Assessment **AY** | | Presentation by Participants **AY** |
| 10/01/2019 | Designing a good question paper, Blue print **DP & SK** | | Cont.... **DP & SK** | | Developing different Types of questions and preparing question paper **DP & SK** | | Cont.... **DP & SK** |
| 11/01/2019 | Performance Assessment Science Process skills **AY** | | Observation as technique of Observation **AK** | | Designing of Rubric for performance assessment-Presentation by participants **AY** | | Valedictory and Distribution of TA/DA |

**Resource Persons:**

IBC - Prof. I.B. Chughtai  
LKT - Prof. L.K. Tiwary  
DP - Dr. Daksha Parmar  

AK - Prof. Anil Kumar  
AY - Prof. Asfa Yasin  
SK - Dr. Saurabh Kumar

# Index

# Assessment of Learning Outcomes at Upper Primary Stage
## *Prof. L.K. Tiwary, RIE, Bhopal*

Learning outcomes are statements that describe the knowledge or skills students should acquire by the end of a particular assignment, class, course or program, and help students understand why that knowledge and those skills will be useful to them. They focus on the context and potential applications of knowledge and skills, help students connect learning in various contexts, and help guide, assessment and evaluation.

The most commonly used and perhaps prudent definition of learning outcomes proposes that they are what a student is expected to be able to DO as a result of learning activity good learning outcomes emphasize the application and integration of knowledge instead of focusing on coverage of material, learning outcomes articulate how students will be able to employ the material both in the context of the class and more broadly. Learning outcomes are statements that describe the understanding skill and values students should be able to demonstrate after a period of learning.

### Need of Learning Outcomes:

The national policy of education (1986), revised in 1992 and programme of action (PoA) 1992 emphasized that minimum levels of learning (MLL) should be laid down and children's learning should periodically be assessed to keep a track of their progress towards ensuring the achievement of NPE goals that all children should acquire at least minimum levels of learning. The MLLs developed in 1992 were highly product oriented and had limited scope for assessment for overall development of children. A radical shift came almost a decade ago when child's capacity to construct knowledge as a natural learner was recognized as central to the transaction of the curriculum, and the teacher's role was primarily as a facilitator of the learning process. The knowledge, thus gained, is an outcome of their engagement with the world around when they explore, respond, invent, and make meaning of it. It means that focus shifted to the process of learning, envisaged conceptual understanding as a continuous process. The overall development of a child through education, conceptualized as a fundamental right under RTE Act 2009, had been a priority of almost all policy documents. The document MLLs at primary stage, too recognized this, yet expressed difficulty in dealing with psychomotor and affective domains. The reason was the assessment through pencil and paper as they are intangible and subjective, influenced by personal preferences and prejudices. Against this backdrop, an exercise was undertaken to relook into the whole process with fresh perspective and device learning outcomes for different curricular areas of elementary stage.

**Learning Outcomes at Upper Primary Stage:**

The document of learning outcomes have been prepared for Hindi, English, Urdu, Mathematics, Science and Social Sciences for Upper Primary Stage (Class VI to VIII). The learning outcomes in each subject has been subdivided into three components. In the first component curricular expectations are identified for entire upper primary stage (Class VI to VIII) for a particular subject. In the second part pedagogical process have been suggested for each subject separately for class VI, VII and VIII. Finally, learning outcomes have been designed again for each class from VI to VIII. The curricular expectations are the long-term goals that students need to acquire over a period of time, and are therefore spelt out stage wise. The learning outcomes defined class – wise are process-based which provide the checkpoints that are measurable in qualitative or quantitative manner to assess the progress of child as per the expected holistic learning for the overall development of a child. To help the teachers understand and achieve the learning outcomes as per the curricular expectations, some suggestive pedagogical processes are provided in the column adjacent to that of learning outcomes.

**Assessing the attainment of learning outcomes:**

The learning outcomes developed by MHRD and NCERT is now a legal document of the nation because it has become a part of RTE Act. Any stake holder has now a right to challenge the educational system for not attaining the expected learning outcomes at any stage. Hence, the school administration has to ensure the attainment of learning outcomes by the students before promoting higher class. The learning outcomes? The school can develop their own mechanism to assess the attainment of these LOs through formative and summative assessment. The test should be designed on each expected learning outcome and questions should be asked to check each of cognitive, affective and psychomotor domains.

NCERT is also making its all effort to assess the attainment of learning outcomes at national level. It has conducted a nation-wise survey under NAS (National Achievement Survey) for class three, five and eight in 2017 to know the base line status of students. This survey was based on designed learning outcomes in various subjects. The items prepared were mainly process oriented and check the all domains necessary for all round development of a child. Based on the results of NAS, NCERT is preparing its programme of action for post-NAS interventions. The gradual decrease of achievement towards higher class has become a serious concern for NCERT and it is trying to find out the reason after a comprehensive research and rigorous discussions. After interventions the status of students will again be assessed by NAS and each child will tried be tracked. This endeavor will specially be useful to raise the educational standard of the country for placing it in the line of developed countries.

# Assessment Rubrics

*Prof. Asfa M. Yasin, Ex. Professor, PSSCIVE and Dr. Sanjay Sen, RIE, Bhopal*

The session was initiated through discussion on science teaching with reference to outcome based learning and importance of assessment. With this background, the assessment rubric was discussed as one of the assessment tools. Presentation to highlight details of AR was done, wherein explanation about purpose, characteristics, types and designing of AR was discussed. AR was described with the help of formats and various items of an exemplar rubric was developed using science process skills. For the purpose of comprehension of the concept and usage of AR, two activities were conducted by the participants under guidance. Participants were given instructions about the setting and conduct of experiments in the given activities with reference to science process skills and their assessment through AR. The details of the two activities are given below:

**Activity 1:** Transpiration in Plants

**Learning Outcomes**

1. Setting up of experiment to show transpiration in plants

2. Demonstrating science process skills during the conduct of experiment

3. Developing AR for the entire activity

4. Presentation of the activity and AR developed

5. Using science process skills in the AR

**Brief of the Activity**

1. To set up the experiment, desired material was procured by the participants

2. Participants undertook the activity in four gps. Each gp identified plants for their experiment

3. Each gp prepared leaves for the experiment ie applied Vaseline on them

4. The experiment was set up in the selected plant in the science park of RIE

5. All the participants started to record observations followed by discussions regarding the changes or processes going on

6. Finally, participants got thrilled to  actually see the transpiration in the leaves trapped in the plastic envelop

7. Participants recorded all the observations and took pictures of the transpiration process which was witnessed by the foggy plastic envelop with leaves without Vaseline whereas there was no foggy state in the envelop which had leaves with Vaseline applied on them.

8. After recording observations and taking pictures, envelops were removed and Vaseline was cleaned from the leaves to allow transpiration

9. Presentations were made by each of the gps. Comments and observations were given by other gp members regarding science process skills and items to be included in the designing of the AR

10. All four gps developed and presented AR based on the plant transpiration experiment

11. Clarifications or doubts and supplementary information were given by the experts of the session regarding experiment, science concepts, science process, observations, skills and AR

**Activity 2:** Development of assessment rubrics using Water Candle Experiment

This experiment was selected to give the understanding of rubrics in which it was focus that how rubrics will help to assess the performance of student during activity and how science process skill can be developed and assessed simultaneously.

**Learning Outcomes:**

1. To give the hands-on exposure and inquiry approach of learning science through water candle experiment.

2. Experience the science process skills during the performance of experiment

3. Developing assessment rubrics for science process skills for water candle experiment

4. Presentation of experiment and developed assessment rubrics on it.

**Brief of activity:**

Around 35 teachers participated in workshop. Firstly, all the teachers were divided in 5 groups with each group having 6-7 teachers. All the required materials were distributed among the groups and instructed them to perform the experiment. It was told to them that as you all will be involved in performing experiment and engaged in developing science process skills like observation, recording, inference, interpretation and analysis etc. we will asses you on the basis effective use of science process skills.

Teachers started doing experiment in which an empty glass is put over a burning candle partially immersed in water in a tray. They performed this experiment where the change in the air volume is clearly observed. They started discussion that why water raised inside the glass after flame of the candle disappear. They discussed with each other and arrived at the conclusion that due the utilization of oxygen in burning process of candle, vacuum created inside the glass and to fill that vacuum water goes up. It was a very challenging task to interpreted and analyse the correct explanation of this simple experiment, to find out the relationship between the change in volume of the enclosed air and the

underline chemical reaction. They inferred that the volume of air inside the glass decreased around 20% and the atmospheric composition of oxygen in air is 20%, so they connected this cause and effect relationship and arrived at conclusion. But Out of five groups two groups were noted the bubbling of hot air coming out from the glass through water. Some groups also observed that maximum change in volume of air inside the glass happened when the flame blown out. On the basis of this observation they raised the questions that why water raised inside the glass only after the blown out of the candle flame. And why hot air bubbles came out through water just after putting the glass over the burning candle. They started arguing that changing of air volume inside the glass is not due to the vacuum created by utilization of oxygen. It may have happened because of expansion of gas due to high temperature inside the glass. After that when it was instructed them to repeat experiment by using two or three burning candles respectively and observe that how much water raised. Two groups out of five used timers to record the time of blown off of candle after putting up glass on it. They recorded and shared the observation that two candles took almost half time compare to one candle till blown off. They observed that water raised up more if we use two or three burning candles for this experiment. Finally, after long discussion they concluded that water raised inside the glass due the compression of the air. Air expanded due to high temperature inside the glass and after blown of candles temperature cool down and air inside the glass compressed. It made vacuum inside the glass. Due to low pressure the water gets up inside the glass. If we use two or more candles the temperature become higher in the glass and hence air expands more and when cool down more vacuum created. During the experiment, participants focussed on science process skills like observation, recording, interpretation, inference, analysis, etc.

**Development of assessment rubrics in science**

After completion of experiment and conclusion given by participants, we have introduced them the rubrics of science process skills and how it can be developed. We have developed exemplar rubrics during the session after the discussion with participants for water candle experiment. We wanted to give them the experience of making rubric assessment and how they utilise this skill to make rubrics in their respective science classes.

| Science process Skills | Excellent | Good | Satisfactory | Unsatisfactory |
|---|---|---|---|---|
| Observation | If participants observed the hot air bubbles coming out through water and also observed the raised of water after extinguish of | Observed the raised of water inside the glass after extinguish of candle but didn't notice | Observed the raised of water inside the glass but didn't notice the timing when water started to raised. | Face difficulty to observed the raised of water inside the glass. |

| | | | | |
|---|---|---|---|---|
| | candle. | bubbles. | | |
| Measurement/ Recording | If participants measured the volume of air inside the glass after extinguished of candle and also recording the time of extinguished of candle flame by using one, two and three candles respectively | Only measure the volume of air inside the glass after doing experiment using one, two and three candles | No measurement taken by participants only observed and get the rough idea of volume of air inside the glass. | Not capable to differentiate the volume of air inside the glass by using one, two and three candles respectively. |

There have been given only two process skills as exemplar in the above table. We have developed indicators of rubrics on other process skills like inference, interpretation, analysis accordingly. We all together (participants and resource persons) have developed rubrics in above experiments. After that the task was given to participants to develop rubrics in other topics. Participants could select the topic according to their choices and develop the indicators of rubrics of science process skills on experiment on selected topics. They have done group work and made the rubrics on experiments/activities of selected topics and presented in groups.

# Blue Print and its relevance and Grading: Concept, need, merits & demerits

## *Dr. D.M Parmar, RIE, Bhopal*

Blue Print and its relevance and Grading: Concept, need, merits & demerits by Dr. Daksha M. Parmar. The speaker talked about Educational Evaluation which was described as a process of determining the extent to which the educational objectives have been achieved. Major Techniques of Evaluation were described as Technique of Testing, Technique of Observation, and Technique of Self-reporting. This was followed by defining of reports of various commissions and committees on evaluation like Indian Universities Commission Report (1902), Calcutta University Commission Report (1917-1919)**,** University Education Commission Report (1948-49)**,** and Education Commission Report (1964-66). The major recommendations of these are internal assessment**,** semester system**,** grading**,** question bank**,** Open book examination**,** scientifically prepared question paper. The speaker described **Blue Print** as a three dimensional table of specification wherein weightage is given to content, levels of objectives, and types of questions.

## TABLE: 1 WEIGHTAGE OF CONTENT

| SUB - UNITS | MARKS | WEIGHTAGE |
|---|---|---|
| 1 | 5 | 10% |
| 2 | 10 | 20% |
| 3 | 20 | 40% |
| 4 | 15 | 30% |
| TOTAL | 50 | 100% |
| Justification… | | |

## TABLE: 2 WEIGHTAGE TO OBJECTIVES

| OBJECTIVES | MARKS | WEIGHTAGE |
|---|---|---|
| Knowledge | 25 | 50% |
| Understanding | 13 | 26% |
| Application | 7 | 14% |
| Skill | 5 | 10% |
| Total | 50 | 100% |
| Justification… | | |

**TABLE: 3 WEIGHTAGE TO TYPE OF QUESTIONS**

| SUB-UNITS TYPE OF QUESTIONS | 1 | 2 | 3 | 4 | TOTAL QUESTIONS | MARKS | WEIGHTAGE |
|---|---|---|---|---|---|---|---|
| Objective | 3 | 8 | 11 | 8 | 30 | 30 | 60% |
| Short Answer | 1 | 1 | 2 | 1 | 5 | 10 | 20% |
| Long Answer | - | - | 1 | 1 | 2 | 10 | 20% |
| Total | 4 | 9 | 14 | 10 | 37 | 50 | 100% |
| Justification… | | | | | | | |

**TABLE: 4 THREE DIMENSIONAL CHART**

**Subject: … … … …**  TIME : 1 ½ hr.
**Third Year … … … …**  MARKS : 50

| OBJECTIVES QUESTIONS SUB-UNITS | KNOWLEDGE | | | UNDERSTANDING | | | APPLICATION | | | SKILL | | | TOTAL ITEMS | TOTAL MARKS | PERCENTAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OB | SA | LA | OB | SA | LA | OB | SA | LA | OB | SA | LA | | | |
| 1 | 3 (3) | | | | 1 (2) | | | | | | | | 4 | 5 | 10% |
| 2 | 6 (6) | | | 1 (1) | 1 (2) | | 1 (1) | | | | | | 9 | 10 | 20% |
| 3 | 7 (7) | 1 (2) | | 1 (1) | 1 (2) | | 3 (3) | | | | | 1 (5) | 14 | 20 | 40% |
| 4 | 5 (5) | 1 (2) | | | | 1 (5) | 3 (3) | | | | | | 10 | 15 | 30% |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Que. | 21 | 2 | | 2 | 3 | 1 | 7 | | | | 1 | 37 | | |
| Total Marks | 21 | 4 | | 2 | 6 | 5 | 7 | | | | 5 | | 50 | 100% |
| Total Marks (objectivewise) | 25 | | 13 | | 7 | | 5 | | | | | | | |
| Note: Number in brackets indicates MARKS;   OB: Objective, SA: Short Answer, LA: Long Answer | | | | | | | | | | | | | | |

She highlighted guidelines for setting a question paper as appropriate weightage should be given to all content units, all level of objectives and all types of questions. There should be questions of different difficulty levels, there should be choices between questions on different content areas should be avoided, there should be clarity of language used and it should include specific directions to students as to what they should do under each question.

## TABLE: 5 ANALYTICAL CHART

| SUB-UNIT | ITEM NO. | OBJECTIVE | TYPE OF QUESTION | MARKS | TIME |
|---|---|---|---|---|---|
| 1 | 1 | | | | |
| | 2 | | | | |
| | . | | | | |
| 2 | . | | | | |
| | . | | | | |
| | . | | | | |
| | . | | | | |
| 3 | . | | | | |
| | . | | | | |
| | . | | | | |
| 4 | . | | | | |
| | . | | | | |
| | . | | | | |
| | 37 | | | | |

## TABLE: 6 ANSWER KEY

| (A) FOR OBJECTIVE TYPE QUESTIONS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ITEM NO. | 1 | 2 | 3 | 4 | … | … | … | … | 29 | 30 |
| TRUE ANS. | | | | | | | | | | |

| (B) FOR SHORT / LONG ANSWER QUESTIONS | | | |
|---|---|---|---|
| ITEM NO. | MAIN POINTS OF CORRECT ANSWER | MARKS | TIME |
| | | | |

This was followed by giving characteristics of multiple choice questions, characteristics of true or false type of question, characteristics of matching type question, characteristics of supply type of items and characteristics of subjective type of items. The characteristics of subjective type include that the question should require definite and restricted answer. Also certain criteria to be kept in mind for forming questions:

- 1. Is the question concerned with important phases of the subject?
- 2. If the question emphasizes minor details, are they useful in linking up other facts, ideas, and theories, involved in the subject?
- 3. Does the question give emphasis to evaluation or to relational thinking?
- 4. Is the question stated in such a way as to stimulate thought or challenge interest of pupils?
- 5. Does the question force the pupil to integrate his ideas around certain interest centres?
- 6. Is the question stated in such a form as to force the pupil to sample widely into his background of fact?
- 7. Does the question call for any originality of thought organization and expression?
- 8. Does the question call for the pupil to integrate facts gained from different sources?
- 9. Is the question limited sufficiently that the pupil has some reasonable chance of writing what he really knows about it in a reasonable time?

She described what is a question bank? It was described as a bank / pool of Questions of known technical values for not only terminal evaluation but also for continuous assessment and individualized examining. Later the explanation was given as to why to

develop a question bank? Because of availability of a large number of questions, it is an effective tool for continuous evaluation, saving of a considerable amount of resources wherein restructuring the patterns of question papers is possible. Explanation was also given as to how to develop question bank? Through content analysis it is possible to develop questions, and also empirical evidence to study nature of questions is also possible. The computerization of question bank is very essential as it helps in reconstruction of the question bank, utilization of the question bank. Also in there is a need to study empirical evidence to study nature of questions. Then tryout on a representative sample and determination of psychometric properties like difficulty index, discriminating power, judging the effectiveness of choices, word perceptions and reliability. Also modifications and rejections are possible. With computerization of question bank weightage to units, weightage to levels of objectives, weightage to types of question, and weightage to difficulty level can also be given.

## 4.3 Group work activities on Model Question Paper Development for Science

Group work activities on Model Question Paper Development for Science were coordinated by Dr. Daksha M. Parmar, and Dr. Saurabh Kumar.

# Assessment in Schools

## *Dr. Saurabh Kumar, RIE, Bhopal*

Guiding Principles according to NCF-2005

- Connecting Knowledge to the life outside school.
- Ensuring that learning is shifted away from rote methods.
- Enriching the curriculum to provide for overall development of the children rather than remain text book centred.
- Making examination more flexible and Integrate it with Class room life; and
- Nurturing an overriding identity informed by caring concerns within the democratic polity of the country.

## Examination Reform: Why is it needed?

1. Because Indian School Board Exams are largely inappropriate for the 'knowledge society' of the 21st century and its need for innovative problem-solvers.

2. Because they don't serve the need of the social justice.

3. Because the quality of the question papers is low. They usually call for the rote memorization and fail to test higher order skills like reasoning and analysis, let alone lateral thinking, creativity and judgement.

4. Because they are inflexible. Based on a 'one-size-fits-all' principle, they make no allowance for different types of learners and learning environments.

5. Because they induce an inordinate level of anxiety and stress. In addition to widespread trauma. mass media and psychological counsellors report a growing number of exam induced suicide and nervous breakdown.

6. Because while a number of boards use good practice in pre-exam and exam management there remain several glaring shortfalls at several boards.

7. Because there is often a lack of full disclosure and transparency in grading and mark/grade reporting.

8. Because there is need for a functional and reliable system of school based evaluation.

## The learning imperatives of the new knowledge societies

- School Education in the colonial era was designed to produce clerks for the bureaucracy.
- What was taught and what exams rewarded, was conformity and mastery of prescribed, narrowly defined content usually learnt from a single text.
- A questioning attitude was dangerous and teaching of skills other than those needed by the colonial state superfluous.

- After, 1947, school education was extended to a wider population and the content prescribed was partially modified to cater to the perceived needs of both nation building and new industrial economy.
- but knowledge remained scarce and was viewed as such.
- Hence the primary goal of education remained that of disseminating it through textbooks and
- The prime purpose of examination was to test the success of such transmission.
- Much before the dawn of the new knowledge society in the 1990s however, this educational model was already under stress.
- Contrary to the early state planners, it was the service industry rather than manufacturing that steadily grew to dominate the Indian Economy and became the biggest source of the new jobs.
- By definition the service economy involves catering to other people's varied needs in a flexible and differentiated manner- be in hospitality, retailing, transport, insurance, or any other sector.
- And if standardization is the key to success in manufacturing, differentiation is the key to success in service sector.
- If consistency is a key quality of a industrial worker, problem solving and analytical thinking are key quality in service provider.
- In the latter, one size manifestly does not fit all
- And it calls for a very different philosophy of education.
- The new knowledge economy – in which India has emerged as a key player – has put the old 'transmission of scarce knowledge' educational model under even greater stress.
- The internet has demonstrated that information even useful information, is not scarce- indeed it is freely available, often in overwhelming quantities, at the click of a mouse.
- What is needed is skilled processors of this information – people who can access it, sift and analyse it, short it and evaluate it.
- For those who can thus convert raw data into useful knowledge, jobs are there for the asking, here and overseas
- The search and shifting raw data and its step wise conversion into useful knowledge – is now at the heart of several traditional professionals.
- Nor it is limited to elite professionals, such as managers, business consultants, doctors, researchers, economists and journalists.
- Pharmaceuticals and used car- sales persons, real estate agents, travel agents, advocates, couriers, retailers and of course personal secretaries- all requires these skills to a substantial degree.
- These societies or professionals may have nothing in common other than the commonality of the process of "information shifting and evaluation"
- Whether one calls this analytical thinking, critical thinking, lateral thinking or problem solving does not matter.

- The point is that most of these types of thinking are required in most occupation today.
- *Yet we are hard-pressed to find a single one of these activities being required of exam candidates in Indian schools today,* let alone such a composite.
- S. A. Deshpande, head of the training and recruitment at one of the India's very large software company, has this to say:
- "19 out of 20 graduates applicants and 6 out of 7 post graduate applicants are unemployable. This simply lack the requisite problem solving skills or often even any real clue as to what problem solving means."
- "We don't really needs engineers as programmers. We could even hire high-school dropouts if they had the right skills. We tend to hire engineers because they, unlike most other graduates, have learnt the problem solving along the way"
- If a country of over 100 crore is struggling to produce one lack youth with these problem solving skills, all is clearly not well with its education system.
- Nor is there much point in merely blaming college education.
- There is a good amount of psychological theory to suggest that if you want inquiring minds who can think 'out of the box' at the age of 21, you cannot begin to create them at the age of 17.
- You have to begin at the age of 7 or at least at 11.
- Are our education and examination systems working to create such 'problem-solving' citizens??

**Continuous and Comprehensive Evaluation (CCE)**

Aims
&
Objectives

Learning
experiences
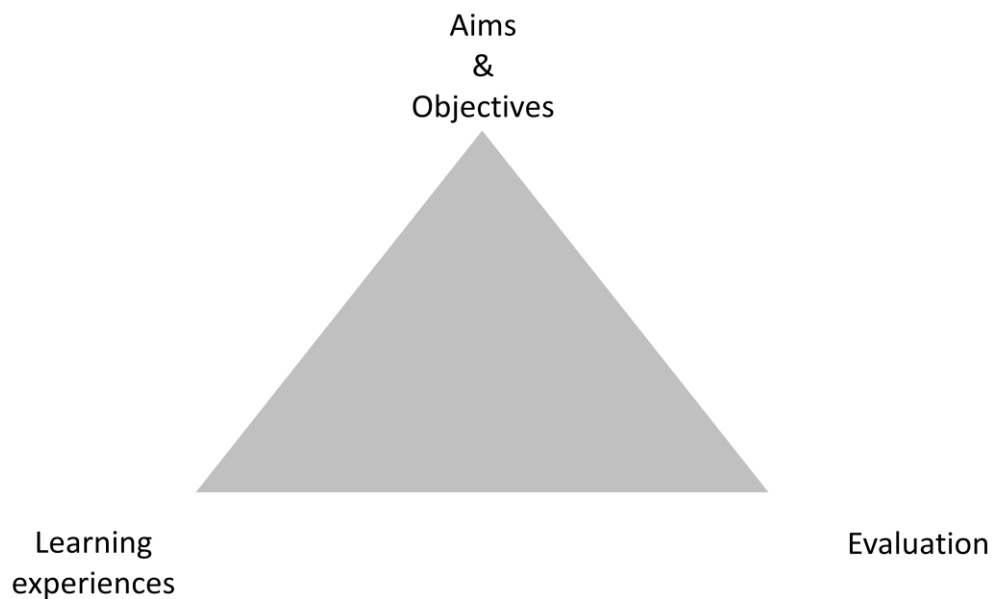
Evaluation

- TEST
- EXAMINATION
- MEASUREMENT
- ASSESSMENT
- EVALUATION
- Assigning meaning to a measurement is called assessment, which may be quantitative as well qualitative
- and final conclusion drawn on the basis of several assessment along with the value judgement is called evaluation

**CONTINUITY OF EVALUATION?**

**COMPREHENSIVENESS OF EVALUATION?**

**Forms of Assessment**

- Assessment of Learning
- Assessment for learning
- Assessment as Learning
- Assessment in Leaning

**Assessment of Learning**

- The process which is meant for quantifying the knowledge, attitude or skills acquired by the students.

- The process is teacher centric and student has very little role in it.
- The teacher designs learning activities and collect evidences of learning during this process.
- Finally the teacher judges what has been learnt.

## Assessment for Learning

- This is seen as a part of the formative assessment.
- There is more emphasis towards giving useful advice to the student and less emphasis on the giving of marks and the grading function.
- Basically, teacher design learning and assessment as feedback to student.
- Finally, teacher and student try to understand what has been learnt and what areas need to be worked upon.

## Assessment as Learning

- Through this process students are able to learn about themselves as learners and become aware of how they learn – become meta-cognitive (knowledge of one's own thought processes).
- Students reflect on their work on a regular basis, usually through self and peer assessment and decide (often with the help of the teacher, particularly in the early stages) what their next learning will be.
- Assessment *as* learning helps students to take more responsibility for their own learning and monitoring future directions.
- What is the purpose of learning these concepts and skills?
- What do I know about this topic?
- What strategies do I know that will help me to learn this?
- Am I understanding these concepts?
- What are the criteria for improving my work?
- Have I accomplished the goals I set for myself?

## Assessment in learning

- The assessment in learning places the question/enquiry at the centre of teaching and learning.
- It deflects the teaching from its focus on the 'correct answer' to a focus on a 'fertile question'.
- In this process the student who is at the centre of learning monitors, assesses and reflects on learning and teacher acts as a coach and mentor.

## What CCE is and What it isn't?

(1) The primary purpose of *assessment and evaluation is to improve children's learning to help them progress leading to their overall development*.

- Information about their learning gathered through assessment during teaching-learning, helps teachers to determine:
  - students' strengths
  - learning gaps in the concerned subjects
- Which serves to guide teachers in adapting curriculum and teaching-learning approaches/methods to suit children's needs.
- However, at the same time, it also serves the purpose to reflect how well a student has achieved the curricular expectations through the process of gathering information from a variety of sources.

(2) Assessment during teaching-learning process (i.e., continuous assessment) gives clues about children, by which the teacher can act upon timely to enhance learning, especially where children are facing difficulties and special help is needed. ()

- Continuous assessment does not require the use of structured tests which are given to all children at the same time.
- In this process, they may not even know that they are being assessed.
- Thus continuous should not mean more frequent formal tests.

(3) One major misconception is related to the words formative assessment.

- In report cards, in a large number of schools, currently teachers report formative assessment in every quarter including project work and other activities under that.
- Actually formative assessments are not meant to be reported in report cards.
- The word formative comes from 'formation', that is, formation of the learning process. These are assessments designed to monitor and improve students' progress during the teaching-learning process (also called assessment for learning).
- Any information on learning of a child, for example, by written work, oral responses or may be simply observing the child, can be used formatively by the teacher to help the learner further.


**Part 1: Scholastic Areas**

Type of assessment Percentage of Month Term wise weighting in weighting academic session

**First Term**

- Formative Assessment (FA1) = 10%  (April- May)
- Formative Assessment (FA2) = 10%  (July- August)
- Summative Assessment (SA1) =30%   (September)
- (FA1+FA2+SA1 = 50%)

**Second Term**

- Formative  Assessment (FA3) = 10%  (October- November)
- Formative  Assessment (FA4) = 10%  (December-January)
- Summative Assessment (SA2) =30%   (February)
- FA3+FA4+SA2 = 50%)

  Term1+Term2 = 100%

(4) The other 'C' in CCE is '*Comprehensive*' component of assessment. Comprehensive component means getting a sense of 'holistic' development of child's progress.

- Progress cannot be made in a segregated manner, that is, cognitive aspects, personal-social qualities, etc.
- After completion of a chapter/theme, teacher would like to know whether children have learnt (assessment of learning) as she/he expected them to learn based on lesson's objectives/learning points.
- For that she/he broadly identifies the objectives of the lesson and spells out learning indicators.
- The teacher designs activities based on expected learning indicators.
- These activities need to be of varied nature. Through these questions/activities she would assess the learners and that data would be one kind of summative data of a lesson/unit.
- Such assessment data must be recorded by the teacher. Likewise in one quarter, she/he would cover 7-8 lessons/topics and in this manner she/he would have substantial data covering varied aspects of child's behaviour.
- It would provide data on how the child was working in groups, doing paper-pencil test, drawing pictures, reading picture, expressing orally, composing a poem/song, etc.
- These data would give 'comprehensive' picture of child's learning and development. This data would help to know to the assessment of learning.

(5) Another misconception is related with assessment of personal-social qualities of children.

- These qualities such as empathy, cooperation, concern for others, etc., are generally assessed at five-point scale of grading.
- Assessment of personal-social qualities is neither confined to a specific subject nor requires assigning a specific time as it can be observed more effectively in various situations such as during teaching-learning, outdoor activities, other activities in the school and peer interaction, etc.
- These should not be assessed in terms of presence or absence.
- These must be described to state the extent the child displays these qualities.

**How to Assess for Personal-Social Qualities (PSQ)?**

- The purpose of assessment of personal-social qualities under CCE is to indicate *how well the child is progressing* in his/her development of personal-social qualities. Personal-social qualities of the child are not to be assessed in terms of their "presence or *absence*" as it can do more harm than good. It is more important to state the extent to which the child displays a particular quality.

- Teacher should make observations throughout the year and report/record once in one quarter the key personal-social quality observed in a particular child.

- While reporting teachers will be required to descriptively state/write only those personal-social qualities observed/seen in a child.

- Direction of development is more important than the status of it. So, focus should be on the strengths of the child and undesirable behaviours should not be highlighted especially in the view of CCE.

- Exemplar on Reporting of Personal-Social Qualities

**Class II Child**

*Initiative Taking*: Rohan is eager to participate in classroom activities. He volunteers to clean the blackboard or go to other teachers for some work, if required. He was the first one in the class to volunteer for cleaning the play ground in school. He helped in gathering leaves, plastic, paper, bottles, etc., for the environment project.

*Emotional Control*: Rohan has the ability to control his actions and behaviour, for example, he waits for his turn patiently during the games or remains in the queue while going to the assembly hall. When he lost his pencil box in class, he was composed and waited for the teacher.

(6) Assessment is a means to gather evidences to meet the requirements of evaluation.

- Assessment does not speak of final judgement but a process through which comparisons among various sets of observations are made.

- Evaluation is the process of finding out *as to what extent changes have taken place in the development and learning among children.*

- It has to be based on reliable and valid evidences so as to arrive at precise formulations.

- *Good evaluation is one which provides a near complete picture of one's accomplishments and is based on multiple sources.*

(7)

- The purpose of assessment is judging the quality of performance of children *while learning is going on.*
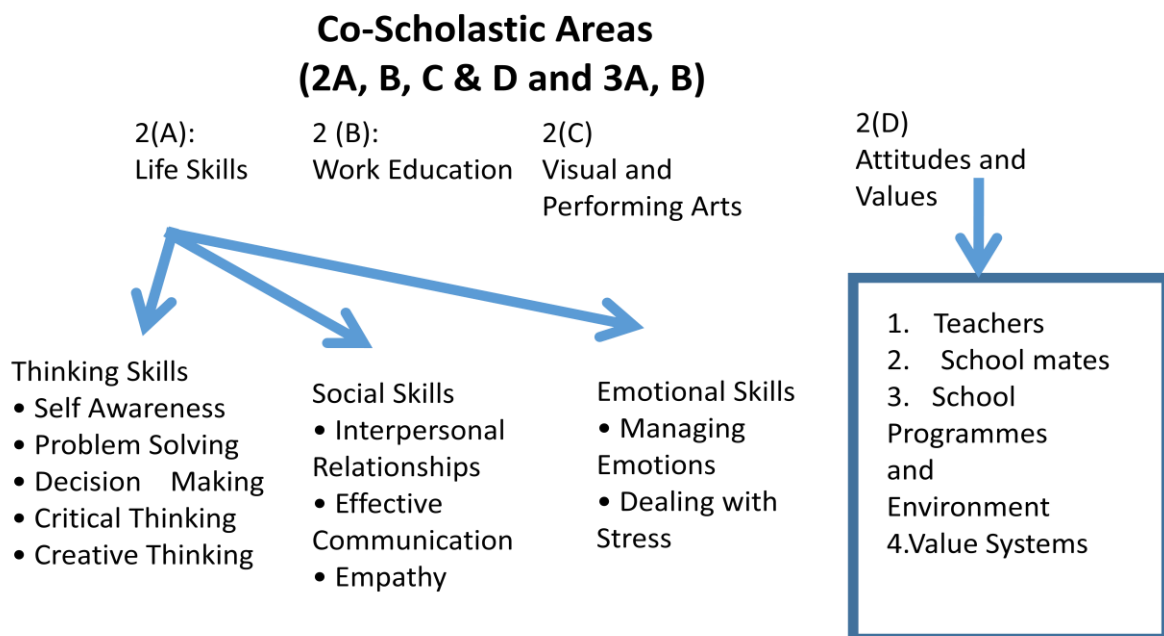
- Evaluation focuses on the actual level attained after a certain period of teaching-learning with no interest in why and how that level was attained. It refers to judging the quality of students' work on the basis of established set of criteria, and assigning a value (e.g., marks or grades) to represent that quality.
- Formative assessment is process oriented while evaluation is product oriented.

(8) Teachers think that the prime purpose of evaluation is labelling or comparing performance of children against each other.

- They also think that these processes are there to point out weaknesses of the child or what the child *does not* know, rather than focusing on improving child's learning.
- The spirit of CCE is to enhance student learning both through process of assessment and evaluation.
- It compares the performance of a child with her/his previous performance, instead of comparing her with her peers.

(9) One confusion is related with what will be treated as *curricular and co-curricular areas.*

- Arts Education, Health and Physical Education, and Work Education are often treated as co-curricular/ co-scholastic areas.
- where as Language, Mathematics, EVS, Science, and Social Sciences are considered as curricular areas.
- National Curriculum Framework, 2005 places art education, health and physical education, work education also as curricular areas.

## Co-Scholastic Areas
## (2A, B, C & D and 3A, B)

2(A): Life Skills
2 (B): Work Education
2(C) Visual and Performing Arts
2(D) Attitudes and Values

Thinking Skills
• Self Awareness
• Problem Solving
• Decision Making
• Critical Thinking
• Creative Thinking

Social Skills
• Interpersonal Relationships
• Effective Communication
• Empathy

Emotional Skills
• Managing Emotions
• Dealing with Stress

1. Teachers
2. School mates
3. School Programmes and Environment
4. Value Systems

(10) Teachers think that in CCE they need to record each child's progress daily or the progress needs to be recorded on a large number of indicators continuously by them.

- This understanding is totally contrary to the spirit of continuous assessment.
- Teachers *need not assess all the children all the time, nor do they need to make elaborate records of children's progress and report them to others*.
- Continuous assessment is only to help the teacher teach better, and she may record only that which would be genuinely useful for her to enhance teaching-learning in her diary/logbook in her own format, which need not be common for all.

(11) It is also mistakenly thought that in CCE, every child needs to be promoted whether he/she learns or not.

The real spirit of CCE is that every child should *get an opportunity to learn all through the process and be helped whenever she/he needs feedback and support*.

- This means if the teacher regulates and monitors assessment throughout the year and devises strategies to help the child so that the child's learning improves, then the situation of the child 'failing' at the end of a term would not arise.

(12) CCE is also misunderstood as the sole responsibility of a teacher.

- This makes the task seem impossible and makes the teacher feel extremely burdened with unrealistic expectations.
- On the contrary, CCE aims at *reducing* the teacher's burden. Actually, it places the collective responsibility of implementing CCE by various stakeholders i.e. administrators, parents, children and teachers.
- Children need to take responsibility of assessing their own work, their peers' work and helping each other learn. Some children can be a good resource to help the teacher.

**Process of CCE in the class room**
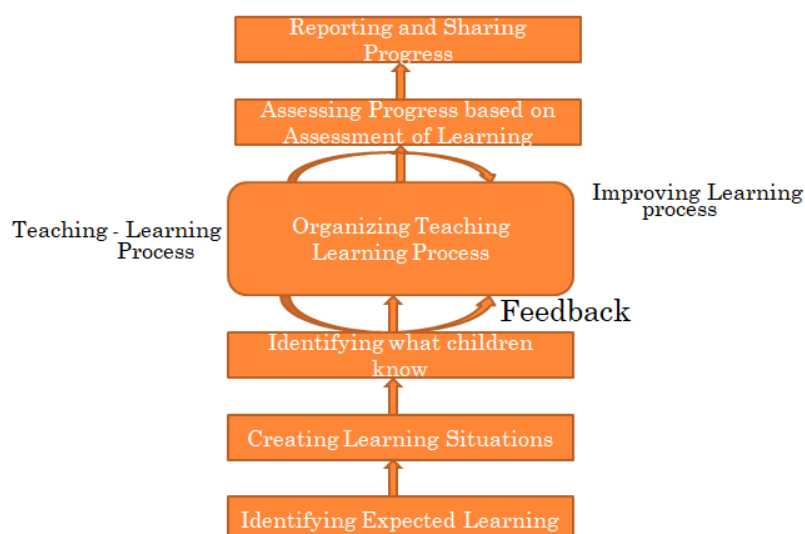
The indicators help us in a number of ways by

- *focusing on and understanding children's* learning as a continuous process;
- *providing a reference point for parents,* children and others to understand the progress of every child in a simple way;
- *providing a framework for monitoring and reporting* the progress of the child.

**Informal Creative Evaluation**

- Informal creative evaluation in mathematics include:
    - o Mathematical communication
    - o Understanding of mathematical concepts and process
    - o Creativity in mathematics
    - o Problem solving abilities and mathematical reasoning
    - o Disposition and attitude towards mathematics

**Methods of Informal Creative Evaluation in Mathematics**
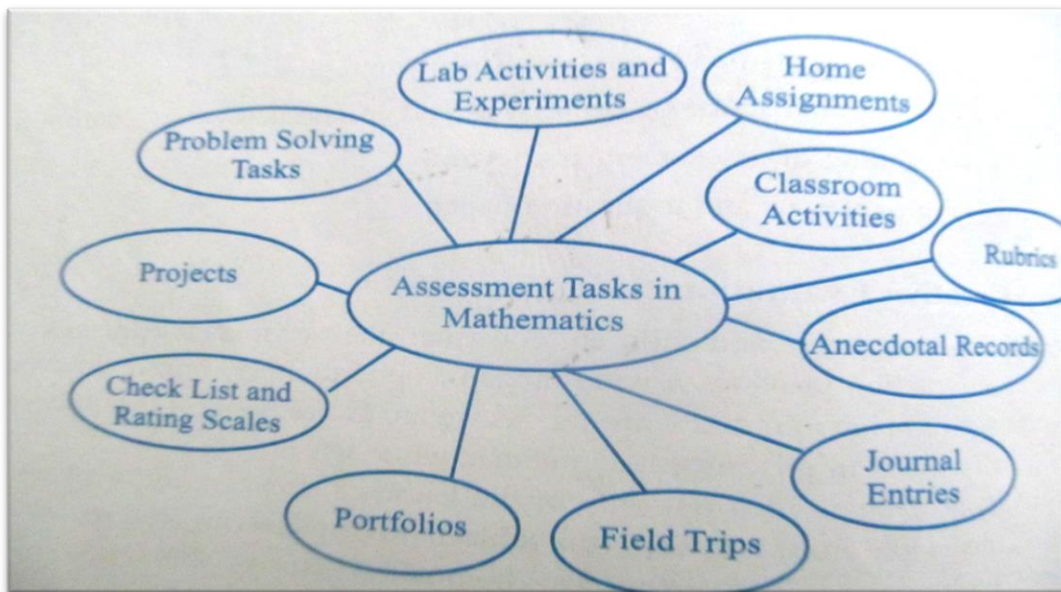


Checklists

Presence or Absence of student's behaviour (cognitive as well affective)

**Name of the student.................**

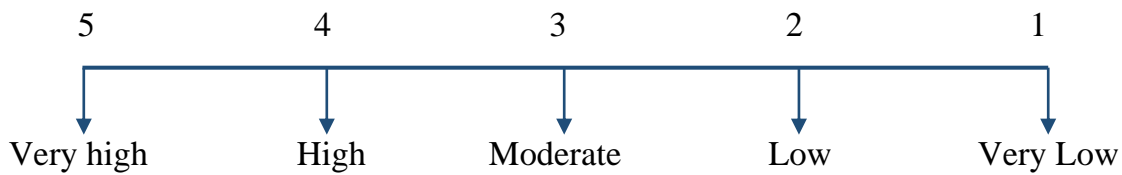| Mathematics Area | Competencies | Yes/No |
|---|---|---|
| Problem-Solving | Did the learner<br><br>- Understand the problem?<br>- use more than one strategy to solve? | |

| Reasoning | Did the learner |
|---|---|
| | • recognise patterns?<br>• make prediction?<br>• justify the solution |

**Rating Scale**

**Example of Rating Scale**

Student shows interest in solving problems:

| 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|
| Very high | High | Moderate | Low | Very Low |

**Rubrics:**

- A set of guidelines for assessment which states the characteristics and or dimensions being assessed with clear performance criteria and rating scale.
- A scoring rubrics consist of:
  - A fixed scale.
  - A list of characteristics describing performance for each of the points of the scale.
  - A clear performance target for students.

**Example of a Mathematical Rubrics:**

| Criteria | Level 4 | Level 3 | Level 2 | Level 1 |
|---|---|---|---|---|
| **Context** | Accurate, precise, relevant and interesting | Accurate, precise, but not so interesting | Content has some errors, relevant but not so interesting | Content is accurate and not relevant |
| **Creativity** | Very high | High | Moderate | Low |
| **Organization** | Very well organized and sequenced | Well organised and sequenced | Not so well organised | Not well organised and content is not sequenced |
| **Originality** | The information is well researched and original | The information is well researched | The information is not original | The information completely copied |

# Portfolio Assessment

*Prof. Anil Kumar, Ex. Professor, NITTTR, Bhopal*

**Introduction**

Portfolio assessment is Purposeful collection of student work that has been selected and organized to show student learning progress (developmental portfolio) or to show samples of students best work (showcase portfolio) Portfolio assessment can be used in addition to other assessments or the sole source of assessment.

**Purpose of portfolios**

To give students the opportunity to reflect on their growth over a period of time To use as a basis for assigning grades (based on effort) To use as a basis for communication with parents As placement/entrance requirements

**What do portfolios contain?**

Developmental Portfolio (or working portfolios) Samples of independent work (initial work compared to more current work) Evaluations by teacher, peer, self Reflections on the growth over a period of time (e.g., "I used to be unsure about punctuation, e.g., where does the comma really go?, but now, I feel comfortable in making decisions about punctuation, and I am right most of the time!") May be used for instructional purposes and may include various stages of products, various drafts, etc.

**Different purposes of Portfolios**

All content in a portfolio must be linked to the learning objectives/outcomes

In addition to learning objectives, there are many general purposes of portfolios:

- Enhancing student learning (little emphasis on content, more emphasis on student reflection)
- Assigning a grade (give clear guidelines to ensure that the portfolio consists of standard items)
- Displaying current achievement (pick the best complete work)
- Demonstrating progress (show changes over time, include various drafts)
- Showcasing student work (only best work)
- Documentation (showing work at variety of levels)
- Show finished work
- Show works in progress

**Characteristics of portfolios used for instructional purposes**

Focus is on development of self-evaluations skills.

Teacher and students must meet to discuss evaluations (teachers can get a good window into students' understanding of their progress).

In addition to improving instruction, then goal is to help student internalize criteria for excellence.

Can be used for student-directed conferences with parents

**Characteristics of portfolios used for assessment purposes**

Focus is on evaluation of students work in its entirety and certifying accomplishment. Teacher should provide student with clear guidelines about content of portfolio and scoring criteria. If used to assess program goals, thus content and organization of portfolios must be highly standardized.

Examples of portfolios for Science subjects u

- Charts, graphs created
- Projects, examples, posters
- Lab reports
- Research reports
- Tests
- Student reflections (either weekly, monthly, or bi-monthly)

# Observations

## *Prof. Anil Kumar, Ex. Professor, NITTTR, Bhopal*

Observation is an important method for obtaining information and judging performance and is used by all of us. Observations can be used for assessing skits and attitudes. Observations are made for both "process" and "product" assessments. During process observations, students are observed while they are working, while product observations can be done independent of the presence of student.

There are usually two types of observations:

### 1. Spontaneous Observations

The observations, which are unplanned and incidental, are termed as spontaneous observations. They are spontaneous because you were not intending to watch for a specific action. Such observations can be very useful in formative assessment and as an impetus and basis for further planned and focussed observations. Anecdotal records explained later are to a certain extent record of spontaneous observations, though effort should be used to make these also planned.

### 2. Planned Observations

As against spontaneous observations, planned and systematic observations ensure that significant activities and behaviour are not missed, that important aspects of the activities are noted, and that we have focussed observations.

Though unexpected events can be exciting and interesting, planned observations can provide information about learners that can be used to provide feedback in a positive way. The planned observations are likely to have objectivity, reliability and validity.

- To make the observations more valid the factors to be observed must be identified earlier. This will also give objectivity in observation.
- To make the observations more reliable

(i)     Criteria of assessment must be identified and agreement obtained between different observers/ teachers about the meaning of each criteria. This will ensure that if there are more teachers dealing with that assessment each teacher will interpret the criteria in more or less the same way.

For example, in case of assessment of drawing sheets all teachers taking drawing class might decide the criteria on the basis of which assessment of drawing sheets will be done. Also they may decide the meaning of each 'criteria'. If it is difficult to put it down in black and white, they can see a sample of drawing sheets and come to an agreement on the meaning of these criteria. They may also decide weightages for each criteria.

(ii)    more observations should be taken.

(iii)   continuous recording should be done.

- Use of checklists and rating scales systematises the procedures for obtaining and recording the judgement of observers. These direct the observer's attention on relevant

aspects. The quality of a set of observations is influenced greatly by the quality of checklists and rating scales that are designed to focus on required observation and to record the same. Sometimes anecdotal records may also be kept. We will discuss about checklists and rating scales, and their design aspects later in this lesson. We will also discuss what we mean by anecdotal records.

## Check Lists and Rating Scales

We can use checklists and rating scales as assessment instruments for recording observations. These consist of a set of aims/ objectives/ abilities/ qualities/ characteristics/ process elements/ product elements to be judged.

- Degree to which a characteristic is present is not identified by check lists but rating scales can do that. An example of checklist is the list which we take to the market for buying our monthly or weekly ration. Another familiar example of checklist is the list of clothes given to washer-man for washing purpose.

An example of rating scale may be that prepared by a young man or woman or parents of young man or woman to judge the prospective bride or bridegroom on several characteristics like height, beauty, education, employment, family background and mark as " 'A', B ', 'C', 'D' etc.

- Check lists and rating scales can be used for both process and product assessments.
- If the characteristics are not very specific, indicators of observable behaviours which indicate the presence, absence, or degree or presence of a characteristic will have to be identified.
- Checklist judges the presence or absence of the characteristic or whether the action was taken or not taken i.e. it has only Yes/No response. Rating scale indicates not only the presence or absence of a characteristic, but degree to which it is observable. Example: Handle the equipment/device carefully Yes /No

## RATING SCALES

We have seen that rating scales are observation tools to indicate the degree to which the identified characteristics or attributes are noticeable in an individual.

Typically, a rating scale consists of a set of characteristics or attributes to be judged and a scale for indicating the degree to which each attribute is present.
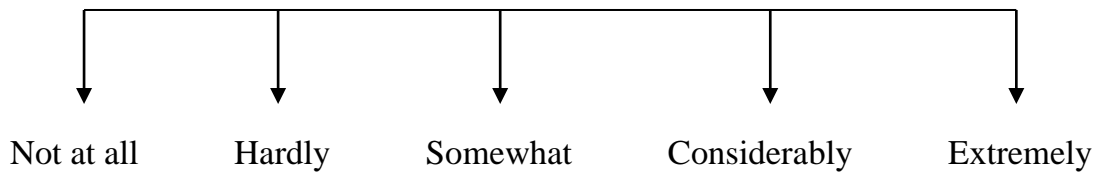
It is generally preferred over checklist when you feel that it is necessary to obtain finer discrimination among the students. The philosophy behind the checklist is that the trait being assessed is either present or absent, while in the case of rating scale it is assumed that most of the students will show achievement, but in a varying degree.

There are three basic types of rating scales which you may use separately or in combination. These are Numerical Scale, Graphic Scale and Descriptive Graphic Scale.
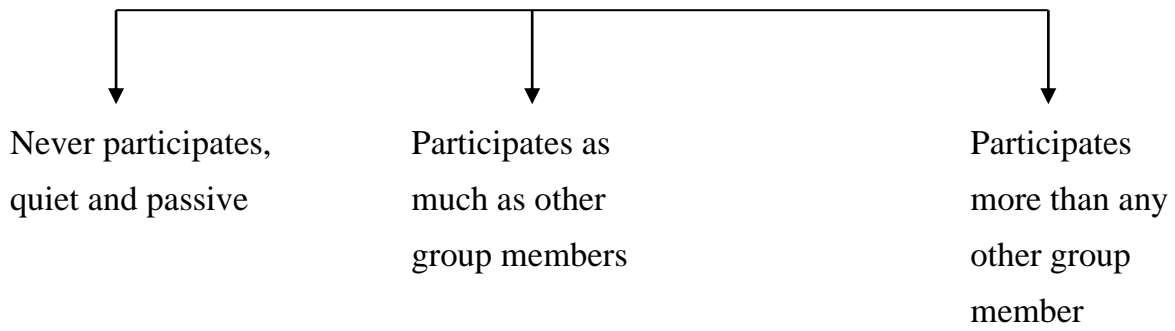
Example 1 Does the student participate in group planning?

     1     2     3     4     5

Example 2 To what extent does the student participate in group planning?

| Not at all | Hardly | Somewhat | Considerably | Extremely |

Example 3 To what extent does the student participate in group planning?

| Never participates, quiet and passive | Participates as much as other group members | Participates more than any other group member |

# Assessment: What and How?

*Dr. Daksha Parmar, Assistant Professor, RIE , Bhopal*

## 1.1 INTRODUCTION

Each one of us is familiar with educational assessment as all of us have gone through rigors and pleasures of being assessed, examined or evaluated at different stages during our student days. We know that in the teaching-learning process, these are important components. It should not be considered extraneous to the main purpose of teaching. Unfortunately in many educational institutions, this is so reflected in the process of assessment being followed.

As a teacher, we knowingly or unknowingly, are deeply influenced by traditions of testing, which influence our approach to student assessment. In recent years, lot of good literature and researches have been generated contributing to the science and technology of student assessment. The simple process of examining the students and giving them marks or grades has many other added dimensions now.

## 1.2 DIFFERENT TERMS USED

Most of the time we use the words test, measurement, assessment and evaluation interchangeably, yet the term measurement is clearly distinct from assessment and evaluation.

### 1.2.1 Examination

Examination is the act or process of examining, the state of being examined. It is an exercise designed to examine progress or test qualification or knowledge. In education an examination is a test to show the knowledge and ability of a student

### 1.2.2 Test

In an educational system, tests cover a wide range of things - test papers, classroom tests, theory papers, practical tests, oral tests etc. Tests, here, are similar to the instruments used for measuring physical quantities. Thus, tests are educational measuring instruments designed and used in specific situations for specific purposes to measure, to assess or to evaluate some characteristic/ability/trait of our students (examinees)

### 1.2.3 Measurement

Measurement is concerned with assigning a number, numerical quantity or giving a quantitative description to a certain characteristic, ability or trait of a student. This numerical quantity is also called a test score or marks awarded, if a test is given for measurement.

Before we undertake measurement, we must define and describe what we intend to measure i.e. identify and define the trait (ability). Once the trait or ability is identified then we can set

the rule to measure it. In some cases it may be simple where as in some cases it may be quite complex because of a number of issues involved which need to be addressed.

## 1.2.4 Assessment

In comparison to measurement, assessment, however, is concerned with determining the worth of something. This can be done by quantitative and/or qualitative descriptions plus some value judgments. Thus we see that it has a value aspect added in judging the worth. In the educational context, a student's achievement on a certain course can be assessed -where it includes examining, marking/grading, certifying and so on. Assessment is, thus, more than measurement.

## 1.2.5 Evaluation

The term evaluation on the other hand has been used in a wider context; though retaining the concept of determining the worth of something. Normally it has been associated with the programmes, projects, and institutions, like evaluation of programme, evaluation of project, instructional evaluation or curriculum evaluation. In USA the term evaluation has also been used in the context of students; synonymously with assessment. As per Gronlund (1981)

Evaluation = Quantitative description ⌐

        and/or                + value judgment

        Qualitative description -

In the educational context,

**Evaluation is the systematic process of obtaining quantitative and/or qualitative information and using it to form judgments, which in turn can be used in decision making.**

Often the terms **'assessment' and 'evaluation'** are used interchangeably. There is a difference in what these terms imply. **Assessment** mainly aims at judging the quality of performance of children *while learning is going on*. **Evaluation** focuses on the actual level of performance attained after a certain period of instruction. Evaluation is not concerned with why or how that level was attained. It judges the quality of students' work on the basis of established criteria and assigns a value to represent that quality (for example, marks or grades).The books published in USA use the term evaluation, whereas those published in UK use assessment. In this module,

## 1.3 PURPOSES OF STUDENT ASSESSMENT

A teacher can use student assessment for following purposes:

**1. Diagnosis**

Diagnosis implies determining strengths and weaknesses of students and based on this data providing some remedial action. If you are trying to find specific difficulties of individual students, you are in the process of diagnosing. It is similar to what a physician does while examining a patient.

**2. Guidance**

Assessment data can provide information which may help your students in making relevant and appropriate choices or decisions about

- subject or course choices
- career

**3. Monitoring students' progress**

We do monitoring to determine student's progress on a regular basis for the purpose of

- diagnosis
- facilitating instruction
- providing early warning, if a particular student is not doing satisfactorily

**4. Feedback**

All of us realise that this is an important purpose of evaluation. Feedback means providing knowledge of results to bring about further improvements. Feedback is required both by students and teachers.

For feedback to be effective, students need information about

- their strengths and weaknesses
- how to improve further?
- how to meet standards?
- how to build upon strong areas?

You as a teacher will require feedback about

- how well you have taught?
- how to improve teaching?
- how to remove weaknesses in students' learning?

**5. Motivation of students**

Evaluation also works as a motivator for learning. It has been seen that

- some students need constant stimulus for them to learn, and results of tests, examinations etc provide that stimulus.
- most of the students study harder when they have to appear in a test or examination.

Thus we see that evaluation promotes learning.

We have seen a number of purposes of evaluation. Some of the purposes are overlapping. For example, a test on a unit can be used for diagnosing strengths and weaknesses of students and monitoring students' progress. It provides feedback to students as well as teacher about strengths and weaknesses. Result of test also motivates a number of students. Result of test may also contribute towards final score or grade of student.

## 6. Certification

This primarily involves assigning to individual students a number (marks) or a letter signifying a 'standard' they have achieved. In this case purpose is to insure quality control. This is what we think we are doing when we give test and award marks on it.

In technical education system, we expect that our students achieve professional competence, proper cognitive and psychomotor skills, and the abilities to handle special situations related to men, materials, and machines. These put special demands on evaluation system. The evaluation system has to cater to such special needs where the emphasis is on performance, and achievement of professional standards, and development of other human qualities that go to make a good engineer. Therefore, deciding about level of performance is the main purpose in educational institutes.

## 1.4 TYPES OF ASSESSMENT

We can classify evaluation in a number of ways, representing different facets of evaluation. We give these classifications for the purpose of clarity.

### 1.4.1 Formative and Summative Assessment

In the context of instructional process, we can say that evaluation is an integral component of teaching-learning process. We use formative evaluation to improve teaching-learning process. They can monitor students' learning progress. The results of these tests can provide feedback to the students about their strengths and weaknesses. As teacher we also get feedback about the effectiveness of our instruction. Formative tests usually cover small segments of learning outcomes, a few units at a time. If we are evaluating of any practical work like laboratory, workshop, drawing etc; while the students are undergoing learning experiences, we are doing formative evaluation. We need to provide feedback to students, based on this evaluation so that they improve.

Summative evaluation is, as the term indicates, held on the completion of the course. The purpose is to determine the overall achievement of the students and to award marks, grades and certificates.

You must appreciate that if a practical test and/or oral test is taken at the end of semester for a course, it is also summative evaluation.



FORMATIVE vs. SUMMATIVE assessments
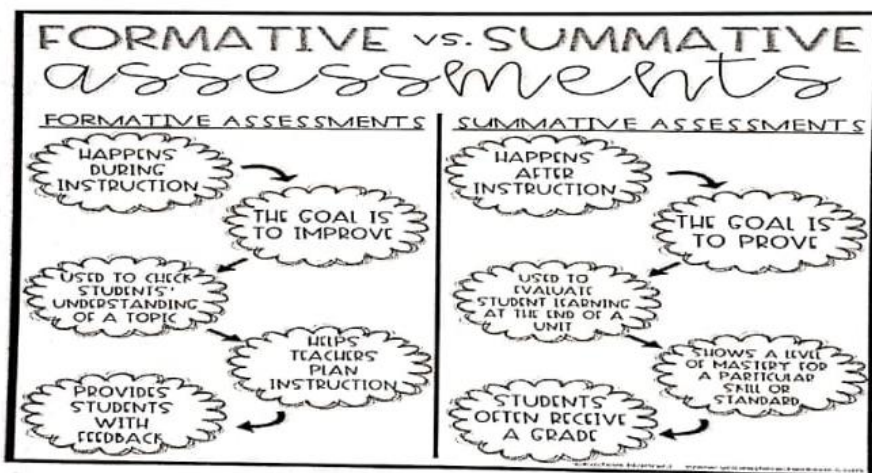
**1.4.2 Continuous (Periodic) and End-of-term Assessment**

You are familiar with these terms. Continuous here means spread over the whole period - may be a semester or a year, while the end-of-term means at the end of the semester or the year, when the course of instruction is completed. End-of-term assessment is used for the purpose of certification or award of grade or marks and to determine who should be declared pass or fail. The continuous assessment is primarily concerned with the CS Scanned with monitoring of the progress of students when the teaching-learning process is going on.

To understand continuous assessment, think of a doctor who is giving a prolonged treatment to a patient. The doctor diagnoses the condition of the patient, gives treatment, but keeps judging from time to time whether the treatment is working. She/he keeps changing treatment strategy if the current one is not giving desired results. The teacher does not have patients with ailments whose condition need correction, but learners with different learning needs and styles. She has to roughly use the same diagnostic strategy to adjust her inputs. She judges the effectiveness of her teaching and gaps in learning from time-to-time. Accordingly she keeps evolving her teaching strategy. This is a very creative and thoughtful process, since there are a large number of learners, who keep responding differently to everything done by the teacher and are at different stages of learning. So the teacher must constantly make alert judgment, using her previous knowledge of her learners. CCE assumes a teacher who is a reflective practitioner, someone who constantly reflects on her interaction with students.

In the continuous assessment, we can use different modes of assessment e.g. periodical tests (progressive tests), assignments and performance assessment in laboratory work, workshop, fieldwork or project. Periodical tests or progressive tests often form part of continuous assessment scheme. In all these modes of assessment, we attempt to know how the students are performing. This assessment can be used to give feedback to the student on his performance in order that he may improve upon. It can also be used for the purpose of awarding grades and marks. In the later case, marks in continuous assessment may be added to the marks given in end-of-term evaluation with appropriate Weightage to the different components. In another situation grades or marks may be awarded only on the basis of continuous assessment, where there is no end-of-term evaluation. This often is the case of assessment of performance in laboratory work or workshop.

### 1.4.3 Process and Product Assessment

In the educational context, there are situations which require evaluation while the learning process is on. This evaluation is called process evaluation. Such situations are more common when students work in laboratory, workshop or in field. Learning experiences given here are deliberately planned to enable students develop proficiency in acquiring certain skills As a result of executing certain operations, the students finally are able to produce- a job, a report, a complete project etc. This we can call as the product, something produced on the completion of certain tasks. Evaluation of the product based on certain criteria is called product evaluation.

For us, both aspects i.e. the way students undertake various processes as well as the quality of output (product) are important Process and product may have relative importance depending upon the purpose of assessment

### 1.4.4 Assessment of learning, assessment for learning and assessment as learning

Terms such as diagnostic, formative, and summative...have recently been supplemented with the phrases assessment for learning, assessment as learning, and assessment of learning. What matters is how the information is used.

Assessment for Learning is the ongoing process of gathering and interpreting evidence about student learning for the purpose of determining where students are in their learning, where they need to go, and how best to get there.

Assessment of Learning is the process of collecting and interpreting evidence for the purpose of summarizing learning at a given point in time, to make judgments about the quality of student learning on the basis of established.

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**Group Photo**



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