UNIT 6 INSTRUCTIONAL OBJECTIVES

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6.1 INTRODUCTION

You have studied the systems approach in Unit 5. You have also studied the meaning of systems approach in instruction. You have also studied the importance of the systems approach in effective teaching-learning process. In this unit we shall discuss the meaning of objectives; their strengths and limitations. You will also study the differences between aims and objectives. We shall discuss the classes of instructional objectives and their validity. We shall also elaborate the role of instructional objectives in making the teaching-learning process more effective. The emphasis in this entire unit shall be on the role of the instructional objectives as a component of systematic instructional process. The term objective has been mentioned in all the units of this course that you have gone through so far. You will be told about objectives in ES-332 also wherein emphasis has been given on the role of objectives in evaluating the performance of the students while in this unit we shall discuss the role of objectives in designing effective instruction.

6.2 OBJECTIVES

After going through this unit you should be able to:

- differentiate between aims, objectives, instructional objectives and behavioural objectives;
- discuss the strengths and weaknesses of objectives;
- classify and discuss the validity of the objectives; and
- discuss the role of objectives in systematic instruction.

6.3 INSTRUCTIONAL OBJECTIVES: BASICS

The term objectives is popularly used in all sphere of life. Before organising any activity or process (for example, organising the teaching-learning process) we have to have a clear idea about where it will lead us. We should know, in the context of this discussion, what destination (the goal, aim, objective, outcome, end-point or terminal behaviour) the student is supposed to reach through the teaching-learning process. We, as teachers or as the organisers of teaching-learning activities, should know the concept, need and role of instructional objectives. At the same time we should be clear in our thinking about the limitations or weaknesses of instructional objectives. This will help us organise the teaching-learning activities more effectively.
6.3.1 Aims, Objectives and Instructional Objectives

In this sub-section we shall explain various terms used in this course in general and in this unit in particular. These expressions are 'aims', 'objectives', 'instructional objectives' and 'behavioural objectives'.

**Aims:** We use the term ‘aims’ to mean the broad goals which our educational system (the whole of the Indian society involved) embraces and which you are expected to attain. The aims of education are based on philosophical and socio-psychological aspects of society and culture. The following examples of aims of education will help you understand the concept better.

- Education to develop patriotism and good citizenship;
- Education for moral, ethical and spiritual values;
- Education to fulfil the vocational needs of the individual and society;
- Education for leisure-time activities such as music, dancing, gardening, reading, hobbies, etc.;
- Education for improved health knowledge (physical and mental) and practices;
- Special education for the disabled.

The central purpose which any educational system must be oriented to accomplish concerns related to its traditional tasks and also the new roles that are emphasised by recent changes in the world.

Educational aims are broad and also hold good for the various educational systems (related to school as well as other agencies). The aims in fact express the expectations of the society that should be achieved by the students through the educational system.

We expect from the school as well as other agencies to help students in

- building up their personality and character so that they can take their rightful place in the mainstream of the nation;
- assimilating vocationally and socially desirable knowledge and skills;
- developing ability to think critically and creatively;
- developing healthy scientific attitudes towards problems and people; and
- motivating them to act according to worthy ideals in the service of community and the nation.

**Objectives:** Objectives are the milestones to reach the destination i.e. to attain the aim or ultimate goal of education. Objectives are specific, direct and practical in nature, objectives are related to the learning outcomes or change in the behaviour of the students. The objectives are meant for both the teacher and the students. Even at the planning stage i.e. before entering the classroom the teacher asks himself, “What changes in behaviour of the students can I bring about through this lesson”? Such changes constitute his (teacher’s) educational objectives.

An objective is thus

- a point or an end-view of something towards which action is directed;
- a planned change sought through an activity;
- what we set out to do.

Educational objectives, therefore, consist of the changes we wish to produce in the child. The changes that take place through education can be represented in:

- the knowledge children acquire (knowledge);
- the skills and abilities children attain (skill);
- the interests children develop (interest); and
- the attitude children manifest (attitude).

If education imparted to a student is effective, he will ‘behave’ differently from the way he did before he came to the school. The student would know something about which he was ignorant earlier. He would understand something which he did not understand before. He can solve problems which he could not solve before. He favourably revises his attitudes towards things. Education is thus the process of bringing about changes in the behaviour of the students in
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- what they know (Knowledge extends)
- how they think (Process of thinking changes)
- how they feel (Process of feeling changes)
- how they work (Methods of working change)

Instructional objectives: There can be two types of objectives as far as the instructional process is concerned. These are

- instructional objectives, and
- behavioural objectives

The objectives of teachers and students are called instructional objectives. In this context, an objective is a statement of a measurable learning that is intended to take place as a result of instruction. Instructional objectives are derived from the terminal behaviours the students are expected to display as a consequence of receiving instruction. Thus, instructional objectives are part of the terminal behaviours. But you will find that these terms are quite often used interchangeably. The teacher is accountable for the achievement of instructional objectives.

Instructional objectives are classroom objectives, unique to each course, subject, or teaching point. These instructional objectives should be so planned that they are consistent with the educational aims. Instructional objectives are set according to the level of the students in a particular class and adopted to the classroom situation. They are formulated in such a way that they are concrete and tangible. The objectives should involve information, skills, attitudes, and interests that could be developed through a particular topic or subject taken up in classroom. For example, "to enable the students to develop skill in finding topics in reference books", or "to help him/her know how to dig a compost pit in a village" are quite acceptable instructional objectives.

Instructional objectives thus relate and contribute to the total educational process. Educational aims are indirect, not immediately achievable, while instructional objectives are direct, specific, and functional and are directly achievable in classroom within a period or couple of periods. According to Dececco and Crawford (1974) instructional objectives for teachers are narrower in scope than educational objectives. Instructional objectives guide the teacher in the selection, emphasis, and omission of subject matter, materials and activities while preparing lesson plan and classifying instruction.

Check Your Progress 1
Notes: a) Write your answer in the space given below.
     b) Compare your answer with the one given at the end of the unit.

Define instructional objectives.

Behavioural objectives: In the preceding discussion you have studied that instructional objectives are derived from learning outcomes. Thus, instructional objectives can be stated by identifying the product of instruction in terms of observable performance. These outcomes have been referred to as behavioural objectives or terminal performances. Thus, when we formulate instructional objectives for students we have to ensure that they are observable or measurable.

An instructional objective certainly tells us about the change(s) we propose to bring about in the student but it will be still clearer if we isolate the critical aspects of a particular change. Statements of objectives in terms of the change in the behaviour of the students are called behavioural objectives. Instructional objectives can be transformed into behavioural objectives.
Here is an example of an instructional objective:

"To develop in the student a sense of civic responsibility".

This objective acquires concreteness, clarity and meaning when we get answers to the following questions:

- What does a person who has a sense of civic responsibility usually do?
- What does a person who has a sense of civic responsibility usually not do?
- What kinds of behaviour distinguish one who has a sense of civic responsibility from one who lacks a sense of civic responsibility?

An objective, when it is defined in terms of student's behaviour, becomes tangible and capable of attainment. It is clear from the above illustration that a clearly formulated objective has two dimensions: one deals with the behaviour and the other deals with the content area in which the behaviour operates.

We have discussed the concept of instructional objectives. The important terms used in this unit have also been discussed.

Now we shall discuss the basics of instructional objectives, but before that you should check your progress.

Check Your Progress 2
Notes:  
(a) Write your answer in the space given below.
(b) Compare your answer with the one given at the end of the unit.

Differentiate between instructional objectives and behavioural objectives.

6.3.2 Why Objectives?

As a matter of fact, the objectives are meant to help us bring about changes in the individual in the desired direction. The achievement of objectives enables the individual to perform certain tasks, develop certain understandings, sustain thinking processes, develop attitudes, add to his stock of knowledge, etc., and thus to lead a happy, productive and socially acceptable life. The question now arises. "How are these objectives responsible for bringing about the required change in the life of an individual"? The answer to this question is presented as follows. The objectives

- provide desired direction to an educational activity;
- distinguish between various aspects of learning;
- focus attention on proper attributes of learning activity;
- determine the nature of an educational activity;
- provide a basis for systematizing or planning an educational programme;
- decide emphasis on educational activity;
- help arrange learning experiences and also evaluation material;
- guide educational decisions — curricular and co-curricular;
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- guide the selection of relevant content;
- give meaning and clarify to the curriculum;
- make learning functional;
- articulate learning at various levels;
- help discover proper learning situations/context;
- fix priorities in an educational programme;
- help identify weaknesses and strengths in the learning process;
- provide a basis for measurement of growth and development of the child;
- guarantee valid evaluation and curriculum;
- help make educational experiences tangible; and
- define the educational process in totality.

The above are some of the reasons why we need educational objectives. We can categorise all the above mentioned reasons into three groups. In other words there are three main advantages of instructional objectives. These are:

First, instructional objectives in behavioural terms help plan instruction. The objectives tell us where we are going i.e. what the students will be able to know or do at the end of instruction. Proper statement of objectives will help the teacher plan the steps or procedure to reach the terminal outcomes/behaviours. Thus there is a relationship between instructional objectives and instructional procedures.

Second, the instructional objectives help design performance assessment procedures and help in test construction and curriculum evaluation (refer to Unit 4 Block 1). The assessment of student performance reveals the gap between the expected outcomes and achieved outcomes.

Third, explicit statement of instructional objectives will help the students know what they are supposed to learn or do after an instructional task. The students can direct their energy and time resources accordingly. The students will also know in advance the areas of knowledge, attitudes or skills on which they will be tested.

We should remember that just writing objectives in behavioural terms does not serve the purpose unless you also know how to achieve them. Some experts or administrators may suggest you various short-cuts (routes) to reach the undertaken objectives but you may end up nowhere. You therefore should know the systematic way for evaluation/assessment of objectives.

6.3.3 Sources of Objectives

Now we will make an attempt to discover the sources for the formulation of objectives. All of us agree that the objectives should be formulated on solid philosophical, psychological, sociological and scientific footings. The utility, appropriateness, practicability and timeliness of the objectives should always be considered. At the same time, we cannot impose any strict limits to the variety of sources. Society, individual and nature of knowledge can be considered to cover most of the areas, if not all. Religion, philosophy or life experiences, for example, may also be used as sources of objectives in their own right. These and many such others can either be considered separately or as part of any of the first three major ones (viz. society, individual and nature of knowledge) mentioned above. All the three can however be accommodated under society. We are of the opinion that the sources should be viewed from the point of view of practicability and relative usefulness of the objectives.

Let us discuss all the three major sources of formulation of objectives.

Society: We can not fail to recognise that objectives of education in the broad sense are determined by society at the local (community) as well as the national level. For instance, there may be such needs as preserving and transmitting cultural heritage, inculcating the democratic values of life and supporting and enhancing the impact of science and technology and other innovations. Social needs are essentially taken into consideration while planning to develop certain competences and qualities in members of society both to develop it (i.e. society) and also to survive in it.
### Individual

We have already seen that though society determines the basic requirements of education, it is the individual whose needs are reflected through the society. In addition, there are certain specific needs of the individuals. These needs may be grouped as self-development or self-fulfilment. For example, self-development encompasses physical and psychological growth of the students. Psychological growth in turn consists of thinking (cognitive), feeling/attitudes (affective) and doing (psychomotor) aspects. Various theories of learning have tried to explain the process and sequence of growth in the child. Needless to say, psychology of learning is helpful in choosing, grading and sequencing objectives to suit the individual growth. These aspects of human growth will be considered while determining educational objectives. Some educators believe that an individual has some spiritual needs too. It will, therefore, be desirable to provide him some opportunity to fulfill these spiritual needs too.

### Nature of knowledge

It is education that differentiates between human beings and animals. One may say that human beings are cultured and civilized animals. We know that knowledge is the most important condition to growth of civilization; in the absence of knowledge, there cannot be any growth of civilization. Knowledge has its own categories such as facts, processes, basic ideas, concepts, thought systems, etc. Its classification and organisation into systems is known as disciplines or subjects. Hence we should know that the nature of knowledge (i.e. subject matter) is one of the most important consideration in formulating educational objectives. This is so because different disciplines (i.e. subjects) have different bearing on the learning process. Therefore, in formulating the objectives, the nature of knowledge should be given due importance.

Fig. 6.1 provides a clear presentation of the three sources of objectives i.e. society, individual and nature of knowledge.

### 6.3.4 Criticism of Objectives

You have already seen that there are undisputable gains in using objectives. Education without objectives can be compared to sailing in a rudderless boat. Hence one cannot think of education without objectives. In spite of such an important role of objectives in the education process, there are, however, some difficulties in using the objectives. A practical difficulty in the use of behavioural objectives relates to analysis and statement of behaviours which is a quite lengthy and difficult process. For complex content, it is difficult to formulate objectives in behavioural
terms. For example, you cannot define a creative response in behavioural terms because the particular creative behaviours to be developed can not be easily identified. The statement of objectives in behavioural terms is further criticised because of the following limitations:

- First, we know that there are varied sources for developing the objectives. These sources are not static. Since society is changing day by day, its needs and expectations are also changing. An individual’s interests, needs, age level, mental age level and the subject matter, its nature and its relevance there are a number of factors responsible for developing objectives e.g. calculative ability is now completely replaced by very simple calculators.

- Second, the method of formulation of objectives also differs from individual to individual. There is no single procedure for the formulation of objectives used by all the class, e.g. interests of individual, age and maturity.

- Third, even though we consider the change in behaviour of an individual the end-product of these objectives, these end-points are different for different students, not only in amount but also in type.

- Fourth, quite often the objectives are vague and overlapping while it is claimed that these are hierarchical in nature. There is no definite cut off point where an objective may end and the next objective begins, e.g. knowledge and understanding, no cutting point between the two.

- Fifth, it is very difficult to frame curricula in accordance with the objectives. Because, for example, it is very difficult to give limits and boundaries to any trait such as Truth, Goodness, Beauty, Honesty, Intelligence, etc. While the objective is to achieve these traits, it is a very difficult task.

- Sixth, the evaluation part i.e. to frame the objective-based test items is also a difficult task. It is a fact that test items based on knowledge (recall or recognitive) are very easy to frame but items based on evaluation, originality of thoughts and ability to imagine or ability for abstract thinking are difficult to frame.

For example:

- What is an atom? Easy to frame
  What is fission or fusion? Difficult to frame

- What is Archimedes’s principle? Easy to frame
  Why does a sports man take dive into water head first and not feet first? Difficult to frame.

With sufficient practice, experience and familiarity with the process of curriculum construction, one can overcome these difficulties to a considerable extent. The experts opinion can be a way that casts the final judgement regarding the relevance in the objectives, curriculum and testing. Though it is very difficult to obtain entirely valid data related to human behaviour, it will nevertheless be a great shortcoming not to use the objectives in preparing curriculum, designing instruction and testing materials and students.
6.4 CLASSES OF OBJECTIVES

By stating the objectives we describe and analyse the tasks we expect the student to perform. Once we have made proper statement of objectives (task description), we can analyse these objectives by fitting them into various classes of behaviour or objectives. The classification and analysis of objectives help teachers in selecting appropriate teaching strategies and formulating the objectives of teaching. Bloom and his associates developed a method of classifying educational objectives through a process called “task analysis”. Most teachers and researchers have adopted Bloom’s classification of educational objectives. Bloom and his associates (1956) prepared a taxonomy of educational objectives. (The word taxonomy has been borrowed from Botany where it is used for a scheme of classification of plants and their parts.) Bloom’s taxonomy of educational objectives has four bases:

- **Educational base:** The educational base means that Bloom developed his taxonomy in the field of education.
- **Logical base:** The logical base means that categorization of objectives is based on logic or reasoning.
- **Psychological base:** The psychological base means that Bloom has considered the needs and capabilities of the individual i.e. the child in this case.
- **Cumulative base:** The cumulative base means that the categories are hierarchical in nature. Each category of objectives is based on and includes the preceding category/categories. For examples.
  - If a student does not know English and Hindi, it is very difficult to translate a passage of English into Hindi or to shorten lengthy passage or to extend a very short idea.
  - If a student does not know about mass and volume, he can not establish the relationship between mass and volume (to define density and relative density).
  - From the above two examples we can draw the conclusion that comprehension or understanding comes after recall or recognition of the subject matter.
  - If a student does not know and understand Archimedes’ principle, he cannot answer the question “why does a small needle of iron sink into water while a ship made up of iron does not?”

From these examples we come to the application of knowledge.

From the above three examples now we can safely draw the conclusion that

![Knowledge - Understanding - Application](image)

This process means that objective classification is cumulative in nature.

You might have marked the differences in Bloom’s taxonomy in the behaviour of an individual. Behaviour is classified into three main categories which are technically called domains. These are:

- **Cognitive domain/objectives**
- **Affective domain/objectives**
- **Psychomotor domain/objectives**

Let us discuss each of these domains in some detail.

### 6.4.1 Cognitive Domain

Cognitive domain is the most central in formal education. Cognitive objectives relate to the processing of information by the student. These objectives specify what students will be able to do intellectually as a result of instruction. Such outcomes of instructional range from recall/recognition of facts to the complex process of evaluation. Thus cognitive domain includes those objectives which deal with recall and recognition of facts and the development of various intellectual abilities and skills.
The cognitive domain may be presented in the following hierarchical order:

- Knowledge
- Understanding or comprehension
- Application
- Analysis
- Synthesis
- Evaluation

i) Knowledge: It is the lowest level in the cognitive domain. Knowledge involves the recall of terms, concepts, processes, methods, principles, generalizations leading to theories, etc. The basic psychological process used is remembering. This is distinguished from the remaining five categories, because they require an organised mode of operations and generalised techniques for dealing with materials and problems. To achieve knowledge objectives, the students should possess knowledge of specifics, methodology, and abstractions. Let us elaborate these three expressions with the help of illustrations. Readings, seminars, panel discussions, interviews, field trips, etc., can be the effective teaching strategies to achieve knowledge objectives.

   a) Knowledge of specifics: It involves the recall and recognition of symbols, terms, facts, concepts, principles, events, places, e.g., what is Archimedes’ Principle? or who discovered America?

   b) Knowledge of methodology: It involves the ways and means of organising, studying and judging about the correctness of the process, e.g., to prepare carbon dioxide in the laboratory; to verify Archimedes’ Principle, etc.

   c) Knowledge of abstractions: It involves knowledge of structure of theories or generalisation or principles, e.g., Archimedes’ Principle is based on upward thrust of liquids; specific gravity has no units, it is merely a ratio.

ii) Comprehension: This is the next category in the hierarchical order of cognitive objectives. One step above knowledge is comprehension or understanding. At this stage the student is expected to have full idea about the facts, materials, etc. Comprehension objectives will be achieved if the students are capable of translating, interpreting or extrapolating the events, concepts, principles, etc. The most common strategies for teaching at the comprehension level are summarising, questioning and answering questions on content, laboratory work, group discussions, etc. Let us elaborate these three expressions used in our discussion.

   a) Translation: At this level the student should be capable of translating symbolic notions into verbal expressions and verbal expressions into symbolic notions. For example, the density of a matter is equal to the mass of a unit volume of that vary matter. This can be also be written as \( D = \frac{M}{V} \) where \( D \) = density of the matter, \( M \) = mass of the matter and \( V \) = volume of the matter. Similarly a written piece of English can be translated into Hindi and vice-versa.

   b) Interpretation: Here the student should be able to give meaning to a particular idea in his own words. Interpretation involves reordering or rearranging an idea, concept, etc. For example, the students can explain the concept of truth and citizen.

   c) Extrapolation: It involves the extension of an idea or piece of work without sacrificing the original theme of the work. It is concerned with implications, consequences, corollaries of a fact, idea, concept, etc. For example, to discuss the meaning of education; to discuss in detail the meaning of truth or good citizenship, etc.

iii) Application: This is the third stage in the hierarchical order in cognitive domain. At this level the students should be able to use the knowledge or understanding of facts and principles in new situations. In other words, the students should be able to use or relate knowledge gained (ideas, procedures, principles or theory) in solving new problems. For example, a very small needle sinks in water while a huge ship easily floats in water. Why?
Application type learning/objectives can be achieved through discussions, laboratory work, role plays, examples, individual projects, practice with correction, simulation, etc.

iv) Analysis: This category expects the student to break down information or problem into its constituent parts such that each part is understood and/or relationship between parts becomes explicit. It includes analysis of elements, analysis of relationships and analysis of organisational principles. Let us elaborate these three expressions for better comprehension.

a) Analysis of elements: It involves the identification of elements included in a particular problem. For instance, simple interest (SI) = \( \frac{P \times R \times T}{100} \) i.e. SI depends upon principal amount (P), rate of interest (R) and the time (T) for which money is lent by an individual. The student should know the components/elements of simple interest.

b) Analysis of relationships: At this stage the student is expected to know how the elements identified are related to the problem, idea or thought and also to each other. For example, simple interest is positively related to principal, rate and time.

c) Analysis of organisational principles: It involves the organisation, systematic arrangement and structuring of the principle(s) involved in the problem. For example, compound interest means simple interest automatically converted into principal and added to the amount wherein interest begins to earn interest, and this process continues. The formula for compound interest (C.I) = \( P \left(1 + \frac{r}{100}\right)^n - P \)

where \( P = \) principal amount, \( r = \) rate of interest, \( n = \) period for which it is to be calculated.

Analysis objectives can be achieved through asking probing questions (compare, contrast, what, if, why), case study, critiques, group discussion, etc.

v) Synthesis: Synthesis can be defined as the ability of putting together elements or parts of a concept, arranging and combining them so as to form a whole. It has elements of creativeness. This objective has three categories which are as follows:

a) Production of unique communication: It involves the development of communication in which the teacher or student attempts to convey ideas, or experiences to others. For example, ability to convey the idea of good citizenship.

b) Production of a plan or proposed set of operations: This involves the development of a plan of work or the proposal of a plan of operation to satisfy the requirements of the task to be performed. For example, preparation of carbon dioxide in the laboratory implies setting up apparatus, using chemicals and applying appropriate methodology. All the three combined together can enable preparation of carbon dioxide in the laboratory.

c) Derivation of a set of abstract relations: It includes the development of a set of abstract relations either to classify or explain particular data or phenomena in symbolic form. For instance, the relationship of electrons, protons and neutrons of an atom. The structure of the atom, for example, is an abstract idea.

\[ p = \text{Protons} \]
\[ n = \text{Neutrons} \]
\[ e = \text{Electrons} \]

\( \text{Fig. 6.2 : Atomic Structure of Oxygen.} \)

An atom is a very small particle of matter which is not visible by the naked eye or even through a microscope. An atom has its own structure and parts. We can present an atom in a figural
pattern before the students. The figure will present the relationship or an arrangement of electrons, protons and neutrons of an atom.

Synthesis objectives can be achieved through relational questions (what is the relationship between .......), essay, report writing, presentation, etc.

vi) Evaluation; This is the highest category of objectives in the cognitive domain. Evaluation is defined as making qualitative and quantitative judgements about the value of ideas, works, solutions, methods, materials, etc. It involves the use of criteria as well as standards for appraising the extent to which particular ideas or solutions are accurate, effective, economical and satisfying. The judgement may be either quantitative or qualitative. Evaluation objectives can be achieved through written and oral critiques, testing and interpretation, debates, etc. There are two components in evaluation objectives:

Judgement in terms of internal evidence: It is based on the logical accuracy, consistency and other internal criteria. For instance, logical lapses in the structure of a story would lower its evaluation.

Judgement in terms of external criteria: It includes the evaluation of material with reference to scientific, social and economical standards. For instance, zero temperature of water or height of Everest is 8848. Temperature is measured as the freezing point of water, while the height is measured from the mean sea level.

6.4.2 Affective Domain

Objectives in this domain concern feelings and attitudes that students are expected to develop as a result of instruction. There is no doubt that a lot of confusion prevails with regard to the statement of objectives in affective domain, as compared to the cognitive domain. Terms like interest, appreciation, values, attitudes, etc., give varying shades of meaning. The objectives relating to these characteristics are hard to define and hence to achieve. Affective learning is not completely separable from cognitive learning. Students invariably think about their feelings and attitudes when they learn various categories of affective domain which have been briefly discussed below. As in cognitive domain, each category of affective domain is more abstract and complex than the preceding one.

i) Receiving (attending and awareness): This is the first and the lowest level of the objectives under affective domain. At this level, we are concerned with the student's sensitivity to certain stimuli; that is, whether (s)he is willing to receive or attend to the stimuli. It is like a teacher catching students' attention. Awareness about the information, willingness to receive the information and the selective nature of attention are the important levels of receiving. These levels are responsible for making students learning-oriented.

ii) Responding (acting, feelings, movement and change): It is the next higher level to simple awareness or attention. This category implies 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. Interest in turn is evidenced at three levels:

(a) Compliance when expected. For example, willingness to comply with health rules.
(b) Voluntary response. For example, the student takes care of his health and that of others too.
(c) Response with emotional pleasure. For example, the student feels satisfaction in looking after sick persons.

iii) Valuing (worth, utility and cause-effect relationship): This is the third level under affective domain and implies commitment to certain ideals or values. This objective includes development of attitudes. For example, the development of scientific attitude plays a role in developing a preference for information acquired from empirical evidence rather than opinions of other people, a disregard for superstition, willingness to suspend judgement until there is ample evidence to make a judgement, etc. These attitudes are the stuff from which the conscience of an individual is developed for control of behaviour.

iv) Organisation (judging, integrating and categorising): This level pertains to building a system of values. At this level, values are conceptualized and conflicts between the values are resolved and interrelationships are established. This level of affective behaviour
involves the cognitive behaviours of analysis and synthesis. Development of one’s own code of conduct or standard of public life is an example of the organisation of a value system.

v) Characterisation (sustained use of new values and expressions of commitment): Characterisation by a value and set of values is at the top of affective domain. It regulates a person’s behaviour through certain values, ideas or beliefs and the integration of values and attitudes into a world view or total philosophy of life of his own.

The taxonomy of the affective domain may not appear quite hierarchical. But nevertheless the categories become increasingly complex as we move from receiving to characterisation. This is not only a taxonomical consideration but also a useful educational principle.

6.4.3 Psychomotor Domain

The psychomotor domain is based on the concept of coordination among various organs of the body. This domain includes muscular action and neuromuscular coordination. Educational objectives in this domain aim at developing proficiency in performing certain acts by effecting the best possible coordination between psychic and muscular action and also between different muscular actions performed by various parts of the body. In this domain, learning depends on mastery of a physical skill. Learning to hold a pencil, play the piano, operate a machine, etc., all depend on manipulative and motor skills. As the level of coordination goes up, the action becomes more refined and automatic. In this domain five broad categories have been identified by Dr. R.H. Dave (1968) of NCERT. These are as follows:

i) Imitation: Imitation is the lowest level of the objectives in the psychomotor domain. When the student is exposed to an observable action, (s)he begins to make a covert imitation of the action. Imitation begins with inner rehearsal of the muscular system guided by an inner push or an impulse to imitate action. Such covert behaviour appears to be the starting point in the growth of psychomotor skill. This is then followed by overt performance of an act and the capacity to repeat it. The performance however lacks neuromuscular coordination or control, and hence it is generally in a crude form.

ii) Manipulation: Manipulation is the next higher level of behaviour in psychomotor domain. At this level, the student should be capable of performing an act according to instructions rather than just on basis of observation as is the case at the level of imitation. S/He begins to differentiate between one set of act from another and is able to select the required act. S/He begins to attain skill in manipulating chosen elements. With sufficient practice of selected action, s/he gradually moves towards the fixation of action. At this level the performance is fairly well set. That is to say, the act is performed with relatively greater ease, though with certain amount of consciousness. The response is not automatic at this level.

iii) Precision: At the level of precision, the proficiency of performance reaches a higher level of refinement in reproducing a given act. The accuracy and exactness in performance become significant. The student does not need a model to reproduce or to guide his/her action. He is able to increase or decrease the speed of the action and introduce several variations according to specific requirements of different situations. Performance at this stage is accompanied by confidence and also by conscious vigilance.

iv) Articulation: This category of behaviour emphasizes the coordination of a series of acts by establishing an appropriate sequence and accomplishing harmony or internal consistency among different acts. In many practical situations, as you know, not one but several acts are to be performed and different parts of the body are involved. The student becomes able to perform them in a harmonious manner with appropriate articulation in terms of time, speed, and other relevant variables. He develops proficiency in performing a number of related acts simultaneously and sequentially and thereby can produce the desired effect.

v) Naturalisation: This is the highest level of behaviour in the psychomotor domain. This category refers to naturalization of the single act or a series of articulated acts. At this stage, the skill of performance attains its highest level of proficiency and the act is performed with the least expenditure of psychic energy. The act is routinized to such an extent that it results in an automatic and spontaneous response. Ultimately, it is automatized to the extent that it is carried out unconsciously. The student does not even know that the act is being performed, until he is obstructed or severely disturbed. In other words, the habit of performance becomes his second nature.
Interrelation between different domains: The tripartite division into domains is not watertight or mutually exclusive. You might have noticed that the three categories of objectives — cognitive, affective and psychomotor — are interrelated. One cannot play the piano without knowing the rules (cognitive) and without having a desire (affective) to be a good musician (piano player). Similarly, understanding (comprehension) may be a prerequisite for attaching proper value to an object or proper cognition may be necessary for arousing proper interest. Interest and attitude affect the quality of performance in both cognitive and psychomotor domains. You may find some degree of parallelism in terms of readiness for and relationship between various categories. Lower levels of objectives in each domain draw relatively closer to each other e.g. knowing, receiving and imitating are dependent on each other. In higher categories too there exists a distinct parallelism. But a category of one domain may correspond to a number of categories of the other domain e.g. a skill may depend on the cognitive domain (knowing understanding, application, as well as interest and attitude).

Recently the statement of objectives in behavioural, or performance terms i.e. in terms of expected terminal behaviour of the students has received renewed attention. For example, Mager’s (1962) and Miller’s (1962) works are devoted entirely to writing good performance objectives. Mager’s work is devoted to the cognitive and affective domains, while Miller worked on the psychomotor domain.

Check Your Progress 4
Notes:  
a) Write your answers in the space given below.  
b) Compare your answers with those given at the end of the unit.

Classify the following objectives in terms of domain and type.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Domain</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) List major events during the reign of Akbar</td>
<td>Cognitive</td>
<td></td>
</tr>
<tr>
<td>ii) Cite some features of ancient and modern education</td>
<td>Cognitive</td>
<td></td>
</tr>
<tr>
<td>iii) Play badminton effortlessly</td>
<td>Psychomotor</td>
<td></td>
</tr>
<tr>
<td>iv) Do additional work in the area of interest</td>
<td>Cognitive</td>
<td></td>
</tr>
<tr>
<td>v) Type on a Hindi typewriter with not more than 30% errors</td>
<td>Psychomotor</td>
<td></td>
</tr>
<tr>
<td>vi) Evaluate a poem on the basis of the given criteria.</td>
<td>Cognitive</td>
<td></td>
</tr>
</tbody>
</table>

Robert Mager’s approach for writing instructional objectives:
Mager has suggested three steps (or components) of writing performance objectives. They are:

- Decide what the student will be able to do at the end of the learning activity.
- Decide under what conditions the behaviour will be developed i.e. indicate the condition(s) under which the behaviour will be observed.
- Decide what will be the expected level of performance i.e. indicate how will the student be expected to perform.

We can elaborate these steps with the help of the following example

‘At the end of the lesson “the student should be able to identify” at least five constellations in the sky at night, with the help of a star chart as a guide.’

The above statement fulfills all the three characteristics of a good behavioural objective. Conditions one and three of writing acceptable behavioural objectives are fulfilled by the first half of the statement i.e. the student should be able to identify at least five constellations. The second condition is fulfilled by the later half of the statement i.e. in the night sky, with the help of a star chart as a guide.

Mager’s approach has adopted the Bloom’s taxonomy of objectives as the basis for writing worthwhile objectives. He has sought the help of associated action verbs for stating different objectives. Only those verbs should be used which are direct and unambiguous. The following list of verbs will help you understand and formulate acceptable behavioural objectives.
Verbs open to many interpretations (to be avoided)
- to know
- to understand
- to really understand
- to appreciate
- to fully appreciate
- to grasp the significance of
- to enjoy
- to believe
- to have faith in
- to respect

Verbs open to proper interpretations (to be used)
- to write
- to recite
- to identify
- to differentiate
- to solve
- to construct
- to list
- to compare
- to contrast
- to grasp

Robert Miller's approach for task description: Miller's method of task description is somewhat difficult to describe because it is a product of research on training process in the Air Force and has not been fully adopted to the school setting. According to Miller, there are three elements that are essential in any task description:

- Indication i.e. the task which calls for a response. In psychology we call this the stimulus or the stimulus condition.
- Activation i.e. the response to be made.
- Feedback i.e. information on the adequacy of the response.

Let us understand these elements with help of the following examples:

- When the traffic light turns green, the driver accelerates the car; the car moves across the cross-walk into the intersection.
- Given the printed instruction subtract any two integers. The student writes the symbol representing their difference.

Now let us analysis the above examples:

Stimulus (indication) – Traffic light turning green,
- Printed instruction and the two integers.
Activation – The driver accelerates the car,
- The student writes the symbol.
Feedback – Proper movement of the car forward over the cross-walk and into the intersection.
- The correct answer (in whatever form is given) furnishes the necessary feedback.

Check Your Progress 5
Notes:  a) Write your answer in the space given below.
       b) Compare your answer with the one given at the end of the unit.
How do instructional objectives help in planning/designing curriculum and other activities?
6.5 OBJECTIVES AND SYSTEMATIC INSTRUCTION

Here we want to emphasise the mental process and the selection of the content so as to achieve the objectives i.e. the modification of behaviour or learning taking place in the students. For example:

i) Topic : Fundamental Rights
   Subject - Civics
   Objectives - Mental processes
   - Students are able to recall the meaning of fundamental rights – knowledge – recall or recognition.
   - Students are able to infer about the fundamental rights from various activities of a citizen Understanding – discriminate.
   - Students are able to analyse fundamental rights from various activities of a citizen Application-Infer.
   - Students are able to analyse Fundamental Rights into its types and elements Creativity – analyse.

ii) Subject – Science
    Objective – Mental processes
    - Students can define density (knowledge - recall/recognition).
    - Students describe the relationship between mass and volume – Application – relationship.
    - Students will explain why a coin made up of metal sinks in water but floats on mercury. Application – reason out.
    - Students can analyse the density of a matter – Creativity – analyse.

iii) Subject - Geography
    Objective - Mental processes
    - Students can define climate Knowledge – recall.
    - Students can discriminate between climate and season Understanding – discriminate.
    - Students can predict the climate of a particular place on the basis of data related to that place Application – predict.
    - Students can analyse a given climate into its components Creativity – analyse.

The main advantages of stating objectives in behavioural terms are as follows:
- teaching activities/learning experiences are determined and delimited;
- teaching-learning process may be integrated for effective learning outcomes;
- appropriate teaching strategies and tactics can be selected for effective learning;
- teaching and learning can be made objectives - centred i.e. outcomes - oriented;
- evaluation procedure can be objective based.

Fig.6.3 : The Teaching Learning Process.
Thus we may conclude that the statement of objectives in behavioural terms helps in
integrating the teaching-learning process for effective learning outcomes, leading to
systematization of instruction. The interaction process in teaching-learning can be represented
as follows:

Classification of objectives according to RIEM system: The teachers of Regional Institute
of Education, Mysore, (RIEM) worked out a very systematic approach to writing objectives.
They converted Bloom’s cognitive system into four categories and these four categories were
further divided into seventeen mental abilities or processes. These are given below:

Comparison of Bloom’s Cognitive System and RIEM System of Objectives

<table>
<thead>
<tr>
<th>Bloom’s Cognitive System</th>
<th>RIEM System</th>
<th>Mental Processes or Abilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Knowledge</td>
<td>Recall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recognition</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Understanding</td>
<td>See relationship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cite examples</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discriminate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Classify</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interpret</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Verify</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Generalise</td>
</tr>
<tr>
<td>Application</td>
<td>Application</td>
<td>Reason out</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Formulate hypotheses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establish hypotheses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Infer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Predict</td>
</tr>
<tr>
<td>Analysis</td>
<td>Creativity</td>
<td>Analyse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Synthesise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Evaluate</td>
</tr>
</tbody>
</table>

Check Your Progress 6

Notes:  

a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

Discuss the role of instructional objectives in systematic instructions.

6.6 LET US SUM UP

Instructional objectives are the milestones to achieving the ultimate goal of education. In the
light of the objectives, the teacher tries to modify the students’ behaviour with the help of tools
(i.e. curriculum and other pedagogic activities) in the desired direction and ultimately the
around development of their personality takes place. This, as you know, is the ultimate goal of
education in every society.

The basis for the formation of objectives are many and varied. Knowledge, individual’s needs
and society’s priorities are the main sources for formulation of instructional objectives. It is
essential to classify the objectives so that we may understand and use them properly and
achieve the ultimate goal of education. Bloom classified human behaviour into three domains:
cognitive, affective and psychomotor. There are other approaches to specifying objectives in
behavioural terms. You have studied the Mager’s, Miller’s and the RIEM approaches to identifying and stating objectives in terms of learning outcomes. The statement of objectives in behavioural terms help in integrating the teaching-learning process for effective education.

6.7 UNIT-END EXERCISES

1. Give at least three objectives from cognitive system, two from affective system and one from psychomotor system with their behavioural changes.

2. What do you think if a student completely absorbs himself in solving mathematical problems? Answer in terms of objectives.

3. Which type of do speed, accuracy and practice come under behavioural aspect. Answer with examples.

6.8 ANSWERS TO CHECK YOUR PROGRESS

1) Instructional objectives are the milestones to achieving the ultimate goals of education through curricular and other activities. In other words, objectives are intents communicated by a statement describing a proposed change in the students’ behaviour.

2) The difference between instructional objectives and behavioural objectives are as follows:

   An instructional objective is an 'intent communicated by a statement describing a proposed change in the learner' e.g. knowledge, understanding, application, skill, interest appreciation, attitude, etc.

   In behavioural objectives the emphasis is not on the statement but on the mental activity. These are described by action verbs e.g. to recall, to recognise, to translate, to interpret, to solve, to analyse, to criticise, etc.

3) a) Your answers might have included some of the following advantages:

   - Objectives provide specific direction to teaching – learning activities
   - Objectives decide the scope and nature of learning experience
   - Objectives help systematise and plan an educational programme
   - Objectives guide educational decisions – curriculum and co-curricular
   - Objectives help decide valid evaluation technique(s)
   - Objectives make learning functional

   b) Limitations of objectives: Your answer should include some of the following points:

   - There are varied sources of objectives.
   - Identification and formulation of objectives differs from individual to individual (difference in priorities).
   - Objectives are given in the form of end-products and the end-products are affected by the change in an individual’s behaviour from situation to situation.
   - Objectives can be vague and overlapping.
   - It is very difficult to develop a curriculum according to objectives.
   - Framing of objective-based items for evaluation is also a difficult task.

4) i) Cognitive – Knowledge
   ii) Cognitive – Comprehension
   iii) Psychomotor – Naturalisation
   iv) Affective – Responding
   v) Psychomotor – Manipulation
   vi) Cognitive – Evaluation
5) Your answer should include most of the following points:

Instructional objectives
- provide direction to an educational activity
- help distinguish between various aspects of learning
- focus attention on proper attributes of learning and instruction
- guide educational decisions regarding curricular and co-curricular activities
- guide in the selection of relevant content
- are helpful in improvement of education
- help discover proper learning situations
- help fix priorities in an educational programme
- provide unity to an educational programme
- make learning functional, and
- help define educational process in totality.

6) Your answer should include the following points as far as possible:
- Teaching activities are determined and delimited.
- Teaching and learning process may be integrated through effective learning outcomes.
- Appropriate teaching strategies and tactics can be selected for effective learning.
- Teaching and learning can be made objectives-centred.
- Testing can be made objectives-centred.

6.9 SUGGESTED READINGS


