UNIT 3 : INSTRUCTIONAL OBJECTIVES

Structure

3.1 INTRODUCTION

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

In our experience with pre-service and in-service teachers and other school personnel, writing objectives has been viewed both positively and negatively. Many of you probably consider the activity worthwhile, some of you may view it as another requirement of paper work, that is not particularly useful to the main tasks of teaching.

Curriculum, syllabus, text book, teaching methods, modes of evaluation - all these are based on certain theories of learning or teaching models. If we want to implement our educational plan or improve the practice of teaching/learning we should require the necessary knowledge of various theories of learning and its outcomes. The concept of instructional objectives is based on those theories. In this unit we discuss the concept of instructional objectives based on learning theories, the concept of learning outcomes, their relationship with instructional objectives for evaluating the teaching-learning process.

3.2 OBJECTIVES

After going through this unit, you should be able to:

● define instructional objectives,

● distinguish educational objectives from instructional objectives,

● describe instructional objectives in three domains — cognitive, affective and psycho-motor,

● delineate the chief characteristics of Bloom's taxonomy,

● explain the changes in instructional objectives introduced by NCERT,

● delineate the chief characteristics of the Gagne's approach,

● critically examine the applicability of Bloom's taxonomy,

● use instructional objectives in framing questions for evaluating students in your subject, and

● familiarise with Gagne's approach in evaluating learning outcomes.

3.3 EDUCATIONAL OBJECTIVES

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

An educational objective is often limited to 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 realising it, and (3) level of learning to be attempted.

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

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

i) Worthwhileness from the standpoint of society's requirements.

ii) Practicability in the light of resources.

iii) Attainability in terms of pupil's readiness and capability.

3.4 INSTRUCTIONAL OBJECTIVES

Everyday, teachers make a wide variety of instructional decisions that directly effect their students' learning. These decisions range from the choice of materials, pacing and sequencing of activities, to ways of reinforcing pupil's learning and means of assessing whatever the students have learnt. Different types of learning require different learning experiences and hence different types of objectives. Teaching students how to multiply differs from teaching

them how to predict future events from history lessons not only in the form of instruction but also in the materials used and the way outcomes are assessed.

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

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

Educational research has established the fact that achievement is enhanced in a classroom, where children can perceive a sense of direction for learning. Classroom management and teaching blend together as a unified process when instructional objectives provide goal clarity for teachers and children.

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

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

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

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

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

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

3.5 RELATIONSHIP BETWEEN EDUCATIONAL AND INSTRUCTIONAL OBJECTIVES

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

The relationship of educational goals and instructional objectives

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

2. Instructional objectives specify learning outcomes more sharply then educational goals.

3. Educational goals ordinarily reflect a synthesis of the expressed ideas and values considered to be the most desirable by society. They are usually normative. In this respect, they do not account for the variability that is encountered in a specific classroom situation. Variability in the classroom can be achieved by instructional objectives. Therefore, educational goals must be translated into instructional objectives that are relevant to the specific situation and specific subject area.

4. In the list of educational objectives sometimes we come across a large list of statements, indicating desirable areas of growth. The statement of such objectives is often very broad and global in nature. They may be realisable through a variety of curricular or co-curricular programmes and may be concerned with no particular stage of education. They may as well be applicable to the whole of the country and in other cases to the whole world. Hence they are overall, major, broad or general goals of education. They are not always amenable to evaluation. In order to make them amenable to evaluation, they would be broken into a variety of curricular activities and be converted into instructional objectives.

3.6 THE CHANGING CONCEPT OF EDUCATIONAL OBJECTIVES INTO INSTRUCTIONAL OBJECTIVES

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

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

a) derivation and statement of objectives;

b) classification of objectives;

c) definition of objectives in terms of behavioural outcomes for actual classroom practices.

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

The second category of such effort is needed for further classification and understanding of these objectives by discovering a system among them and articulating them appropriately in terms of an educational programme.

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

Check Your Progress 1

Give five differences between educational and instructional objectives.

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3.7 CLASSIFICATION OF EDUCATIONAL OBJECTIVES (TAXONOMY)

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 interconnections (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, Conginitive, 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 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;

(A) Cognitive Domain

The cognitive domain represents the intellectual component of behaviour and is the most important from the point of view of education. A variety of attempts have been made to classify mental processes.

This domain includes learning objectives which deal with recall or recognition of knowledge and development of intellectual activities and skills. This is known as the knowledge component of educational objectives.

Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation, the six categories of behaviour, are arranged from simple to complex, a continum being familiarity and production in a hierarchical way. These six categories have been further defined in terms of following more specific behaviours.

Knowledge: Specific ways and means of dealing with I) specifics, II) universal, III) abstractions in a field.

Comprehension: I) Translation, II) interpretation, III) extrapolation.

Application: Ability to apply learning in different and new situations.

Analysis: I) Elements, II) relationships, III) organizational principles.

Synthesis: Production of a unique communication, I) A plan, II) proposed set of operations, III) derivation of a set of abstract relations.

Evaluation: I) Judgements in terms of internal evidence, II) Judgements in terms of external criteria.

(B)   Affective Domain

This relates to the emotional aspect of educational objectives. Learning in the affective domain pertains to changes in interest, attitudes, values and development of appreciation and adequate adjustment. This is a higher level of learning at a different level and it has a close relationship with cognitive and behavioural changes. This relationship is operative at the instructional as well as evaluation level. Each affective behaviour has a corresponding cognitive behaviours.

The taxonomy developed by Krathwohl seems to systematise these objectives into five broad categories given as under:

1.   **Receiving (attending)**

2.   **Awareness**

    2.1   Willingness to receive

    2.2   Controlled or selected response

3.   **Responding**

    3.1   Acquiescence in responding

    3.2   Willingness to respond

    3.3   Satisfaction in response

4.   **Valuing**

    4.1   Acceptance of a value

    4.2   Preference of a value

    4.3   Commitment

5.   **Organization**

    5.1   Conceptulisation of a value

    5.2   Organisation of a value system

6.   Characterisation by a value complex

6.1   Generalised set

6.2   Characterisation

Receiving: Is the lowest or rather the most rudimentary category of affective behaviour. At this level the learner shows sensitivity to certain stimuli. It is like the teacher catching the student's attention.

Awareness: Willingness to receive and the selected nature of attention are its important sub-levels.

Responding: Acquiescence, willingness, satisfaction.

Responding, which is the next category, expects greater motivation and regularity in attention. It may also for practical considerations be described as "interest" by which we mean a tendency to respond to a particular object or stimuli.

Valuing: Acceptance of a value, preference of a value, commitment. It incites the motivation of behaviour not by deliberate desire but by "the individual's commitment to the underlying value guiding the behaviour". This objective may conveniently be called "attitude". These objectives are "prime shift from which the conscience of the individual is developed into control behaviour".

Organisation: Conceptualization of a value, Organisation of value system.

Organisation connotes a system of values or attitude. An individual's behaviour is not ordinarily motivated by a single attitude in isolation but by an 'attitude complex'. Development of one's own code of conduct or standard of public life may be an instance of the organization of a value system.

Characterisation by a value or value complex: Generalised set. Characterisation is the last of the categories, reached when an individual is consistently found behaving in accordance with the values or attitudes he has imbibed, ultimately reaching a stage when he has a consistent philosophy of life of his own and an internal compulsion to pursue it.

The taxonomy of the affective domain may not appear quite hierarchical especially in as much as one order does not completely telescope into the other as a taxonomical characteristic. Each, however is also a useful educational principle.

Psychomotor Domain (R. H. Dave's Model)

The psychomotor Domain concerns itself with levels of attainment of neuro-muscular coordination. As the level of coordination goes up, the action becomes more refined, speedy and automatic.

Dave (1971) included the following levels arranged in terms of the concept of coordination.

1.   Imitation

1.1   Impulsion

1.2   Overt repetition

2.   Manipulation

2.1   Following direction

2.2   Selection

2.3   Fixation

3.   Precision

3.1   Reproduction

3.2   Control

4.   **Articulation**

    4.1   Sequence

    4.2   Harmony

5.   **Naturalization**

    5.1   Automatism

    5.2   Interiorisation

Imitation accounts for the lowest level of psychomotor behaviour. It starts as an inner push or impulse. It is represented by "covert inner rehearsal of the muscular system", which may be taken to be more of an action at the mental level. Soon it may grow into an overt act with capacity to repeat the performance with very rudimentary coordination.

Manipulation is the next higher level of psychomotor behaviour. It involves following directions, selecting certain actions in preference to others and acting accordingly. It means the beginning of the fixation of operation and the end of initial fumbling in the manipulative actions.

Precision is the third category and is reached when reproduction of operations is carried out with speed and refinement, giving the learner the ability to control (increase, decrease or modify) his action in response to requirements.

Articulation which is the fourth category, can be said to have been attained when the learner is able to handle a number of actions in unison, keeping in view their sequence and rhythm. It involves coordination in action i.e. right sequence in right proportion of time or at the right moment.

Naturalisation which is a high level of proficiency, i.e. automatic response.

Interrelation between different domains

The tripartite division of Instructional Objectives into domains is not watertight or an exclusive one. Firstly, the achievement in one domain is to a quite appreciable degree, dependent on the other domains of learner's behaviour. For instance, understanding (comprehension) may be a prerequisite for attaching proper value to an object or proper cognition necessary for arousing proper interest. Similarly, interests and attitudes affect the quality of performance in both cognitive and psychomotor domains. Comprehension is a natural component of the precision level in the psychomotor domain and similarly interests can be traced as affective components of almost all the congitive proficiencies. Lower levels of each domain draw relatively closer to each other e.g. knowing, receiving and imitating are very much interdependent among themselves. In the higher categories too, there is discernible parallelism. A particular category of one domain, may correspond to one or more of categories of the other.

The three taxomomies would be called the CAP (Cognitive, Affective and Psychomotor) classification of objectives.

Check Your Progress 2

1) Identify three important classification of Instructional Objectives.

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ii)   Identify levels of classification of Cognitive Domain.

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3.8 NEED : WHY SHOULD AN EVALUATION WORKER TAKE PART IN THE FORMULATION OF OBJECTIVES

Evidently, the task for formulating educational objectives should be taken up while a curriculum is being framed. Teachers come into the picture later. However, instruction and evaluation go hand in hand and they cannot strictly be seperated from curriculum work. The formulation of objectives should better be a joint venture for all those who are concerned with learning activities.

Besides, evaluation as a comprehensive and interactive process should in turn help to revalue the objectives and it is here that the evaluation worker like a teacher, should be well conversant with the ways of determining the objectives. Only then, he can do justice to the reassessment of the objectives. It will help to develop proper weight into their meaning and implication, a thing of utmost importance, for knowing with definiteness as to what to evaluate. Clarity and specificity about objectives goes a long way in discovering situations which can become a spring-board for planning both the instructional activities and the evaluation material.

3.9 FUNCTIONS OF EDUCATIONAL OBJECTIVES

The formulation of educational objectives is needed for a variety of reasons.
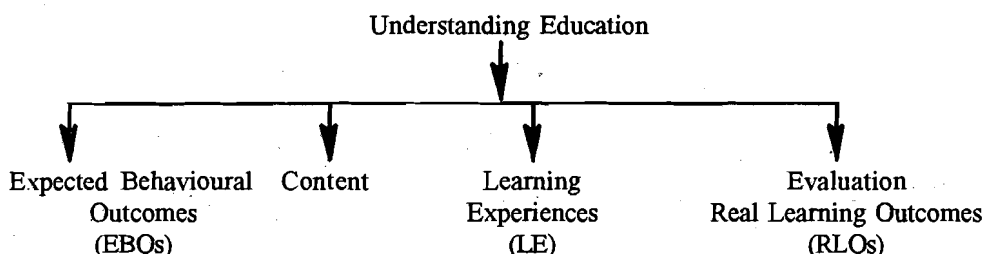
The educational objectives:

1.   provide the desired direction to educational activities;

2.   provide a basis for systematising or planning an educational programme;

3.   give unity and coherence to an educational programme;

4.   provide the basis for the measurement of growth and thus guarantee valid evaluation;

5.   help focus attention on proper attributes of teaching and evaluation;

6.   help grade learning experiences and evaluation material;

7.   guide educational decisions in curricular or co-curricular areas;

8.   guide in the selection of relevant content;

9.   guide improvements in education;

10. give meaning to and clarify the structure and content of curriculum;

11. help to make learning functional;

12.   help to make the intangibles in education tangible;

13.   help to identify weaknesses and strengths of pupils in learning;

14.   facilitate communication among educational workers.

The above functions are by themselves enough to indicate the wide variety of problems of educational objectives and the pivotal role they occupy in guiding and directing the educational process and evaluation.

3.10   RECENT CHANGES IN INSTRUCTIONAL OBJECTIVES

In 1963 and than in 1967 a vigorous movement of examination reform was initiated, developed and sustained among professionals. Everywhere around the country, the committed evaluation experts were orienting teachers and other concerns to the concept and practices of evaluation. There were also American subject-cum-education experts who were suggesting the introduction of new lesson plans having Objectives in terms of Expected Behavioural Outcome (EBOs) Learning Experiences (LE) and Evaluation in terms of Real Learning Outcomes (RLOs). The subject and pedagogy experts of NCERT skilfully observed both these exposition concepts viz-viz, NCERT objective-based evaluation and the American objective-based instruction and developed the initial curriculum scheme. The vertical American presentation got changed into the horizontal lesson plans as given below:

Understanding Education

| Expected Behavioural Outcomes (EBOs) | Content | Learning Experiences (LE) | Evaluation Real Learning Outcomes (RLOs) |

A highly sophisticated approach to instruction and evaluation was realised. This system, unlike the laboratory systems had to be evolved in order to meet the felt needs of school education, i.e., the need for improving teaching of school subjects. The questions such as what is learning? What is teaching? Is teacher meant only for teaching 'contents'? What is meant by teaching content? Does teaching necessarily mean learning? Were n't such early queries vaguely answered? What kind of evidence should be collected for assuring teaching? If learning is defined as change in behaviour in terms of whose behaviours should a given lesson plan be followed? If it is a child whose development is the ultimate goal, why than should learning not be defined in terms of pupils' behaviour and why should other activities, methods, modes, aids, media and evaluation items not be selected which relate to the pupils' behaviour. If learning is development, is it not most pertinet that it is continuously evaluated? Is there only one level of learning usually defined as 'achievement', or is it a complex phenomenon which requires scientific and systematic analysis? If learning is a process, how can it be linked with products?

Bloom and some of his associates, on the invitation of the Government of India, visited India and conducted intensive seminars/workshops to orient their Indian counterparts in new techniques of evaluation for reforming the examination system. The evaluation unit of NCERT made commondable efforts to reform the structure of our examinations during the year 1960-70.

The Bloom system, the NCERT version of the Bloom system, led to the horizontal approach to lesson planning by the Regional College of Education, Mysore (RCEM). The educational staff of RCEM started developing and experimenting with instructional and evaluation material. A question was raised at the time, "whether educators are evaluating product which is not purposefully developed and probably might not have been developed." It was argued that it would not only be unjustifiable to evaluate what is not purposefully developed but would also be futile. Thus an attempt was made to shift the focus from product to process and

an integrated lesson plan was developed. In this lesson plan, Expected Behavioural Outcomes (EBOs) are to be realised through teaching learning experience (LE) by a given content of the syllabus. This content is further to be evaluated simultaneously. This is termed as Real Learning Outcomes (RLOs).

The difference among approaches of Bloom, the NCERT and the RCEM

The Bloom system classified the objectives of learning (cognitive domain) into six categories i.e., knowledge (K), Comprehension (C), Application (A), Analysis (ANA), Synthesis (S) and Evaluation (E). It assumes the following hierarchy.

$$K$$

$$K < C$$

$$K < C < A$$

$$K < C < A < ANA$$

$$K < C < A < ANA < S$$

$$K < C < A < ANA < S < E$$

Many times evaluation experts failed to convince the critics about the exclusiveness of the classifications, as the themselves were putting the same items into two or three categories at the same time. There was also confusion regarding the term used for learning outcomes (specifications). RCEM faculty cleared this confusion and developed support among them regarding the system. Then this system was consolidated, standardised and rigorously and empirically tested. The team experts finally evolved the following 14 Expected Behavioural Outcomes (EBOs). They also arranged them for the first time in a specific hierarchical order, on an adhoc basis.

The Scheme showing the total Hierarchy with respect to EBOs and Behavioural Hierarchies within each Objective is given below:

Instructional Objectives and Expected Behavioural Outcomes (EBOs)

KNOWLEDGE

1. Recognition
2. Recall*

UNDERSTANDING

3. Seeing Relationships
4. Citing
5. Discrimination
6. Classification
7. Interpretation
8. Verification
9. Generalisation

APPLICATION

10. Reasoning
11. Formulating Hypothesis
12. Establishing Hypothesis
13. Inference
14. Prediction

Knowledge, understanding and application are broad Instructional Objectives.

Recognition, Recall, Seeing, Relationship, Citing examples, Discrimination, Classification, Interpretation, Verification, Reasoning, Formulating Hypothesis, Establishing Hypothesis, Inference and Prediction are the expected behavioural outcomes or mental Processes which are essentially related to the subject matter aspect of a lesson. For example, when a pencil/ pen is shown to the pupil and is asked what it is, the answer is "Pen/Pencil", by recognition of the object. Similarly, when we ask what is the difference between Pen and Pencil, The answer or expected behaviour outcomes is that there is an ink in a Pen and lead in the Pencil and so on and so forth. There can be any differences based on the mental processes.

Knowledge level is more or less based on a basic mental process of memory i.e., recall. This is essentially related to the subject matter aspect of an objective. For example, the recall of a specific term, a method or a principle, seems to be directly related to a specific content.

Objectives are classified as general and specific. Both of them are in vogue but a distinction is made here. The example of 'recall' under knowledge can very well explain this distinction. The former being specific and thus prone to direct measurement and the latter is a more comprehensive term. Specific objectives are usually stated in terms of BEHAVIOUR and labelled differently in different systems.

Expected Behavioural Outcomes (EBOs), Learning Outcomes: Attention needs to be drawn to the fact that originally there was a reference to implied mental processes or specific objectives which are some times referred to as abilities or skills. For example, the knowledge objective emphasised most the psychological process of remembering. In the same way, several examples such as interpretation, forming hypothesis, prediction, judging can be found, thereby supporting implicitness of mental processes. Thus educational objectives state both, what behaviour is intended to be developed (curricular aspect) and what actual behaviour is developed and tested (evaluation aspect).

3.11 USEFULNESS OF THE TAXONOMICAL CLASSIFICATION

The usefulness of the taxonomical classification of instructional objectives is often disputed. It, therefore, appears necessary at this place to summarise some of the uses to which it can be put, particularly for testing your students.

1. Since categories in the Taxonomy are arranged on the principle of graded complexity, the scheme is very useful in identifying the meaningful level at which the learner is working.

2. The techniques and tools of assessment can be relevently decided upon and developed. Their categorization becomes easy and clear.

3. It will be helpful in translating into practice the principal of comprehensiveness of evaluation by ensuring proper coverage of various aspects of pupils' growth.

4. The examination of the evaluation devices in terms of their validity will be facilitated.

5. The evaluation may prove to be very helpful in arriving at a meaningful synthesis of the various dimensions of a pupil's growth. Identification of areas of interrelationship among the three domains may be of particular significance in this regard.

6. The logical nature of categorisation helps in identifying and grading teaching-learning situations which can be an important source of selecting proper testing situations too.

7. Curriculum development and preparation of Instructional material should profit from such a scheme of classification in many ways. Preparation and analysis of textbooks based on well defined objectives many prove to be a big improvement.

8. The classification through its well defined criteria "will provide a bridge for further communication among teachers, between teachers and evaluators, curriculum and research workers, psychologists and other behavioural scientists".

9. The taxonomy has also opened new avenues for research in education. To name a few, the re-evaluation of objectives should be the immediate reaction, such as finding out the relationship between different domains, categories and sub-categories. Empirical validation of the Taxonomies besides being a worthy area of research in its own way, will open new vistas of work. The problems of retentivity and recession in learning different objectives may be an equally fruitful project. Teachers may also be motivated to undertake experimentation on objective-based teaching and testing. The scope is likely to become more wide and varied in due course of time.

As regards the objectives of the congnitive domain, they have been limited to the first three of the steps of Bloom's Taxonomy, viz. Knowledge, Understanding and Application with analysis, synthesis and evaluation compressed into creativity as the 4th step. This has been done because the average teacher is likely to find it difficult to discriminate between them and consequently to tackle them, for the purpose of teaching.

The objectives of the affective domain have also been condensed. They have firstly not been just limited to 'interests' and 'attitudes' which are commonly understood.

The objectives of the psychomotor domain have been reduced to the muscular skills related to the subjects of study. Basically, these require the abilities of 'precision', 'precaution' and 'proportion' needed in doing experiments, drawing sketches and diagrams, pursuing performing arts, etc.

Check Your Progress 3

Give the format of the horizontal approach to Lesson Planning.

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3.12 PRINCIPLES FOR THE STATEMENT OF INSTRUCTIONAL OBJECTIVES

Some of the basic principles to be kept in view while stating instructional objectives, after they have been derived are:

1. The statement of an objective should include both (a) the kind of behavioural outcome expected and (b) the content. The former is sometimes called competence or modification part. The term modification implies that it is at the level of the individual's behaviour that the change occurs as a result of learning. Content on the other hand is the medium for the realisation of the desired behaviour. It does not acquire any direction unless it is harnessed to mental processes. It is the question of activising a product through the application of processes, using various communication symbols. For example, "Summer monsoon", is just an item of knowledge but educationally it becomes meaningful only when we say 'the pupil explains the causes of the reversal of wind movement during the monsoon season'.

2. An objective should be conceived and stated in terms of pupil's Expected Behavioural Outcomes.

3. Objectives should be worked out at the right level of generality (specificity) so as to be neither so vague nor so specific as to be non-functional. Complex or compound objectives need particular attention in this respect.

4. Objectives should be stated non-compositely, so as to avoid confusion, repetition and contradiction.

5. Objectives in a list should not overlap. It may be helpful to group together similar objectives.

6. Objectives should be so stated that there is a clear indication and even distinction among learning situations required for realising different behaviour changes. For example, learning situations for memorizing certain facts would be basically different from the ones needed for developing critical thinking.

7. Objectives need to be conceived in terms of continuity of growth over a period. They should essentially be developmental in their purpose.

8. Worthwhileness of objectives should be carefully judged from various points of view including their social acceptability.

9. Objectives should be realistic. They should be attainable through available or procurable resources and testable through available or manipulative tools.

10. The list of objectives as a whole should be comprehensive enough to cover different outcomes expected of an educational programme in the cognitive, affective and the psychomotor domains.

Check Your Progress 4

Identify Expected Behavioural Outcomes in three levels of cognitive domain.

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GUIDELINES TO FORMULATE THE OBJECTIVES FOR CLASSROOM ASSESSMENT

INSTRUCTIONAL OBJECTIVES AND BEHAVIOURAL TERMS FOR THE COGNITIVE DOMAIN OF THE TAXONOMY

Illustrative General Instructional Objectives.	Illustrative Behavioural Terms for Stating Specific Learning Outcomes.
Knows common terms	Defines, describes, identifies
Knows specific facts	labels, lists, matches, names,
Knows methods and Procedures	outlines, reproduces, selects,
Knows basic concepts	states.
knows principles.	

Understands facts and principles, Interprets verbal material. Interprets charts and graphs. Translates verbal material to mathematical formulas. Estimates future consequences implied in Data, Justifies methods and procedures.	Converts, defends, distinguishes, estimates, explains, extents, tends, generalizes, gives examples, infers, paraphrases, predicts, prepares, rewrites, summarizes.
Applies concepts and principles to new situations, Solves mathematical problems, Constructs charts and graphs, Demonstrates correct usage of a method of procedure.	Changes, computes, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses.
Recognizes unstated assumptions. Recognises logical fallacies in reasoning. Distinguishes between facts and inferences. Evaluates the relevance of data. Analyses the organizational structure of a work (art, music, writing).	Breaks down, differentiates, discriminates, illustrates, distinguishes, identifies, infers, outlines, points out, relates, selects, separates.
Writes a well organized theme. Gives a well organized speech. Writes creative short story (or poem, or music).	Categorizes, combines, compiles, composes, creates, divices, designs, explains, generates, modifies, organizes plans, rearranges, reconstructs, relates, reorganizes.

3.13 GAGNE'S VIEWS ON LEARNING

Robert M. Gagne's is a prominent educational psychologist whose 'conditions of learning' are generally employed to explain the teaching-learning process. He identifies the factors that account for the complex nature of human learning. His views are often used to underpin the mechanistic instructional technology that is associated with behaviour modification and 'performance or competency based education'.

For Gagne 'learning is a change in human capability, which can be retained, and which is. not simply ascribable to the process of growth'. According to him, learning is a process that takes place inside an individual's brain (comparable to the organic processes such as digestion and respiration). The most important aspects of a learner are 'his senses, his central nervous system, and his muscles'.

Gagne combines a basic behaviourist position with elements of cognitive thought and builds a hierarchical model of the different types of learning. Gagne shows the way in which a unifying theory may be able to explain how different kinds of learning, relate to consistent explanations for all types of learning.

Gagne puts forward a set of psychological principles of learning. For example, learners learn best when information is presented in logical sequences consisting of short units with a clear framework.

Conditions of learning

Gagne distinguishes eight conditions of learning or learning types or varieties of learning, beginning with the simple forms and ending with the complex ones. Although Gagne refers to these conditions as learning types, he is primarily interested in the observable behaviour and performance which are the products of each condition.

Here, we shall give a brief description of the types of learning Gagne talks about.

Types/Varieties/Conditions of Learning	Brief Description
1. Signal learning	The individual acquires a conditioned response to a given signal; the learning is involuntary.
2. Stimulus response	The individual makes a response to specific stimuli: the desired response is rewarded.
3. Chaining	Two or more previously learned stimulus response connections are linked together.
4. Verbal association	Chains that are verbal e.g. a child identifies an object and calls it by its proper name - (e.g. 'the red ball') or he finds a Hindi equivalent for an English word.
5. Multiple discrimination	The learner learns to distinguish between motor and verbal chains he has already acquired.
6. Concept learning	A common response to a class of stimuli: in learning a concept the learner responds to stimuli by identifying its abstract characteristics like shape, colour, etc.
7. Rule learning	In learning a rule one relates two or more concepts. For example, the water will boil at 100 °C. Hence, temperature and boiling point are concepts.
8. Problem solving	The learner uses the rules learned to achieve some goals; problem-solving is the combined product of two or more lower-order rules; it thus requires internal events (thinking).

Phases of learning

Gagne has identified nine phases of cognitive processing that are essential to learning and which need to be executed in a sequential order. The phases of learning are the typical series of external and internal events that constitute a single learning act. The internal conditions of learning include two factors — a learner's psychological states and cognitive processes required for learning. The internal processes may be influenced by external events in the form of environmental situation.

For the purpose of clarity they are categorised as:

1. Motivation 2. Apprehension 3. Acquisition 4. Retention 5. Recall
6. Generalisation 7. Performance 8. Feedback 9. Transfer of Learning.

Varieties of learning or Categories of human capabilities as the outcome of learning.

Gagne identifies five categories or varieties of human capabilities as the outcome of learning. They are: verbal information, intellectual skills, motor skills, attitudes, and cognitive strategies. Each type of learning is acquired in different ways, i.e. each requires a different set of prerequisite skills and a different set of cognitive processes (i.e. internal conditions of learning). Gagne accepts that environmental stimuli (i.e. external conditions of learning) are required to support the learner's cognitive processes during learning. Let us discuss briefly the four categories mentioned above by Gagne.

1. **Verbal information:** It consists of a student's merely stating the desired information.

2. **Intellectual skills** are the most important skills involving the mental operations. They include: conceptualisation of environment; discriminating between things; understanding concepts; seeing relationships between things. Reading, writing and handling of numbers are the other abilities which also fall under this category. These abilities range from the simple to the complex.

3. **Motor skills:** Motor skills are psysical skills. These include performing a sequence of physical movements such as driving a car or playing a musical instrument.

4. **Cognitive strategies:** Cognitive strategies include learner's thinking, remembering and learning the procedures we use for ordering and processing information internally. They are learned over a long period. They are special kind of intellectual skills that pertain to the behaviour of a learner, these are the internally organised capabilities that a learner employs including his process of attending, learning, remembering and thinking.

   They determine our predisposition to positive and negative responses towards an object. Our attitudes strongly affect our motivation for learning. They refer to the internal states of an organism that influence their actions towards certain classes of things, persons or events.

Check Your Progress 5

i)   Describe Phases of Learning by Gagne.

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ii)   Briefly enumerate the conditions of Learning.

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Educational implications of Gagne's theory of learning

We present here three broad educational implications of Gagne's theory of learning.

i)   **Prerequisite behaviour:** Gagne advocated that processes of learning move from the simple to the complex. The learner has to develop prerequisite capabilities before he/she acquires new terminal behaviour. Thus, the use of hierarchy of learning and task analysis is an integral part of instructional activities.

ii)   **Learners' characteristics:** Learners' individual differences, readiness and motivation to learn are the important issues to be considered before designing instructional activities.

iii) **Cognitive process and instructions:** Transfer of learning, students' self-management skills, and teaching students the skills of problem-solving are integral parts of implicit conditions of learning applicable to instruction. The skill of learning 'how to learn' should be developed in the learner. The emphasis should be on the individuality of the learner.

A teacher, according to Gagne is a designer and manager of instruction and an evaluator of student learning. To him, a process of instruction means, on the part of teachers, proper conditions of learning that are external to the learner. Those conditions include the teachers' communication with students about conveying to them the target of learning i.e. what they are expected to learn, informing them of what they already know, directing their attention and actions as well as guiding them to think along certain specific lines.

The following conditions are to be taken care of in planning your objectives.

1. They relate directly to the students in your classroom.

2. They are attainable by the students in your classes.

3. They are meaningful in terms of content, skills, abilities, attitudes and values to be developed.

4. They are specific enough to guide

    a) end of year assessment and evaluation.
        (terminal instructional objectives)

    b) lessons and activities including on-going assessment.
        (short-term instructional objectives)

5. They can be understood by others who can assist with suggestions on implementation and assessment.

6. To influence the process of learning, a teacher works on: i) stimulation of recall of previously learnt capabilities, ii) direct presentation of appropriate stimuli, iii) the activation of desired mental sets of learners and iv) the provision of feedback. These are known as the four most general components of instruction at the command of a teacher.

7. Gagne's concept of teaching-learning leads to the development of capabilities in the learners. The process of teaching-learning results in behaviour modification.

3.14 LET US SUM UP

We have discussed the importance, need and significance of writing objectives, especially instructional objectives, as a part of teaching-learning and evaluation. We have tried to differentiate between educational objectives as general and particular educational objectives as normative long termed and instructional objectives as immediate, observable, attainable, expected behavioural outcomes.

Further the classification of objectives has been discussed. In this regard taxonomical classification of instructional objectives into three domains of behaviour by Bloom and his associates has been discussed. The interrelationship among different domains has been made very clear for your understanding. The importance of cognitive domains in evaluation, the recent changes in instructional objectives by the NCERT and RCE Mysore, the usefulness of this classification in preparing items for evaluation have been discussed in detail.
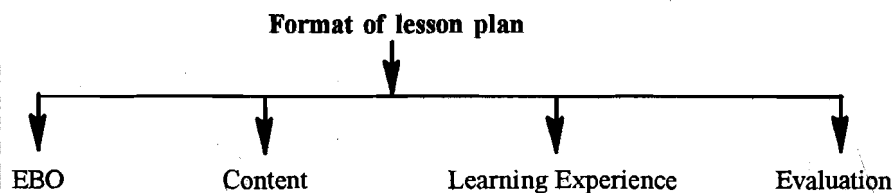
Gagne's view of learning and evaluation has further been discussed for more clarification in the context of evaluation. This is helpful for formulation of instructional objectives for evaluation. Pre-requisite behaviour, learners' characteristics and cognitive processes in instruction and evaluation are helpful for teachers for evaluating learning outcomes of their schools.

3.15   UNIT-END EXERCISES

1.   What is the basic difference between educational and instructional objectives? Give at least five points.

2.   Identify three important classifications of instructional objectives.

3.   Identify the levels of classification of cognitive domain.

4.   Give five points of difference between Bloom and Gagne.

5.   What is the role of psychomotor domain in learning?

6.   Identify three important educational implications of instructional objectives in evaluation.

7.   Imagine at least three different learning situations where the needs of three domain of learning should be met for successful learning and evaluation.

8.   Give five action verbs for each classification of cognitive domain for formulating questions in your subject area.

3.16   ANSWERS TO CHECK YOUR PROGRESS

1.   i)   Educational Objectives are generalised outcomes whereas Instructional Objectives are specific.

   ii)   Educational goals are to be realised over an extended period of time, whereas instructional objectives have an immediate intent.

   iii)   Instructional Objectives specify the learning outcomes more sharply than Educational Objectives.

   iv)   Educational Objectives are normative, whereas Instructional Objectives are immediately related with the content.

   v)   Educational Objectives are not always amenable to evaluation whereas Instructional Objectives are.

2   i)   Three important classification of Instructional Objectives are the three domains i.e., Cognitive, Conative and Affective.

   ii)   Levels of Classification of cognitive domain are Knowledge, Understanding, Application, Analysis, Synthesis and Judgement.

Format of lesson plan

| EBO | Content | Learning Experience | Evaluation |

4.   The Expected Behavioural Outcomes in first three levels are:

   i)   Knowledge — Recognition, Recall.

   ii)   Understanding — Seeing Relationship, Citing examples, Discrimination, Classification, Interpretation, Verification, Generalisation.

   iii)   Application — Reasoning, Formulating hypothesis, Establishing hypothesis, Inference and Predicition.

5. i) Phases of Learning are — Motivation, Apprehension, Acquisition, Retention, Recall, Generalisation, Performance, Feedback and Transfer of Learning.

ii) Conditions of Learning are — Signal Learning, Stimulus - Response Learning, Chaining, Verbal Association, Multiple discrimination, Concept Learning, Rule learning, Problem solving.

3.17 SUGGESTED READINGS

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