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ASSESSMENT FOR LEARNING

Unit 2: Different domains/ areas of learning

Educational objectives in different domains – cognitive, affective and psychomotor – Learning outcomes as behavioural changes – Relationship between educational objectives, learning experiences and evaluation –writing educational objectives-different kinds like knowledge, understanding, application, skill, affect attributes, behavioural terms and level of performance – Measurable and non-measurable learning outcomes.

2.1 EDUCATIONAL OBJECTIVES

An educational objective is often limited to what is mentioned in the prescribed syllabus or to what the teacher does in the classroom.

An educational objective may better be defined "*as a desired change in behaviour in a person that we try to bring about through education*" **(E.J.Furst)**. These changes have the basic characteristic of direction and nature (quality and extent). In other words, it may **mean**

(1) a dimension of learning,

(2) Worthwhileness of a pattern of learning for realizing it, and

(3) level of learning to be attempted.

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

2.2 RELATIONSHIP BETWEEN EDUCATIONAL OBJECTIVES, LEARNING EXPERIENCES AND EVALUATION OR LEARNER APPRAISAL

Teaching-Learning Process

The main purpose of classroom teaching is to influence pupil behavior in the desired direction. The desired direction is guided by the educational objectives

formulated by the school and the teacher. The teacher first of all, must be conscious of the goals and aims of education. More specifically, the teacher must formulate instructional objectives for various lessons and units in the systematized and rearranged syllabus in a subject of study. Secondly, the teacher should be in a position to construct effective learning experiences on the basis of student learning and the modes of effective communication channels. Finally, the teacher will determine the extent to which these objectives are being achieved. Hence, three major elements in the education process are objectives, learning experiences and learner appraisal. The simple representation of educational process is shown below:

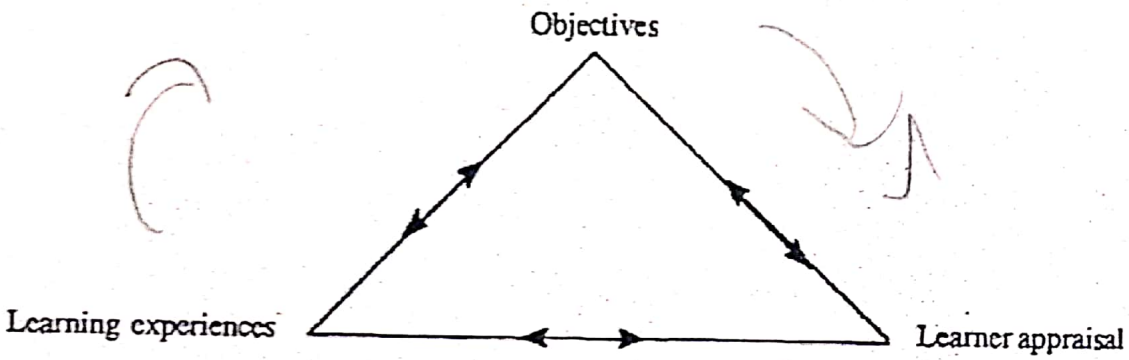

Fig : Representation of Educational Process

The above representation is a dynamic one and shows interaction among three major elements as shown by directional arrows. Objectives refer to one's intention of desired behavior that learners should acquire. The term learning experiences, refers to those activities and experiences that the learners undergo in order to acquire the desired behaviors.

The teacher plays an important role in providing learning experiences. Learning experiences involve interaction of students and content with the help of a teacher. The teacher uses various teaching methods and techniques for providing learning experiences to the learner. These learning experiences lead to behavioral changes among learners. So, learning involves modification in the behavior of a learner through learning experiences. In order that there may be an appreciable learning on the part of students, it is important that teaching must be effective. The teacher must provide situations for close interaction

of students with content by using appropriate teaching methods and techniques. Hence effective teaching leads to successful learning experiences.

Besides teaching, the learning experiences can also be brought about through a number of ways such as the library, laboratory readings, radio, films, film strips, science clubs, field trips or such other learning situations in real life.

Learner appraisal is concerned with ascertaining the extent to which the objectives have been met.

The representation of the educational process shows the linking of each element with each of the other. Let us explain the linkage of three major elements of educational process.

Beginning ***with objectives, the arrow pointing to learning experiences*** indicates that objectives serve as a guide for the selection or creation of learning experiences. For example, if a geometry course is aimed at developing deductive thinking abilities in learners, then learning experiences require work other than geometry content. This may include home assignment to work on newspaper editorials, advertisements and also individual projects. The point is that the nature of one's objectives will be an important determinant of the learning experiences that constitute the operational programme.

The ***arrow pointing from objectives to learner appraisal*** indicates that the primary focus of appraisal is on gathering evidence on the extent to which the objectives of the programme have been attained. Just as objectives provide specification for establishment of learning experiences, they also furnish specifications for learner appraisal. For example, the development of deductive thinking among students might require in its appraisal of learning, the evidence regarding students' proficiency to apply deductive principles to the analysis of a variety of material in life situations, which may be outside the field of geometry.

Now, ***the arrow pointing from learning experiences to learner appraisal*** is indicative of the fact that learning experiences provide examples for the development of appraisal tasks. The objectives that the students are engaged in, during the learning phase of the programme, should furnish ideas for appraisal situations. Thus, the arrow pointing from learning experiences to learner appraisal indicates that learning experiences furnish

ideas and suggestions for learner appraisal. The appraisal task may not be identical but contain an element of novelty for the learner.

The *two arrows pointing from learner appraisal to objectives and to learning experiences* are especially important. In the case of the former, the arrow signifies that appraisal procedures should furnish information about the extent to which the objectives are being attained. In addition, appraisal information can furnish valuable information that may result in the modification of some objectives and the elimination of others. The appraisal helps in providing a solution to the following questions:

- Should the objectives be modified or perhaps eliminated?
- Are the objectives realistic for the particular group of learners?
- Are the necessary references available for achieving the objectives?

The *arrow-pointing from learner appraisal to leaning experiences*, is suggestive of two important notions. First, it provides information about the extent to which learning experiences appear to be working well. Hence appraisal procedure can suggest the modification or elimination of learning experiences. A second important idea suggested by the arrow pointing from appraisal to learning experiences is that tasks, experiences and problems developed by evaluation specialist may be suggestive of new learning experiences. The incorporation of moral and imaginative appraisal materials into the learning phase of a programme has contributed significantly to the improvement of learning experiences.

The *last arrow, which points from learning experiences to objectives*, denotes that learning activities can result in encounters involving teachers, learners and learning materials which in turn may suggest new objectives.

2.3 EDUCATIONAL OBJECTIVES IN DIFFERENT DOMAINS – COGNITIVE, AFFECTIVE AND PSYCHOMOTOR

The desirable outcome of learning experience - the way individuals are to act, think or feel as a result of participating in some instructional activities, are to be subjected to a proper framework of classification. Classification of educational objectives helps (1) to view them as parts of the system (2) to increases their usability by proving clarity

about their inter- connections (3) Keep in avoiding overlapping of similar objectives in a list.

A number of models of classification of objectives have been developed. The most convincing of this has been the Taxonomical Model of Educational Objectives developed by Bloom and his associates. It has adopted a three dimensional division of Learning experiences which are classified into three domains, that is, ***Cognitive, Affective and Psychomotor. (Knowing, feeling, doing: Head, -Heart, Hand.)***

The taxonomy of educational objectives of Bloom is basically a judicious combination of educational, logical and psychological classification systems. The distinction between I different categories is educationally significant. The terms have been defined precisely in a manner in which meanings are logically consistent among themselves. The classification is consistent with the correct psychological, findings about mental processes. This classification employs a decimal enumeration system. All the three domains of Bloom are briefly described below;

Educational Objectives

Cognitive Domain *(Area of Knowing)*	**Affective Domain** *(Area of Feeling)*	**Psychomotor Domain** *(Area of Doing)*
1. Knowledge	1. Receiving	1. Imitation
2. Understanding	2. Responding	2. Manipulation
3. Application	3. Valuing	3. Precision
4. Analysis	4. Organization	4. Articulation
5. Synthesis	5. Characterization	5. Naturalization
6. Evaluation		

2.3.1 COGNITIVE DOMAIN OBJECTIVES

Knowledge

Specific ways and means of dealing with

1. *Specifics*
2. *Universal*
3. *Abstraction in a field*

Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain.

Comprehension / Understanding

- *Translation*
- *Interpretation*
- *Extrapolation*

Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (words or numbers), by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material and represent the lowest level of understanding.

Application

- *Ability to apply learning in different and new situations*

Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws. and theories. Learning outcomes in this area require a higher level of understanding that those under comprehension.

Analysis

- *Elements*
- *Relationships*

- *Organizational principles*

Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material

Synthesis

Production of a unique communication

- *Plan*
- *Proposed set of operations*
- *Derivation of a set of abstract relations*

Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan of operations (research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of new patterns or structures.

Evaluation

- *Judgments in terms of internal evidence*
- *Judgments in terms of external criteria*

Evaluation is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria. These may be internal criteria (organization) or external criteria (relevance to the purpose) and the student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all of the other categories plus value judgments based on clearly defined criteria.

2.3.2 *AFFECTIVE DOMAIN OBJECTIVES*

Receiving (attending)

- *Awareness*
- *Willingness to receive*
- *Controlled or selected attention*

Receiving refers to the student's willingness to attend to particular phenomena or stimuli (classroom activities, textbook, music, etc.) From a teaching standpoint, it is concerned with getting, holding, and directing the student's attention. Learning outcomes in this area range from the simple awareness that a thing exist to selective attention on the part of the learner. Receiving represents the lowest level of learning outcomes in the affective domain.

Responding

- *Acquiescence in responding*
- *Willingness to respond*
- *Satisfaction in response*

Responding refers to active participation on the part of the student. At this level he not only attends to a particular phenomenon but also reacts to it in some way. Learning outcomes in this area may emphasize acquiescence in responding (reads assigned material), willingness to respond (voluntarily reads beyond assignment), or satisfaction in responding (reads for pleasure or enjoyment). The higher levels of this category include those instructional objectives that are commonly classified under interest; that is, those that stress the seeking out and enjoyment of particular activities.

Valuing

- *Acceptance of a value*
- *Preference for a value*
- *Commitment*

Valuing is concerned with the worth or value a student attaches to a particular object, phenomenon, or behavior. This ranges in degree from the more simple acceptance of a value (desires to improve group skills) to the more complex level of commitment (assumes responsibility for the effective functioning of the group). Valuing is based on the internalization of a set of specified values, but clues to theses values are expressed in

the student's overt behavior. Learning outcomes in this area are concerned with behavior that is consistent and stable enough to make the value clearly identifiable. Instructional objectives that are commonly classified under *attitudes* and *appreciation* would fall into this category.

Organization

- ***Conceptualization of a value***
- ***Organization of a value system***

Organization is concerned with bringing together different values, resolving conflicts between them, and beginning the building of an internally consistent value system. Thus, the emphasis is on comparing, relating, and synthesizing values. Learning outcomes may be concerned with the conceptualization of a value (recognizes the responsibility of each individual for improving human relations) or with the organization of a value system (develops a vocational plan that satisfies his need for both economic security and social service). Instructional objectives relating to the development of a philosophy of life would fall into this category.

Characterization by a Value or Value Complex

- ***Generalized set***
- ***characterization***

At this level of the affective domain, the individual has a value system that has controlled his behavior for a sufficiently long time for him to have developed a characteristic *lifestyle*. Thus, the behavior is pervasive, consistent, and predictable. Learning outcomes at this level cover a broad range of activities, but the major emphasis is on the fact that the behavior is typical or characteristic of the student. Instructional objectives that are concerned with the student's general patterns of adjustment (personal, social, emotional) would be appropriate here.

2.3.3 PSYCHOMOTOR DOMAIN OBJECTIVES

Imitation (impulsion, overt repetition)

For the learning of a psychomotor activity, i.e. drawing or surveying skill in social studies, the task begins with the imitation of observed acts. The child observes the demonstrated behaviour related to drawing of a map outline, measurement of latitude and longitude on a globe. lie feels an inner push or an impulse (by having an inner rehearsal of the psychomotor activities) to imitate the action, It is followed by the overt repetition (imitation) of the demonstrated behaviour.

***Manipulation** (following direction, selection, fixation)*

This second category of psychomotor objectives emphasizes manipulation on the part of the learner for the acquisition of skills by following directions, performing selected action and fixation of performance through necessary practice.

***Precision** (reproduction, control)*

In the third category of psychomotor objectives, the learner is able to perform skilled acts or motor activities with a desired level of precision (accuracy. exactness and right proportion) and as such may be said to reach a higher level or refinement in reproducing a given act or skilled task.

***Articulation** (sequence, harmony)*

It is the fourth category in the hierarchy of learning the psychomotor activities or skills. At this stage, the learner becomes capable of coordinating a series of acts by establishing appropriate sequence and accomplishing harmony or internal consistency among different acts.

***Naturalization** (automatism,interiorization)*

It is the highest stage reached in terms of the development or proficiency acquired in the learning of a skill or psychomotor act. On can now perform a single act or a series of articulated acts with a greater refinement, ease and convenience as automatic and naturally as possible.

2.4 LEARNING OUTCOMES AS BEHAVIOURAL CHANGES

What occurs as a result of learning experience is termed as the **learning outcome**, while as stated desirable outcome before the students undergo a learning experience is termed as **specification.**

2.4.1 FOR COGNITIVE DOMAIN

Objectives	Illustrative General Instructional Objectives	Illustrative Verbs for Stating Specific Learning Outcomes
Knowledge	• Knows common terms • Knows specific facts • Knows methods and procedures • Knows principles	Defines, describes, identifies, labels, lists, matches, names, outlines, reproduces, selects, states
Understanding	• Understands facts and principles • . Interprets verbal material • Interprets charts and graphs • Translates verbal material to mathematical formulas • Estimates consequences implied in data • Justifies methods and procedures	Converts, defends, distinguishes, estimates, explains, extends, generalizes, gives examples, infers, paraphrases, predicts, rewrites, summarizes
Application	• Applies principles to new situations • Applies theories to practical situations • Solves mathematical problems • Constructs charts and graphs • Demonstrates correct usage of a procedure	Changes, computes, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses
Analysis	• Recognizes unstated assumptions • Recognizes logical fallacies in reasoning • Distinguishes between facts and inferences	Breaks down, diagrams, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, points out, relates, selects,

	• Evaluates the relevancy of data • Analyzes the organizational structure of a work (art, music, writing)	separates, subdivides
Systhesis	• Writes a well-organized theme • Gives a well-organized speech • Writes a creative short story (or poem) • Proposes a plan for an experiment • Integrates learning from different areas into a plan for solving a problem • Formulates a new scheme for classifying objects (or events or ideas)	Categorizes, combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells, writes
Evaluation	• Judges the consistency of written material • Judges the adequacy with which conclusions are supported by data • Judges the value of a work (art, music, writing) by use of internal criteria • Judges the value of a work (art, music, writing) by use of external standards	Appraises, compares, concludes, contrasts, criticizes, describes, discriminates, explains, interprets, justifies, relates, summarizes, supports

2.4.2 *FOR AFFECTIVE DOMAIN*

Objectives	Illustrative General Instructional Objectives	Illustrative Verbs for Stating Specific Learning Outcomes
	• Listens attentively • Shows awareness of the	Asks, chooses, describes, follows, gives, holds,

Receiving	importance of learning • Shows sensitivity to social problems • Accepts differences of race and culture • Attends closely to the classroom activities	identifies, locates, names, points to, selects, sits erect, replies, uses
Responding	• Completes assigned homework • Obeys school rules • Participates in class discussion • Completes laboratory work • Volunteers for special tasks • Shows interest in subject • Enjoys helping others	Answers, assists, complies, conforms, discusses, greets, helps, labels, performs, practices, presents, reads, recites, reports, selects, tells,
Valuing	• Demonstrates belief in the democratic process • Appreciates good literature (art or music) • Appreciates the role of science (or other subjects) in everyday life • Shows concern for the welfare of others • Demonstrates problem-solving attitude • Demonstrates commitment to social improvement	Completes, describes, differentiates, explains, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, selects, shares, studies, works
Organizing	• Recognizes the need for balance between freedom and responsibility in a democracy • Recognizes the role of systematic planning in solving problems • Accepts responsibility for own behavior • Understands and accepts	Adheres, alters, arranges, combines, compares, completes, defends, explains, generalizes, identifies, integrates, modifies, orders, organizes, prepares, relates, synthesizes

	own strengths and limitations • Formulates a life plan in harmony with abilities, interests, and beliefs	
Characterizing	• Displays safety consciousness • Demonstrates self-reliance in working independently • Practices cooperation in group activities • Uses objective approach in problem solving • Demonstrates industry and self-discipline • Maintains good health habits	Acts, discriminates, displays, influences, listens, modifies, performs, practices, proposes, qualifies, questions, revises, serves, solves, uses, verifies

2.4.3 *FOR PSYCHOMOTOR DOMAIN*

Objectives	Illustrative General Instructional Objectives	Illustrative Verbs for Stating Specific Learning Outcomes
Imitation	• the ability to carry out the basic essentials of a skill • he total act is not performed with skill, nor is timing and coordination refined • Copy action of another; observe and replicate	Copy, follow, replicate, repeat, adhere, attempt, reproduce, organize, sketch, duplicate
Manipulation	• to perform a skill independently • entire skill can preformed in sequence • Conscious effort is no longer needed to perform • the skill, but complete accuracy has not been	Re-create, build, perform, execute, implement, acquire, conduct, operate

	achieved • Reproduce activity from instruction or memory	
Precision	• the ability to perform an act accurately, efficiently, and harmoniously • Complete coordination of the skill has been acquired • skill has been internalized to such an extent that it be can be performed unconsciously • Execute skill reliably, independent of help, activity is quick, smooth, and accurate	Demonstrate, complete, show, perfect, calibrate, control, achieve, accomplish, master, refine
Articulation	• Adapt and integrate expertise to satisfy a non standard objective	Solve, adapt, combine, coordinate, revise, integrate, adapt, develop, formulate, modify, master
Naturalization	• to have high level performance become natural • Automated unconscious mastery of activity and related skills at strategic level	Construct, compose, create, design, specify, manage, invent, project-manage, originate

2.5 WRITING EDUCATIONAL OBJECTIVES

The statements of specifications or learning outcomes may run into hundreds, but with the help of taxonomies, one may classify them under a relatively small number of headings. We shall consider the following headings form the taxonomies.

2.5.1 FOR COGNITIVE DOMAIN (Knowledge, Understanding, Application, Skill)

1. Knowledge: The pupil acquires knowledge of .....

2. Understanding: The pupil develops an understanding of .....

3. Comprehension: The pupil will comprehend.....

4. Application: The pupil applies his knowledge and understating of ..... to new and unfamiliar situations.

2.5.2 FOR AFFECTIVE DOMAIN (Affect Attributes)

5. Interest: The pupil develops an interest in .....

6. Attitude: The pupil develops a positive attitude. (It may be social attitude or scientific attitude)

7. Appreciation: The pupil develops an appreciation of .....

2.5.3 FOR PYSCHOMOTOR DOMAIN (Level of Performance)

7. Skill: The pupil develops his skill in .....

This may vary from subject to subject. **For example,**

- Laboratory skills: a) Skill in the process of performance.
  b) Skill in the product of performance
- Communication skills such as conversation, reading, writing
- Computational skills
- Work skills
- Study skills, etc.

2.6 MEASURABLE AND NON-MEASURABLE LEARNING OUTCOMES

For objectives to provide a useful basis for creating test questions they must contain verbs that describe observable, measurable, achievable actions and specific levels of thinking, because these are things that can be tested. Avoid using verbs that represent

Action verbs for measurable & Non-measurable

actions or concepts that are difficult to measure – they are difficult to assess and to recognize whether the objective has been achieved.

2.6.1 MEASURABLE LEARNING OUTCOMES

Measureable objectives allow transparent and accurate assessment of whether the objective has been achieved. Objectives that cannot be measured are vague and often result in the inability to objectively assess successful learning as any attempted assessment of these usually involves a lot of subjectivity.

2.6.2 NON-MEASURABLE LEARNING OUTCOMES

Many very worthwhile goals might be non-measurable but just because some goals are not quantifiable does not automatically make them less valuable; it just makes it harder to objectively determine the level of achievement. Short answer/MCQ assessments are unlikely to be able to do this successfully.

2.6.3 EXAMPLES

MEASURABLE TERMS VS. NON-MEASURABLE TERMS

Measurable - Use words like	*Non-Measurable - Avoid words like*
Identify	Appreciate
Compare/distinguish	Be familiar with
Justify	Understand/comprehend
Demonstrate	Believe
List	Learn
Describe	Know
Explain	Be aware of
Solve	Realize the significance of
Evaluate	Have a good grasp of